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CANADIAN

MINING REVIEW

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OTTAWA.

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

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

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

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

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

The gold and silver mines on the north shore of Lake Superior are attracting attention beyond the limits of the Dominion, and capital is being freely invested where owners are not unreasonable in their demands. We give some account in another column of what is being done towards developing the deposits.

Encouraging results are now being obtained from some of the gold mines of Nova Scotia. During the past two years suitable machinery has been brought in and skilled labour employed, and in all cases where this has been done, and the mines placed under efficient management, the quartz has been found to yield gold in paying quantity.

In this issue of the REVIEW will be found some interesting facts in connection with the phosphate mining industry of the county of Ottawa which are evidences of its rapid development and of the great importance it is becoming in the district. During the past two years it has been our pleasant duty to record the advancement of this industry, but never has the condition of the mines or the outlook for the future of the Canadian phosphate trade been so encouraging as at present.

We are informed by correspondents in London and Liverpool that a great number of Canadian phosphate mines are being offered in these markets. As far as we can learn, these so-called mines, with few exceptions, are mere prospects where no development work has been done, and for the most part have not even surface indications to warrant the reports that are being placed before capitalists, or the prices asked for the properties. We are also informed that this is much the case in New York as well as abroad.

The alluvial gold deposits in Beauce are being more extensively and systematically worked this year than at any former time, and there exists no doubt that with a proper system for saving the fine gold contained in the alluvium this district will prove to be one of the most attractive mining fields in Canada for the investment of capital. The quartz ledges are also being carefully prospected throughout the district, and the results already obtained point to extensive gold quartz mining in the near future.

The asbestos mines of the Eastern Townships are giving employment to a large number of quarrymen and labourers and are being worked with much energy and very profitably. The output of these mines is of a quality equal to that of any asbestos mines in other parts of the world and has become well known in the European markets, and is much sought after by dealers and manufacturers. This industry has been making rapid strides during the past three years in the county of Megantic, and the entire serpentine formation in the district has been thoroughly explored, to a great extent prospected, and the mines that have been located are being systematically and profitably developed.

We find further testimony to the great mineral wealth of our Lake Superior district in the *Chicago Mining Review*, as follows:—

"There are evidences which prove beyond a doubt that the Lake Superior country is destined to become one of the most important mineral regions of the world. Nature, as far as her gifts have been brought to light, evidently gave with lavish hand to this favored section, the extent and variety of whose resources have never been appreciated."

Speaking on the same subject, Prof. Chas. F. Eschweiler, in an interview with the editor of the Port Arthur *Sentinel*, said:—

"The mineral wealth and the really wonderful resources of the country cannot long be hidden from practical men of means. You have here the proper geological formations in which to look for the minerals. You have evidences on every side of you of the disturbances of the rocks which make a mineral country. You have the veins, and in many of them I have now no doubt you have the minerals in paying quantities. I was a skeptic of your mineral resources when I put foot in Port Arthur. I am now a strong believer in the country; strong in the faith that you are surrounded by one of the most promising mining fields on the face of the earth. This is saying much more than I ever said of any country before, and much more than is necessary. You ask me what I have seen that leaves these favorable impressions on my mind? Well, sir, I will tell you that I have seen enough to convince the most stubborn unbeliever that you have veins in this country that will pay handsome dividends to investors if they will but work them in a proper way. I have been into your silver region, known as the Rabbit Mountain District. I saw enough there to convince any man of the value of your silver veins. I do not like to particularize where there are so many assurances of the value of the veins. On seeing the Beaufort mine I determined to go on further without examining the country around it. I camped near it and made and secured a discovery in less than a week. I was satisfied with the richness of your silver country. Some people say the silver deposits are only to be found at surface. That is true only in local instances the result of local causes. I could soon explode that theory in a way you would understand. Then I desired to see something of your gold district, and made a tour of inspection of several gold bearing veins. I saw them and am convinced of the great value of your gold country. 'See Naples and die,' is an old expression. I say, let any mining man see the Huronian mine vein and he will be convinced of the value of your gold country. Good as it is, it is not the only promising vein I saw in the gold region. I examined several that in history will leave their own great record. Believe me, sir, I am not a sanquine man. I have seen too many disappointments in mining adventures to admit of any indiscretion in expressing my views now. But I can tell you this, that during an active life of forty years among many mines, I never saw a young country with such a promise as this district has."

The Nova Scotia meeting of the American Institute of Mining Engineers will open at Halifax on September 15th, and promises to be not only interesting and instructive to the visitors but of much importance to the Province. It is expected that 200 to 250 members will be present at this meeting which promises to be a grand success. Arrangements are completed for the entertainment of members and guests, including, besides the inspection of the picturesque city and suburbs of Halifax, a sail down the harbor, a drive to the Montagu gold district, and excursions to the Pictou and Springhill coal regions, Londonderry iron-works, Cape Breton, the Joggins, Grand Pré (the country of *Evangeline*), etc.

Prospectors should be encouraged in every way, and not looked upon as visionary men who dislike regular work. Many

good miners make poor prospectors. Prospecting is a kind of work for which some men are particularly adapted, and because they lead a nomadic life it is no reason that they are not as good citizens as those living in a town for years. They are the pioneers of the mining camps, and serve a most useful purpose since the result of their searches is the basis of the mining system. —*The Press*, Idaho.

America has long been celebrated among mineralogists as the home of enormous crystals; and the prodigious specimens of apatite, beryl, and other minerals, have been the subject of wonderment. But for size the crystals of spodumene exposed in the excavations upon the Etta tin mine, in Pennington county, Dakota, carry off the palm. Professor Blake, reporting on the subject, is authority for the statement that one of these crystals is *thirty-six feet in length* in a straight line, and from *one to three feet in thickness*. The cleavage is smooth and straight, but the lateral and terminal planes are obscure. Crystals from five to twenty feet long are numerous, and recline in all directions.

Notice has appeared in the *Canada Gazette* that application will be made for Letters Patent of incorporation, under "The Canada Joint Stock Companies Act, 1877," for the "North America Mica Company," with $1,000,000 capital stock, divided into ten thousand shares of one hundred dollars each. The names and residences of the applicants are:—D. L. McArthur, Winnipeg; W. S. McLennan, Winnipeg; W. L. Boyle, Winnipeg; James Fisher, Winnipeg; Alex. Matheson, Rat Portage; Geo. McPherson, sr., Anabaskasing Bay; J. C. Hunter, Duluth, Minn; A. R. Macfarlane, Duluth, and A. M. Morrison, Duluth. The head office of the company is to be Winnipeg, and its object is to develop the mica, asbestos and other mineral resources of the land it holds or may acquire in Ontario, Manitoba and the North-West Territories.

THE PHOSPHATE TRADE.

This has been a season of unusual activity at the phosphate mines of the du Lievre River district, and miners have met with much encouragement. The large increase in the output of the more important mines is evidence that Canadian phosphate is coming more and more into demand as the mineral becomes better known and that mine owners are not dissatisfied with the present market price. True it is that some years ago the price paid in England for our phosphate was a good deal higher than it is now, but the margin of profit to producers was then little, if any, greater. The cost of transportation in former days added quite two dollars per ton for delivery at points of shipment, and ocean freights ruled much higher than they do to-day. Now the increased railway accommodation and summer transportation on the du Lievre river have reduced the cost of delivery from the mines to Montreal to a minimum. Ocean freight, a few years ago, could not be relied on at less than fifteen shillings a ton while for the past two years eight shillings has been the highest paid, and five shillings may be said to have been the average rate; so that by the reduction in transportation charges the output of our mines can now be laid down in London, Liverpool and other British ports at about $4.50 per ton less than formerly. This in itself will compensate for a considerable falling off in values But it is not at all likely that the phosphate market will remain sluggish, if it can be styled so at the present time; it is only in sympathy with general trade which is characterized, the world over, as being greatly depressed; and it has this advantage, there is a demand for every pound of mineral that can be produced, at a price that shows a margin of profit of from 75 to 100 per cent. on the cost of production. That an increased demand for Canadian phosphate is imminent there exists not the slightest doubt; the high grade of the mineral has brought it much into favour in Germany and France, in which countries there is an increasing consumption, and in England our phosphate is now better known than it was when shipments did not exceed four or five thousand tons annually. A letter recently received from one of our mine owners, dated London, gives a most encouraging report of the probable future for the product of our mines in that market. He says: "I am much encouraged as to the future demand for Canadian phosphate. The objections which were to be encountered on all sides a few years ago have now subsided, and the difficulties that had been met with in its use have for ever been overcome. A low grade Belgian phosphate, soft and of a dull shade, is coming largely into use here in England, which is found to combine well with Canadian, and a large supply of the latter is wanted for this purpose. Demand is not limited, but prices, though steady, are in sympathy with the depressed state of all agricultural markets. There is some question as to the continuance of the supply of Spanish phosphate, and this together with the high cost of Norwegian, favours an increased demand and higher prices for Canadian in the future.

THE MINES.

To describe the mines now would be but to repeat what we published in our last number. They are all turning out ore in large quantity and doing excellent work towards further development. The deep workings are all showing immense bodies of mineral which in every instance is found to be purer and more free from admixture with foreign matter than are the deposits near the surface, and hence there is a great saving of labor in cobbing and dressing the output. The production of the more important mines in the district for July and August has been most satisfactory.

The Emerald, with an average force of 80 men, all told, has produced an aggregate of 1,460 tons during the past two months.

The North Star, with a force of 65 men, including all classes of workmen, has produced 1,210 tons.

Star Hill Mine, during the past two months has given employment to an average force of 102 men and has turned out 1,211 tons.

High Rock Mine, with 130 men employed for the last two months has mined and dressed 1,380 tons, making a total output, for the months of July and August, for the four mines of 5,264 gross tons with a force aggregating 377 men.

The *Little Rapids* mine, of which we gave a full description last month, continues to improve with development, and although but a small force is employed the monthly output is more than sufficient to cover all expenditure for the large amount of dead work that is being done in opening up new veins. It may be said that there is no mining being actually done here, the object being to thoroughly prospect the deposits before attacking the bodies of mineral of which there are several thousands of tons in sight in the shafts and open workings. Buildings are being erected for the accommodation of a large number of miners and other improvements are being made for the advantageous handling of the output of the mine.

The *Gold Hill* mine has been quite recently opened in the Gore of Templeton and promises to develop well. Work was begun on this property on August 5th with a force of 15 men and already upwards of 50 tons have been forwarded to point of shipment.

The mines of the Du Liévre district have been visited during the summer by a large number of strangers from the United States, England and Europe, all of whom have expressed much surprise at their condition and the large quantity of phosphate they are producing. The quality of the mineral also has been very highly spoken of by these visitors and a great future for the industry predicted by them.

PHOSPHATE QUOTATIONS.

The foreign market remains steady and prices have not varied since last report. The market continues firm at 1s. ½d. for 75 per cent., a fifth of a penny rise, ex-ship London and Liverpool.

OCEAN FREIGHT.

Little variation has been reported during the summer months; S.S. rates from Montreal to Liverpool and London varying from 6 to 8 shillings per ton.

PHOSPHATE SHIPMENTS from MONTREAL for JULY and AUGUST.

Date.	Vessel.	Destinat'n.	Shippers or Agents.	Tons.
July 3	S.S. Ontario	Liverpool	Lomer, Rohr & Co	300
" 6	S.S. Benbrach	London	Wilson & Green.	253
" 6	S.S. Benbrach	"	"	100
" 9	S.S. Ocean King	"	Lomer, Rohr & Co	268
" 9	S.S. Bristol	Bristol	Wilson & Green.	498
" 10	S.S. Elgonshire	London	Lomer, Rohr & Co	262
" 16	Bq. Hafrsfjord	Cardiff	Millar & Co	65
" 16	S.S. Carmona	London	Lomer, Rohr & Co	502
" 16	S.S. Montreal	Liverpool	"	250
" 17	S.S. Texas	"	"	135
" 18	S.S. Oxenholme	"	"	427
" 18	" "	"	Millar & Co	270
" 21	S.S. Escalona	London	Lomer, Rohr & Co	255
" 21	S.S. Scotland	"	Irwin, Hoppe & Co	100
" 23	Barq. Merritt	Sharpness	Wilson & Green.	45
" 23	S.S. Mississippi	Liverpool	Lomer, Rohr & Co	135
" 24	S.S. Somerset	Bristol	Wilson & Green.	386
" 21	SS. Storm Queen	London	A. D. Cameron	276
" 25	S.S. L. Nepigon	Liverpool	Wilson & Green.	250
" 29	Barq. Johanna	Hull	Lomer, Rohr & Co	40
" 29	S.S. Aslona	London	"	174
" 29	S.S. Kehrweider	Hamburg	"	548
" 29	" "	"	Lievre Riv. Phos	256
" 30	S.S. Brooklyn	Liverpool	W. M. Knowles.	91
" 30	" "	"	Millar & Co	27
" 30	" "	"	Lomer, Rohr & Co	280
Aug. 1	Barq. Scotia	"	"	100
" 3	S.S. Eel King	London	"	180
" 5	S.S. Dominion	Liverpool	"	277
" 5	Barq. Achille F.	Penarth Rs	"	109
" 7	S.S. Oregon	Liverpool	"	241
" 8	S.S. Quebec	"	"	184
" 8	S.S. L. Winnipeg	"	Wilson & Green.	303
" 13	S.S. Draconia	London	Lomer, Rohr & Co	310
" 13	S.S. Sarnia	Liverpool	"	428
" 15	S.S. L. Champl'n	"	Millar & Co	325
" 20	S.S. Montreal	"	Lomer, Rohr & Co	210
" 21	S.S. Ocean King	London	"	200
" 27	S.S. Carmona	"	Wilson & Green.	195
		Total for July and August		9,243
		" May and June		5,347
		Total to date		14,590

Villeneuve Mica Mine.

The value of this mine has long since been established, and as work progresses in the drift that is being run into the mountain side the depth and continuity of the micaceous lead is more and more positively demonstrated, and the crystals become more compact, larger and more free from defect than those that were mined near the surface. The floor of the drift or tunnel, from its mouth to the extreme end, a distance of sixty feet, is thickly studded with well formed crystals lying on their edge in the vein of white quartz and feldspar. The walls also, and the roof of the tunnel show innumerable crystals of mica, well formed and of good average size. There is now at the mine about ten tons of crystals sorted into grades, as regards size and quality, which will be cut and otherwise prepared for market. A contract has been given for the erection of a cutting-house that will afford accommodation for a force of workmen adequate to the output of the mine. It is expected that all necessary preparations for carrying on permanent work will be completed about the first week in September, after which this mine will supply a large quantity of mica of a quality such as has never before been produced in Canada and better than which is not produced at any mine in the world.

Galetta Lead Mine.

This mine, situated about seven miles from Arnprior, produced during last year 294 tons of galena, which was manufactured into lead at Kingston, yielding 2,883 pigs, or 155 tons of pure lead. New machinery had been ordered and it was expected that the output for the present year would show a large increase. We are informed, however, that work at the mine has recently been shut down.

OTTAWA AT ANTWERP.

The great success which has attended the Antwerp exhibition, and particularly the Canadian exhibit, has called forth most flattering comments from the European and British *press.*

The Canadian court is situated between the English and German sections, with the exception of the Manitoba Farm exhibit, which occupies a separate and distinct position.

In the Industry section Mr. W. A. Allan, of Ottawa, exhibits some very fine specimens of apatite from his *Little Rapids* mine in Portland East; 36 specimens of mica from his Villeneuve and Pike Lake mines; and a magnificent specimen of apatite crystal mounted on a pedestal.

The Canadian Granite Company exhibits some fine specimens of red granite from its quarry on Deadman's Bay, and Prof. Selwyn a large number of specimens of ore, whilst the Geological Survey is represented by 292 specimens of Canadian ores, pebbles, building stones, &c, together with an obelisk, representing the gold obtained from the auriferous deposits of British Columbia during the past twenty-four years, which is valued in official returns at $48,672,128.

The manufacture of rope from asbestos bids fair to become an industry of considerable importance in England.

A prominent broker has recently sold 1,000 tons of steel rails from the Pennsylvania mills, to be delivered in Illinois before 1886, at $29 per ton. Eight months ago the same quantity of steel rails was sold to the Canada Pacific road at $26 per ton.

IRON MINES.

THEIR DEVELOPMENT IN CENTRAL ONTARIO.—FURNACES LIKELY TO BE ERECTED.—THE OUTLOOK.

The report of the Commissioner of Crown Lands of the Province of Ontario, for the year 1884, which has reached us since our last number issued, contains interesting information concerning the iron mining industry in the Province. In the counties of

FRONTENAC, LANARK AND RENFREW

the iron ore output, during 1884, is reported to have been 18,094 tons, 15,094 tons of which were shipped to the United States, the balance, 3,000 tons, had not been forwarded.

On account of the depressed state of the iron markets, the mines in Eastern Ontario have been worked but to a limited extent during the past two years.

THE MINES.

ZANESVILLE IRON MINE.

This mine is four miles from Bedford station on the Kingston and Pembroke Railway, with branch line into the mine, which is situated on the shore of Thirteen Island Lake, with shaft sunk to the depth of 200 feet. The machinery is driven by steam, with air compressor, capable of driving fifteen drills. The hoist loads ore direct from the shaft on Kingston and Pembroke Railway cars. Value of machinery, $10,000. Owing to the depression in the iron market there were only from ten to fifteen men employed during the past year, whereas if the machinery were worked to its full capacity 100 men would be required.

ROBERTSVILLE MINE.

The Robertsville Mine, in the Towhship of Palmerston, on line of the Kingston and Pembroke Railway, with shaft sunk to a depth of nearly 200 feet, has machinery valued at $8,000. Very large quantities of ore have been taken from this mine in past years, but during 1884 it had not been worked to any extent.

WILBUR MINE.

This mine is in the Township of Lavant, and on the line of the Kingston and Pembroke Railway—worked by the Bethlehem Iron Company—and the ore forwarded to their works in Pennsylvania, for the manufacture of Bessemer steel. The shaft is sunk to a depth of about 200 feet, mine opened about 350 feet in length underground, has all necessary machinery for successful mining, including 40-horse power boiler, with air compressor, two portable 15-horse power boilers and Lidgerwood hoist. This machinery is capable of 3,000 tons output per month, if worked to full capacity. Quality of ore say 55 per cent. metallic iron.

BOYD CALDWELL MINE.

This is adjoining the Wilbur Mine, and on same vein, sunk to a depth of about 200 feet; has been worked with steam drills, by a 15-horse power boiler. Hoist lands the ore on platform of Kingston and Pembroke Railway. No ore has been forwarded from this mine during the past year, but there is an output of about 3,000 tons ore ready for shipment.

CALDWELL AND GILDERSLEEVE MINE.

This mine is a half-mile distant from Flower station, Kingston and Pembroke Railway, Township of Lavant, and has been worked with drills by a 25-horse power boiler. Shaft sunk to a depth of eighty feet, but no mining has been done during 1884.

RADENHURST MINE.

The Radenhurst Mine is about three-fourths of a mile from Flower station, and believed to be the same vein as the Caldwell-Gildersleeve Mine; is sunk to a depth of eighty-feet. Drills worked by two boilers of 10-horse power each.

CALABOGIE MINING COMPANY'S MINE.

There are three shafts sunk on east side of Grassy Bay, at Calabogie Lake, Township of Bagot, about one-fourth, one and a-half, and one and three-fourth miles respectively from Kingston and Pembroke Railway track. This mine has not been worked to any appreciable extent, not having any machinery.

WILSON-MARTELLE MINE.

This mine is also on east side of Grassy Bay, Calabogie Lake, one mile from Kingston and Pembroke Railway. Shaft sunk to a depth of thirty feet, no steam-power used up to the present. Vein about 1,100 feet in length, as indicated by survey with magnetic needle, and lies in low land, covered with about ten feet of soil. The indications point to an improvement of the ore and decrease of silica as the shaft goes down.

Analysis of ore taken from the surface by J. Blodgett Britton, of Philadelphia.

Pure metallic iron	60.72
Oxygen with the iron	23.14
Water	.97
Silica	11.78
Sulphur	none.
Phosphoric Acid {Phosphorus, 0.64 / Oxygen 0.84}	0.148
Alumina	1.09
Lime	1.23
Magnesia	0.31
Oxide of Manganese	0.27
Undetermined matter and loss	0.342
Total	100,000

The report contains the following interesting statement of the operations, during the past year, of the Coe Hill Mining Company, forwarded to the Commissioner of Crown Lands by Mr. W. Coe, Madoc. The greater part of the ore from the Coe Hill mine has been shipped to Cleveland, Ohio. This ore was then tested as to its suitability for the manufacture of steel rails. The usual test made is to allow for five defective rails out of every one hundred and twenty turned out, but I am glad to state, that the proportion of using this ore was only one in every one hundred and seventy two. The test made proved it so satisfactory for this purpose, that a considerable quantity of the ore sold was placed in this use, but owing to slackness of orders for steel rails in the depressed state of the iron market during the past season, and the consequent curtailment in their production, one establishment used this ore entirely for making crucible steel—which is the higher grade of steel for making cutlery. We have many assurances that on the renewal of business we can place every ton of ore taken from this mine in good hands at paying prices.

COE HILL MINE.

The excavations already made on the surface of the deposit are a thousand feet long and from 20 to 60 feet wide. There are now three shafts on the vein. Number one shaft is seventy-five feet deep, and is opened eighteen feet wide at the bottom from the hanging wall. There are no signs yet of the foot wall, and from all appearances this part of the deposit will prove to be of immense width. Everything taken out of this shaft has been ore of the finest quality—not a single load of rock has been separated from it. On the west end of the shaft and fourteen feet below the top or surface there is a drift driven thirty-eight feet. Close to the bottom of the shaft there is another drift driven the same direction as the one above, and communication opened from it to the first drift by

means of a wenze or small shaft. This has been done for the purpose of being better able to mine the ore, also affording a pillar in end shaft, for protecting the shaft from the blast of the holes, as well as keeping the foot and hanging walls in a firm position.

Number two shaft is 105 feet deep and is developed by means of drifts or tunnels in each end of shaft, also communication opened to the drifts by means of wenzes or small shafts, thus leaving pillars fourteen feet in thickness and from eighteen to thirty feet high for the same purpose as number one shaft. This shaft is located 500 feet from number one, and shows a width of sixty-five feet of ore. We tested this part of the property with the diamond drill to the depth of 240 feet before sinking the shaft, and got at that depth sixty-five feet of ore.

Number three shaft is ninety-three feet deep and is also developed by means of drifts east and west of main or hoisting shaft, with pillars in each end of shaft the same as numbers one and two. Number three is situated 400 feet from number two.

ARTHUR MINE.

We have done considerable work in opening up the Arthur mine in Chandos. We have about eight miles of railway to build to get to this property. This is contemplated being done the coming season. We have made three different borings with the diamond drill, in all about 500 feet, on this deposit, and find from these the ore to be in great quantity, while its quality is excellent.

CLEVELAND MINING COMPANY'S MINE.

We have been very fortunte in making a new discovery of iron ore in Tudor. This is a large deposit, and has the advantage of being situated very near to the railway. An analysis of the ore shows sixty four per cent. of metallic iron, no titanium, and faint traces of sulphur and phosphorus. This analysis is made from an outcrop of surface ore. Work has been begun here with a diamond drill and will be followed up by clearing about ten acres for the purpose of building up a location the same as at Coe Hill. Our engineer has been over the ground, and located a branch from the main railway into the mine. The work of chopping out the right of way will be proceeded with at once. We intend working the mine vigorously the coming season, and expect to make large shipments from it.

THE BAKER MINE.

We have leased this mine, situated in the Township of Tudor, to some Cleveland gentlemen. Owing to the lateness of the season when they commenced work, little could be done besides stripping and making other preparations on the surface for active work the coming spring.

THE ORTON MINE.

The mine is situated on the Free Grants in the Township of Tudor. We have just removed our diamond drill from this mine, where it has been at work for a month past. This has proved an immense deposit, but contains a percentage of titanium. We hope to be able to sell a considerable amount per year of this ore, in small quantities, to large consumers to be mixed with other varieties of ore.

GENERAL REMARKS.

The depressed state of the iron trade the past year has caused us to slacken operations in opening up new properties, but we hope that confidence in manufacturing circles will soon be restored and business activity again prevail.

In January of this year there were lying on the different docks of the United States, upwards of a million tons of ore that was mined for last year's furnace supply, which has not been used. This fact keeps the iron ore market in a very depressed state.

However, looking over American statistics, we have every reason to congratulate ourselves on the progress we have made in the iron ore trade.

On comparing the results of our business with the whole of the Marquette section—the great iron-producing district of Lake Superior—we find that the shipments from there, from 1852 to 1857 inclusive, amounted to only 85,319 tons, an average of a little over 17,000 tons per year, while our first season's operations show shipments of 30,000 tons from one mine.

THE ERECTION OF FURNACES.

Referring to this subject, Mr. Coe says: "It has been my ambition to get a furnace in operation by which we could smelt, at home, a considerable portion of our iron ore. In fact, the building of a furnace is a necessity in our business, as we have, in sorting our ores, to lay aside such grades as will not pay for shipment. The cost of mining, hoisting, and sorting these ores would be lost entirely were we not to use them; they amount to over fifteen per cent. of the whole quantity mined. These ores cost just as much as No. 1 ore, and while the metallic iron itself they contain is just as rich as No. 1, they are too lean to pay the cost of transportation, not usually averaging over fifty per cent. In every mine we open there will be at least 20,000 tons of this material, and a considerable quantity yearly thereafter. Now it is to our interest to make use of these just as well as other or best quality of ore, and to do so we must have furnaces to smelt them. The question will be asked, why have you not done so? In answer, I may say, for two reasons: Our time has been occupied in opening up mines and making freight for the railway, and doing a variety of work which is preliminary to every mining enterprize, such as constructing pockets for the ore, building up our location, and other matters comprising a variety of details which it is almost impossible to enumerate. Another reason is, that the iron trade has been in a very depressed state; values have seriously fallen with large stocks on hand, which it would be ruinous to try to compete against. We have been compelled to defer for a period the erection and using of a charcoal furnace in connection with our business. But there has been no time lost in this matter, as we consider it very necessary to have a large accumulation of ore on hand before starting a furnace; our estimate for a furnace being based upon the No. 2 ore production of five mines."

RAILWAYS.

This subject is here taken up by Mr. Coe, and of the Ontario Central Railway he says—It was built in order to develop the mineral resourses of the section of country through which it passes, as well as for the accommodation of the general public; but I will first illustrate the way similar enterprizes have been treated in the United States.

The Marquette, Houghton and Ontonagon Railway is a line about ninety miles in length, including its branches. This was the pioneer line in the famous iron fields of Marquette County, Lake Superior. A large land grant subsidy both from the general Government and the State of Michigan was given to the road, and by which the road was aided more than three million dollars. The North-Western Railway also received large aid in the way of land grants. The Detroit, Mackinaw and Marquette Railway, which now reaches these iron mines, likewise received a large land grant.

The Duluth and Iron Range Railway, completed last summer from Two Harbours, on the north shore of Lake Superior, to Vermillion Lake Iron Mines, a line about seventy-five miles in length, received a land grant from the State of Minnesota, the pine alone from which was more than sufficient to pay the entire expense of the road, a sum considerably in excess of two millions of dollars, all the mines being given as well to the company. We lay down our ore on the docks at Cleveland, beside the product of these subsidized companies, and pay a tariff charge of seventy-five cents per ton to the United States Government for the privilege of doing it. In marked contrast is the policy of the United States in developing these great natural storehouses of wealth to that pursued towards our company in attempting to develop a similar enterprize. We have not received one dollar of aid from Government, municipality, or individual; but fault has been found with us for buying less than one-tenth the amount of lands given to any one of the companies named, for which the Government had never been able to find a purchaser. How can it be hoped that enterprizes of this kind in their infant state can flourish without the fostering aid of the Government, similar to that given like enterprizes in adjoining countries. A railway has never been built nor works like ours attempted to be prosecuted, outside our own company, without assistance of some kind. If the Government desires the success of this and kindred enterprises, we feel it ought to treat us, as all other enterprises of this kind, which have succeeded, have been treated both in this country and in the United States. The money paid for these lands is paid under a feeling of protest, as we think the Government is exacting outside pay for what it could and should freely give us. If the results indicated by the figures above given are more desirable than the stale barren rocky ridges in their natural state, through which our road passes, and in which our mines are located, we hope that the Government will indicate its appreciation of them by giving such aid as is easily within its power, by refunding the money paid for these lands.

THE MINERAL BELT OF ONTARIO,

extending from Lake Nipissing to the Ottawa River, comprises ten times the area of any known mineral territory in the United States, but there is this difference, in our country the process of development has only commenced, while in the States the minerals have been opened out and the mining industry long since passed the experimental stage. The building of the Central Ontario Railway has done a great deal to encourage enterprise on the part of prospectors and mine owners in the section through which it passes by providing means and facilities for the ready transportation of ore and supplies. There is a necessity for similar roads every thirty miles distant between Nipissing and Ottawa, and there would be a business similar to that now done by the Central Ontario for each of the roads when built. I believe if the interior of the country was opened up by lines of railway branching from the Canada Pacific Railroad they would not only pay but prove an immense feeder to that road, which would then be the backbone of a system running into and developing the great mineral belt of the interior, the products of which would thus find an outlet to the markets of the world, and the results would soon show themselves in the marked increase of Ontario's wealth and population.

It is a subject which will eventually attract public attention, and when the magnitude and importance of the interests involved are fully known, it will be a matter of surprise that these opportunities should have been so long neglected and unimproved.

In conclusion Mr. Coe says: The import duty now paid by shippers to the American Government on iron ore is a serious drawback to the successful carrying on of this trade. I should like very much to see reciprocity in natural products between the two countries, which would remove this embargo and put us on more equal terms with the ore-producing interests of the Lake Superior sections.

AN EPITAH.

SACRED TO THE MEMORY
OF THE
WESTERN IRON ASSOCIATION.
BORN IN PITTSBURG, PA., 188-.
DIED IN CINCINNATI, O., 1885.
OF RICH BUT RESPECTABLE PARENTAGE,
IT HAD A ROUGH STRUGGLE
WITH ADVERSITY
AND DIED AT A TENDER AGE.
DEPARTING,
IT LEFT BEHIND A RECORD
FULL OF GOOD DEEDS AND BAD MISTAKES.
ITS CHIEF AIM
SEEMED TO BE A DESIRE
TO
BENEFIT THE IRON TRADE,
BUT
IT WAS SINGULARLY UNFORTUNATE,
IN THAT
IT RARELY ACCOMPLISHED ANYTHING
EXCEPT TO AFFORD
ITS PITTSBURG PROGENITORS
OPPORTUNITIES OF GETTING
THEIR OUTSIDE BRETHERN
INTO VARIOUS FORMS OF TROUBLE
AND THEN
WITH REFRESHING UNANIMITY,
SIGNING THE SCALE
AND
SCOOPING IN THE CONTRACTS.
FROM THIS EXPOSURE
TO SUDDEN CHANGES OF TRADE CLIMATE
IT CONTRACTED
A CHRONIC FORM
OF WHAT IS KNOWN AS
PITTSBURG WIND COLIC,
WHICH,
COMBINED WITH WESTERN CHILLS,
BROUGHT ABOUT
ITS EARLY AND LAMENTED DEMISE.
READER, PONDER!
EVEN IRON ASSOCIATIONS
ARE BUT HUMAN.
LEARN FROM THIS
THAT
IT IS THE LONG POLE
THAT KNOCKS THE PERSIMMONS.

Put aside the litt e wage-scales;
Do not try to force a "boom."
Little Josie will not need them—
He's gone up the golden flume.
Iron Trade Review, Cleveland, O.

MINES NORTH OF LAKE SUPERIOR.

Their Development Progressing—Immense Bodies of Ore—Rich in Gold and Silver.

The mines of Thunder Bay are attracting as much attention at the present time as those of any other mining locality in North America, and deservedly so. During the past few months they have been visited by a vast number of scientists, capitalists, and practical mining men, among whom there is a concensus of opinion as to the unquestionable richness of the enormous mineral region which is now being explored and prospected. It cannot be said, however, that the mines which have been opened up are being developed by their owners with that degree of push and energy which characterizes mine owners in the Western States and other mining districts, and it is only just to suppose that the reason for this is found in the fact that the capital employed is inadequate to the requirements of the mines. Before much can be accomplished towards a proper development of these valuable properties, machinery and other mining plant must be brought on the ground, and little can be done in this direction until transportation is facilitated by the construction of permanent roadways. That this may be speedily done, the Ontario government should be liberal with its grants, and in the absence of government aid mine owners should adopt a policy of co-operation and do the work themselves if they have means at their disposal for this purpose. If they are without the necessary capital to carry on this important work and to establish their mines on a paying basis, then they should offer sufficient inducement to capitalists to come to their assistance. *The Engineering and Mining Journal*, commenting on this very subject, points out that the parties who own the prospects, thus far discovered in the Thunder Bay district, are for the most part with means wholly inadequate to develop or successfully work mines; but with the exaggerated confidence of ignorance, they are all convinced that a prospect is a mine, and they accordingly put prices upon their property which are far too high for any prudent capitalist to pay. It may be that a few bonanzas near the surface can be worked with profit; but the present owners, or those buying at their prices, will have to go through the usual experience until they get educated up to the appreciation of the fact that the value of a mine is the net value of the ore actually proved by shafts and levels, and that the man who invests his money to work a mine is he who takes all the risk, and should have most of the chances in his favor. Nothing can be more injurious to the interests of a new mining field than to fall into the hands of those who can not work it themselves, and who put such high prices upon the prospects as to keep capital out or cause what goes in to be unprofitable.

THE MINES.

At *Rabbit Mountain* mine little work is being done at present. Several prospect shafts have been sunk on this location, all of which show good silver bearing rock, one of them at a depth of 150 feet showing a seven foot vein of fairly rich ore. A large heap of high grade ore taken from the shafts awaits the crusher. It is said negotiations are in progress which, if carried to a successful issue, will enable the owners of this property to proceed with operations on a permanent and business-like basis. Meanwhile a few men are engaged in collecting from the dump all the *pay* ore.

SILVER MOUNTAIN MINE.

Here quite a village is springing up but very little opening has been done at the first discovery on this location. There is plenty of ore in sight and native silver can be seen well disseminated through the dump at the opening that has been made. We are informed that five sixths of the eastern half of this location has been sold to Cleveland capitalists, who are preparing to take in machinery and to get to work systematically to develop this truly valuable property, whose enormous richness is admitted by every one who has inspected it, all of whom express surprise that more work has not already been done towards opening up the vein. The Cleveland people have now twenty men employed doing preliminary work.

BEAVER MINE

is now working day and night and good progress is being made. This mine shows to great advantage; the mountain on which it is situated is over two hundred feet high with the vein uncovered, cross-cut and driven into on the escarpment on both sides, all the vein matter being, it is said, good *pay* ore.

TWIN CITY MINE.

Here considerable tunneling has been done but the mine has been idle latterly, pending the completion of the waggon road which will enable the company to take in its mill and such machinery as will be suitable for the reduction of the ore. When this has been done mining operations will be actively resumed. The ore now on the dump at this mine is very rich in silver.

Explorers have been numerous and busy during the summer throughout the Silver Mountain region and much prospecting has been done. Claims have been taken up in all directions and a number of mines have been located. Within a few miles of the *Rabbit Mountain* mine there are the *Silver Creek, Cambrian, Silurian, Crown Point, Silver Falls* and *Silver Hill* mines, all of which promise to develop into valuable properties.

HURONIAN MINE.

In the gold bearing district, adjoining the silver region to the north and west, is situated this very rich gold mine. On the property owned by the Huronian Mining Company is a decided fissure vein of gold and silver bearing quartz, having an average width of over six feet, which has been exploited for a distance of 2,500 feet. The vein is highly mineralized throughout its entire length and carries, as far as tested, the sylvanite ore, a compound of gold, silver and tellurium. The entire vein matter is *pay* ore while some of it is extremely rich. A shaft has been sunk on the vein to a depth of 140 feet, at the bottom of which rich sylvanite ore is found. Drifting has also been run on the vein for a distance of 160 feet and some stopping has been done, all of which workings have proved the persistency of the vein in its mineral features. Free gold has been constant in all the workings, and gold and silver are not only finely disseminated throughout the veinstone, but they are in union with the sulphurets with which the vein is so heavily charged.

The mine is now being worked under new management, and from what is known of the results already obtained under former management there is no doubt that it will become ere long one of the best paying mines on this continent. The ore which has been taken from the shaft and drift has yielded an average of $20 the ton in gold, and it has been since discovered that a large portion of the gold was lost owing to the imperfect machinery employed, which consists of a ten-stamp mill, two Frue vanners and a concentrator. A recent assay of the

ore, by Ledoux & Ricketts, New York, gives 138·40 ounces in gold, and 1057·32 ounces in silver per ton (2000 lbs.), equivalent to a money value of nearly $1,000. This was, of course, selected ore; but it is not at all unreasonable to expect, after what has already been demonstrated, that the entire veinstone will yield an average of $30 the ton if properly treated by suitable machinery and under efficient management.

THUNDER BAY COLONIZATION RAILWAY.

It would appear there is now some hope that this much needed line of railway will be constructed in the near future. The Dominion government has granted a subsidy of $3,200 per mile, and the route has been explored and reported on by Mr. Wm. Murdock, C.E., who is quite enthusiastic, not only as to the necessity of the railway, but on account of the easy location the country affords and the natural richness of the section the railway will penetrate. Mr. Murdock in his report, says :—

"This railway would connect Port Arthur and north shore stations with the American system of railways at Duluth, and thus supply an urgent need without doing injury, but on the contrary, assisting the traffic of the Canadian Pacific railway.

"The proposed route would open up an entirely new country, and would pass through the finest forests of the district, the richest silver country on the continent, and the Iron Range Railway has the largest deposits of the finest iron in America, which would be all tributary to this line of railway, and on either side of the proposed line, the soil is suitable for cultivation, and the greater part of it would produce crops equal to any grown in Manitoba.

"It would supply the struggling mining industry which must have railway facilities to foster and establish it.

"The line as laid down by me is the correct one, inasmuch as it would give railway facilities to all the working mines, without favoring any particular one. The mining industry of the district will bring millions of dollars of foreign capital to the country, if assisted by railway facilities in time.

"The route throughout presents no engineering difficulties, and would simply be ordinary railway work similar to the Canadian Pacific between Port Arthur and Savanne, and the same in distance."

British Columbia's Mineral Deposits.

What is Being Done this Year to Develop Them.

Mr. Amos Bowman, Mining and Civil Engineer, of the Dominion Geological Survey, arrived in Victoria early in July on a mission of much importance to British Columbia, that of specially examining the mineral deposits of Cariboo, and reporting and mapping the same, and obtaining every general information possible in reference to the mines of the district. The work of the Dominion survey in that province has heretofore been confined to locating and examing a certain belt in blocks to connect with surveys in the east, so as to have one continuous belt from sea to sea.

The Dominion and Provincial authorities have combined this year, and each appropriated $2,500 for the purpose of the present survey. In previous years the amount set apart was too small to allow of more than a superficial survey being made, for the geologist had to also act as geographer. The appropriation this year will obviate this, and the services of a geographer have been secured for that special work. Mr. McCoy, of Ottawa, a graduate of McGill, has been sent out as a general assistant, being specially adapted for that position, while Mr. Voligny, of New Westminister, has been employed as draughtsman and topographical assistant, which will enable the work done to be reported quickly, as draughting can be done while in the field.

Mr. Bowman will thus be able to devote his whole time to the geological work, and will examine the various mining districts in Cariboo, and it is expected that good results will follow. The design is to map out the placer mines where worked, and denote them on a map, with amounts of gold taken out marked, and also to locate and determine the extent and worth of quartz ledges. The direction and extent of the gravel formations will be gathered, and every information that will be of use in mining will be clearly shown in map form. Districts that have been worked will be mainly followed. The benches of the Fraser will also be examined. These were undoubtedly a lake country and extend into the mountains to gravel deposits, some of which contain gold while others do not.

Another feature that will be demonstrated, it is thought, is that the rich mineral deposits which occur in Utah and north of that state also exist in British Columbia in the same mineral belt. There is little doubt but the rich deposits which prevail south also exist in the province and northward to Alaska. Of course this will all have to be determined afterwards by the prospector. However the maps will be prepared showing the mineral belt which will prove of great assistance to the prospector in his work.

The age of the gravel deposits will also be determined, whether tertiary, glacial, volcanic, or of a later period, and it will be shown when and how these deposits were placed in Cariboo. The reports will be printed and given to the public as quickly as made, and the means at the disposal of the survey are such that this can be readily done.

BEACON HILL QUARTZ.

A Shaft Partly Sunk on a Ledge at Finlayson Point, Victoria, B.C.

The last quartz excitement that interested people was the reported rich strike at Goldstream, in which a number of contractors and engineers were interested, and from which they had great expectations. However, it has quieted down and we hear no more about it, further than the query of a stranger when he picks up the specimen from the collection on our office table. But there is always some restless spirit among the great majority, and one of these has discovered that it is not necessary to go to Cariboo or even Goldstream to get the precious gold-bearing quartz, and the other day he recorded a claim on the rock off the battery at Finlayson's Point. His name is John Lundy, and he arrived here last spring from California. He has had a long experience in prospecting in California and Nevada and for the past month has been prospecting in the mountains off the Chemainus River. In April last he discovered a quartz ledge running from one side of the rocky point to the other, and disappearing into the sea. Staking out his claim on the legal length, he hired a couple of men to sink a shaft on one drift of the lode, which is about a foot in width. Spurs run out in several directions, but Lundy believes that when the shaft is down twenty-five or thirty feet the main ledge and color will be found. The shaft, as at present, is about 8 feet by 6, and shows a well-defined ledge of quartz to its full depth. In all of this there is plenty of pyrites of iron, but nothing more. Still Lundy thinks that if the shaft was but sunk twenty or thirty feet further the precious metal would appear. About five feet down the quartz becomes of a bluer color and between the trap wall and the quartz is a drift of blue clay and slate, which the prospector informed the reporter was always a favorable sign, and he is very sanguine that gold would be found at the greater depth. He has expended about $80 and his time in sinking the shaft so far, but like many another worthy prospector is now impecunious and wishes to form a company, to sink it deeper and thoroughly test the ledge. This would cost comparatively little, probably a couple of hundred, and in the event of the mine proving a valuable one, it would well repay the investment. It would be rather startling news if such should prove the case, and a mine of wealth have been under our feet and passed over thousands of times, and yet not known. The quartz can be readily examined by a trip to Beacon Hill.—*British Colonist, Victoria, B.C.*

BRITISH COLUMBIA MINING NOTES

The gold-diggings around Lillooet and Bridge river are returning fair wages. Miners in the Soda Creek vicinity are also getting some gold.

Prospectors have brought specimens of galena and a quantity of gold dust from Cowichan lake and river, and will return to further prospect the district.

An argentiferous galena claim has been rediscovered on the north fork of the Ille-cille-wat and recorded. Assays of the ore have given $84 in silver to the ton.

What is supposed to be silver ore has been found in a ledge near Cowichan lake, and specimens have been forwarded for assay. Men are now engaged in sinking on the ledge.

The prospects for a successful season in the Kootenay district is said to be bright. There has has been quite a rush to Fenley Creek. About forty Chinamen have gone up and have been taking out for $1.50 to $8 per day. It was expected that when the water subsided even better results would be had.

About twenty new claims have been located in the Semilkaween district, where recent gold discoveries have been made, and miners are reported to be taking out about $3 to $10 per day. The creek in which these discoveries have been made is a tributary of the Tulameen, and has been named *Granite* creek.

A mica mine, discovered last autumn, is being developed at Clearwater lake, between Big Bend and Cariboo districts. A trail has been cut to the mine and provisions and tools taken in. We are not informed if any quantity of mica has as yet been produced, but the quality is said to be very good.

More recent reports from Lorne Creek and Kitsum-Kaylum, are not encouraging. Miners are disappointed at the poor out-put, so far, this season. The *Discovery* claim, on Lorne Creek, after six days' washing, scarcely showed a *colour;* but better results are hoped for. Prospectors have made no new discoveries.

Other creeks in Lorne Creek district have been prospected and several claims staked out, on

some of which the ground yields as high as $1 to the pan and averages well. It is, therefore, expected that the bed-rock will be very rich. It is rumoured that the miners have been earning $4 a day from the gravel at Kitsum-Kaylum.

At Zerran mine, on Scotch creek, a tunnel has been driven forty-eight feet, and has entered a fine body of mineral. At fifty feet a cross-cut will be made to test the width of the vein, and a quantity of ore will be forwarded for mill test. An assay already made gave $109. 50. the ton, but the mill test is expected to prove the average richness of the vein.

Up to the beginning of July little has been done at the Lorne Creek placers on account of exceptionally high water, though some of the claims were being successfully worked. It is expected a great deal of fluming will be done this summer and some new ground has been paying well. The indications point to a large yield for the season from this creek.

Gold quartz has been discovered at the head of McCullough Creek, which flows southerly into Gold creek; the latter, a tributary of the Columbia, flows into that river about 50 miles above Farwell. The quartz, described as "rotten quarts," is said to be very rich, and free gold is visible to the naked eye. If there is any quantity of the quartz this is an important discovery.

A claim has been located at Leech River, within twenty miles of Victoria, which promises to become of importance. A careful examination of the ground gave many *colours* to the pan, and mining experts have pronounced the claim worthy of introducing hydraulic. Water can be brought from a lake a mile distant and paying results are predicted from these alluvial diggings if worked by the hydraulic system.

Thirty to forty miners are reported at work at Lake Kootenay, in galena ledges. Gold has been discovered on Slocan stream, a tributary to the Kootany river, about ten miles from its junction with the Columbia. Development of these claims will, however, be retarded, owing to the difficulty of access, which renders it impossible for prospectors to take in tools and other means wherewith to test their discoveries.

Specimens of galena from the strike near Shuswap Lake have assayed $40 the ton and if expectations are borne out by further tests mining operations will be carried on extensively next year. Practical miners are of opinion that the ledge will be found to carry ore in fairly paying quantity. The vein is from seven to fourteen feet wide and has been traced for miles. If it can be proved that this ledge will pay, ample capital is available to work it.

No new discoveries have been made this year in the Cassiar district, and the old ones are said to be worked out, consequently, most of the miners have decamped. On McDame's creek there are about 28 white miners and about the same number of Chinamen. The *Lorne* claim is the only one on the creek where miners are encouraged, it is returning about $10 a day per man. Thibert creek has about 25 miners at work on it, and Dease creek about 15. None of the claims on these two creeks are paying the miners more than their grub.

The mineral production of the United States is estimated at $400,000,000 per annum and that of Great Britain at $350,000,000.

UNITED STATES MINING NOTES.

Gold ore, worth no more than $5 per ton, is being profitably worked in California.

The Tamarack Company's combination shaft has reached the great Calumet & Hecla ore-bed at a depth of 2,260 feet.

The dividends paid by mining corporations in the United States for the first five months of the year aggregated $2,114,030.

The ordinary yield of the gravel channels in the northern counties of California is from $40,000 to $50,000 per acre.

The gold production of the United States in 1884, was equivalent to 1,789,949 troy ounces; and the silver to 37,744,605 troy ounces.

The net product of the 20 stamp mill of the Granite Mountain mine of Montana since December 1, 1884, to July 22, was $718,927.63.

The following is the June output of the copper mines of Lake Superior as far as reported: Calumet and Hecla, 2,576 tons; Quincy, 270; Atlantic, 212; Franklin, 190; Huron, 115.

From January 1, 1885, to August 8, the output of anthracite coal was 16,724,560 tons, as compared with 17,459,917 tons for the like period of last year, showing a decrease of 735,357 tons.

The production of copper in the United States in 1884, including 2,858,754 pounds made from imported pyrites, was 145,221,934 pounds, worth $17,788,687, at an average price of 12¼ cents per pound.

News has been received from Alaska that the new 120-stamp mill at the Treadwell mine, on Douglas Island, was placed in position in June last, and that the first month's receipts amounted to $100,000. This is the largest quartz mill on the continent, and was erected at heavy expense and under many disadvantages, in that out-of-the-way country. It was expected that $250,000 would be recorded for the second month's mill-run, and as the expense of mining is not more than 20 per cent. of the proceeds, there is every indication the mill will prove a very valuable investment.

Plymouth Consolidated Gold Mine.

The product of this dividend-paying property for June is reported officially at $82,656.70 making the product for the six months ending with 30th June, $493,607.65 or a monthly average of $82,267.94. The operating expenses of property aggregated $160,792.84 for the six months, being a monthly average of $26,799. The profit of the half year was $332,814.81, which added to cash left over on 1st of January, 1885, made the sum disposable for dividends $407,109.87. The six dividends paid this year aggregating $300,000, together with $10,914.86 expended in constructions, left a cash balance of $96,195,000 on the 1st of July, or $46,195 after the dividend of the 9th of July was paid. The stockholders of this company have already received $13 per share in the form of dividends.

Production of the precious metals in Mexico since 1493 amounts to almost $3,000,000,000, or about $1,000,000,000 for each century.

Deep Mining in Australia.

The ten deepest shafts in Victoria on the 31st March were: 1. Magdala Company, Stawell, 2,409 feet; 2. Lansell's 180 mine, Sandhurst, 2,041 feet, 3. Victory and Pandora Company, Sandhurst, 2,000 feet; 4. Newington Company, Pleasant Creek, 1,940 feet; 5. Prince Patrick Company, Pleasant Creek, 1,830 feet; 6. Crown Cross United Company, Pleasant Creek, 1,815 feet; 7. Prince Albert Company, Pleasant Creek, 1,770 feet; 8. North Old Chum Company, Sandhurst, 1,684 feet; 9. Oriental Company, Pleasant Creek, 1,676 feet; 10. New Chum and Victoria Company, Sandhurst, 1,625 feet. Only two of these shafts were deepened during the quarter, viz.: that of the Victory and Pandora Company by 60 feet, and that of the North Old Chum Company by 20 feet.

Gold Product of Victoria.

While the aggregate product of gold of the Australian colony of Victoria for the first quarter of 1885 was less than last year for the same quarter and aggregated but $3,848,000, we observe that these same Victoria mines have paid during the quarter at least $1,056,995 in dividends or, according to districts, as follows:—

Ballarat	$ 410,959
Beechworth	6,280
Sandhurst	405,565
Maryborough	32,555
Castlemaine	81,100
Ararat	13,745
Gipp's Land	106,800
Total	$1,056,995

—*Financial and Mining Record, N. Y.*

Jordan's Patent Pulverizing Machine.

This is an appliance recently exhibited in London by the engineering and manufacturing firm of T. B. Jordan, Sons, & Commans, London, of which the London *Mining Journal* gives the following description:

"Jordan's patent pulverizing machine for the reduction of hard or tough substances, such as ores, emery, quartz, flint, coprolites, paint materials, cereals, etc., to a fine powder, is a machine that will meet the requirements of mining engineers and manufacturers. This pulverizer is a massive cast iron casing, inside which beaters revolve in opposite directions at great velocity; the faces of the beaters are so angled as to prevent the material to be pulverized flying against the casing, and so as to strike it to and fro from the path of one set of beaters into that of the other. The material falls from the automatic feeder into the crushing casing and is beaten by impact into any fineness required. The pulverized material is carried away by a current of air induced through the machine by vans on revolving beaters. The force of the air current can be regulated by valves, and delivers the material when reduced into a collecting chamber in any required fineness, from 30 to 120 mesh. From thence the material is drawn off at will or delivered automatically. The machine is simple and very effective, and subject to little wear and tear. No grates or sieves used, and may be pronounced an admirable machine."

The same firm also exhibits, a "Dry Gold Amalgamator," to be worked in connection with the pulverizer, and for extracting the gold from the pulverized ores in a dry state. This amalgamator consists of a cast iron cylinder about 3 feet 6 inches in depth, in the centre of which works a revolving iron tube which works inside a larger tube revolving in an opposite direction; the powdered gold ore is fed into a hopper at

the top of the centre tube. Mercury is kept in the amalgamator in such quantity that there is a vertical height of about 30 inches of the liquid metal in the outer tube when the inner tube by its rotation is centrifugally emptied of mercury. Its r sd upward progress through the mercury is counteracted by a set of revolving blades, which k eps it agitated and separated in the mercury. On rising to the top of the column of mercury, a blast of air blows the ore along a pipe to waste pits or settling chambers as desired. The dry powdered ore having to pass through this column of mercury in a separated condition causes the finest particles of gold to come in contact with it and thus perfect amalgamation ensues. To show the superiority of this machine over those in ordinary use, it is reported that quantities of pyriteous ores, containing 4 ozs. 8 dwt. per ton was put through the apparatus with the result that only 4 dwts. 20 grs. of gold were left in the tailings, showing that 96 per cent. of the gold had been taken out, and in dealing with various descriptions of the refractory ores, from 92 per cent. to 98 per cent. of the gold has been extracted. These machines and the pulverizers are likely to come into great use in future gold mining operations.

They also have a Hydraulic Amalgamator for the amalgamation of free gold. Consists of a hollow column set in a cylindrical basin or muller revolving within another fixed basin charged with mercury, the slime or tailings from the mills are conducted into the hopper on the top of the shaft which is caused to revolve at about 30 to 40 revolutions per minute; the pressure in the column, about 10 feet, causes the material to pass through the mercury which is kept agitated and bright by the rotatory motion, the slime rising over the edge of the outer basin is discharged.

Large Casting in Italy.

The largest casting ever attempted in Italy was successfully accomplished at the ironworks of Signor Gregorini, of Levere, on the Lake of Isao, Lombardy. The colossal block of cast iron, measuring 14 cubic metres (494·43 cubic feet), and weighing 107 tons (105 English tons), is intended for the anvil of a 10-ton steam-hammer now being constructed for the Royal Arsenal of Spegia. The operation occupied twenty-three hours.

The World's Production and Consumption of Copper.

At a recent meeting of the shareholders of the Arizona Copper Company, held in London, England, Mr. G. Auldjo Jamieson gave a comparative summary of the world's production and consumption of copper, as follows:—

"The production of copper for the year 1879 was 149,000 tons all over the wo ld; in 1883 it was 193,000 tons. In those ye rs the production of copper had increased 11 per cent.—no very great increase after all, compared with the enormous increases during preceding and longer periods. The consumption of copper in England and France in 1883 was 91,331 tons, and in 1884 it was 107,143 tons—an increase in one year of 13 per cent. So that measured by these figures they had come up at last to this point, that the consumption of England and France—two by far the most important of the consuming countries—had outstripped the rate of increase in the supply. In the United States in 1883 the consumption was 58,000,000 pounds, and in 1884 it was nearly 96,000,000—an increase of 8,000,000 pounds. On January 1st, last year, the price of copper was £290 a ton and the stock visible and in hand, was 40,186 tons. On December 31st last, the price was £236 a ton, but the stock on hand was only 36,638 tons. There took place during the year 18 per cent. of a fall in prices and 812 per cent. of a fall of the visible stock on hand. America, with which they were mostly concerned, had in 1880 to import its copper largely from Chili. In 1882 it exported 745 tons to England; in 1883 it exported to England 9,110 tons; and in 1884 it exported to England 17,309 tons. So that from 1880 when it was importing copper, there had been a rise from a negative quantity to a positive exportation of over 17,000 tons. The question was—Is consumption come up to the level of and is it likely to outstrip production? On these matters he could offer no observations that would be worthy of their consideration; but it was his duty to observe what was said by those whose authority carried weight. In the report of the most authoritative of the metal brokers in London, this statement was made in the end of 1881:—'We are apt to undervalue the fact that although the demand for electricity is still behind hand, we have nevertheless absorbed and more than absorbed all available supplies. Indications of the copper wealth of the world increased, but the cost of mining is not to be judged from sensational newspaper articles; and there are important sources of supply where not only will exploration cease, but actual production must be killed by present values. Isolated mines may be able to give us copper at a fabulously low price, but they may grievously mislead us as to the average cost of production; and if a little more hopeful feeling springs up, if sentiment which has throughout the year been against all markets, turn in their favor, we may a year hence look back on the value of copper to-day as a momentary depression at variance both with former experience and with the present circumstances of the consumption.'"

Minerals Found with Gold in New South Wales.

The most common minerals that are found with vein gold are iron pyrites, which is never quite free from gold, and is sometimes exceedingly rich in it; iron oxide, which is for the most part derived from the decomposition of various pyrites; mispickel, in calcite, as at Lucknow, where the mispickel contains in parts over 2,000 ounces of gold per ton; also in calcite, at the Crow Mountains, Barraba, at Lake Cowal; at Humbug Creek; at Grenfell; at Solferino, in the Garibaldi Reef; at Merimbula; and also, it is stated, near Gunnedah. With mispickel at Carcoar, and at Moruya with silver sulphides also; with pyrrhotine and calcite, as at Hawkins Hill; with galena and zincblende at Grenfell; with galena, zincblende, magnetite, molybdenite, chlorite, and scheelite at the Williams mine, Adelong; talc, asbestos, and serpentine, near Gundagai; steatite, cuprite, malachite, tenorite and other copper ores, notably in the Canobolas and in the Winterton mine, Mitchell's Creek, near Bathurst, where it is also associated with barytes in well-developed although small crystals, and with mimetite, a chloro-arseniate of lead; it is also found with mimetite in the Adelong district; it is reported with tinstone in the cliffs at Eden, and with native arsenic at Solferino. Beautiful specimens of native gold, in malachite and red oxide of copper, have been yielded by the Kaiser mine, Mitchell's Creek, near Bathurst. Gold and native copper have been found together in quartz veins, and in the rocks through which the veins pass. In alluvial deposits, gold is associated in New South Wales with a very large number of minerals; and it is remarkable that certain of them, such as platinum, osmo-iridium, sapphire, ruby, oriental emerald, and diamond have not yet been found *in situ*. Among other minerals, we have tinstone, titaniferous iron, magnetic iron, chrome iron, brookite, rutile, anatase, emerald, beryl, topaz, zircon, hyacinth, spinel, garnet, red and brown hematite, pyrites, binoxide of manganese, galena, blende, tourmaline, magnesite, and many more of less value.—*(E. and M. Journal, N.Y.)*

The Deepest Mines Known.

The deepest mine, according to Humboldt, is an abandoned one at Kuttenburg, in Bohemia, where the lowest part of the mine is 629.33 fathoms deep. A staple which had been sunk from the workings of the colliery Des Viriers, at Gilly, in Province of Hainault, in Belgium, had attained the depth of 581.5 fathoms. The Adelbert mine, in the Przibam district, in Austria, has a shaft 546.5 fathoms deep, according to M. M. Jars and Duhamel. An abandoned argentiferous copper mine, at Kuty Puhl, near Inspruck, in Tyrol attained a depth of 546.83 fathoms. The Sampson silver lead mine, at Andreasburg, in the Hartz mountains of Germany, is 468.66 fathoms deep. The Rosebridge colliery, at or near Wigan, Lancashire, England, is 403 fathoms deep. In the Zwicken district, in Saxony, coal is drawn from a depth of 434.5 fathoms. Duckinfield coal mine, in Cheshire, is 358.5 fathoms. At the Dolcoath tin mine, in Cornwall, the engine shaft is 350 fathoms. The Wheal Vor, a tin mine in Cornwall, containing rock kilas, in 1859 was 321 fathoms deep. A silver mine in the Konsberg district, in Norway, is 311.5 fathoms deep. The Wheal Mary Ann, a lead mine in Cornwall, is 300 fathoms deep. The Camphausen coal mine, in the Saarbruck district, in Prussia, is 275 fathoms deep. Ince Hall coal mine, Lancashire, is 300 fathoms; Worthington coal mine, Lancashire, is 300 fathoms; Ryhope coal mine, County Durham, is 271 fathoms; Renard coal mine, Anzin mines, France, is 272 fathoms; Pendleton coal mine, Lancashire, is 363.5 fathoms; Douglas Bank coal mine, Lancashire, is 262 fathoms.—James V. Murphy, in *National Labor Tribune.*

ASPHALT.

In about the centre of the island of Trinidad, just off the coast of Venezuela, there is an asphalt lake. It is said to cover about one hundred acres and is apparently inexhaustible. It is a black, sandy substance, and is believed to be crude rotten petroleum. A singular feature of the substance is that, although about fifty thousand tons are taken out of this lake annually, it constantly fills up so that there is no lessening of the supply. This singular lake of paving material is owned by the Venezuelan government, but leased to a company in Washington.

A lump of coal brought from the Victoria, Sydney, C.B., mines, is three feet five inches in height, nineteen inches wide, fifteen inches thick and weighs 400 pounds.

The returns relating to gold mining in the colony of Victoria for the first quarter of 1885, show a falling off in the yield to the extent of 8,351 oz. 4 dwts. 22 grs. compared with the preceding three months.

Gold Mining Simplified.

A somewhat incredible gold story has appeared in the U. S. *Press* to the effect that Mr. Bob Paul, of Township No. 10, Cabarrus county, N.C., went to the Charlotte mint for the purpose of having his gold dust coined, and told this tale:

"On my farm is an old gold pit that was dug by an English miner, as tradition says, during the revolutionary war. The same authority says that this miner took $15,000 from this pit in gold, and being satisfied with his wealth, abandoned the pit and went back home, leaving the mine full of rich ore. The people of the neighborhood worked the mine at different times, but it was finally neglected and forgotten. Weeds grew up around it, and the rains partly filled up the excavation. During the past winter I was troubled with mud in my front yard, and at the suggestion of my wife I went and hauled three cart loads of sand and gravel from the old pit-hole and scattered it over the yard. Last Monday, while walking over the gravel, I noticed a glittering object, and on picking it up I found that I had a nugget of virgin gold, weighing an ounce. I examined further, and the sand and gravel proved to be rich in gold. I carted the three loads to a branch near by, and 'panned out' gold valued at $325. I then went to the mound taken from the pit, and got a bushel of the ore and pounded it to dust in a mortar, and obtained gold to the amount of $125."

After hearing the story and seeing the $500 in gold, Mr. Eli Hinson, a wealthy citizen of Mecklenburg county, offered Mr. Paul $50 a bushel for the 2,060 bushels of sand and gravel lying at the mouth of the pit-hole. The offer was promptly refused. The story about the Englishman is said to be true by a doctor 50 years old, who lives near Mr. Paul. Experts have gone into the mine, and a full supply of modern machinery will be put in.

On a Possible Genesis of the Canadian Apatite.

By G. Henry Kinahan, M.R.I.A., &c.

(Read before the Geological Society of Manchester.)
Continued from page 11, *Vol.* 3, *No.* 4.

In the S.W. of Galway and the S.W. of Mayo these rocks also occur (*Lettermullen* and *Croaghpatrick beds*); but in these places the bands are of less width, while the rocks are not as well exposed: those seen are, however, more similar to the Canadian rocks, being more altered.

There are also in West Galway two other bands of more or less similar rocks; one, the younger (highest strata in the *Great Micalyte series*), being the uppermost member of the group of rocks that appear to be the equivalents of the Arenig rocks (Upper Cambrian) of Wales; while the older is a group in the supposed Lower Cambrian (*Ophiolyte* and *Dolomyte series*). In the latter there are some peculiar calcerous or allied rocks, exactly similar to some of those met with in the vales of the Du Lièvre and the Gatineau. In the Co. Donegal there are also similar bands, but of even less widths; they, however, are interesting on account of the rocks in them. The exact age of these is not yet satisfactorily worked out, but in the "Geology of Ireland" it is suggested that they are probably of Cambrian or Cambro-silurian age.

Certain limestones and dolomytes, in these groups of rocks in S.E. Ireland, Galway, Mayo and Donegal, also in other Irish localities that need not now be specially enumerated, are very curious, entangled in, and associated with, basic eruptive rocks [*Gabbro, Granitone, Euryte* (Daubuisson) or *Hybrid rocks* (Durocher) and allied rocks], also with quartzites or greissen (*quartz rock* or *reef quartz*). This connection of cilicious and calcerous rocks with eruptive rocks induced me some years ago to suggest that they were probably adjuncts of vulcanicity (*Geology of Ireland, chap. XII. and XIII., and prior papers*); while, since then, subsequent explorations seem to add strength to the suggestion, as rocks of these kinds occur in such intimate relations to eruptive rocks that they could not be ordinary sedimentary accumulations, but must have come into their present position in solution, or have been injected therein; the first, however, is more probable than the last.

The similitude between the Irish association of rocks, if the limestone w replaced by apatite, and those in the vale of the Du Lièvre forcibly presented itself when the latter was first seen, while subsequently, examination strengthened it.* An examination of the "back" of the lodes and bunches exhibited a color similar to that of rocks which, in Ireland, give indication of the presence of phosphoric acid, although in some cases very faint. This seems to suggest, considering the relative state of the rocks, those of Canada being more metamorphosed than the Irish ones, that there might be an affinity between them; while further examination and consideration appear to strengthen the impression.†

It should also be mentioned that in some of the Irish eruptive rocks, which apparently belong to those called *Eurgte* by Daubuisson or the *Hybrid rocks* of Durocher; there seems to be small quantities or traces of phosphoric acid.‡ This appears to be an important consideration, as will be presently mentioned.

The inquiry in connection with the home rocks is as yet far from being complete. After I learned the "gossan colour" of the apatytes, which was previous to my going to Canada, I have not had an opportunity of examining any but submetaphoric rocks, in which the pyroxene is little if at all changed; while according to the researches of G. H. Williams, of Baltimore, in the associated eruptive rocks of the apatites of the vale of the Du Lièvre, and also in Scandinavia there is a paramorphoses of the pyroxene and the felspar, the first "being more or less changed into hornblende and the latter into wernerite." Nevertheless, the home researhes, up to the present, appear to suggest that in the Irish submetaphoric rocks there has been a limited paramorphoses of limestone into apatite.

From what has been observed in Canada and in Ireland, I would venture to suggest that *it is possible the present Canadian apatites were originally limestone or allied rocks, the change to apatite being due to paramorphoses, which at present cannot be satisfactorily explained.* Such a suggestion seems allowable, when we consider that the paramorphoses of pyroxene, into hornblende, although known to take place, cannot as yet be explained. An objection that may be raised is,—Where did the phosphoric acid come from? If, however, it can be satisfactorily proved that in some or many of the unaltered Irish eurytes this acid is present, this objection would in a great measure be answered. Because if in the Irish assembly of submetamorphic rocks there are found phosphoritic eruptive rocks and limestones associated, while in the Canadian metamorphic rocks apatite and non-phosphoritic eruptive rocks are similarly related, it may be supposed that the additional action to which the latter were subjected was such as to allow the phosphoric acid to replace the carbonic acid.

In addition to the similitude between the form and occurrence of the limestone and apatite, there are other circumstances that may add weight to the previous suggestion, besides showing that other characteristic minerals of Canadian Archæan Rocks may be also the products of metamorphic action. Not however to excessive metamorphism, that is, an excessive change that took place at one time, or in one period of time; but to successive alterations, due to periods of metamorphic action, with intervals of greater or less duration between each. Rocks of such a great age as the Laurentian should necessarily be subjected to such vicissitudes; as during the lapse of time since they were first accumulated, they must sometimes have been at great depths below the surface of the earth, while at other times they were at or near it; therefore it appears safe to conjecture that the change they underwent during the first period of metamorphic action was subsequently augmented by the action of latter periods. Artificially, graphite can be produced by heat, so also can specular iron ore; if therefore in the Canadian rock, when submetamorphic, there were graphitytes, pyritilytes, pyrrhotilytes, with ferriferous limestones, and schists, as found in the Irish rocks, there would have been rocks that, by subsequent alteration, should change into the graphite-schist and other graphite producing rocks, the "specular schist" and other iron ores; while it might be also suggested that the metamorphoses of pegmatyte would further develop its minerals, and by concentration increase the size of each individual mineral; thereby accounting for the great size of the crystal of mica and other constituents of the Archæan pegmatytes.

It may appear presumptuous in a person, not a chemist, to put forward some of the above suggestions, still, as during the last six or eight years I have been studying the possible or probable genesis of apatite, they may be excusable. Besides, from my knowledge of Irish rocks, and also of rocks in a few English and Scotch localities, I suspect, now that special attention is directed to the subject, that apatitic rocks will be discovered in different localities; nor would I be surprised if some of them were of commercial value.

In the Atlantic States, from Maine to Virginia, 65,000 long tons of land plaster and 60,000 tons of stucco, total 125,000, were made in 1884, of which nearly all was from Nova Scotia gypsum.

The Austrian product of the money metals for the calendar year, 1884, was as follows: Gold, $15,670, and silver, $1,267,142. This is a somewhat larger product of both metals than that of 1883. The gold product of Hungary is not included.

A Russian Expert Expedition.—The Russian government proposes sending experts to Turkestan, to study the turquois mines on the Persian frontier. The same commission will visit the sulphur deposits recently discovered near Khiva, and the lignite mines and petroleum springs in the district of Ferghana.

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* Regular lodes of dolomyte and calcite occur in Irish eruptive rocks: also veins of bastard limestones, with *one wall* merging at the other side into the country rock,—such lodes and half-lodes that I call to remembrance are, however, mere bagatelle to the Canadian lodes of apatite.

† Phosphoric acid in small quantities is frequently found by chemists in limestones and dolomytes. It would, however, be necessary to know the exact localities where such limestones and dolomytes came from in order to determine whether the rocks were an ordinary deposit or subsequently partially altered. This is an important point: as unless special localities where such apatite limestone came from is known, they ought not to be brought in as evidence "that many limestones contain apatite."

‡ These rocks weather with a partial gossan colour of the Canadian apatite.