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MINING REVIEW

VOL. 1.—No. 11.

OTTAWA, SEPTEMBER, 1883.

VOL. 1.—No. 11

Canadian Mining Review.

PUBLISHED MONTHLY.

ANNUAL SUBSCRIPTION - - - \$1.00
 ADVERTISING RATES—15c. per line (12
 lines to 1 inch).

OFFICE:
 UNION CHAMBERS, 14 Metcalfe Street.

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

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

Mining news and reports of new localities of mineral deposits are solicited.

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

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

CANADA'S
PHOSPHATE INDUSTRY.

Reports received during the month from the phosphate mines in the County of Ottawa are of a very satisfactory nature, and the output continues to be appreciably in excess of any previous year. The temporary dullness of the market has in no way affected the conviction of miners that prices will improve by the time manufacturers abroad are prepared to make contracts for next season's shipment, this is evidenced by the activity prevailing at the mines and the determination of owners to increase their facilities for

raising ore. There has been no noticeable falling off in the number of men employed, except in isolated cases and under extenuating circumstances. Several new mines have been opened during the past month, but, as yet, there has not been sufficient work done to warrant any detailed account of prospects or even a description of the properties. Some of them have, however, been paid from the surface, and continue to improve. The weather has been everything that could be desired for the profitable prosecution of work, and it has been fairly taken advantage of.

The analyses of shipments to England during the summer show that the output sent forward was of a higher standard than that of any former season, which goes to prove that miners have begun to appreciate the importance of shipping their mineral in as high a state of purity as can be arrived at by hand manipulation. The extra labour employed in careful cobbling is insignificant compared with the advantage to be gained by raising the analysis of a shipment two or three units; not only is there immediate benefit derived, but it has a tendency to facilitate negotiations for future sales.

A party of English gentlemen, more or less interested in mining matters at home, visited some of the phosphate mines in this neighbourhood, and in the vicinity of Perth, and expressed themselves much interested in the industry. No doubt we will hear from them again, as they were very careful in collecting statistics and all information and data that would enable them

to speak intelligently on the subject when they returned to England. These gentlemen had no idea that phosphate mining in Canada had assumed such proportions, which is fresh evidence that this important Canadian industry is known abroad but to the few. There is capital in England awaiting investment that will be sent to Canada for the development of any legitimate enterprise, and it is the duty of everybody, directly or indirectly interested in our phosphate industry, to do all in their power to establish it on a sound and permanent basis. Lack of capital to develop the natural wealth of Canada has been the cry for years. Let Canadians prove themselves worthy the confidence of capitalists outside of the Dominion, and the requisite means will be forthcoming.

THE MINES.

Owners of mines express themselves satisfied with the result of the month's work, many of whom are forwarding their output regularly to the Canadian Pacific Railway Stations, while others, not so conveniently situated, are allowing theirs to accumulate, awaiting winter transportation.

THE "HIGH ROCK" MINE

continues very productive and the openings are developing with that regularity which has already established the character of the mine. About 15 tons are being raised daily, and the ore is of a high grade. This property has much increased in value in the hands of its present owners, whose manager, Mr. A. McIntosh, appears to understand his business and to watch the interest of his employers beyond the ocean.

THE "DUGWAY" AND "STAR HILL" MINES

owned by the Union Phosphate Mining & Land Company, though more recently opened, are keeping pace with "High Rock" and their daily output is much the same. The ore raised on this Company's property is very pure, and a quantity has already been delivered at Buckingham station—it appears to have been carefully picked over and has been forwarded in a clean state. The many openings which have been made on the location are developing most satisfactorily, and are confined to but a small portion of the Company's territory. Money has not been spared in equipping the mine with appliances most suitable to this class of mining, and everything connected with it is of a substantial character.

THE "NORTH STAR" MINE,

formerly worked by a firm of contractors, is now being developed by its owners, the Dominion Phosphate Company, with encouraging prospects. The mineral at this mine is the purest that has been raised from any part of the County, free from admixture with impurities, with which Canadian apatite is so frequently associated, and which adds to the cost of cleaning up. Mining operations are being conducted by Mr. W. H. Smith, a practical and shrewd superintendent, and the general management of the work is carefully attended to by Mr. Huntoon, Managing Director of the Company. The amount of phosphate being raised is limited, as the force is employed, exclusively, in making a second open cut before attacking the body of ore, but, in doing this, a considerable quantity of phosphate has been met with, the value of which will reduce the cost of dead work to a minimum.

THE "EMERALD" MINE,

now the property of Mr. W. A. Allan, of Ottawa, is, without doubt, the most valuable phosphate mine yet discovered in

Canada, not only on account of the quantity and purity of the mineral, but from the fact of its being the most conveniently situated mine, within a stone's throw of the navigable waters of the Rivière du Lièvre, and not more than ten miles distant from the railway station. During the summer, each day's output has been sent forward, and in the winter season it will be delivered for about one-half the cost to other miners. There is, comparatively, but a small force of men employed at the mine, and yet the daily output amounts to 20 tons, and the body of ore in sight measures several thousand tons; in fact the wall has not yet been reached in any direction, and the bottom of the pit shows solid mineral.

THE "McLAURIN" MINE.

Of this mine little can be said that is not already known to people in any degree interested in the phosphate industry of this section. For some years past the repeated reports of practical men have characterized it as a property of great value and it continues to deserve the enviable reputation it has earned. Ever since it fell into the hands of its present owners a uniform annual output has been sent forward, and shipments have invariably analysed 85 to 86 per cent.

THE "POST" MINE.

situated in the Township of Templeton, not far distant from the McLaurin property, is sending a quantity of very fine phosphate to the front, and the mine is looking well; a large quantity of mineral is in sight, and development shows the deposit to be one of considerable extent and of a solid character.

OTHER MINES

continue to improve with development, and prospects are reassuring to their owners. The "Gemmill," the "Haldane," the "Jackson Rae," the "Moore," the "International" and many less important, and more recently opened mines are carrying on active operations; in fact from end to end of the County of Ottawa phosphate mining is being established on a permanent basis, and the force employed aggregates about 450 men, distributed, approximately, as follows: "High Rock" 70, "Union Phosphate Mining and Land Company" 60, "Emerald" 30, "North Star" 12, "Chapleau" 20, "Philadelphia Company" (Portland East) 20, "McLaren" 15, "French Company" 40, "McLaurin" 30, "International"

10, "Jackson Rae" 15, and at other mines about 100. A report has come in that the "Moore" mine in Wakefield, is opening up well, and that recent stripping has exposed large bodies of phosphate. This is comparatively a new mine and is capable, no doubt, of being vastly improved. With further development it will, of course, increase in value.

2nd Quality Phosphate.

A large quantity of low grade phosphate is lying at the mines, and many hundred tons have been delivered at point of shipment, but owing to there being no demand at present for "seconds," it is not being forwarded. This grade of ore is the refuse of the mines, or so mixed with rock and other impurities that miners have found it more profitable, while they had a market, to sell it at a low price than to pick it over and cob it. The demand having ceased, Mr. Allan, who has a large quantity at Buckingham Station, has set men to cob and clean up so as to raise it to the standard of first quality. This is unquestionably a wise move, and others might do well to benefit by the example.

Phosphate Quotations.

Prices have taken another drop and Canadian apatite is now quoted in London at 1s. for 75 per cent., which is equivalent, all charges accounted, to \$15 per ton at points on the Canadian Pacific Railway, for 80 per cent. mineral. The cause of this drop is not attributable to any special cause, and those who can afford to hold will unquestionably realize better prices for next season's delivery. Manufacturers in Europe are not anxious to buy at present, and recent sales have been made under pressure.

Transportation of Phosphate.

Messrs. Allen and Bothwell, owners of one of the steamers on the du Lièvre, are building a scow of 60 tons capacity for the accommodation of miners up the river. It is their intention to contract with owners of mines to deliver their output, during the season of navigation, at the Buckingham landing, from whence it will be forwarded to the railway station or Ottawa River in waggons, a distance of 3 and 4 miles respectively. The steamer, with the scow in tow, will make a daily trip to High Falls, and this extra facility for transporting ore will, undoubtedly, be a great convenience to the owners of phosphate mines contiguous to the river.

Weighing Phosphate.

Mr. R. Smith, agent of the High Rock Mine at Buckingham Station, is about to erect a Fairbank Scale at the entrance to the yard for the

accommodation of shippers. Heretofore the phosphate hauled to the Canadian Pacific Railway has been weighed in the waggons or sleighs at the village of Buckingham, and afterwards forwarded to the station. This has always been looked upon as risky, there being no check on teamsters after their load had been weighed until it was deposited in the bins at the railway, and, as it had to be carried quite 3 miles, the opportunities and temptations for dishonesty have been manifold. The proposed scales at the station will circumvent any contingency of this nature and, as they will be so erected that teamsters will drive on them on entering the yard and continue thence to the bins, they must prove a great convenience, and will supply a want long and seriously felt.

ANALYSES.

HOW SAMPLES OF PHOSPHATE ARE SELECTED FOR ANALYSIS IN ENGLAND AND ON THE CONTINENT.

As many of our readers are unaware of the *modus operandi* for the proper selection of samples from shipments of our phosphate for analysis, we herewith furnish full details of the manner in which it is carried out. The phosphate is discharged over the vessel in a shoot on to a wooden staging, from whence it is wheeled in barrows over the weighing machine, and then on to the warehouse. Every hundredth barrow load is, after being weighed, run into a small bed close by, the floor of which is stone, well swept, and quite dry and clean. The whole of the sample is well mixed together and put through a crusher, after this the sample is divided, and half put through the machine again; then, after well mixing, a tenth part is put through the machine, after which the sample is again divided in tenths, and one portion filled into clear dry glass bottles, sealed, and forwarded to the chemists selected for analysing. This information is given to us by one of the largest exporting houses in Montreal.

IMPORTANT SALE.

Mrs. E. W. Murray, of Buckingham, has sold her half interest in the "Emerald" mine to Mr. W. A. Allan, of Ottawa, for the handsome sum of \$40,000 in cash, the money having been paid on the 21st inst. Mr. Allan, who was part owner with Mrs. Murray in this mine, is now the sole proprietor of the most valuable phosphate mine in Canada, and has by this purchase added one more to the list of valuable mines of which he is the fortunate owner. He is to be congratulated on acquiring the proprietorship of this property, and Mrs. Murray has been very fortu-

nate in realizing such a handsome sum, in cash, for that portion of her late husband's estate which could not receive her personal attention.

ROADS.

Again it becomes necessary to direct attention to the bad condition of the road leading from Buckingham Village to the Railway Station. Shippers of phosphate are crying out for improvements, of a substantial and permanent character, that would render traffic more practicable. The owners of mines whose output must find an outlet over this road have, time and again, expressed a willingness to co-operate with the municipal authorities in making the much required improvements, but there has been no disposition shown to meet them halfway. The amount of freight in the shape of lumber, phosphate and farm-produce that is daily hauled from the village to the railway is very great, and no temporary patchwork, such as has been done at odd times, since last spring, can be expected to stand the wear occasioned by such traffic. The wet fall weather is approaching, and, unless prompt attention is given to putting the road in good order, it will shortly become impassable for heavy freight. Let the ratepayers of Buckingham combine with the phosphate miners to devise some means of inducing the corporation to give attention to such important requirements of the municipality.

A NEW INDUSTRY

For the County of Ottawa.

That the articles which have appeared from time to time in the REVIEW, setting forth the importance of the Canadian phosphate mining industry, are having a good effect, is made apparent by the many letters, asking for further information on the subject, which have been received, from the United States and England, at the REVIEW office. We are now in receipt of communication from some scientific gentlemen, experienced in mining and treating minerals, asking for our views on the feasibility of, and the advantages that might be expected to attend, a new enterprise which they propose to inaugurate in connection with our phosphate industry—which is as follows. They propose to form a company with sufficient capital to enable them to erect crushing and concentrating mills, with a view to the utilization of the waste phosphate rock which so rapidly accumulates about the mines. These gentlemen are holders for Canada of the patent for Paddock's Pneumatic Ore Separator, and they profess to be able to utilize all rock containing 75 per cent. down to 20 per cent. of phosphate, and, by means of crushing and concentrating, to bring it up to 85 per

cent. standard. Their machine has been successfully in use for all kinds of minerals, and phosphate, though but experimentally, has been treated by it with success. The extensive graphite concentrating mills at Tyconderoga use this machine exclusively.

The phosphate rock treated by the above process, would of course be pulverized, and our correspondents state that it would ultimately be to the advantage of the Company to add plant for the manufacturing of super-phosphate.

This is a matter well worth the attention of owners of mines, and we will be obliged to them if they will formulate their views as to the practicability of conducting such an enterprise on a paying basis, and forward them to the REVIEW. Much will depend on the quantity of waste rock as above described; the intention of the promoters would be to purchase from owners at the mines or mill, and to treat it as their own property. They appear to be quite confident that, if the quantity of raw material can be had to keep the mill working, the Company would experience no difficulty in paying handsome dividends. We are of opinion that such an enterprise would be of enormous advantage to miners, as it would not only free their properties, to a great extent, of waste heaps, but would provide a convenient market for their second, third and lower grade ore.

MONTREAL HOUSE, BUCKINGHAM.

People who are interested in mining in the valley of the Rivère du Lièvre, and who have occasion to visit Buckingham, will regret to hear that Mr. J. W. Lynch, the popular proprietor of the Montreal House, will shortly retire from the business of hotel-keeping. For many years his house has been a favourite stopping place for mining men, and though it may fall into other hands, its former genial proprietor will be greatly missed. Mr. Lynch is now, and for sometime has been, Superintendent at the Emerald Mine, and has become so interested in his work, that it has effectually weaned him from any attachment he may have had for his former occupation. He takes with him the best wishes of all his old patrons.

MICA.

The production of mica promises to become one of Canada's important mining industries. During the past few months much attention has been given by explorers to searching for this mineral, and innumerable deposits have been discovered; many of these have proved to be valueless, some on account of its not appearing in paying quantities, and others owing to the inferior quality of the mineral. Some valuable

veins have, however, been found, carrying crystals from which large sheets of clear white mica can be obtained. One such vein occurs in the County of Ottawa, and, although the work of developing it has not yet been started, the surface indications are such as to allow of no reasonable doubt as to the quantity of marketable mica that can be mined. The specimens sent to this office with a description of the geological formation and diagram of the vein, lead to the belief that this property is one of great value. Another vein, though occurring in a different formation, is now being opened at a point on the Upper Ottawa, and the mica is above the average in point of size and clearness. The vein, which is well defined between granite walls, is of fair width at the surface, and extends for several hundred feet in length. What little work has been done on the vein goes to show that the crystals increase in size and are more compact below the surface, while the sheets become almost free from discoloration. But little more work on this property will be necessary to establish its value, and mica mining, once successfully begun, will rapidly become an industry in the district of as great importance as the mining of any other mineral.

THE HAYCOCK IRON MINE.

Negotiations with the English capitalists for the reorganization of the Ottawa Iron and Steel Manufacturing Company, and the resumption of work at the mine, have not yet been concluded. Every detail connected with the proposition that has been made to them is being carefully considered, and a thorough examination of the property by experts, sent from England for the purpose, has satisfied the people in England of the correctness of the statements and reports that have been laid before them. In view of this, it would be unreasonable to anticipate any hitch, and it is not unlikely that satisfactory terms will be definitely agreed upon within a short time, and the nature of same publicly announced.

NEW DISCOVERIES.

A report has reached us of a recent valuable discovery of silver in the Township of Grenville, County of Argenteuil, but we are not informed as to whether it occurs in native form, argentiferous galena, or as sulphuret of silver ore. Further particulars of the discovery will be looked for with much interest.

Recent discoveries of phosphate deposits in Florida have been purchased by the Ashley Phosphate Company, of Charleston, S.C., who value the property at a high figure, not only on account of the extent of the deposits, but owing to the grade

of the mineral, which has been pronounced superior to that of South Carolina.

Phosphate has also been discovered in North Carolina, similar in composition to the deposits of South Carolina. It is found to occur in the same formation and has been traced to various points in the State. No mining has yet been done and the extent of the deposits is therefore not determined.

Phosphate mining in the Southern States will in no manner affect the industry in Canada, as the mineral, which is of a much lower grade, averaging not higher than 50 per cent., finds a different market, and dealers have not yet been known to be in competition with shippers of Canadian apatite.

MINING NOTES.

Manitoba and Nova Scotia Gold Mines.

Rat Portage, District of Keewatin.

The contract work has been completed on the Minnisabic, and Messrs. Rideout and Gibbons are more than satisfied with the results.

The "Lake of the Woods Company's" property has for some time been idle, but hopes are entertained that work will be commenced on it within a few days.

The "Argyle Company" are steadily working on their property, and proving that, although far from being the richest vein on the lake, it is a good location, and will amply repay the work done.

The "Winnipeg Consolidated" have put in the water pumps and have placed in their mill the Caldwell Grinder and Amalgamator, by which it is expected to take over \$50 per ton out of the ore. The shaft is down 114 feet, and the vein is widened out to 6 feet.

The "George Heenan Company" are jubilant over the acquisition of a new mine, the "Red Star," said to be the mammoth vein of the lake. It is 40 feet on the face and at some points across the island measures 80 feet. The pyrites contains 23 $\frac{3}{4}$ per cent. of copper and \$118.93 in gold. Where the vein matter does not carry copper, it runs \$15 to the ton. Five dollars a ton will both mine and mill the rock. A number of Chicago capitalists are expected to take hold of the property. —*N.Y. Mining Record.*

The correspondent of the CANADIAN MINING REVIEW at Rat Portage, reports that, comparatively speaking, mining matters are dull in the district owing to the scarcity of money necessary for further development, rather than to any depreciation in the value or richness of the mines.

Nova Scotia.

OXFORD GOLD MINE.—The clean-up for the last week of August resulted in 114 ounces from 30 tons of ore, or about \$80 per ton.

SALMON RIVER MINE.—A bar of gold weighing 300 ounces and valued at about \$6,000 was the result of work at this mine during the month of August.

The "Sydney and Lewisburg Coal and Railway Company" has recently engaged in the manufacture of iron from the Cape Breton Island ore. The ore, as well as an inexhaustible amount of coal, is in large quantity on the island.

BRIDGEWATER.—A bar of gold weighing about 70 ounces has recently been forwarded from newly discovered lodes near Bridgewater, Lunenburg County. It is said to have been taken from 600 pounds of quartz, selected out of four or five tons of ore. If this statement is correct it would appear to yield a minimum of fourteen ounces per ton, which, if maintained, at once stamps the new field as one of the most valuable in the province. —*Ibid.*

BRUNSWICK G. M. Co.—This company is one of the few mining companies that seem to conduct their business on true business principles, and bids fair to be very remunerative to those interested. The property is a mile in length, 1,000 feet in width, with a 10-stamp mill, 30-horse-power engine, with buildings for the miners, blacksmith shop, etc., all in perfect condition. Their close proximity to Halifax by water enables stores, etc., to be cheaply and quickly transported. Three shafts are being sunk on the lode, and, although rich from the start, is improving in depth. Since the cleaning up in August the mill has been running on rich ore, and the plates indicate more than satisfactory results. Owing, no doubt, to judicious management this company's property appears to be one of the best paying mines in Nova Scotia. Two bricks, weighing 115 and 112 ounces respectively, have recently been forwarded from the mine to the head office of the company.

COXHEATH.—According to reports, work has been temporarily stopped at this copper mine. This is said to be in consequence of the large quantity of ore which has already been raised and hauled, the company not having fully decided whether to ship the ore abroad or have it smelted at Cape Breton. The mine is situated near Sidney, C.B., and, as has already been stated in the REVIEW, is owned by Bostonians. Reports of progress received lead to the conviction that this temporary suspension is attributable solely to the cause above mentioned and not to the development of any weakness in the mine.

IRON.

The quantity of iron ore that has been exported to the United States has been the means of establishing a reputation for the product of Canadian mines and, as a consequence, the sales of many iron locations have been reported. Information has been received, from an authentic source, to the effect that a number of Cleveland gentlemen, having formed a syndicate, have placed a large amount of money in iron mines in the Province of Ontario. The *New York Engineering and Mining Journal*, thus speaks of their prospects: "The iron range is 90 miles inland from Lake Ontario, and the area is supposed to be in the neighbourhood of 60,000 acres, part of which, however, is owned by Canadian and New York capitalists. The mines will be

reached by the Central Ontario Railway, which is now in course of construction, and which will have the entire monopoly of the carrying trade of all the mines. The terminus of the road is on Weller's Bay, the best harbour on Lake Ontario, and only 60 miles distant from Oswego, and about 36 miles from Rochester (this should be about 70). Extensive docks and ore-pockets have been constructed to facilitate the shipment of ore to the United States. The ore outcrops at considerable elevation, and, in order to secure a large output from the mines that have been started, it will not be necessary for some time to erect expensive plant. The mines have already been located, and the output the first year the road is completed will be somewhere in the neighbourhood, it is thought, of 100,000 tons. The whole matter is yet in such a shape as to give very little idea of the resources of the beds. It will be some time

before the Central Ontario Railway is completed, and until then operations cannot be commenced. Samples taken from a number of localities on the range show magnetic and Bessemer ore of the finest quality. The Cleveland syndicate starts out with a capital of \$2,000,000."

This augurs well for the future development of the iron mines in the district referred to, and, as the gentlemen composing the syndicate have already invested a very large amount of money in the construction of the extension of the Central Ontario Railway, it is more than probable that work at the mines will be vigorously pushed, as the ore will be the principal freight carried on the road, and its main support.

The extension of the Kingston and Pembroke Railway, now in course of construction, penetrates a section of country where extensive deposits of magnetic and hematite iron ore have been discovered, and

which have attracted much attention since the location of the railway through the district. In the Township of Bagot, the ore carries a high per centage of metallic iron and the outcroppings indicate almost inexhaustible deposits; analyses show the ore to be exceptionally free from objectionable features, and there exists little doubt in the minds of experts that the locality lying to the north of Kingston, and traversed by the above mentioned railway, is capable of producing iron ore of as high grade and in as great quantity as any other section of Canada. The lake terminus of the road at Kingston is not more than 65 miles from Oswego, so that the mines will be conveniently situated for transportation of ore to the United States. A number of deposits have already been located in this section, and it is not at all improbable that active mining operations will be begun within a short time.

ANALYSES OF CANADIAN IRON ORES.

The following tables, compiled from different sources, will serve to illustrate the composition of Canadian magnetic and hematite ores.

TABLE OF ANALYSES OF MAGNETITES.

CONSTITUENTS.	I.	II.	III.	IV.	V.	VI.	CONSTITUENTS.	VII.	VIII.	IX.	X.	XI.	XII.
Peroxide of iron.....	73.90	93.82	66.20	69.77	90.14	72.80	Peroxide of iron.....	89.22	58.35	59.39	80.76	65.44	90.36
Protoxide of iron.....			17.78				Protoxide of iron.....		24.87	26.93	13.59	14.50	
Oxide of manganese.....	none.	0.12	traces.		traces		Oxide of manganese.....	none.	0.13	traces.	0.06	0.11	0.17
Alumina.....	0.61	0.79		5.65	1.33		Alumina.....		0.42	0.67	0.71	0.60	
Lime.....	none.	0.45	1.85		0.82	1.69	Lime.....	none.	1.43	0.33	1.30	3.90	3.04
Magnesia.....	1.88	0.94	0.18	4.50	0.84	6.86	Magnesia.....		2.56	0.82	0.45	0.45	traces.
Phosphorus.....	0.027	0.08	0.015	0.085	0.007	0.035	Phosphorus.....	0.012	0.07	traces.	0.21	traces.	0.19
Sulphur.....	0.685	0.11	0.28	1.52	0.12	0.027	Sulphur.....	0.073	0.04	0.07	0.04	2.74	0.00
Carbonic acid.....			1.17			1.50	Carbonic acid.....					1.64	
Silica.....	20.27	3.75	11.11	7.10			Silica.....		11.17		0.01	11.45	
Titanic acid.....	none.		none.	9.80	1.03		Titanic acid.....		0.73	3.23	none.	none.	none.
Graphite.....			0.71				Water.....				0.22	0.14	
Water.....	3.27			2.45		3.50	Organic matter.....				0.04		
Insoluble matter.....					5.25	14.73	Insoluble matter.....	10.42		8.38*	2.75		6.50
	100.042	100.06	99.295	100.875	99.537	101.142		99.725	99.77	99.82	100.14	100.97	100.20
Metallic iron.....	53.51	67.94	60.17	59.52	65.27	52.72	Metallic iron.....	64.61	69.19	62.52	67.10	58.37	65.43

* Silica and insoluble rock matter. † Bisulphide of iron.

TABLE OF ANALYSES OF HEMATITES.

CONSTITUENTS.	I.	II.	III.	IV.	V.	CONSTITUENTS.	VI.	VII.	VIII.	IX.	X.
Peroxide of iron.....	84.42	84.10	88.08	89.80	85.45	Peroxide of iron.....	82.25	86.80	75.67	92.01	96.63
Protoxide of iron.....			6.86	7.06	5.24	Protoxide of iron.....				0.52	2.16
Protoxide of manganese.....			0.24	trace.	0.15	Oxide of manganese.....			0.45	0.21	
Alumina.....						Alumina.....		trace.	1.37	0.71	
Lime.....	3.02	4.93	0.55	trace.	0.41	Magnesia.....			0.46	0.20	
Magnesia.....	0.50		0.13	0.22	0.17	Phosphoric acid.....	0.026*	trace.	0.22	0.08	none.
Phosphoric acid.....	0.03*		0.16	trace.	0.13	Sulphur.....		0.092	0.29	0.16	0.00
Sulphur.....	0.065		0.03	trace.	0.07	Carbonic acid.....			1.59	0.79	
Carbonic acid.....	2.93	3.87				Silica.....			19.43	3.68	3.24
Silica.....		4.00				Titanic acid.....			trace.	trace.	
Titanic acid.....			3.17	2.34	2.12	Water.....		0.66			
Graphite.....			0.35	0.43	0.28	Insoluble matter.....	16.05	12.75			
Water.....							98.986	99.642	100.00	100.00	100.75
Insoluble matter.....	7.16		0.26	0.11	5.77						
	98.125	96.90	99.83	99.96	99.79						
Metallic iron.....	59.09	58.80	66.98	68.34	63.88	Metallic iron.....	57.60	60.76	54.36	64.41	68.88

* Phosphorus. † Pyrites. ‡ Silica and insoluble matter.

A GREAT MINE'S OPERATIONS.

(From New York Mining Record).

At the recent meeting of the shareholders in Boston of the Calumet & Hecla Copper Mining Company, 81,490 out of 100,000 shares were represented; the old board of trustees was unanimously re-elected. It consists of Alexander Agassiz, Quincy A. Shaw, H. H. Hunnewell, George Higginson, James N. Wright, all of Boston or its suburbs, except Mr. Wright, of Michigan.

At a subsequent meeting of the directors, Alexander Agassiz was re-elected president, and Chas. W. Seabury, secretary and treasurer.

According to the financial statement, \$1,250,000 has been paid within the financial year ending April 30th, for 120 acres of land purchased—a property worth to the company more than \$5,000,000. The opening on the south part of the property is being done "little by little" and the product of 50,000 tons of rock, secured in opening, has paid a profit of about \$20,000. This new property will come in as a "reserve" when the old mine is "worked out," but in making this statement, President Agassiz did not name any particular date for that event of the future. Included in the extra expenses was the purchase of a large tract of timber land for the use of the mine, which is now well supplied. They are using less and less wood for fuel, coal being substituted, and the principal demand for that purpose now is the supply for family use. The demand for timber for use in the mine, is naturally large.

The following statement of the assets and liabilities for three years, will give a condensed view of the general results of its business.

ASSETS AND LIABILITIES.

	1881.	1882.	1883.
Total assets.....	\$3,151,790 38	\$3,912,038 26	\$2,438,674 11
Less liabilities.....	668,914 24	432,725 70	452,849 58
Surplus May 1.....	\$2,882,876 14	\$3,479,312 56	\$1,980,824 53
By due May 15.....	500,000 00	500,000 00	500,000 00
Actual net su plus.....	\$2,382,876 14	\$2,979,312 56	\$1,480,824 53
Increase or dec.....	dec. 31,795 58	inc. 596,436 42	*dec. 1,498,488 03
Profits of year.....	\$1,968,205 42	\$2,596,436 42	*See note.
Dividends paid.....	2,000,000 00	2,000,000 00	\$2,000,000 00

The annexed statement of the product of the mine for four official years, given in monthly figures, as actually smelted, shows the magnitude of the property and its resources, being more than an average of 1,310 tons of ingot per month in 1882-83.

	1879-80.		1880-81.		1881-82.		1882-83.	
	Tons.	lbs.	Tons.	lbs.	Tons.	lbs.	Tons.	lbs.
May.....	1,411	1,096	1,713	1,538	1,764	1,919	1,906	1,610
June.....	1,326	188	1,727	953	1,763	898	1,679	1,840
July.....	1,397	105	1,672	1,099	1,635	1,817	1,482	455
August.....	1,397	879	1,701	1,645	1,818	339	1,771	174
September.....	1,444	1,649	1,684	881	1,612	1,437	1,764	748
October.....	1,446	482	1,750	822	1,709	959	1,624	1,651
Six months.....	8,405	399	10,250	928	10,304	469	10,329	478
November.....	1,617	320	1,665	1,304	1,652	173	1,708	1,509
December.....	1,737	1,253	1,703	1,570	1,731	252	1,530	1,824
January.....	1,761	1,557	1,659	207	1,691	1,432	1,655	1,195
February.....	1,519	951	1,435	1,835	1,713	1,799	1,518	1,699
March.....	1,733	164	1,710	1,496	1,908	707	1,935	1,908
April.....	1,701	972	1,881	1,797	1,901	353	1,713	1,067
Total.....	18,465	1,616	20,290	1,137	20,905	1,187	20,392	1,480
Per cent.....	77.32		77.86		76.95		77.06	
Ingot, tons.....	14,277	1,435	15,797	1,300	16,094	1,985	15,714	258
Ingot, pounds.....	28,555,425		31,595,300		32,189,985		31,428,258	

The above figures are given in a manner to conform to the fiscal year of the company, which ends April 30th. Annexed are the figures for the first six months of each calendar year from 1879. The figures given are officially smelting returns, which run about five per cent. ahead of the product, as published each month.

	1880.		1881.		1882.		1883.	
	Tons.	lbs.	Tons.	lbs.	Tons.	lbs.	Tons.	lbs.
January.....	1,751	1,557	1,152	207	1,691	1,431	1,655	1,195
February.....	1,519	951	1,435	1,835	1,713	1,799	1,518	1,699
March.....	1,733	164	1,710	1,496	1,908	707	1,935	1,908
April.....	1,701	972	1,891	1,797	1,901	355	1,713	1,067
May.....	1,713	1,528	1,764	1,019	1,906	1,610	1,915	1,977
June.....	1,727	953	1,713	898	1,609	1,840	1,740*	1,558
Total mineral.....	10,147	125	10,208	7,252	10,728	1,742	10,460	1,404

*There is an apparent decrease in assets of \$1,498,488.03, and the net profits of the year would appear to be only \$501,511.97, against \$2,000,000 paid in dividends, but \$1,250,000 was paid for lands purchased last year, and probably \$100,000 to \$150,000 additional extra expenses.
*Five per cent. added to the June product which the smelting return will over-run to at extent.

THE GOLD FIELDS OF CANADA.

Gold mining in Canada is, for the most part, in its infancy, and her gold fields are not yet in a position to admit of a fair comparison with those of other countries where all the appliances which art, experience and money can bring to bear have long been in operation. Until within a few years ago our miners were unskilled and the machinery employed at the mines was of the most crude and cheapest description. This state of affairs is, happily, giving way to the introduction of modern machinery, while the management of the mines is being transferred to practical and scientific men, and the result will soon be felt. From the Atlantic to the Pacific Oceans, in every province of the Dominion, excepting Prince Edward Island, gold has been discovered to exist in paying quantities in auriferous alluvions and in quartz. In

Nova Scotia

the discovery of gold was first made known in 1860, and it has since been traced over an area of quite 5,000 square miles. The principal gold mining districts in this province are: Cariboo, Moose River, Fifteen Mile Stream, Gray's River, Lawrencetown, Montagu, Waverley, Oldham, Renfrew, Sherbrooke, Isaacs, Stormont, Wine Harbour, Tangier, and Mount Uniacke, while the existence of gold is reported in numerous other localities. In

New Brunswick

no gold mining has yet been done, though it has been discovered at several points on the coast, in Albert County and in the Tobique River, a northern tributary of the St. John. Indications lead to the belief that the quartz veins of the Province of Quebec extend across the central part of New Brunswick, in the direction of the Bay of Fundy, and this is not improbable. In the

Province of Quebec,

gold has been traced over an area of 15,000 square miles, bounded to the north by the Notre Dame Range of Hills, to the south by the International Boundary Line, and extending east and west from the headwaters of the Rivière du Loup (*en bas*) to Lake Champlain. Of this, about 4,000 square miles are the richest, and contain the metal in the form of alluvial gold, quartz and gold bearing black sand. This area embraces the beds of the Rivers Chaudière, Des Plantes, Gilbert, Famine and Du Loup (*en haut*) where alluvial gold mining was carried on in a primitive way for years at a fair profit. The gold fields of this province are capable of yielding metal at a fair profit if they were in the hands of experienced and practical men with the means to enable them to prosecute mining operations to the best advantage. In the

Province of Ontario,

the region embracing gold is supposed to extend from Madoc to the

northern shores of Lake Huron, but the richest and paying deposits occur in the Townships of Madoc, Elgin, Hungerford, Marmora, Lake and Tudor. There are no alluvial deposits in this district, the gold appearing in brown ferruginous earth in crevices of the rocks, in quartz and sulphurets and associated with antimonial grey copper ore. Further to the west, in the Province, it is thought probable that gold will some day be added to the mineral riches of Lake Superior, and already active gold mining operations are being carried on on the Lake of the Woods, and at Rat Portage, with most promising indications. The last mentioned locality is in disputed territory, and may some day belong to the Province of

Manitoba,

where important gold leads have been found during the past few years. Prospectors are still busily engaged in exploring the Province, and new discoveries are almost daily reported. Some valuable mines are being already worked, at which expensive machinery has been erected during the past summer, and gold mining in Manitoba bids fair to becoming an important and very profitable industry. In the

North-West Territory,

traces of gold have been found a short distance south of Great Whale River, on Dog Island, near Cape Jones, and in the Little Whale River Valley. On the North Saskatchewan gold is found, more or less, below the mouth of the Brazeau, on the bars and in the river banks. It occurs in the gravel in the bed of the South Saskatchewan, about Edmonton and in the Peace River district. In

British Columbia,

it may be said, without exaggeration, that there is scarcely a stream of any importance in the Province in which the "colour" of gold cannot be found. Its discovery, first made known in 1858, led to the influx of miners during that and the following year. Gold, thus the first cause, attracting attention to the country, has ever since been an important factor in its prosperity. The Cariboo, Kootenay, Omineca, Cassair, and the Fraser River districts, as well as the Leech River district in Vancouver Island, have been the chief centres where gold mining has been carried on. The alluvial deposits have so far absorbed the mining energy of the country, but attention cannot be too soon or too carefully directed to the more permanent quartz mining, as it would give a more reliable character to the industry and would indirectly tend to cheapen labour by affording steady employment. In the discovery and development of her gold mines, British Columbia has laboured under many disadvantages, such as their inaccessibility and the cost of labour and supplies. The condition of the Province is rapidly changing, however, and the

increased facilities for communication, together with the rapid growth of farming settlements, will do much towards removing many of the difficulties which have heretofore retarded the development of the mining interests.

LAKE SUPERIOR COPPER MINES.

The multitarious uses for which the mineral can be employed and the cheapness of its production renders copper-mining one of the most lucrative fields for capital, and the Lake Superior region is being proved one of the most productive of this metal. Hitherto our neighbours in Michigan have carried off the palm for copper production, but there are indications that Canada has entered the lists, and that she will make a fair exhibit before many years is not at all improbable.

Two English companies have commenced the development of the native copper deposits on the north shore of Lake Superior viz: "The Michipicoten Copper Company," at Michipicoten Island, and "The Lake Superior Native Copper Company," at Mamainse. These companies have been engaged during the past eighteen months in equipping their mines where mining operations have, so far, met with most flattering results. Each company has expended over two hundred thousand dollars on its property, and they have now reached the point when handsome returns will reward them for their large outlay. The crushing mills and dressing floors at Mamainse will be in operation this month, and we learn that sufficient ore is in sight to keep the stamp mill running for two years, while new ground is being opened. This company expects to double the capacity of its mill next spring by the addition of a ball stamp. About 160 men are employed at this mine; a post office has been established, and the number of buildings that have been erected for the accommodation of the employes and other uses, present the appearance of a village where, but a short time ago, a barren wilderness existed. The steamer *Steinhoff* has recently been purchased by the company; she is capable of accommodating sixty to eighty passengers, as well as about two hundred tons of freight, and will ply between the mine and Sault St. Marie, and probably Michipicoten, supplying a want long felt by fishermen and miners in the vicinity.

"The Michipicoten Company," although somewhat more tardy in getting its crusher in operation, gives assurance of a prosperous future, if we may judge from the mineral now being taken from the shafts, specimens of native copper ore from which, weighing from $\frac{1}{4}$ to 10 and 12 lbs., have been received at the office of the Managing Director, in Montreal, where we had the opportunity of inspecting

them. This company has all its surface work completed and is now directing its attention to opening up the mine, where about 60 men are employed. We are informed that the company purposes starting its new Crushing Mill next spring, by which time sufficient ground will have been opened to insure its continued working.

Both of these companies are prosecuting their mining operations with the most approved rock drills and air compressors, with which treble the amount of work can be accomplished, in the same time, as formerly. We will keep our readers informed, from time to time, of the progress of this important industry, the value of which, to the country, can scarcely be over estimated. The successful prosecution of mining in, and the extension of railway facilities to, the Lake Superior region is all that has been requisite to open up to capital and enterprise this extensive mineral field which, until now, has been looked upon as quite inaccessible.

TO ENGLISHMEN AND ANGLO-CANADIANS.

The Mineral Resources of Canada.

That Canada is, day by day, growing in importance, in the eyes of capitalists and scientists of other countries, as a field for the investment of foreign capital, is fairly demonstrated by a letter, under the above heading, which has recently appeared in the *Mining Journal*, London, England, as follows:—

Sir,—As this subject may interest many of your readers, I have forwarded you some practical hints, which may be turned to suit the requirements of the present time, so as to hasten the development of what may be the most valuable portion of Canada, and which has not been especially named by previous writers on mining subjects. You will see by the enclosed complimentary article of April 6th, 1878, from the *Mining and Scientific Press*, of San Francisco, that the opinions expressed in my "Explorers', Miners' and Metallurgists' Companion," published so far back as the year 1869, as to where extensive mining fields would be found on this Continent, have been, in all cases, fully realized in and across the United States on the several slopes of the northerly trending mountains and their foot hills, as therein more particularly named. The chief reasons for this present communication, are to show, so far as proved in the United States, even up to points very near its northern boundary, that these predictions have been practically demonstrated by innumerable operations and very large profits; secondly, to repeat these statements and call renewed

attention to the established facts that the same mountain ranges will carry similarly favourable analogy northward in their courses through British possessions.

The Americans are the best prospectors for mineral in the world, and have, during the period named above, performed an amazing amount of exploration work, and made many valuable discoveries. The trans-continental railway of Canada will enter into and cut its way across—or in a mining manner, coastwise—the whole mountainous portions of the country, and will soon enter the wide and most interesting mineral zones of the Rocky and Wasatch mountains, where intelligent observations and explorations will, in my opinion, cause Old England to be once more proud of Colonial wealth.

This field for mining, with mountains running over 1,000 miles northerly, the whole breadth of the Canadas, will probably extend across the longitudes of Western Dakota, Montana and Idaho, of the United States of America, but for lode or vein mining will not reach so far west as Cariboo in British Columbia, as the Sierra Nevada chain of mountains is thereabout broken and detached for a few hundred latitudinal miles. This does not prevent the possibility of auriferous discoveries in gravel formations, which are very likely to be found in many valleys that have received the water washed debris from the western declivity of the previously named mountains along the route. I have been frequently questioned by letters from England: Where is the best place to explore for minerals? and I answered both English and Canadians—Prospect the breadth of the Canadas on either side of the advancing railway, but more particularly opposite to Western Dakota, Montana and Idaho, for vein mining, and thence westward for gravel and placer gold, where vast mineral areas lie unexplored.

When this railway is sufficiently far advanced, the north and south branches of the Saskatchewan River, the Athabaska, and Peace Rivers, and the Rivers Laird, Peel, and McKenzie, will be found also convenient for both prospection and power for mining this 1,000 miles long of the east slope of the Rocky Mountains, whilst the five branches for mining the head waters of the great Yukon River may be utilized for the north-western slope with its spurs and parallel range. A few brave and strong men may make immense fortunes along this range of mineral-bearing strata. I know of no other unexplored belt in North America that exposes superior inducements, and there is probably nothing on this continent but the unexplored eastern slope of the mighty Andes, which extends 4,000 miles from north to south through the several rich countries of Columbia, Ecuador, Peru, Bolivia, the Argentine Republic, and Patagonia;

but Canada has the great advantages of your own language, laws, and flag; whilst these are mostly inaccessible, and more particularly so to foreigners.

I have not the slightest interest in this matter beyond goodwill for my countrymen; but, having during the last 18 years travelled over North America, and studied its mineral formations as much as but few men, and feeling certain that this region will be found valuable, I perform this pleasant duty of publication.

J. S. PHILLIPS,
State St., New York.

August 4th, 1883.

The article referred to in the former part of the above letter as having appeared in the *Mining and Scientific Press*, of San Francisco, April 6th, 1878, was reprinted by the *London Mining Journal*. It gives Mr. Phillips much praise for familiarity with the geological condition of North America, evidenced by subsequent events which have so largely verified opinions advanced by him in his "Explorers', Miners' and Metallurgists' Companion," published in 1869.—[Ed.]

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*The work of construction is being pushed ahead, and about five miles of the road-bed is already graded, notwithstanding that the Contractors and the Company have been severely handicapped by the many obstacles that have been thrown in their way by property owners along the line. Much difficulty has been experienced in acquiring the right-of-way in consequence of the unreasonable prices demanded for land. It would appear that the residents of that section of country to be traversed by the railway were indifferent to the many advantages they and the public at large will gain by having railway communication, and that they were ignorant of the fact that the construction of the road will enhance the value of their property to a very great extent. It would not have been expecting too much if the Company had looked for a free grant of the right-of-way from one terminus to the other, including the land necessary for station grounds; but they did not ask for this, and have been disposed to pay very liberally for all the land it is necessary for them to acquire, and that the progress of the work should be retarded by the exorbitant demands of property owners is to say the least, unreasonable, and shows a great lack of public spirit, and an absence of fair and honest feeling on the part of those who have been instrumental in occasioning delay. That the road will be ultimately completed, despite all the

obstacles of this nature, no doubt exists, and it is not at all unlikely that those very people who have been the prime movers in an endeavour to hamper and embarrass its promoters will derive the greatest benefits from the advantages and accommodation the railway will afford.

READ THIS!

(From the Chicago Mining Review.)

The chief factor in the development of the mining industry of any locality is the unappreciated and usually poorly sustained local paper. The true value of mining claims, the advantage to capitalists, the rich strikes of well conducted properties all fail of their legitimate influence if the fact is not made known outside of the narrow circle of isolated localities. As important as is the local and special press to the mining interests, it has been proven in a thousand cases, no other business expects so much or pays so little to the very right arm of its success. Papers that have earnestly and faithfully laboured to attract the attention of capital and to build up on a permanent basis the mining industry of a camp, have been left to starve and die in the place that they have done so much to establish. No other business expects gratuitous advertising, and it is a short-sighted policy for publishers and mining companies to neglect the best, and in many instances the only means that can be used to advance the interests of the camp and industry.

Subscribers to the CANADIAN MINING REVIEW are not as numerous as they might be, and correspondents are not prompt in reporting progress at the mines. We look for reform in both particulars. [Ed.]

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Persons tendering are notified that tenders will not be considered unless made on printed forms supplied and signed with their actual signatures.

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

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

By order,

F. H. ENNIS,
Secretary.

Department of Public Works,
Ottawa, 18th September, 1883.

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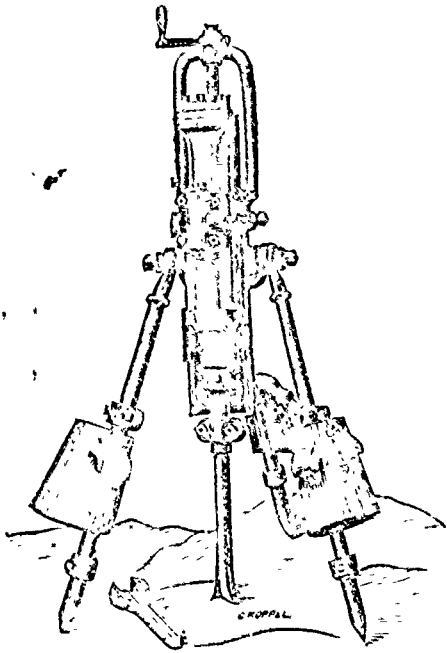
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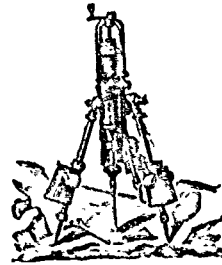
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Section.	Town-ship.	Range- West.	Acres.	
	3	14	23	640
	17	14	23	640
	15	14	23	640
	19	14	23	640
W $\frac{1}{2}$ and N. E $\frac{1}{4}$	15	14	23	480
N $\frac{1}{2}$ and S. E $\frac{1}{4}$	19	15	23	480
S $\frac{1}{2}$ and N. E $\frac{1}{4}$	15	16	23	480
E $\frac{1}{2}$ of N. W $\frac{1}{4}$	15	16	23	80
S $\frac{1}{2}$	3	17	23	320
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Mining Rights on S $\frac{1}{2}$ of Lot No. 1
 the 1st Range
 " " on Lot No. 23, 1st
 2nd Range
 " " " No. 26, 1st
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The fee simple of Lots No.
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