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Established 1882

Vol. VII.—No. 10.

1888. OTTAWA, OCTOBER 1888.

Vol. VII. No. 10

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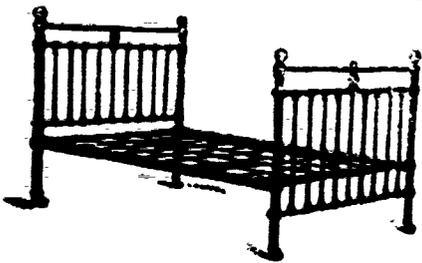
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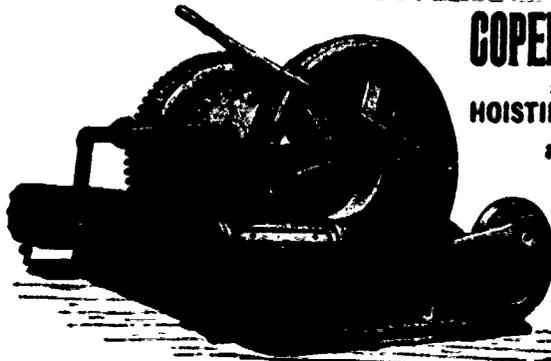


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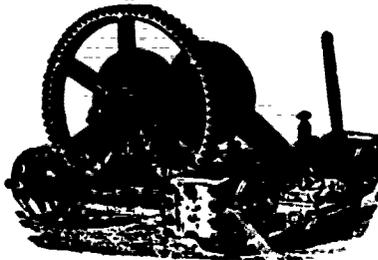
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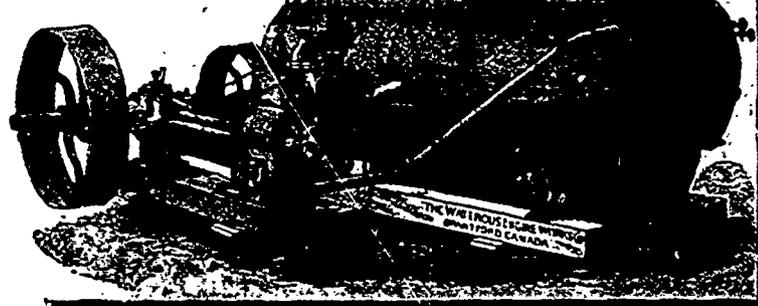
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Cost of Quarrying.—From a paper upon the cost of excavating and handling rock, read recently before the Western Pennsylvania Mining Institute, we excerpt the following:—"The average weight of a cubic yard of sandstone or conglomerate in place is given as 1.8 tons, and of compact granite, gneiss, limestone, or marble two tons, or an average of 1.9 tons, or 4,256 pounds. A cubic yard when broken up ready for removal increases about four-fifths in bulk, and one-fourteenth of a cubic yard, or 177 pounds is a wheelbarrow load. Experience shows that with wages at \$1 per day of ten hours, 25 cents per cubic yard is sufficient allowance for loosening hard rock. Soft shales and allied rocks may be loosened by pick and plow at a cost of 20 cents to 30 cents per cubic yard. The quarrying of ordinary hard rock requires from 1/3 pound to 1/2 pound, and sometimes 2/3 pound, of powder per cubic yard. Drilling with a churn driller costs from 12 to 18 cents per foot of hole bored. Upon these data Mr. Rigby estimates the total cost per cubic yard of rock in place, for loosening and removing by wheelbarrow (labor assumed at \$1 per day of 10 hours), as follows: When distance removed is 25 feet total cost equals \$0.537, when 50 feet \$0.549, when 100 feet \$0.573, when 200 feet \$0.622, when 500 feet \$0.768, when 1,000 feet \$1.011, and when 1,800 feet \$1.401. This is exclusive of contractor's profit.

When labor is \$1.25 per day, add 25 per cent. to the cost prices given; when \$1.50 per day, add 50 per cent., and so on. In hauling by cart, the cost of loading, which will be about 8 cents per cubic yard of rock in place, and the additional expense of maintaining the road, must be added. Allowing, then, \$51 pounds as a cart load, the total cost per cubic yard is estimated, when removed 25 feet, at \$0.596, when 50 feet at \$0.599, when 100 feet \$0.605, when 200 feet \$0.617, when 500 feet \$0.655, when 1,000 feet \$0.717, and when 1,800 feet \$0.940.

A New Calculating Machine.—One of the most ingenious of recent American inventions is a calculating machine called "The Comptometer." It is the work of a resident of Chicago and with its aid the most complicated mathematical computations can be made with great accuracy, ease and swiftness. The instrument is 14 1/2 in. long, 7 1/2 in. wide, 5 in. high, and weighs 8 lbs. It can be placed upon an ordinary table. It differs from all other machines of this character, as it can be worked with type writer keyboard. This machine performs large multiplications in a second of time. It was recently tried by the official experts at the Treasury at Washington. Various examples not previously known to the inventor were given to him for the testing of his apparatus, as well as to experts detailed from the treasury. The machine always surpassed the experts in speed and was invariably correct. The inventor was given an example like the following:—Suppose you bring £234 from England to New York, where the rate of exchange is 4-84 1/2 dols., what is the American value of your money? In one second of time this marvellous calculating machine recorded the correct answer of 1,134-60 1/2 dols.

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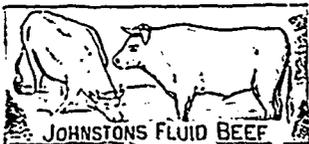
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Terrible Experience of Miners Shut up in a Coal Mine.—Last month two men employed at the Draper Colliery, Gilberton, Pa., had a very trying experience by being "closed in" by a fall for a period of about twelve hours, most of which time they were in doubt as to whether they would be rescued. The men were engaged in robbing a pillar and were at the face of the workings when a fall behind them closed the breast and cut them from the gangway. This occurred about 9 o'clock in the morning, but the fact that the men were closed in was not discovered until 4 in the afternoon. Mine Inspector Stein happened to arrive at the colliery about the time the discovery was made and at the risk of his life went into the workings adjacent to where the men were entombed and discovered that they were living and well, but without light. He remained and directed the work of rescuing the men from their perilous position, which was accomplished about three hours later at the risk of the lives of the force of about 30 men who took part in the work. During their imprisonment the men cut a heading four feet long into a pillar, into which they went for safety. Most of the work was performed in the dark as their light became extinguished for want of oil soon after the fall occurred. The men say they had a terrible experience.

The Great Explosives.—The composition of some of the modern high explosives is as follows:—Dynamite—75 parts of nitro-glycerine and 25 of infusorial earth. Dualine—80 parts nitro-glycerine and 20 of nitro-cellulose or gun cotton. Rendrock—40 parts of nitro-glycerine, 40 nitrate of potash or soda, 13 of cellulose and 7 of paraffine. Giant powder—36 parts of nitro-glycerine, 48 of nitrate of potash or soda, 8 of sulphur and 8 of resin or charcoal. Mica powder—52 parts of nitro-glycerine and 48 of pulverized mica. Tonite—52½ parts of gun cotton and 47½ of nitrate of baryta. Blasting gelatine—82 parts of nitro-glycerine and 8 of gun cotton. Atlas powder—75 parts of nitro-glycerine, 21 of wood fiber, 5 of carbonate of magnesia and 2 of nitrate of soda. Rackarock—77.7 parts of chloride of potash and 22.3 of nitro-benzol.

The Transvaal Gold Output.—For the Witwatersrand district as reported by the local newspaper, to include July, has been as follows:

	Ounces.	Value.
January.....	11,239	\$197,557 50
February.....	12,069	212,957 50
March.....	14,706	257,355 00
April.....	15,553	267,427 50
May.....	19,022	332,535 00
June.....	16,318	269,297 00
July.....	19,963	349,352 59

Total of district.....\$1,836,432 00
Monthly average..... 269,490 28

For the same period the product of the De-Kuap field was 109,242 ounces worth, say, \$1,738,114.

Mineral Production of France.—Provisional returns of the mineral production of France in the first six months of the year give the output of coal, including anthracite and lignite, at 11,077,721 tons, an increase of 798,734 tons as compared with the same period of 1887. The production of pig iron was 821,824 tons in 1888, and 764,643 tons last year; of wrought iron, 428,076 tons, and 378,897 tons in the two years respectively; and of steel, 239,624 tons and 240,313 tons.

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Manager.

The Canadian Mining Review

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Mineral Wealth of the Great Mackenzie Basin.

The report of the select committee of the Senate appointed to enquire into the resources of the Great Mackenzie Basin has appeared in the form of a blue book, containing a large amount of very valuable information regarding a comparatively unknown district of Canada. That part of the report which principally concerns the readers of the CANADIAN MINING REVIEW, however, is the space devoted to minerals and mines. The evidence on this point given before the committee shows that very little is known of the mining capabilities or of the minerals of the district east of the Mackenzie River and north of the Great Slave Lake. But from the evidence elicited respecting the country west of the Mackenzie, and of the rivers there joining it, the Peace and the Liard, the fact appears that there are between 150,000 and 200,000 square miles of territory which may be considered auriferous. In addition to this, west of the Rocky Mountains gold bearing rocks are met with over an area some 1300 miles long with an average breadth of from four to five hundred miles. Gold, the report says, has also been found on the west shore of Hudson Bay. On the upper waters of the Liard and Peace rivers silver exists, and on the Coppermine River, the very name of which is significant, copper is found. Through the same section of country iron, graphite, mica, gypsum and asphaltum are found, while the petroleum area is so extensive as to justify the belief that the main supply of this article for the whole northern part of America will be produced there, and that shipments of it to Great Britain and Europe will eventually contribute a large part of the ocean traffic which sooner or later must come in and go out via Hudson Bay and Straits.

Salt is found quite extensively in some parts in a pure state, and in others in crystals equal in purity to the best salt rock and in highly saline springs. A curious feature in this connection is the fact that petroleum and salt deposits occur mainly near the line of division between deep water navigation and that fitted for lighter draft vessels, thus giving them possibly a greater commercial value. The report, in speaking of the coal and lignite deposits of the district, says that when the time comes for reducing the iron ores of the Mackenzie Basin, and the transportation of its products by steam sea-going or river vessels, this fuel will be found to be of great value.

Although some years may elapse before the district referred to becomes part of the inhabit-

ed area of Canada, it is some satisfaction to know that there is evidence of abundant mineral wealth there, and that a source of fuel, especially valuable to northern climates, is available for years to come. Judging from analogy, the Mackenzie River Basin will be to Canada what Siberia is to Russia; and as the climate of Siberia has been erroneously recorded as the extreme of cold, although really much like Canada as a whole, so our great north-western river basin will be found correspondingly suitable for settlement, and its mineral wealth will probably be the inducement that will first draw a resident white population.

Minerals and Revenue. — Sales and Lease Systems.

According to the report of the mining statistics branch of the Geological Survey of Canada, the total mineral production of the Dominion may be estimated at \$15,000,000 for 1887. If all this mineral wealth was made a revenue producing power, as is done in the Provinces of Nova Scotia and British Columbia, at say a rate of Lease or Royalty of five per cent, the total income would be \$750,000, which for purposes of illustration of the benefit that can be derived from this source might be portioned out as follows:

Nova Scotia,	£100,000
New Brunswick	100,000
Quebec,	100,000
Ontario,	100,000
Manitoba	100,000
North West Territories ..	100,000
British Columbia	100,000
Geological Survey	50,000
	\$750,000

In practice, however, under the Lease or Royalty System:— Nova Scotia receives yearly \$120,000, and British Columbia receives yearly \$60,000 to \$70,000, amounts that are yearly on the increase, while under the policy of the sale of minerals, as practiced by the other governments, who at present do not seem to regard our mineral wealth as a revenue producing power, this increase does not take place, as the capital or revenue producing power passes from government control and the compulsory condition of development or working is optional with the purchaser. It is true that some revenue is received from the Sales system but it is not equal, nor can it be compared to the ever increasing revenue that would accrue from Lease or Royalty, with a compulsory condition of yearly and continuous development. Hence it is that holding mineral lands on speculation is the rule under the sale system, and working towards national development, is the system under Lease or Royalty, and as the latter is the British Crown Lands Policy, it ought to be worthy of example for all colonies claiming a loyal allegiance to British laws and customs. The

system of reservation for a time, and then letting the minerals pass from Government or State control, is the United States system, and works well enough so long as development goes on, but that being optional with the owner, after the government has parted with it, work is not in all cases carried on, and interests are bought up to control a section of country, or class of mineral and this unconstitutional tenure prevents others from acquiring the right to work old claims. This is now a cause of complaint in many parts of the Western States, but under the Lease or Royalty system work has to be done to hold the claim, and however small that may be, new discoveries are bound to be made. Under this system too, inspection is more easily enforced for the permanent and continuous working of mines and the securing of safety to the lives of miners, while litigation and costly law suits are the exception not the rule as in the present system of unconditional and irresponsible ownership. Under the Sales system a certain area is conveyed unconditionally, embracing other minerals than that for which it is purchased, and for which the owner has no use, or does not know the use, and these consequently remain unworked; but under the Lease system only the class or vein he discovers or acquires is leased, and any other minerals or veins can be worked or leased to others, and so it is that the largest possible amount of industry to the country is secured on this plan. In all countries where government control and inspection, with compulsory development on the Lease or Royalty system is in force there does mining flourish. As an example we might mention the State of Mexico, where minerals are made the chief source of revenue, under geological conditions similar to the Canadian Northwest, but not so favorable nor as good as regards climate and other conditions. If a policy of compulsory development was enforced, and it ought to be enforced, there can be no doubt of the future wealth and prosperity to be derived from our rich inheritance of mineral wealth in the Provinces of Ontario, Quebec, New Brunswick and the great Northwest Territories. We commend to the attention of our readers the able paper by Mr. Arthur Strauss, on "Foreign Mining Laws," reproduced in this issue of the REVIEW from the Transaction of the Mining Institute of Cornwall.

The Excelsior Copper Mining Co.

Cable advices from London announce the formation in that city of the Excelsior Mining Co. (Limited), with a capital of £450,000 sterling, shares of £1 each, to acquire and work the Harvey Hill Copper mines situated about seven miles from Broughton station on the Quebec Central Railway. The directors of the new corporation are: Lord Elphinston, London; Sir James Marshall, London; Col. Mattison, London; P. A. Appleyard, Vice-President Halifax Joint Stock Bank; with the Hon. H. Mercier,

Premier of the Province of Quebec; Hon. W. W. Lynch, Q.C., D.C.L., ex-Minister of Crown Lands, Province of Quebec, and J. W. Green-shields, Advocate and Crown Prosecutor, Mon-treal, Canadian directors. Mr. J. N. Green-shields, the vendor, receives £10,000. Applica-tions are invited for £150,000 shares. These mines were at one time extensively worked by the English and Canadian Mining Company and are situated on Lot 1, Range 15 of Leeds, County of Megantic, and are on an elevation of about 400 feet above the Broughton station of the Que. Central R.R. The road on which the principal buildings and the shops are built is on the brow of the hill at about 100 feet below the summit. The property comprises 2,800 acres in fee simple and 1301 acres of mining rights. Part of the lands are said to be good for farming and part are thickly wooded with birch, maple and spruce, of great value for building and for fuel. The copper ores at this locality occur both in courses of veins and in beds. The strata are here for the most part, finely micaceous slates, which from their unctuousity are often called talcose, but are generally not magnesian. The courses as described by Sir William Logan are really irregular and interrupted veins, which do not coincide with the strata either in dip or strike. The bearings of eight of them are from north, to N. 20° E., while others run nearly eastward. Their underlie is generally to the westward, at from fifty to nearly ninety degrees. These veins which appear to have filled up fissures in the slates, are more or less lenticular in shape. Some of them have been traced for as much as 100 fathoms on the surface and are occasionally six or seven feet wide in the thickest part, thin-ning out however, both horizontally and verti-cally. Assays have been made from various quantities of the ore as follows:

Messrs VIVIAN & SONS, Swansea (May 7, 1888)
 Metallic Copper..... 69 per cent.
 Silver..... 5 oz. to the ton.

ALSO
 Metallic Copper..... 56 per cent.
 Silver..... 5 oz. to the ton.

Messrs. JOHNSON, MATTHEW & Co., Assayers and Melters to the Bank of England, Her Majesty's Mint, &c. (June 23, 1888):—

	Sample No. 1.	Sample No. 3.
Copper.....	59.20	31.40
Iron.....	11.20	9.40
Lead.....	traces	nil
Bismuth.....	.20	.10
Manganese.....	nil	.30
Magnesia.....	.30	4.80
Lime.....	.11	10.60
Sulphur.....	21.90	13.40
Carbonic Acid.....	.30	15.20
Phosphorus.....	traces	traces
Silicious Insoluble Matter.....	2.10	12.60
Water.....	nil	.30
Silver Oxygen Loss.....	1.30	1.90

No. 1. Produce of Gold.....none. Silver.. 5 oz. 5 dwts.
 No. 3. Produce of Gold.....none. Silver.. 2 oz 10 dwts.
 Per ton of 20 cwts. of ore.

The property has been prospected on a large scale in by-gone years, as may be seen by the numerous surface openings, shafts, drifts and an adit. There are twelve shafts, four of which

have been recently worked along with the cross-cut or adit. For a description of these workings and their plant and machinery we cannot do better than quote the words of Mr. J. Obalski, Government Mining Engineer, of the Province of Quebec, who closely examined the property for the new company.

The American Shaft has a depth of 240 feet, is stro-gly timbered and covered over by a frame building 30 feet 6 inches by 25 feet 6 inches, with boiler house adjoining thereto, and is surrounded by a twelve feet high fence of one hundred feet by eighty feet area. The machinery there consists of a steam hoist and its boiler, and a Cameron Steam Pump. I descended and inspected the shaft. I found several quartz veins intersecting it about 100 feet from the surface. No drift-ing having been done thereon I could not judge of their importance. At the 240 feet level I found a drift 10 feet by 7 feet by 6 feet on the N. E. side. Therein was seen the beginning of a vein carrying copper ore, commonly known as "Grey Silver" ore. The vein at this point was about 2 inches, and now at a depth of twelve feet shews a width of eighteen inches, and carries the same rich copper ore throughout. This vein which dips westerly gives great promise of immediate good returns.

The Cross-cut or Adit.—I visited and inspected this for a distance of 900 feet from the entrance to the No. 2 Shaft, which is intersected by it. I found several quartz veins that would warrant being thoroughly prospected. At 247 feet from No. 1 Shaft I found two drifts, one running south-west the other north-east from the Adit. The north-east drift seems to have been cut a distance of sixty feet for the purpose of following a quartz vein. At the end of this drift a shaft has been sunk below the level of the Adit to a depth stated to be about 50 feet, and from information gathered from men who had worked therein it seems that ore was struck at its bottom. In the south-west drift which has been run on the same vein as in the other drift, drifting has been carried on for about sixty feet and it has been stoped out about 18 feet in height. The portion of this vein now in view shews rich "Copper glance" and "Erubescite". Much may be expected by sinking on this vein.

No. 2 Shaft: Stratified Bed, known as Bed Rock Ore:—I descended to the 90 feet level of this shaft and there found that the stratified bed had been stoped out on both sides of the shaft. On the N. E. side the stop-ping has been done for a distance of about 25 feet by 20 feet upwards on the bed for a height of six feet. The bed proper at that point averages about four feet and widens on the incline westwards. On the S. W. side the stoping has been done for a distance of sixty feet and about fifteen feet upwards on the bed to a height of twelve feet. The bed here shows rich copper ore for a height of about eight feet at the base of the stoping. On examining the side of the stope it shows plainly that the quality and quantity of the ore in the bed improves on its downward course. The bed seems to be the same as is met on the surface east of this No. 2 shaft. At about 500 feet westward of No. 2 shaft it seems that the bed has again been met in the Douglas Shaft at a depth of 86 feet, and likewise at the Kent Shaft which is 1020 feet westward, in the 120 feet level thereof. These two shafts being full of water I could not examine them, (see Sir Wm. E. Logan's report relative to the Kent Shaft). Ore found on the dump of the Douglas Shaft is of the purple variety. I also found in the 90 feet level of No. 2 shaft above the stratified bed and evidently running parallel thereto for a distance of about fifty feet, a quartz vein averaging one foot in thickness and carry-ing rich purple copper ore.

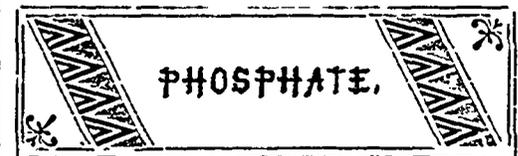
The McGee or Hill Shaft, and Poulin Shaft.— These shafts are situated about 400 feet west of the Kent Shaft—were formerly separate, but were recently con-nected by an 120 feet incline on the vein. The McGee is 23 feet and the Poulin is 32 feet in depth, the latter having been sunk lower down on the Hill is 29 feet lower than the McGee. The vein now to be seen at the bottom of the McGee shaft was traced and mined into prior to the sinking of the said shaft, for a distance of about forty feet, and in sinking the shaft on the incline the vein thinned out by a fault in the strata and the work was then abandoned. Last October Mr. Lionais, then proprietor, continued work on this vein and had been only a few days so engaged when the vein widened out and this incline was continued on the vein towards the Poulin, simultaneously with the sinking of the Pou-lin Shaft, and stoping from the Poulin towards the McGee. The Poulin Shaft at the time Mr. Lionais be-gan to sink it was only 27 feet deep, but after deepen-ing it some three feet the same vein which occurred in

the McGee was encountered and stoped on as above stated. The Poulin Shaft has now a depth of 32 feet, and shows besides the vein above mentioned, two other branch veins carrying rich purple ore. The vein now exposed, between the Poulin and McGee averages about four feet in thickness and is remarkably fine, showing fully one foot of solid copper ore, and the remainder of the vein matter rich in disseminated copper. The opera-tions in these shafts warrant great expectations and foremen miners of former companies agree in predicting most favorable results.

Besides the above mentioned works which I have in-spected, there are other shafts known under the names of the "Sayles," the "Kent," the Douglas, the "Freemont," the "Harvey Hill" and the "Whiteburn." These shafts are full of water but the timbering has been rebuilt recently and they all seem to be in good condition. From conver-sations with foremen miners who were in charge of these shafts they say that copper was found and taken out of all of them, with the exception of the "Whiteburn," which was sunk with the view of ventilating the "Fanny Eliza" Mine. The "Fanny Eliza" vein is said to have been one of the richest ever worked by the old com-pany. The rock is nearly everywhere sufficiently solid not to need timbering. Certain openings which I visited, and abandoned for over 20 years did not re-quire any timbering. Water is not abundant in the workings on account of the altitude of the Hill and was bailed out formerly by horses with whims. The con-ditions of the workings is therefore very good. Good miners, both English and French Canadians, can be had in the neighborhood. Around the mines on the Com-pany's property are to be found dwelling houses for Manager and workmen, workshops, forges, stables, scale building, one large engine and boiler house of stone and brick containing four boilers and a one hundred and fifty horse-power engine.

The "Fanny Eliza" vein now under water, which has been followed and stoped out for a distance of 1053 feet as shown on plans at the Mine is—as seen when the work was stopped by the old company—in a condition to be profitably worked.

The above remarks shew plainly that these are not accidental deposits, but are rather a wide field of fissures filled with mineral and interstratified beds. The sink-ings have not exceeded a vertical depth of 672 feet below the summit of the Hill, (Extremity of the incline on the Fanny Eliza) and 260 feet on the brow of the Hill. It seems therefore probable, and I have every reason to be-lieve that in sinking deeper, other veins and stratified beds may be encountered, and established by Assays of former and present outputs which show the ore to be remarkably rich and free from impurities. In looking over the Assay Book of the old Co., I find that the Assays of a great number of shipments of Bed Rock and vein ores give from 20% to 50% of metallic copper.



Shipments.

The following are the Shipments from Mont-real for month ending October 18th, 1888:—

Date.	Name of Vessel	Destina-tion.	Shippers.	Quan-tity.
S pt. 15	Marquis.....	Liverpool..	Lomer, Rohr & Co	50
21	Lake Huron..	do	Wilson & Green..	158
26	Emon.....	London..	do	250
..	do	do	Millar & Co.....	165
29	Ripon City..	do	Wilson & Green..	198
..	do	do	Millar & Co.....	170
Oct. 3	Oxenholme..	Liverpool..	Wilson & Green..	657
4	Creston.....	Hamburg..	do	165
10	Sarnia.....	Liverpool..	Lomer, Rohr & Co.	50
15	Orca.....	Hillegow..	do	211
15	do	do	Wilson & Green..	265
15	Lake Superior.	Liverpool..	do	221
18	Oregon.....	do	Lomer, Rohr & Co	190
			Total.....	2,580

RECAPITULATION.

SHIPPERS.	
Wilson & Green	2,024
Lomer, Rohr & Co.	520
Millar & Co.	295
DESTINATIONS.	
Liverpool	1,326
London	743
Hamburg	365
Glasgow	45

In General.

Messrs. Parent Bros., Montreal, will sell by auction on 15th Novem' er, a large number of phosphate lots making a total area of 5,000 acres, in the township of Portland West, the property of "La Compagnie Francaise des Phosphates du Canada."

Du Lievre.

Sir John Johnstone and Mr. W. W. Pickford (of Pickford and Winkfield, of London, Eng.) paid a visit during the month to the Little Rapids mines and expressed themselves as well pleased with the present appearance of the mines, and the large bodies of ore exposed. At present but a small force is employed, principally uncovering new shows and improving the property. 127 tons of high grade, consigned to Pickford & Winkfield, London, were shipped last month.

Latest advices are at the operations at the mines of the Canadian Phosphate Co. are as follows: **STAR HILL.**—The west sink of the big pit has been continued by hand and steam drilling through favourable looking pyroxene rock carrying small branches of apatite, and the management are expecting daily an improvement in the yield of phosphate. The last drift has been advanced to the south east, following a good course of phosphate, which holds out very fine and strong. This week's work has been chiefly hand drilling on the head drift, but a new steam drill was set working on the night of the 7th inst., being a little stiff at first and in consequence of the great distance from boiler (about 250 feet) the drill does not attain the duty which it should do, and to rectify this we have to put in a steam pipe of larger diameter. At west drift, now 20 feet, work continues in good phosphate ground and is now well under shelter for winter work. The east drift is also yielding its normal proportion of apatite. **McANDREW'S NEW OPENING.**—Work has been commenced by derrick and gives much promise of becoming a very important pit in future.—**NEW DUGWAY:** Steady work has been carried on here by a few men hand drilling and hoisting by horse derrick. This deposit improves as we uncover the face rock, and the quality and the massive character of the phosphate is the finest I have seen. We shall probably have an important pit here.—**LAPOINTE:** The northwest drift and stopes have been advanced under difficulties, but in splendid phosphate bearing ground during this week, the phosphate making upwards as well as down. With the difficulty to procure miners and hand drillers required for advancing the head drift, the steam drill has not been working advantageously. This is a very fine pit, but depreciated a little at present by the infiltration of water.—**BEAVER MEADOW:** The surface stripping has commenced on east of this pit by a team and a plough scraper working 1½ days, and labourers are now continuing to remove the overburden of gravel and boulders of which there is about 6 ft. to 7 ft. depth.—**NEW CUT:** Much dead work has been done here but the new ground opened up justifies our former good opinion and hopes of it. The present small output must not be regarded as a measure of the capacity of this working, since we are purposely leaving the phosphate in the bottom for the present, in preparing the disposition of the quarry for running a steam drill more advantageously as soon as we have a machine at our disposal. 4 steam hoisters on pits, 2 hoisters on tramways, 5 steam drills in constant operation, etc., may be mentioned as some of the machinery now in operation at the mines. Equipped with new boilers,

etc., the towing capacity of the "River Belle" now gives every satisfaction. A new boarding house, magazine store house, root house, stables and barn, manager's house and offices (which will include a chemical laboratory) are in course of erection and a number of new tenement houses will probably be erected during the winter.

Templeton District.

The North American Phosphate Company, with head offices at Montreal, has recently been formed to acquire and work phosphate lands in the Township of Templeton. The directors are:—Ex-Ald. Dupuis, President; Albert Holden, merchant, Montreal, Vice-President; Arthur Gagnon, financial agent, Montreal, Secretary-Treasurer; R. Prefontaine, Q.C., M.P., Chas. H. Walters, S. Lachance, all of Montreal, Directors; Arthur M. Perkins, Managing Director. The capital is \$18,000. The property includes lots 17 and 18 in the 8th, S½ of 18 and 19 in the 9th, and S½ of 18 and 19 in the 10th. An acre and a half has been stripped, and phosphate is at present being taken out of a small surface pit.

The Templeton and Blanche River Company of Montreal have suspended operations on their property for the present. Mr. Trimble, the managing director, was out at the mines lately taking an inventory of the plant, machinery, etc. We understand an endeavour will be made either to increase the capital stock of the company or to place it on the market.

Mr. Jackson Rue's mines are reported to be looking well, and a satisfactory output, with a small force, is being maintained. The new pit is down 40 feet and looks well. 150 tons have been shipped.

The Canada Industrial Company have 120 tons ready for shipment.

The new works at the Blackburn mines are nearing completion. The new cut is nearly through. The management have struck a vein going through, which is yielding largely. At present from 10 to 15 tons of ore per day is being mined.

Perth District.

Messrs. Taylor & Wilcox, of Cleveland, O., are reported to have made a large purchase of phosphate lands near Perth.



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.

With the closing of navigation the winter prospects of the Pictou coal mines are not very encouraging, the Springhill mines having secured the lion's share of the government contract, while the Intercolonial, Acadia, and Black Diamond companies have only secured some 15,000 tons each. This quantity will keep the Black Diamond mine pretty well employed as its daily output is small compared with that of the Intercolonial and Acadia Co's. mines.

The shipments from the Drummond have been exceptionally large despite the difficulties the management has had to contend with. It is doubtful whether operations will be continued

at their No. 4 slope during winter as preparatory work must be pushed forward at the New Lift. A little work has been done in the third seam discovered some time ago.

At the Albion every effort is being made to re-open the whole of their valuable mines. The new slope, the scene of the explosion in January last, is being successfully opened up, and the building of the new Bank House is being rapidly pushed forward. One of the engines has been placed in position, and a Dominion Safety boiler is about to be added to the boilers at present in use. At the Vale Colliery the six-foot seam has not been working for some time, but the old slope or "McBean" seam, has been working fairly well, and a new lift is now being sunk there which, when complete, will make that slope 3,000 feet deep.

The seam of coal discovered at Five Islands, Colchester County, and reported in a recent issue, proved to be but a few inches thick but of most excellent quality. Prospecting has been vigorously followed up by Mr. Wilkinson, with the result that he has discovered the outcrop of a larger seam although at the time of writing he had not got it sufficiently opened up to justify him in making a report. It is to be hoped that it will turn out well as the parties interested will spare no expense in development, and will make things "hum" in that part of Colchester County.

Work still keeps brisk at the Gowrie collieries, C. B. A large number of sailing vessels are calling for cargoes and fill up the interval between the arrival of the steamboats. The slack dump is on fire and causing trouble in keeping it from spreading. The shipments of slack have fallen off this year. Though the coke ovens consume large quantities there is scarcely room for the large quantity at present banked.

The reported sale of the Amherst coal property has no foundation in fact, and its announcement in the columns of the local newspapers has caused much annoyance to the parties interested.

From the prospectus of the Colchester Coal Mining Co. (Limited), which has been formed provisionally with a view to testing and developing what is believed to be a valuable coal deposit near Onslow, about eight miles from Truro, we learn that the following are the provisional directors:—Wm. S. Muir, M.D., of Truro, M.D., President; D. J. Thomas, Esq., Gardiner Clish, Esq., Capt. Edward Archibald, of Truro, N.S., and E. A. Charters, of Sussex, N.B. The Solicitors of the company are Messrs. Longworth and Layton, of Truro, and Secretary-Treasurer, Mr. George Ross, of Truro. The company is formed with a capital of \$50,000 in 1,000 shares of \$50 each, and 200 shares of the Treasury Stock are set aside for sale as special or preference shares to raise the required amount for prospecting and development. These shares, \$50 each, are given to first subscribers at \$20 in four instalments of \$5 each, and the first payment of \$5 when the share is taken, and remaining calls if required at regular intervals thereafter at the instance of the provisional directors.

At the Springhill mines, the company are putting down two bore holes, between five and six hundred feet, at the back of North slope,—a six inch and a two inch hole,—for the pur-

pose of sinking another "lift." They intend to place an engine on the top and run a hoisting rope down the larger hole, and the smaller one for a rafter wire. This will do away with sending steam down the pit, thereby keeping the roof good and strong.

A meeting of the shareholders of the Londonderry Iron Company has been held in the office of Messrs. Gillespie, Patterson & Co., Montreal, at which the provisional directors submitted their report. The following board of directors was elected:—Sir George Stephen, Bart., Hon. Dona'd McInnes, Messrs. A. T. Latterson, John Turnbull, James A. Gillespie, Sir Charles Tennant, Bart., and A. McLelland, the latter two gentlemen being of Glasgow, Scotland.

The last clean up of ten days' crushing at the mill of the Mulega Mining Company has resulted in a brick of 250 ounces, worth \$5,000. The result of the first clean up after 23½ days' crushing, was 450 ounces, the yield of 350 tons of ore.

Forty-five tons of quartz crushed on the Withrow property, near Rawdon, have yielded 93¾ ounces of gold.

An important discovery of bituminous coal is reported to have been made at a point eight miles north of the mouth of Diligent River, Parsboro.

350 ounces of gold valued at \$7,000 is given as the result of 16 day's crushing at the mill of Northup mine, Central Rawdon.

The returns from Sherbrooke were 56¾ oz. gold from 255 tons crushed.

The Egerton Gold Mining Co. returns for September 79 oz. of gold from 200 tons quartz crushed.

M. T. Foster, C. Perkins, and others, have bonded the property at West Caledonia, owned by Messrs. Parker and Ford, and are now prospecting it under the supervision of Mr. LeChair. Extremely rich boulders were found on this property last season. Mr. LeChair, although much hindered in his efforts by the excessive rains and depth of surface, has found several promising leads.—*Critic.*

Reports received just as we go to press announce that No. 4 slope at the Drummond collieries have shut down for the winter, the last steamer leaving with cargo for Montreal, on 18th instant.

The following are the gold returns so far received at the Mines Office for September:—

District	Mill.	Tons crushed.	Oz. Gold.
Sherbrooke	Sherbrooke	255	56¾
Darrs Hill	Don River	850	224
Caribou		120	44½
S. Uniacke	Withrow	45	13¾
Whiteburn	The McGuire	35	119½
15 Mile Stream	Egerton G. M. Co.	200	79
Stormont	Rockland	15	15½
Kempt	Kempt G. M. Co.	4	3½
Wine Harbour	Napier	75	45¾
Central Rawdon	Northup-Dunock		
	Co.	80	364
Lake Catcha	Oxford	128½	103¾
Oldham		116	101

Ontario.

Port Arthur District.

There has been quite a rush of explorers, prospectors, &c., during the past month to secure all that could be located before snow falls, when such work cannot be carried on to advantage. The principal surveys are along the Silver belt north of Whitefish and Arrow Lakes along the projected railway route. The greater portion of the surveys were for Americans, chiefly from Minnesota, who are now fairly well convinced that the rich silver region does not cross the boundary into their state.

The Silver Mountain "West End" mine has got its new hoisting and pumping apparatus in good shape and is making a grand showing both in the main shaft and about 1000 feet further east where another shaft has been commenced, and is now down some 20 feet.

The "East End" although showing occasional bunches of rich ore, is looking better than it has for many months past. Work was delayed for a few days at No. 3 shaft by the breaking of the crank of the big hoisting engine. A small shipment of rich ore has just been made to the owners in Liverpool. This mine has recently been visited by some of the shareholders from England, who expressed themselves as well pleased with the outlook.

"Crown Point" mine is still trying to rival its famous rival to the south, the "Shuniah Weachu" mine. Lack of capital still continues, however, a great drawback.

The Beaver Mine was unfortunate in losing by fire their magnificent shaft house &c., on top of the hill. It will probably take a couple of weeks to put things to right again. Advantage can however, be taken of other openings so that work will be carried on pretty much as usual.

The Badger Mine is reported to have realized about \$70,000 from their last shipment of ore to New York, and are still adding to their pile of bonanza ore. It is by far the richest producer at present.

A couple of rich veins have been struck recently, one west of Silver Mountain, and one north of the Beaver Mine, but for obvious reasons cannot be publicly particularized at present.

More iron lands have been taken up in the Thunder Bay district, but nothing will be done in the Rainy River district, until the decision of the Privy Council next month, in the matter of the ownership of Minerals & Timber, which is claimed by both the Dominion and Provincial Governments.

Captain Plummer, lately in charge of the bonanza "Granite Mountain" mine in Nevada, is about to take up his residence in Port Arthur. He is reported to be "well fixed" and eager to try his luck in this district.

Sudbury District.

Mr. Edward D. Peters, of the Canada Copper Company, writes as follows regarding the report of his evidence given before the Ontario Mining Commission, an excerpt of which was reproduced in our last issue:—"The article consists of my answers to some scores of questions, con-

densed into a few paragraphs, and applies rather to the deposits at large scattered throughout the district, than to any special mine, except where so stated. I do not feel at liberty to give the exact grade of the ore mined by the Canada Copper Company, but it certainly varies very considerably from the figures here given, which referred mostly to the entire body of ore as mined from the average undeveloped deposits in this section."

Manitoba and North-West Territories.

Sir A. T. Galt has given notice that he will apply to parliament for an act incorporating "The Alberta Railway and Coal Company," with power to construct and operate a line of railway from the railway of "The Northwestern Coal and Navigation Company, limited," near Lethbridge, in a southerly direction to the international boundary line; and to connect with the railway of any company in the territory of Montana, and to lease the railway of such company or otherwise to make arrangements for the joint operation of the same, with power to amalgamate with or otherwise acquire the property of "The Northwestern Coal and Navigation Company, limited."

British Columbia.

At a meeting of the Eureka Silver Mining Company, held recently in Victoria, the vacancies on the board of directors were filled up. The new board is constituted as follows: Hon. Hugh Nelson, Hon. John Robson, C.E. Pooley, J. Van Bramer, R. P. Rithet, Wm. Dalby and G. W. Haynes. An effort will be made to reorganize the company and place it on a better basis. The mine is situated on Hope Mountain and is said to be of undoubted richness.

During the month of September the coal shipments from Nanaimo and Wellington amounted to 49,908 tons of coal, being nearly 4,000 tons in excess of the July shipments, which were the highest reached at that time. For custom purposes the coal is valued at \$4 per ton, making a total value of coal exports for September of \$176,000. These shipments do not embrace the coal taken to Vancouver for the use of the China steamers, nor the provincial trade. The coal was exported in twenty-five vessels, the greater bulk going to San Francisco. In addition to the coal shipments, the steamer Ferudale took to the Irondale smelting works at Port Townsend, 1700 tons of Texada Island iron ore for the month of September, the value of the ore for export purposes being \$3 per ton, thus swelling the total by \$5,100.

Correspondence from Donald report a rich discovery of galena, carrying gold and silver at Toby creek. Assays are said to be high.

The Selkirk Mining Company still continue developments on the Lanark, one of their best properties at Illicillewaet.

Mr. R. G. McConnel, of the Geological Survey, has returned to Ottawa from the Yukon country. He states that the mineral prospect along the Liard, below the mouth of the Dease is not encouraging. The old mining camps are, with very few exceptions, deserted and no new ones have taken their places. The mineral resources of the great Slave Lake region he reports indifferent but the supply of petroleum appears to be almost inexhaustible.

The Coalfields of Cape Breton.

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

(Continued from September issue)

The following analyses will serve to show the composition of this coal at the Collieries operated on it from Cow Bay to Sydney Harbor:

	Gow- rie.	Calo- donia.	Re- serve.	Lin- gon.
Moisture .....	.50	.92	.52	.75
Vol. Comb. Matter, slow Coking.....	28.13	28.62	34.21	34.61
Vol. Comb. Matter, fast Coking.....	31.41	30.31	37.60	37.26
Fixed Carbon, slow Coking.....	66.01	64.02	59.73	61.39
Fixed Carbon, fast. Coking.....	62.73	62.33	56.34	58.74
Ash	5.36	6.43	5.54	3.25
Sulphur	2.71	1.10	1.25	1.35
Specific Gravity ...	1.31	1.33	1.28	1.29

The ashes of this coal vary in color from light to deep red.

The gas values of this seam vary from 8,900 to 9,500 cubic feet of gas, of from 13 to 15 candle power, and a good Coke is left.

The following ultimate analysis of the coal from the Reserve mine, made at the Royal School of mines, will prove of interest:

Carbon.....	77.41
Hydrogen	5.47
Nitrogen.)	9.30
Oxygen.)	9.30
Sulphur	2.47
Water	1.00
Ash	4.35

The following analysis of the Coke from this mine is from a report of Mr. E. D. Peters, on practical tests made by him in experimental smeltings of Coxheath copper ore, and it may be remarked that a better article would be produced if the manufacture was conducted on a large and systematic scale.

Moisture	1.03
Carbon.....	90.04
Sulphur.....	.70
Phosphoric Acid..	trace
Ash	8.01

The ash of this seam presents the following composition,

	Lingan Mine.				Reserve Mine.	Caledonia Mine.	Average.
	Top.	Middle.	Bottom.	Average.			
Iron Peroxide	35.66	1.57	27.75	21.66	21.810	11.853	21.66
Alumina	9.07	6.08	4.91	6.63	8.110	4.206	6.63
Silica	43.07	79.06	48.62	57.05	68.330	65.734	57.05
Lime	6.13	8.84	11.83	.93	915	7.151	.93
Manganese	5.73	3.08	6.52	5.11	480	.950	5.11
Sulphuric Acid.....	.34	.97	.37	.56	trace	2.150	.56
Alkalies .....	.....	.....	.....	.....	.....	1.260	.....
Phosphoric Acid.....	.....	.....	.....	.....	.....	2.725	.....
Chlorine .....	.....	.....	.....	.....	.....	trace	.....
	100.00	100.00	100.00	100.00	99.645	100.306	100.00

The following is the composition of the lowest of the seams worked to any extent. The coal is usually compact and lustrous with fine laminae. Some specimens show mineral charcoal, while others are free from it.

	S	South Head.	Emery.	+Collins.
Moisture	1.767	.65		
Vol. Comb. matter, slow coking.....	28.000	32.21		36.75
" " " fast	28.833	34.80		
Mixed Carbon, slow coking	62.263	63.49		57.10
" " " fast	61.430	60.90		
Ash	7.970	3.65		6.06
Sulphur	2.641	2.41		.....
Specific gravity...	1.382	1.28		1.27

The ash of this seam, as worked at the Emery Colliery, has the following composition:—

Iron peroxide.....	38.764
Alumina	1.336
Silicious residue.....	50.673
Lime	4.200
Manganese	trace.
Magnesia	1.015
Sulphuric acid.....	4.030
Phosphoric acid.....	.012
Chlorine	decided trace.
Alkalies.....	do.
	100.030

During the examination of the ash of this coal numerous small rounded quartz pebbles the size of a pea were noticed. The following analysis shows the ultimate composition of the seam as worked at the Schooner Pond Colliery (analyst unknown.)

Carbon	78.10
Hydrogen	5.48
Oxygen and nitrogen	7.81
Sulphur.....	2.49
Water.....	2.67
Ash	3.45
	100.00

The coals from this seam are claimed to be good for steam raising, and to give off less smoke than the overlying coals.

The following analysis will serve to show the character of the best known seams opened below those referred to above.

Tracey seam, of Mira Bay, (analy. Geol. Survey.)

Moisture	22.35
Volatile combustible matter ..	30.09
Fixed carbon	66.61
Ash .....	.98
	99.915

Mullins' seam, south side Sydney Harbor:

	ft. in.
Coal	2 0
Shale.....	0 4
Coal.....	4 0
	6 4
Volatile matter	31.4
Fixed carbon	62.4
Ash	6.2

This analysis was made some years ago by Dr. Dawson, and he remarks: "This coal has some of the properties of cannel. It has great heating power and yields much dense carbonaceous gas."

In the Glace Bay section, a few feet below the Hub seam, is a bed of cannel coal one foot two inches thick lying on nine inches of ordinary

bituminous coal. The following analysis was made by Dr. How:

Moisture .....	.83
Volatile combustible matter.	30.07
Fixed carbon.....	44.42
Ash	24.68
	100.00

BROAD COVE DISTRICT.

In the Geological Survey Report for the year 1874, there is a description of the Broad Cove coal field, and a set of analyses made by Dr. Hoffmann, of the Survey, which are given here with his remarks, in a condensed form:

	7 ft. Seam.	5 ft. Seam.	4 ft. Seam.
Moisture.....	4.02	7.78	8.45
Vol. Comb. Matter, slow Coking	20.17	27.67	28.36
" " " fast	25.39	34.51	36.52
Fixed Carbon slow Coking	79.41	52.87	56.94
" " " fast	65.18	46.03	48.78
Ash	5.40	11.68	6.25

These coals do not soil the fingers. They are black, with pitchy lustre, banded, with uneven fracture. The powder of the five and of the four feet seams when boiled in caustic soda imparts a brown color to the liquid, this with the percentage of water would make them approach in character to brown coal, although they occur in strata of carboniferous age. The coal from the largest seam does not color a solution of caustic soda and is more closely allied with the typical carboniferous coals. Zinc blende was observed as a film in this coal. These coals are said to produce little smoke when burned in marine boilers.

PORT HOOD DISTRICT.

As yet but little mining has been done here, and the qualities of the coals have not been settled by practical experience. The Geological Survey Report, 1876-77, page 469, gives a report on the coal of the lower or 7 feet seam.

It appears to resemble in its general characteristics the Broad Cove coal, and yielded on analysis:—

	Fast Coking.	Slow Coking.
Moisture	4.02	4.02
Volatile combustible matter	38.81	34.86
Fixed carbon	49.65	53.60
Ash (purpleish red).....	7.52	7.52

The coal is said to contain rather above the percentage of sulphur usually found in Cape Breton coals.

I have no analysis of the Chimney Corner coals. They are not as bright as many of the eastern coals, but are good steam coals.

Reference has been already made to the area of millstone grit extending from Sydney up the valleys of the Mira and Salmon Rivers. These measures show several outcrops of coal beds apparently underlying large tracts of country.

The beds are known only by natural outcrops, and no attempt has been made to ascertain if other beds are present. They do not exceed two feet in thickness, and, as the route of the Cape Breton railway will not follow these rivers as was expected at one time, they will probably not receive any attention for many years to come.

The following analysis is from the Canadian Geological Survey:—

Moisture	1.53
Volatile combustible matter..	20.16
Fixed carbon.....	47.49
Ash	30.82
	100.00

At other points the coal is reported by Mr. Fletcher as yielding an inconsiderable amount of ash. Another outcrop of coal in this district is interesting, as it presents in the Lower Carboniferous conglomerate the evidences of an origin identical with that of the more important seams of the productive measures. It yielded.

Volatile combustible matter...	17.80
Fixed carbon.....	29.04.
Ash.....	53.16

About eight miles from Baddeck, at Hunter's Mountain, is an outcrop of coal similar in composition and mode of occurrence to that just mentioned. The coal is irregular, varying in thickness from a few inches to two feet. It is divided by numerous cleavage planes, sometimes coated with galena.

At East Bay, in the marine limestones and marls, pockets occur holding calc and fluor spar and patches of bright cubical coal yielding on analysis;

Volatile matter.....	36.72
Fixed Carbon.....	46.64
Ash.....	16.64
	100.00

For comparison with the seams of coal of economic value the following analysis of coal from a fossil carbonized tree in millstone grit measures in the same district may prove interesting:

Volatile matter.....	31.9
Fixed Carbon.....	59.9
Ash.....	5.2
	100.0

Coke firm and vesicular.

Some years ago a good deal of interest was aroused by a statement that active work was being performed on a seam of anthracite coal at McAdam's Lake, near the head of East Bay. The bed occurred in red and gray shales and conglomerates of the lowest division of the Carboniferous. It, however, proved to be little more than a coaly shale, lustrous and resembling the poorer anthracite coals of the United States. On analysis it yielded:-

Volatile Matter.....	17.80
Fixed Carbon.....	29.04
Ash.....	53.16
	100.00

Notwithstanding the large amount of ash the coal yielded a firm and porous coke.

Irregular pockets and beds, or rather seams, of hard compact coal are frequently found in the carboniferous of this Province. The mineral frequently breaks irregularly, does not soil the fingers, and resembles anthracite. On a closer examination however these coals are found to be either highly carbonaceous shales, or compact semi-anthracite coal—its more volatile ingredients being lowered in amount by the hardening, etc., the containing strata have undergone. Considerable sums of money have been spent in testing and prospecting these deposits, but so far the results have not been at all satisfactory.

RIVER INHABITANTS COAL DISTRICT.

I am not aware of any recent analysis of the coals of this district. Little systematic mining has been carried on for a number of years, and the writer is obliged, like Mr. Fletcher, to refer to the report made a number of years ago by Dr. Dawson to the Government of Nova Scotia.

He gives the following analysis of the Little River four feet seam:—

Volatile matter.....	30.25
Fixed carbon.....	56.40
Ash.....	13.35
	100.00

and remarks that it is more bituminous than the Sydney or Pictou coals, and should prove practically a good domestic and gas coal.

He also gives the following analysis of the eleven-foot seam found at Sea Coal Bay:—

Volatile matter.....	25.2
Fixed carbon.....	44.7
Ash.....	30.1
	100.00

The amount of ash given in this analysis would make the coal of little use for ordinary purposes. I am informed, however, by parties interested, that it by no means yields this large percentage of ash, and that the other seams are apparently of excellent quality. These beds are very well situated, as the harbor remains open all winter, and they will no doubt be re-opened whenever the conditions of the coal trade hold out more promising inducements to the miner. I have no analysis of the coal found at the head waters of the inhabitants river.

From the analysis I have given it will be seen that the island of Cape Breton furnishes Coals adapted for every purpose. They are largely used for steam raising in locomotive and marine boilers, and as their qualities become better known they will be a favorite railway fuel. For gas making and domestic purposes they have established a good reputation. In connection with the various schemes mooted for iron and copper smelting in Cape Breton it is encouraging to note that practical tests have shown that an excellent coke can be made from them. At the low price obtainable for coal, and the presence of large mines in the eastern district, will operate against developments in other parts of the Island. But it is to be hoped that the discovery of metallic deposits in the districts surrounding the western and southern coal beds may lead to the erection of works drawing their fuel from local sources, and the projected railway from the line of the Sydney and Hawkesbury Railway to Broad Cove will give this part of the island an outlet to good shipping ports.

Foreign Mining Laws.

Arthur Strauss.†

As there has been recently a good deal of discussion about amending the mining laws, and more particularly the laws relating to mine leases, I think the time opportune to lay before you some peculiarities of the Foreign Mining Laws. You will find that many of them, although they may work well in other countries, are totally inapplicable to this country, but you will notice some which may with advantage be adopted or assimilated here. I purposely shall endeavour to make as few comments as possible but simply put the plain facts before you; for with the present agitation going on, I am anxious not to say in this institute, devoted to science and research, anything that might savor of political bias. I must leave you to draw your own conclusions and confine myself simply to the act of giving you the materials where-with you may form your own opinions. It would naturally take too long to give you the full details of the mining laws in fore-

ign countries. I shall therefore content myself in pointing out to you the material differences, and while briefly referring to all countries, shall particularly dwell on the German law, for the German law is the most complete, and almost in every particular different to the English. It therefore affords the greatest features of interest and study. In speaking of the laws of a country, I shall also take the rule and not the exception; for almost in every part of Europe we find certain provinces which do not share the general law of the land, and in order to put some system into my address, I shall try to direct your attention step by step to the position of adventurers to landlords, adventurers amongst themselves, adventurers to miners, and lastly, miners amongst themselves.

The basis of the German law is free mining, that is to say the minerals belong to the nation, or, as others explain it, are things without an owner, and everybody has a right to dig for minerals anywhere, subject to certain restrictions which will be fully discussed hereafter. This principle of free mining can already be found in the Roman law, where it prevailed in some provinces. I beg to refer you to the collection of imperial edicts under Emperor Theodosius, in the year 438. There is an edict under Emperor Constantine of the year 320, to the Consul of Africa, giving permission to all men to dig for ores wherever they please. In the year 363, under Julian, this was extended to the whole of the orient, and in the year 376 to other provinces. In the year 382 there is an edict that all miners have to pay one-tenth to the state and one-tenth to the original landlord, while the most curious edict is of the year 393, showing that even then mining laws could be abused, unless carefully drawn up. The order runs thus: "We have been informed that certain people, under the pretence of digging for ores, sink deep shafts for the purpose of damaging the foundation of other people's houses. Therefore, in future, permission will be refused to dig for ores under buildings, so as to prevent the practice of forcing the owner to sell his house cheap, on the pretence of a discovery of mineral wealth under the same, and thus abuse a law made for the common weal, to the detriment of another man's property." The general rule, however, in the Roman law was, that the mines belonged to the Crown, and were let out to the miners for a high royalty.

In England, as you are aware, the maxim of the law is that the soil belongs to the owner to an indefinite extent, upwards and downwards, whatever is in a direct line between the surface of any land and the centre of the earth. He therefore, who is entitled to the soil, is, according to this doctrine, also entitled to the minerals beneath the soil. But when, as it sometimes happens, the title to minerals is distinct from that of the soil, and vested in different persons, the owner of the minerals would *prima facie*, have no right to interfere with the surface, but the English law invariably accompanies a right to property with the necessary means for its enjoyment, and upon this principle the right to mines implies a right to work them and to the use of as much of the surface of the land as may be necessary for the purpose of effectually carrying on mining operations. We have evidence from the year 1198, in a document which is still in existence and in perfect preservation, among the records of the Exchequer, that the Cornish miners enjoyed certain rights and privileges, and in the remarkable charter of 1305, under Edward I., the ancient franchises and liberties of the tanners were confirmed. They consisted

chiefly of freedom from personal molestation and from servile obligations, exemption from the jurisdiction of other courts in all matters as between themselves and as between themselves and strangers, together with an extensive liberty of mining according to ancient custom. The earliest reliable proof, however, of the ancient custom of tin bounding is the charter of King John, granted by that monarch in the third year of his reign (1202) to the tanners of Cornwall. This custom, which approaches free mining very closely, was confirmed by all the Stannary Parliaments held since; the latest in the 26th or 27th year in the reign of George II., and has not been revoked by any acts of parliament since; on the contrary, we find it repeatedly confirmed. Through the scarcity of wastrel land it has, however, become more or less obsolete. Lord Brougham as counsel for the plaintiff in *Rowe v. Brenton*, is reported to have explained the ancient custom of tin bounding in the following manner: "That the miners had a right to go upon the lord's or the freeholder's tenement, and cut bounds, that is to say, to cut up a turf so as to form a mark upon the surface or area of the soil, which those people called bounds. The miner then, at the Stannary court gave notice to the lord, that if the lord would not work the tin mines under these bounds, he, the miner who proposed to do so, claimed the privilege. Accordingly, this notice was given in three successive courts, according to the usage of the Stannary laws passed, and if at those three courts, the lord, who had the first right to work the tin mines under his soil, would not work them, the miner, through that process, acquired a right as against the lord, and that is what is commonly called bounds." A clear description of the custom was also given by Lord Denman, in the case of *Rogers v. Brenton*. His Lordship said: "There can be no doubt that this is most remarkable, fulfilling every requisite of good custom. In substance it is this: The mine is parcel of the soil, but it is a parcel which to discover and bring to the surface may ordinarily require capital, skill, enterprise, and combination, which, while in the bowels of the earth, is wholly useless to the owner as well as to the public, the bringing of which into the market is eminently for the benefit of the public. If, therefore, the owner of the soil cannot or will not do this for himself, he shall not be allowed to lock it up from the public, and therefore, in such case (unless when by enclosure he may seem to have devoted the land to other important purposes inconsistent with mining operations), any tinner, i.e. any man employing himself in tin mining, may secure to himself the right to dig the minerals under the land, rendering a certain portion of the produce to the owner of the soil." The idea of the minerals belonging to the public and not to the individual underlies this definition. It is not my province to go further into this ancient custom of tin bounding, to which reference is only made here to show that the spirit of free mining, as will be unfolded to you presently, seems to have pervaded Cornwall from very remote times up to the present moment. The oldest document still extant in Germany which proves the ancient right of free mining, is dated 24th March, 1185—a contract between Bishop Albrecht, of Trent and the miners, and it has prevailed there ever since, until the last general law, passed in the year 1865, fully confirms and particularises it. Though I purposely refrain from giving any opinion upon free mining, I am entitled to give you an interesting discussion which took place in the French Chamber of 1791. A commission was appointed to enquire into the mining laws,

and in the sitting of 20th March, 1791, the Deputy Regnould D'Epeney brought in the new law which embodied free mining, and recommended it in a speech of which the following is an extract:—

"Landed property was originally created through a general division or through labour, and it is clear that the object of such a division could only be to give food to individuals and their cattle.

This division could not possibly have reference to minerals which were hidden in the earth, and not discovered till long after the State was established, for their necessity and value were yet unknown. If the thus acquired property did not refer to minerals, the existence of which was undiscovered, thus evidently they were not included in the division, and if undivided, what is the result? You must perceive that these minerals never had an owner, that therefore they remain a property of the nation, and therefore every nation has the right to dispose of them. As it is further admitted that the minerals are situated in the earth in such a way that they never or but seldom correspond to a single property, they cannot possibly be a complement to a single property, they must rather be taken as everybody's property, they are at the disposal of the nation, for it is certain that such things as have no owner belong to the nation. According to this principle nobody may call himself the owner of the mine, nobody can have any right to a mine but such as the nation concedes to him." To this Humboldt Lamerville made a spirited reply on the following day:—He contended:—"The nation would become a caretaker instead of an impartial sovereign. It is one thing to subject an entire property to the common weal, and another to make a property uninhabitable and sacrifice it to the common weal. The nation may take all my property against payment if they deem it useful, but let it not in a dangerous manner assert itself as my co-proprietor in one and the same property, by taking the minerals and leaving the surface to me. The State has only once recognized the right of the first occupier, that is, when society was established; the State has no right to alter my legal holdings now. Moreover, the miners who would covet the same deposit of minerals would be led to dispute and strife. It is enough that the scourge of war should be spread on the surface of the globe, surely you don't want the terrible scourge of a subterranean war, which could hardly be pacified by the sword of the law. By conceding to the discoverer the right of the property, you do not help the poor, you would create discord among the rich and foment new disputes."

The famous Mirabeau concluded the debate by a memorable speech on the same day:—He said: "Society, in its first stage, permitted the attainment of landed property for the purpose of agriculture, building, and for that purpose only the surface was given. The original proprietary right could not possibly refer to minerals 1,200 feet deep. They cannot be a compliment to the soil, and are moreover, by their course, unfit to be concluded in the partition of the surface." He then pointed out how difficult it is to get a proprietor to go to the expense of working a mine, for, after all, he may find the true vein under his neighbor's property. He further argued that the proprietor seldom has the capital to work a mine, and that adventurers experience sufficient difficulty to defray the expenses of working without paying any extraordinary value for the land, and concludes that, if you give the landowners the right of the minerals,

the mining industry would suffer and come to a speedy end. The Act was consequently passed on 28th July, 1791. We now come to the German Law. It distinctly states that owners of property have no right to the minerals, and there are heavy fines or imprisonment against the appropriation of minerals, even on your own property. The French Law expresses it differently, but it comes to the same thing. It says: "The moment the concession of a mine is granted, that mine property is distinct from the surface, and is considered a new property. Everybody has a right to dig for minerals, except under streets, railways, and churchyards. It is allowed to dig on other people's property, except under their buildings, or within 200 feet thereof. The owner's permission is requisite, but should he refuse it, the Mining Courts force him to grant it, unless he can show good reasons to the public safety for refusing his permission. Should the forbidden area of 200 feet within his building not be situated in his own property, he has no right of interference. The digger is bound, if required, to pay yearly in advance any damage that may accrue, and to return to the owner the ground after he has finished with it, paying him the depreciation in value. The landlord may demand security for depreciation in advance. In case of dispute about damage, the mining authorities have to settle the amount without appeal. Having discovered the minerals, the miner has to apply to the Mining Court for a concession. The application is advertised in the official newspapers. The demand note has to state the exact hour when it was handed in, and must contain the petitioner's name, a description of the mineral for which the concession is asked, a description of the land required, and the name of the mine. The concession is granted provided the minerals are found really to exist, and provided no other parties can claim a prior right. A new concession for an abandoned mine is granted without inspection, unless it is notorious that the abandonment was owing to the mine being worked out. The moment a concession is asked for, it is plainly marked on the official map, which is open to the inspection of the public. Should several demands for concessions be handed in simultaneously, then the landlord, if one of the claimants, has the prior right, barring him, the man who regularly explored the ground has the preference to the man who discovered the mineral by mere chance. The adventurers, for we may now call so the parties who have obtained the concession, are bound to work the mine if, by their not doing so, the public interest is endangered. The mine has to be worked according to a working plan, which has to be submitted for approval to the mining authorities. Objection is only raised if the working is considered insecure. The adventurers may, however, appeal to the Board of Trade if they consider the objections ungrounded. Should the original plan be changed, such change to be notified to the authorities. If a mine is worked contrary to the approved plans, the authorities may fine the adventurers, or have power to close the mine. The mine may only be worked under the management of duly qualified persons. The managers' names must be submitted to the mining authorities, who make them pass an examination before qualifying them. The managers are personally responsible for working the mine according to the plans handed in, and for all other rules and regulations which exist as regards the working of mines, safety of boilers, etc., etc.; and are fined for any transgression. The royalty in Germany is 2 per cent. to the Government, but

nothing on iron, as it was found that even such a small royalty on iron might impede the industry. In *France* free mining is likewise of ancient date, and included a general liberty of search in all uncultivated places, and a right to work mines whenever the owner, after distinct notice, delayed for three months to work them himself. Such are the prominent features of the various edicts, until the law of 28th July, 1796, the discussion on which has been mentioned before, declared that the mineral wealth of France below the depth of 100 feet was the property of the nation, to be disposed of by the Government in the general interest of the public, and unfettered by any claim from the owner of the soil, who, however, was entitled to preference. The law of 21st April, 1810, declares the property in mines to be distant from the soil, which cannot be explored without a concession of the Government. According to this law, the French Government has a right to grant the concession to whomsoever it pleases, and acknowledges no right of preference in the owner of the soil, or the first discoverer of the minerals, but the first discoverer has, nevertheless, a claim upon the consideration and good will of the Government. The mine owner has to pay double the usual rent for the surface property required, and double the amount of real damage done to the landowners. If the works should deprive the landowner of the use of his ground for more than a year, or unfit it permanently for cultivation, the explorer must buy the plot, for a sum not to exceed double its value, before the occupation. The royalty in France may change every year, but is not allowed to exceed, and generally amounts to, 5 per cent. of the net produce of the mine, to be paid to the State. Over and above, however, the government makes an additional charge of 10 per cent. to form a relief fund for accidents.

The law of *Belgium* closely resembles that of France, but by a law of 2nd May, 1837, a preference is given to the proprietor of the soil to have the first concession for exploring minerals situate under his own land; but two conditions are attached to this preference: First, that the proprietor satisfies the mining authorities that he possesses the necessary funds for exploring the mines and carrying on the undertaking; the other, that the land can be profitably worked. It also differs from the French law, in so far as the latter does not allow any shaft to be sunk within 300 feet of an habitation without consent of the owner, while the Belgium law merely confirms this, provided the 300 feet are within the owner's land and not in adjacent property. In addition to the 5 per cent. royalty to the state, a royalty from one to 3 per cent. is paid to the land owner, the mining authorities fixing the exact proportion according to the richness of the mine.

In *Austria* the same free mining exists, and the mining authorities settle the amount of the damage for devastated land. A concession is easily obtained; it is, however, only granted for one year, when it must be renewed and made absolute, after sufficient proof has been given that the researches have been successful. No special royalty is paid either to the landlord or to the state, but the income tax, and particularly the provincial or municipal taxes, are very heavy.

In *Spain* free mining prevails. The concession is granted by the civil governor of the province, after satisfactory proof that the minerals exist. The landowner has to be compensated for the damage, and no shaft may be sunk within 40 yards of any building, or within 1,400 yards of fortified places. The surface

owner has preferential rights, provided he undertakes to commence working within thirty days. The Government royalty is very small, and is levied at so much per acre.

In *Sweden* and *Norway* we also find free mining, but here the owner of the ground is entitled to participate to the extent of one half in the mining and the profit derived thereof. The land required by the mine is valued in proportion to the highest value of other ground in the neighbourhood. No tax is paid for the working of a mine either to the government or any private individual.

In *Italy* there is no universal legislation respecting ownership of mines, but free mining generally prevails, except in sulphur mines, which can only be worked by the owners of the soil. The law of 20th November, 1859, now governs the mining industry in most provinces. Minerals can only be worked by virtue of a government concession, and from the date of the act of concession the mineral ownership becomes distinct from the ownership of the soil. The concession does not exceed two, or at furthest three years, and may be at any time revoked in case of the suspension of working. Questions of priority, or of property, between contending applicants, are decided by the ordinary tribunals. The royalty payable to the state is generally 5 per cent. of the net produce of the minerals. This tax may be converted for a definite period into a fixed annual tax. The government may remit, in whole or part, the tax payable, in case of heavy expenditure, extraordinary work, or on account of damage suffered from accident, not imputable to negligence.

It would be impossible to go here into the laws in force in the *United States*, owing to the numerous statutes and mining regulations existing in the different districts, often inaccessible, and, more frequently, various, indefinite, and conflicting. For instance, there are not less than 500 mining districts in California, 200 in Nevada, and 100 each in Arizona, Idaho, and Oregon, each with its set of written regulations. The main objects of the regulations are to fix the boundaries of the district, the size of the claims, the manner in which claims shall be marked and recorded, the amount of work which must be done to secure the title, and the circumstances under which the claim is considered abandoned and open to occupation by new claimants. The right of private ownership in minerals extracted from the soil is recognized in nearly all the States and Territories. All such minerals belong to the owner of the land, and the government claims no royalty.

We thus find in nearly all European States, free mining, and I must not omit to mention that the miners have the same right and claim on watercourses, roads, and other matters necessary for their industry, as they have on the land.

Throughout the Continent mines are worked either by individuals or by ordinary limited liability companies, as the system of unlimited companies is almost entirely unknown there. If more capital is required it is generally raised by further issue of shares or by debentures.

In Germany, however, we find a system very similar to our cost book system, and just because it is similar but not identical, it is interesting to study wherein it differs. The adventurers there can make their own articles of association and regulations, which, however, must be confirmed by the holders of at least 75 per cent. of the shares. The object of having such a large percentage is thoroughly to protect the minority, and to prevent a few large shareholders taking

advantage of their position at the cost of the minority. Adventurers are bound to pay their share of the cost, and of the liabilities incurred in proportion to their shares. Creditors of a mine can only levy distress on the property of the mine, but have no claim against individual adventurers. You have, therefore, this difference that each adventurer can only be made to pay his original share of the liabilities, and not his partner's share, should the latter be unable to fulfil his engagements; at the same time the management cannot commit the adventurers unto very extensive liabilities, as creditors, knowing they have only the machinery and other moveable assets to look to, are careful in their dealings. As a rule, there are either 100 or 1,000 shares, which may, however, be subdivided into tenth parts. A certificate is issued, but the shares cannot be transferred without a return of the certificate. At a general meeting each share has a vote. No voting can take place unless the invitation to the meeting distinctly stated the object on which a vote may be taken; simple majority decides, but more than half the number of shares must be represented at the meeting. Should such a number not be present, another meeting must be convened, which may then finally decide, irrespective of the number present. A majority of at least 75 per cent. of all shares, however, is necessary for any vital decision, such as the sale of the mine, consolidation, or liquidation. Any shareholder has a right to appeal against the resolution of the shareholders in the ordinary tribunals, on the plea that the resolution is not to the real advantage of the body of adventurers. While the decision of the tribunals is pending, the resolution of the meeting may be duly carried out without responsibility to anybody, but if the plea is properly made out, the tribunal may rescind the decision. As you are aware, such an interference of the tribunals in the decision of a company, even if in accordance with their own by-laws, is not at all rare in this country, for you constantly find the Court of Chancery interfering in arbitrary decisions of club committees, even if the aggrieved member is bound by the rules of the club to submit to such a decision. The adventurers are bound to name to the mining authorities one or two persons, who represent the company in all judicial and other matters. These representatives, corresponding to a committee here, are bound to see that the books are properly kept, and to show them to every adventurer at any time he may require. This committee has to call a general meeting at least once a year, or at any other time, if asked to do so by shareholders representing 25 per cent. of the shares. Adventurers are liable for any responsibilities incurred by the committee in the name of the mine, and the committee themselves are free from all personal liability in the matter, unless they exceed their authority. Shares may be abandoned as here, and the adventurers may, as here, either sell the abandoned shares or retain them. The mine can only issue special rules for the workmen, which are not in conformity with the law of the land, such as the imposition of fines, etc., with the approval of the mining authorities. Unless specially arranged before hand to the contrary, a fortnight's notice to quit must be given, either by employee or employed. Miners can only be dismissed without notice, or before the specially arranged contract expires:—

1. For theft, embezzlement, repeated drunkenness, gross disobedience, or continued obstinacy.
2. For acting contrary to the rules laid down by the mining authorities for the working of the mine.

3. For actual violence or verbal abuse of their superiors

4. If incapacitated for work, or inflicted with an infectious disease.

Miners are allowed to leave without notice:—

1. If they are physically incapacitated to do their work.

2. If actual violence has been used against them by their employers.

3. If they do not receive the promised or contracted wages.

The employer is bound to give a character to a leaving miner, and should any accusation be made therein, the miner has a right to have the matter examined by the mining authorities. Employers are not allowed to engage miners who have previously worked in other mines without inspecting their character.

Then we have the usual strict regulations with regard to employment of children, which are the same for mines as for all other manufactories.

Employers are bound to pay the miners in cash, and not in goods. They may, however, supply the miners, in deduction of their wages, and with the consent of the miners, with housing, fuel, food, and the necessary tools. A list of miners employed, with full particulars, must be kept in the counting-house, open for inspection to the mining authorities. The law makes Friendly Societies amongst the miners compulsory. These Friendly Societies may embrace other workmen in the neighboring districts, with the consent of the mine owners or adventurers, for this term is now synonymous. Clerks, managers, and all other employees, are admitted in these miners' Friendly Societies. The mine owners, together with properly chosen delegates of the miners, have to draw up the rules and regulations of these Friendly Societies. These rules must be approved by the mining authorities, who may only interfere if they contain provisions contrary to the general law of the land. The miners may become full members if—

1. They have been members for a certain specified period.

2. They are not beyond a certain specified age.

3. They are free from all sickness, which presumes that they were invalids before joining.

After being full members they are entitled—

1. In case of illness to, free doctor and medicine; they are not allowed to choose the doctor themselves, but must accept the doctor of the Society.

2. A sick allowance during the time of illness, provided their illness is not caused by a gross negligence of their own. The allowance lasts for thirteen weeks, after which time, if not cured, they receive the ordinary allowance of invalids.

3. An allowance for cost of burial.

4. An allowance as invalids during lifetime, unless they are incapacitated through gross negligence of their own. This allowance is, however, stopped as soon as the miner is fit for work again, and the convalescent invalid is bound to take any work which his physical capacity allows him to execute.

5. A pension to the widow for life, unless she marries again.

6. Support for the education of children of deceased members and invalids up to their fourteenth year.

Members who are not full members are entitled only to doctor, medicine, and sick allowance; further, to costs of burial and invalids pensions, in case of accident while at work. Either a single mine, or several mines combined, may have these Friendly Societies, and the

allowances are to be decided by the committee of these Societies.

The allowance cannot be transferred by the recipient to third parties, nor can they be put a stop to by legal process. Both the mine owners and the miners have to contribute to the societies. The contributions of the miners may be regulated either in proportion to their wages, or a corresponding fixed sum. Mine owners must contribute at least 50% of the amount paid by the miners in their employ. The mine owners are bound to see to it that the miners pay their contribution, otherwise they are made themselves responsible for the deficiency; they are bound to supply the Friendly Society with a list of the men in their employ. The committee consists of a certain number, to be fixed by the Society; half are chosen by the mine owners, and the other half by the miners. The committee is bound to look to the proper execution of the rules, and has the care of the money, and chooses doctors, chemists, etc. The committee is under the supervision of the mining courts, who send an inspector to every meeting to watch over their proceedings. The committee may, instead of supplying such patient who has a family with doctor and medicine, send him to the hospital, with his consent, or even without his consent, if in their opinion proper care cannot be bestowed upon him in his own home, and patients without a family they may send to the hospital in any case.

If a man with a family is sent to the hospital, and the family is dependent on his earnings, half the usual sick money must be paid to his family. The usual allowances are, during time of sickness, a labourer's ordinary wages as customary in the district; two-thirds of ordinary wages for invalids; in case of death, 20 day's ordinary wages for burial expenses; for the widow 20 per cent, for each child under fifteen, an additional 15 per cent, and if the child loses its mother 20 per cent of the ordinary day wages. For such incapacitated persons as have been dependent on the workman during his lifetime, 20 per cent of his wages until he or she is no longer in need of such support. Power is given to the committee to impose fines upon their members if they are guilty of any transgression of their rules, necessarily imposed for the purpose of securing safety to human life.

You will see the rules of these compulsory Friendly Societies differ materially from the ordinary English Friendly Societies, and I hope to have an early opportunity of explaining to the mining community the usages in force in the voluntary English societies.

(To be continued.)

Amber Deposits of the Baltic.—It is a somewhat peculiar geological fact that the only place in which amber deposits are known to exist in payable quantities is in the head of the Baltic Sea. It has been ascertained that the vent of Amber extends from the west Russian shores of the Baltic to Denmark, Norway and Sweden. Formerly the supply was obtained mainly through the agency of storms which tore up the amber lying at the bottom of the sea and caused it to be thrown on shore. Within the past quarter of a century, however, mechanics have been applied to the pre-existing methods of obtaining amber economically and with despatch. The most profitable strata have been found in the vicinity of Meme, and it is stated that there are now 20 large dredging boats con-

WORKS

—BY—

Professor E. J. CHAPMAN

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MOST IMPORTANT AUCTION SALE

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Phosphate Lands, situate in the Phosphate Region of the Ottawa District, Province of Quebec, Canada.

By instructions received from "La Compagnie Française des Phosphates du Canada," the hereinbelow described Mining Lands and Mining Rights will be offered at auction in the Real Estate Rooms of

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—ON—

Thursday, the 15th November next,

At TWO P.M.,

In the Township of Portland East.

Lot 11, in first range. West 1/2 of lot 2 and north half of lot 3 in 2nd range; also mining rights of lots Nos. 1 and 2 in 3rd range, and of south half of No. 1 in 4th range and fee simple of west half, west half of lot 2, and north half of lot 3, in 4th range. Mining rights of lots 3, 7, 10, of north part of lot 1, in 6th range; and fee simple of lots 8, 9, 22 and 24 in same range. Also fee simple in lots 7, 8, 9, 10, 21, in 7th range, and 6 and 30 in range 8; and mining rights in lot 12 same range. Fee simple in lots 9, 18, 19, 20 and 4, 5, 20, 21 in 9th range, and mining rights of lot 17, and of south part of No. 16 in same range. Mining rights of lots 27 and 28, in 7th range. Fee simple of lots 9, 10, 11, 16, 17, in 8th range.

Township of Portland West.

Lot No. 20 in the 4th range and mining rights in lot 1 in range 10.

Township of Templeton.

Lot 3 in range 13.

Making a total of some 5,000 acres of the finest phosphate lands in the world.

Show pits have been opened almost all over these lands, bringing to light exceedingly rich deposits.

Printed copies of government and engineers' reports will be sent on application.

Lots to be sold separately to suit purchasers.

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stantly at work for at least eight hours out of the 24. Further to the west the amber is obtained by divers, who go down with diving apparatus and remain below for four or five hours. Each diver has a little bag round his neck and a peculiar hook, with which he pulls up the sand, and every piece of amber that he finds is thrown into the bag. But that is only one way of obtaining amber. The stratum of green sand in which it is found exists in some places for about 30 miles inland, and the valuable material is mined. In the amber mines there are about 40 miles of passages, while 700 men are employed in the various departments. The miners simply cut the sand and load it in tracks; it is

then brought to the surface where it is thrown into a long trough filled with rushing water, which separates the amber. The latter is caught by nets of various sizes, is then cleaned by machinery, and assorted according to its quality and purity. Although the consumption of amber is considerable, there are few substances for the supply of which mining and dredging operations are required (though it should be borne in mind that amber is not a mineral proper, but a fossil resin) about which so much ignorance prevails.

• Analyst: H. How. †Analyst Professor Chapman.
‡ Read before M. I. of Cornwall.

By Royal  Letters Patent.

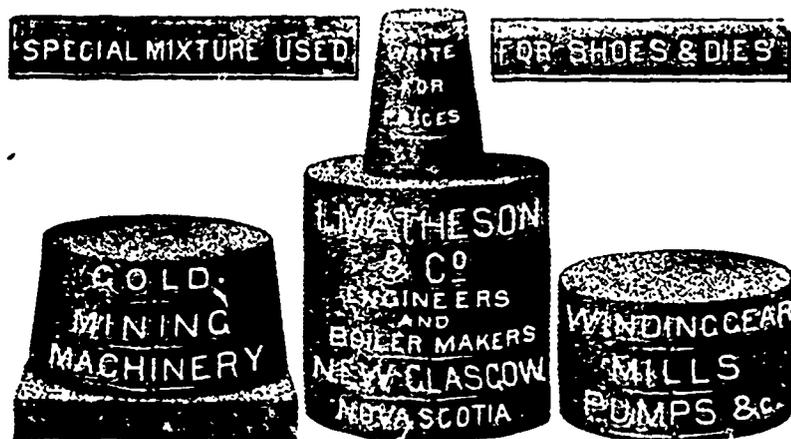
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1st.—Lot 28, in the 6th range, containing 100 acres, in addition to the salina of the lake.

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 Battersea 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.

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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. MALL,
15th Dec., 1887. Commissioner.



**ONTARIO
Mining Regulations.**

The following summary of the principal provisions of the General Mining Act of the Province of Ontario is published for the information of those interested in mining matters in the Algoma District, and that part of the Nipissing District north of the Mattawan River, Lake Nipissing and French River.

Any person or persons may explore for mines or minerals on any Crown Lands surveyed or unsurveyed, not marked or staked out or occupied.

The price of all lands sold as mining locations or as lots in surveyed townships is two dollars per acre cash, the pine timber being reserved to the Crown. Patentees or those claiming under them may cut and use such trees as may be necessary for building, fencing or fuel, or for any other purpose essential to the working of mines.

Mining locations in unsurveyed territory shall be rectangular in shape, and the bearings of the outlines thereof shall be due north and south, and due east and west astronomically, and such locations shall be one of the following dimensions, viz: eighty chains in length by forty chains in width, containing 320 acres, or forty chains square,

containing 160 acres, or forty chains in length by twenty chains in width, containing 80 acres.

All such locations must be surveyed by a Provincial Land Surveyor, and be connected with some known point or boundary at the cost of the applicant, who must file with application surveyor's plan, field notes and description of location applied for.

In all patents for mining locations a reservation of five per cent. of the acreage is made for roads.

Lands patented under the Mining Act are free from all royalties or duties in respect to any ores or minerals thereon, and no reservation or exception of any mineral is made in the patents.

Lands situated south of the Mattawan River, Lake Nipissing and French River are sold under the Mining Act at one dollar per acre cash.

Affidavits showing no adverse occupation, improvement or claim should accompany applications to purchase.

T. B. PARDEE,
Commissioner
Department of Crown Lands, Toronto.



SEALED TENDERS, addressed to the under- and endorsed "Tenders for Additions, etc., to Post Office, at Coburg, Ont.," will be received at this office until Saturday, 16th November, 1887, for the several works required in the erection of an addition, etc., in the Post Office at Coburg, Ont.

Specifications can be seen at the Department of Public Works, Ottawa, and at F. A. Munson's Law Office, Coburg, on and after Tuesday, 16th October, and tenders will not be considered unless made on the form supplied, and signed by the actual signatures of Tenderers.

An accepted Bank Cheque payable to the order of the Minister of Public Works, equal to 5 per cent. of the amount of the Tender, must accompany each Tender. This cheque will be forfeited if the party decline the contract, or fail to complete the work contracted for, and will be returned in case of non acceptance of tender.

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

By Order
A. GOBEIL,
Secretary.
Department of Public Works,
Ottawa, Oct., 11th 1887.

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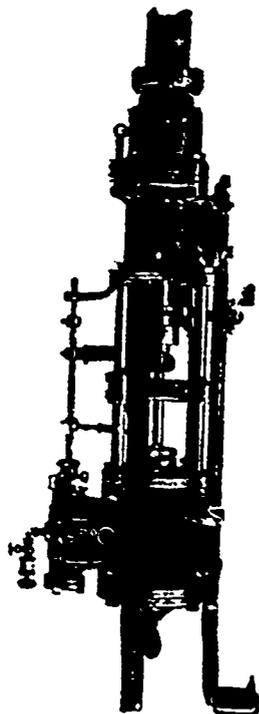
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" 40, " " " 50.....	50c.

For further information see OFFICIAL POSTAL GUIDE.

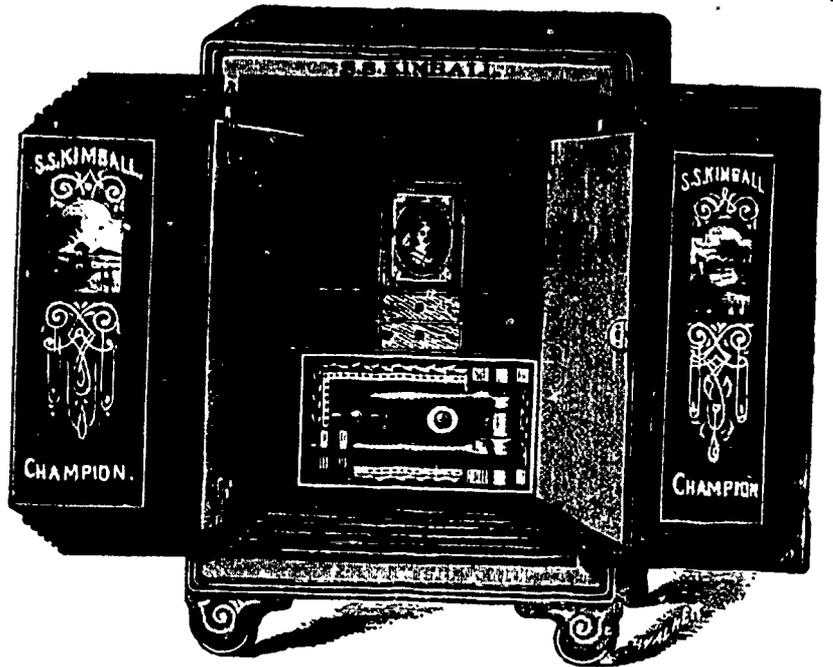
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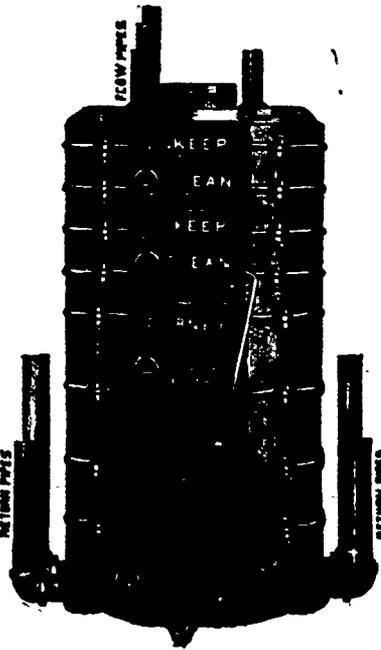
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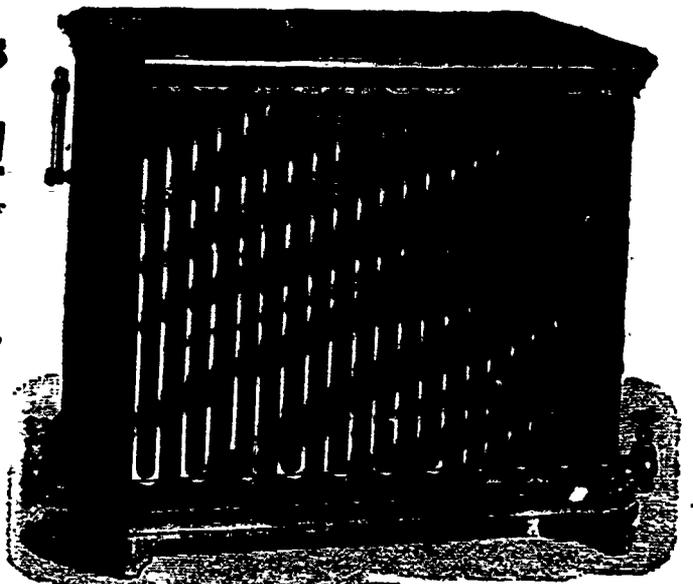
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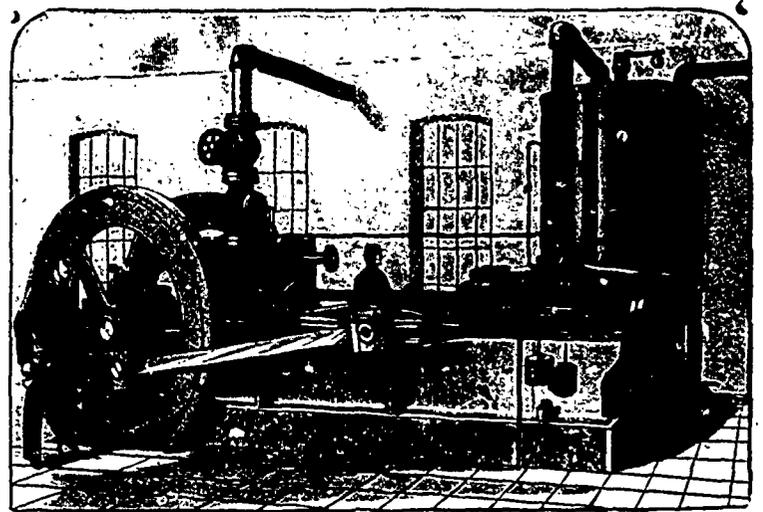


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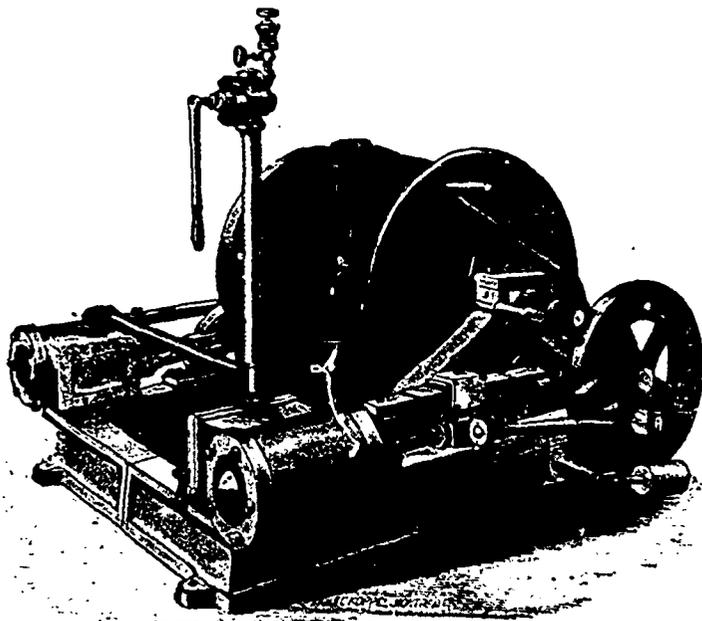


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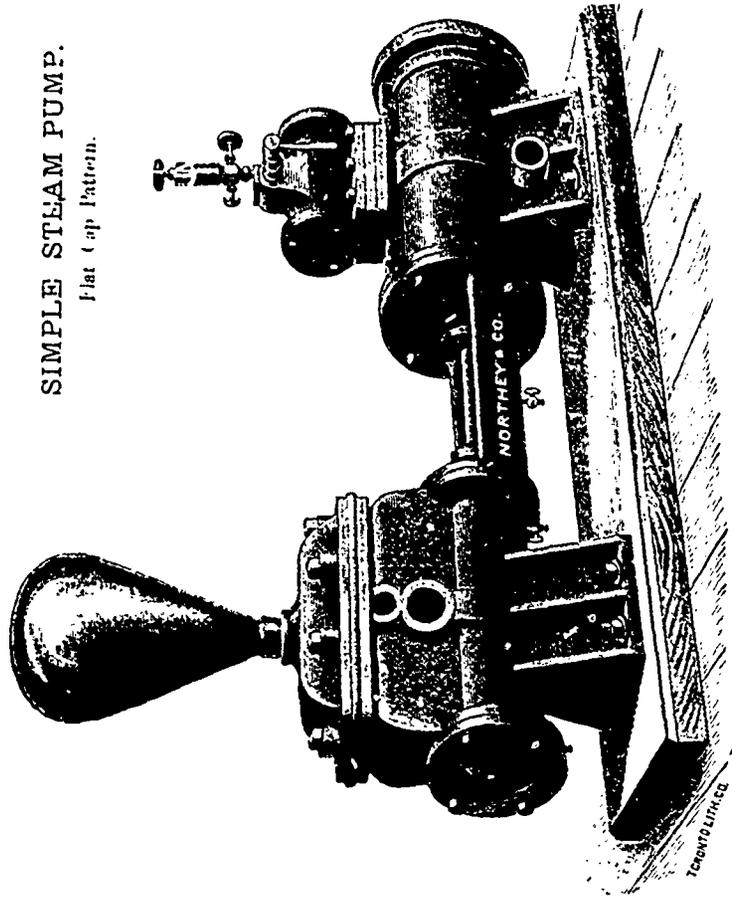
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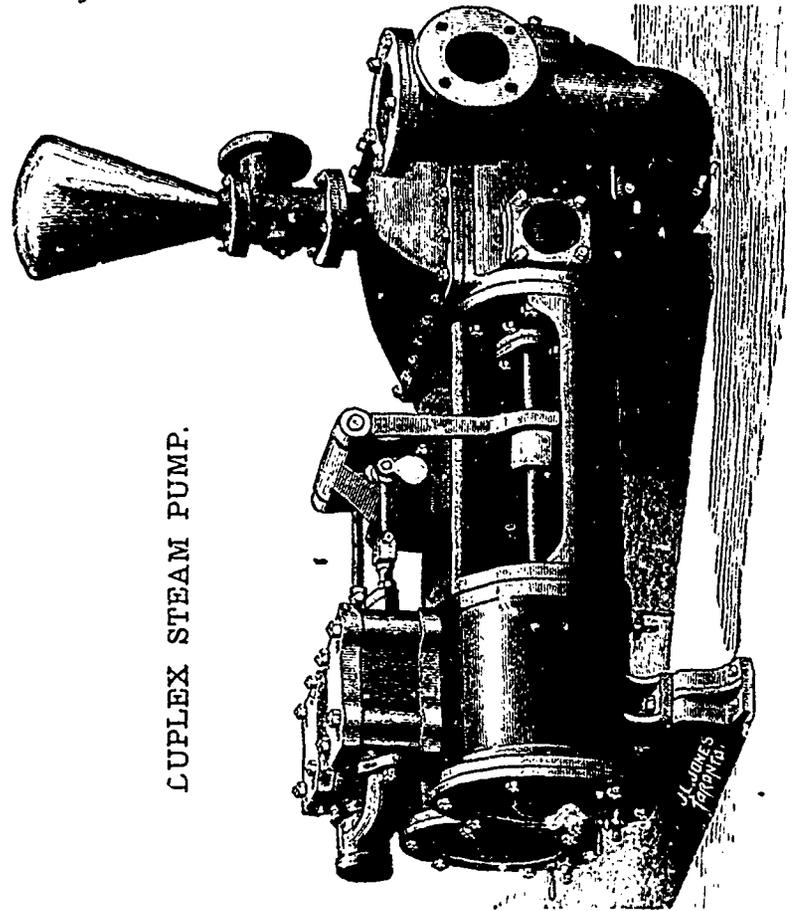
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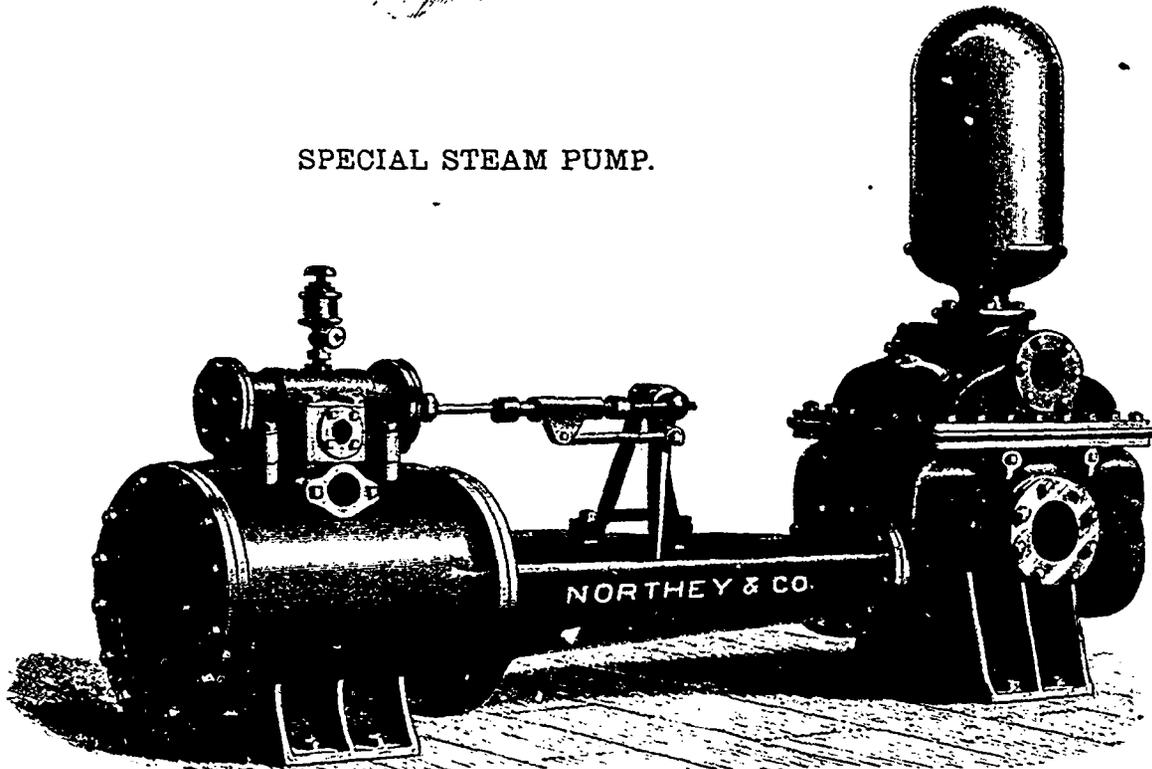
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Mining Regulations

TO GOVERN THE DISPOSAL OF

Mineral Lands other than Coal Lands, 1886.

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

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

QUARTZ MINING.

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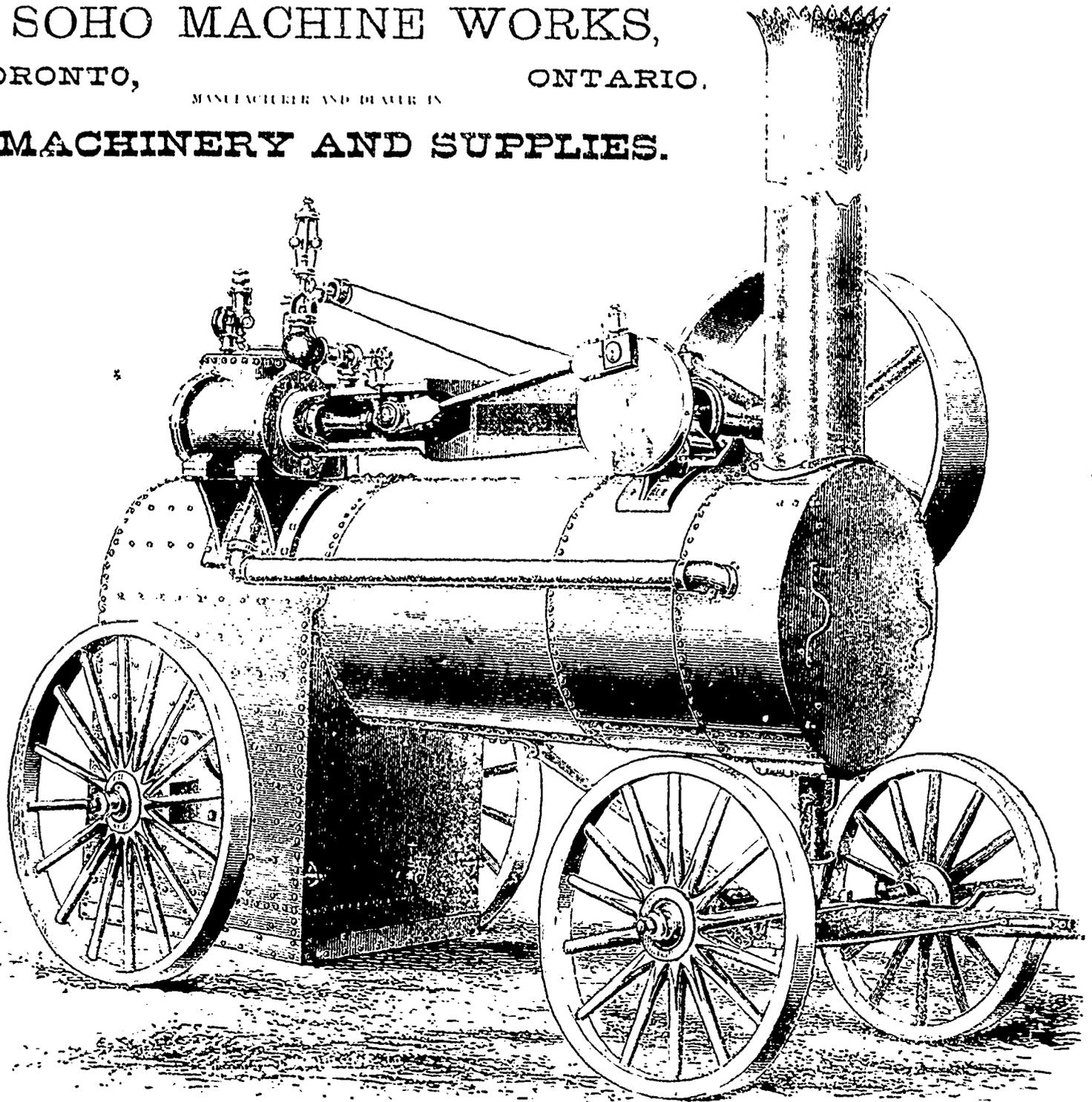
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