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# CANADIAN

# MINING REVIEW

VOL. 3.—No. 8.

1885—OTTAWA, NOVEMBER—1885

VOL. 3.—No. 8

## ROCK DRILLS, AIR COMPRESSORS,

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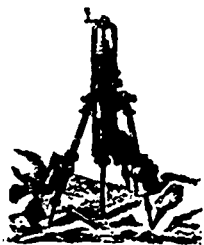
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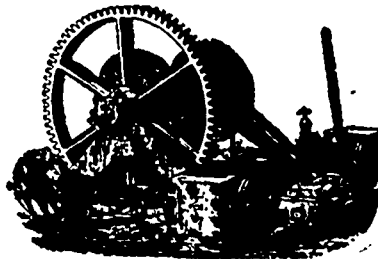
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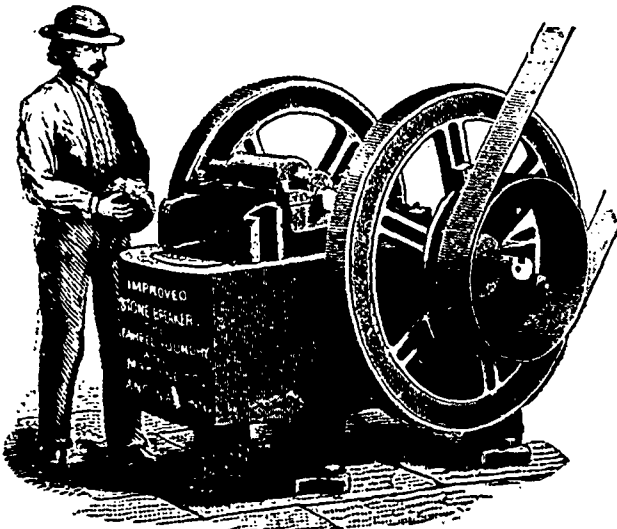
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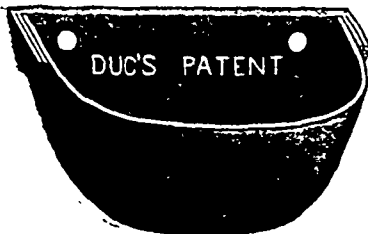
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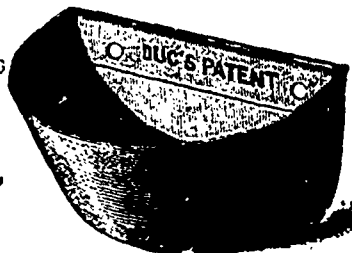
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Forms of Tender and Specifications can be had at this office, where all necessary information can be obtained.

Separate tenders will be required for each work, and must be endorsed “Tender for Removal of Snow, Public Buildings,” and “Removal of Snow, Rideau Hall” respectively. Each Tender must be accompanied by an accepted bank cheque, made payable to the order of the Honourable the Minister of Public Works, equal to five per cent. of the amount of the tender, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender is not accepted the cheque will be returned.

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

In order,  
**A. GOBEIL,**  
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Department of Public Works,  
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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.*

Notwithstanding the valuable work that is yearly being accomplished by our Geological Survey, and the information that is being given to us in the Director's periodical report, it is incontrovertibly true that the people of Canada are practically without information and comparatively ignorant concerning the extent and variety of the mineral resources of their own country. Lack of information concerning the past history of our mining industries, and the continued neglect on the part of the Dominion Government to establish a mines branch in connection with the Geological Survey of Canada, for the systematic compiling of mining statistics and the publication of an annual report of mines, has a tendency to retard the progress of our mining industries and to perpetuate our ignorance of what might be achieved by enterprize and judicious use of capital in the development of our mineral deposits. There is much need of wider knowledge of Canada's mineral resources and a better understanding of their capabilities; for their successful development would become a potent factor in advancing our national prosperity. This knowledge and understanding can only be given to us through governmental interposure, and it is to be hoped that the Minister of the Interior will not delay in establishing a Department of Mines capable of liberally dispensing mining information.

Now that the shipping season for phosphate is drawing to a close, mine owners have ceased to forward ore from the mines,

as all the available freight from Montreal to foreign ports, per steamship and sailing vessels, up to the close of navigation, has been secured, and the phosphate awaiting shipment has been delivered at Montreal.

For this reason the Canadian Pacific Railway Company has seen fit to discontinue the running of trains on the branch line from Buckingham station to the village. This is certainly a most unwarrantable proceeding, and has created much dissatisfaction among mine owners in the Lièvre district, who have been liberal patrons of the C. P. R. By the carrying of the output of the phosphate mines over the road to Montreal, that portion of the freight charges credited to the Buckingham branch has shown it to be the best paying portion of the Eastern Division. This traffic can be relied upon for seven months in the year (the shipping season from the mines to Montreal) and the profits therefrom to the railway would warrant more liberality on the part of its managers than they are now displaying. Machinery and other heavy freight is constantly being forwarded to the phosphate mines, and at this season of the year mine owners are laying in their supplies. From the first of November of each year, until sufficient snow has fallen to make good sleighing, the roads between the railway at Buckingham station and the village are practically impassable, and at this very time, when railway communication would be of the greatest convenience to the miners, the company sees fit to discontinue to run trains over the branch. Had timely warning been given of this ungenerous intention, steps would have been taken to forward all heavy freight before the cancelling of trains; but no intimation of such discontinuance was given, until within a few days of its taking effect, and consequently everybody was unprepared for it. One train daily to and from Buckingham village could be run during the winter months at a profit, as the passenger traffic alone would be sufficient to defray the expense. During the season of navigation the company realizes large profits from this short piece of its line, and it is surely not asking too much of its managers in requesting that the order to discontinue the running of trains over the Buckingham branch be rescinded, and that thereafter there may be at least one train daily.

A meeting of representative phosphate miners of the Lièvre river district was recently held in Buckingham to protest against the action of the Canadian Pacific Railway Company in taking off the train between Buckingham station and the village. Mine owners are very indignant, and justly so, that their interests should be thus disregarded, and will take prompt steps to have their grievance favorably considered. The capital invested in the phosphate mining industry has reached large proportions, and the men who have interest at stake here are sufficiently independent not to allow themselves to be trifled with. Another meeting has been called, at which will be

discussed the propriety of constructing an independent narrow-gauge line from Buckingham village, on the west bank of the Lièvre, for the transportation of ore to the Ottawa river and thence to Montreal by barge. If their request to have a daily train over the Buckingham branch of the C. P. R. is not granted, these gentlemen will certainly provide for themselves this other accommodation.

An exchange tells us: "Graphite and black lead are identical, or nearly so, with plumbago. The mine at Ticonderoga, N.Y., produces nearly all the graphite mined in America. It is the purest known, and is used for all the purposes to which graphite can be put, excelling all others as a lubricant."

If Canada forms a portion of America, and we understand that such is the case, our contemporary is in error. There are two mines in the Province of New Brunswick producing graphite in large quantity as pure as any that has yet been found in other parts of the world, and the deposits of graphite in the Ottawa district are in no respect inferior to that produced in Ceylon or at Ticonderoga.

In this number of the *Review* we publish Mr. Edwin Gilpin's paper on "Nova Scotia Gold Mines," read before the Halifax meeting of the Institute of Mining Engineers, which will be found to be replete with interesting facts and statistics. Of the meeting, *The Engineer and Mining Journal* says:

"The recent visit of the mining engineers to Nova Scotia served to dispel many erroneous impressions. Not a few were surprised to find that Nova Scotia has a known coal area of nearly 700 square miles, or nearly twice the area of the Pennsylvania anthracite fields, and that some of the Nova Scotia fields have a greater thickness of workable coal than probably exists anywhere else in the world. The coal, too, is of good quality, though, when not washed, the slack and coke contain generally very large percentages of ash and sulphur.

The iron ore deposit of Londonderry is one of the finest in the world, and greatly surprised many experts. The country altogether is larger and better than was expected.

It was pretty generally believed that the climate of Nova Scotia was both cold and wet. This erroneous impression was thoroughly dissipated; for certainly no trace of coldness or frigidity was found anywhere to offset a warmth and ardour rarely equalled in any other part of the world the Institute has yet visited. As for the legend that in Nova Scotia the normal condition of the atmosphere is rain and fog, the visitors were convinced, both by personal experience and private information, of the contrary; for they found it a well established fact that the natives are always dry."

This speaks well for the natives. Their being *always dry* is, we take it, a reference to the hospitality they extended to their guests, and this is further corroborated by a special correspondent of the *E. & M. Journal*, who says:

"At New Glasgow we briefly examined the steel works, where steel is made from scrap and pig-iron, said to be the only steel works in

Canada; and the glass works, which make lamp chimneys, tumblers, wine-glasses, &c. Judging from our experience, we should say that Nova Scotia furnishes an extensive market for the last named article."

The same journal, referring to Nova Scotia's mineral wealth, says:

"Nova Scotia has been treated with great partiality by nature, which has heaped upon it with great prodigal hand, the choicest treasure of her mysterious laboratory. Gold, the sorcerer that bewitches the world, coal, the mainspring of civilization; iron ore, manganese, gypsum, and many other useful minerals are placed in large abundance within easy reach of man, in a fertile country with wholesome climate. In their proximity to each other and to magnificent harbors, nature has provided all the natural elements of national wealth and prosperity. The artificial elements, capital and energy, only have to be added to secure for this favored land an enviable position among the nations of the earth."

Such, it may be said, is the case in nearly every province of this Dominion. Our people are energetic, but we lack the enterprise and capital necessary to the advancement and successful development of great mining industries. The former can be fostered and nourished by the judicious employment of capital that must be looked for from more wealthy communities, and to procure this indispensable agent, we must offer sufficient inducement to capitalists to encourage them to come to our assistance, and we must be scrupulously careful to see that the capital that may find its way into Canada, for the development and advancement of her mining industries, is directed into channels where it can be profitably employed.

The South African gold field, of which many promising reports have been printed in London, according to Mr. Thomas C. Kitto, M.E., are really without a substantial trace of gold, and the geological formation of the country is not one that promises gold. The large nuggets that have been displayed there as of local origin have all been carried thither from Australia.

### THE PHOSPHATE TRADE.

The shipping of phosphate for this season has virtually ceased—at least the forwarding of ore from the mines has been discontinued—and will not be resumed until the opening of navigation in 1886, excepting from those mines that are so situated as to necessitate winter transportation, and from these hauling will be begun as soon as the roads are in good condition for sleighing, and the ore delivered at railway to await shipment next season.

At the mines in the Lièvre district nothing could be more satisfactory than has been the result of the past six months' operations. During the two months after the breaking up of last winter, the managers at the mines directed their attention to opening new ground in some cases, to adding new machinery in others, and in all cases to increasing and improving the facilities, and putting the mines in shape, for permanent and more extensive operations.

In consequence of this determination on the part of mine owners to prepare for systematic mining in the future, it became necessary to do a certain amount of dead work; but their wis-

dom has been amply evidenced by the increased monthly out-put since these improvements have been accomplished. Nevertheless, the time that had to be given to this work has had the effect of reducing the year's production of ore, and it is not probable that the shipments for 1885 will aggregate more than 23,000 tons.

The shipments of Phosphate during the past season from Canadian mines have given more satisfaction to the buyers abroad than have those of any former year, due, certainly, to the greater care of the mines superintendents in seeing that the ore is properly dressed and cleaned before it is forwarded. The quality of the past summer's shipments has been of a very high grade, the cargoes of first-quality ore having averaged quite 80 per cent. The richest shipments, however, that have been reported to us were from the *Little Rapids* mine, the return of which, from the London brokers, gave in one case 85.79 and in another 85.18 per cent. tribasic phosphate of lime. These are probably the highest analyses ever given for Canadian phosphate in cargo lots, but there is no reason why a very large proportion of the out-put of the mines should not be shipped in an equally pure state, though in some cases more than others it is more difficult to separate the ore from foreign matter which tends to lower the analysis. These shipments from the *Little Rapids* mine were made through Wilson & Green, of Montreal, and the result is evidence of their careful handling of the ore on this side, and that of their representatives on its arrival at London.

The most important development in mining during the past season has been at the Dominion Company's *North Star* mine, in Portland East, where a shaft has been sunk to a depth of 266 feet, the bottom of which is in a fine body of ore. From the surface to its present depth this shaft has penetrated ore, but the extent of the deposit has not been determined, nor will it be until drifts and cross-cuts have been run at different levels. At the 200 ft. level a drift has been run for some distance in solid ore, and some stoping has been done. We understand it is the intention to start another drift when a depth of 270 ft. has been reached. The present condition of the *North Star* is such as to insure a heavy out-put for many months to come. The ore is of a very high grade, and the way it has been handled, and the manner in which the work has been carried on at this mine, reflects much credit on Mr. W. H. Smith, the company's competent manager.

At other mines in the Lièvre district much lower depths have been reached than had ever been attempted before, and with very satisfactory results, and some important developments have been made at mines that have been but recently opened.

At the *Little Rapids* mine, during the past month, a cross-cut was started on a vein in one of the open cuttings, which has penetrated a body of ore, apparently another vein, the extent of which has not yet been defined. The miners are working in solid ore, which forms the roof, floor and sides of the drift. This work has exposed one of the largest bodies of phosphate ever met with in the district.

The *Emerald*, *High Rock* and the Union Company's mines maintain the reputation they have long since earned as heavy producers, and from each there is a steady production of high grade phosphate. The *Emerald* and *High Rock* mines have increased their out-put, month by month, since last year, and the October production of the mines in the Lièvre district has aggregated about 2,500 tons; the force of miners employed being much the same as reported last month.

The Glasgow Canadian Phosphate Company's mine, in Dery, has been developing satisfactorily and is producing a fair quantity of ore. This company has now put its mine in good working order, and has equipped it with machinery and other plant necessary for extensive operations. One of the directors of the G. C. P. Company (a Scotch organization) visited the property not long since, and expressed himself well satisfied with the prospects as he then saw them.

### PHOSPHATE SHIPMENTS FROM MONTREAL FOR SEPTEMBER.

Date.	Vessel.	Destinat'n.	Shippers or Agents.	Tons.
Sept. 30	S.S. L. Superior	Liverpool.	Millar & Co.....	210
Oct. 3	S.S. Baumwall	Hamburg.	Lomer, Rohr & Co	780
" 15	S.S. Oregon	Liverpool.	Lomer, Rohr & Co	250
" 10	S.S. Enrique	Liverpool.	Lomer, Rohr & Co	1.5
" 10	S.S. Enrique	Liverpool.	W. M. Knowles.	200
" 17	S.S. Oxenholm	Liverpool.	Wilson & Green.	255
" 17	S.S. Oxenholm	Liverpool.	Lomer, Rohr & Co	450
" 10	S.S. Concordia	Glasgow.	Wilson & Green.	207
" 19	S.S. Glenrath	London.	Millar & Co.....	260
" 19	S.S. Glenrath	London.	Lomer, Rohr & Co	183
" 26	S.S. Maharajah.	London.	Wilson & Green.	273
Total for October .....				3,133
Previously reported .....				17,853
Total to October 31st .....				20,986

### Phosphate Quotations.

One shilling for 75 per cent., with a fifth of a penny rise, has been the ruling price for Canadian phosphate in the London market during the past three months, and no report of any variation from these figures has reached us.

### Ocean Freights.

The average freight charges for phosphate shipments from Montreal to Liverpool and London for the past season have been about five shillings and sixpence, having varied from three to seven shillings per ton. To Hamburg they have ruled at twelve shillings and sixpence. As the shipping season is virtually closed, there is no freight offering, and consequently no rates are reported.

The phosphate location in Templeton, adjoining the *Post* mine, formerly the property of Mr. J. H. Post, has recently been purchased by Mr. John Lamb, of Toronto, who purposes putting a force of men on at once to open it up, and will continue mining operations throughout the winter. Mr. Lamb is well satisfied with his purchase, and expects to make a good shipment of ore from the mine next season.

### VILLENEUVE MICA MINE.

Recent reports from this mine are to the effect that it is producing a liberal quantity of excellent mica with but a small force of miners employed. Several experienced cutters are engaged, and find it impossible to keep pace with the miners; consequently there is a large accumulation of crystals, (in the neighborhood of eight tons) awaiting the cutters to prepare them for market. A shipment of several hundred pounds of cut mica was made from the mine in October, which has been pronounced by the consignee to be of as good quality as any that has ever been mined in America—quite equal to that which he has received direct from the North Carolina mines.

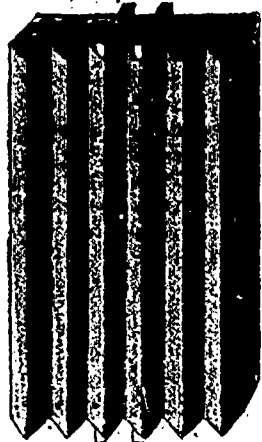
The drift, or tunnel, which is being run into the micaceous lode has reached a distance of 80 ft. from the face of the mountain and has opened up a body of mica-bearing quartz in which well



formed crystals are everywhere imbedded and are to be seen in vast numbers in all directions. This *Villeneuve* mine is certainly developing into a property of incalculable value, and ere long it will be capable of supplying almost the entire Canadian market, and it is not improbable that there will be a surplus to ship abroad.

**Adamantine Shoes, Dies and Crusher Plates.**

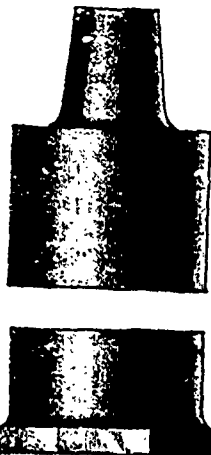
A visit to the *Chrome Steel Works* in *Brooklyn, N. Y.*, was made recently by our correspondent, where were seen made the celebrated *Adamantine Shoes, Dies and Crusher Plates*, which are being extensively used in the gold and silver reduction mills, and wherever rock breakers are employed, in all the States and Territories of both North and South America, with the most satisfactory results. When it is understood that they outwear any other known, their value as compared with those of other materials may be computed. This is a large saving and



economizes not only in the freight, which is quite an item, as in many cases they have to be carried on the backs of mules over rough and mountainous country, thus adding greatly to the first cost, but in the trouble and delay caused in replacing those worn out, which, occurring at such short intervals, amounts to a considerable sum in

time. They save also in the amalgam. The wear is so slight that little, if any, of the metal from which they are made gets mixed with the crushed ores, which saves the precious metals from a mixture of foreign materials. It is often the case that certain *Shoes and Dies* break off at the shank; these are made extra strong at that point, and there is no danger of their breaking.

The *Chrome Steel Works* are also manufacturing plates for amalgamating pans, from the same materials, which are destined to become very popular. There was also seen in process of manufacture the well-known *Chrome Tool Steel* made by this company. Their trade has increased wonderfully of late years, and now reaches over twenty tons per day. It is used for every description of tools. It is made of several grades, in rounds, squares, and octagons, and is guaranteed to do more work, as a tool steel, than any other known brand by from 50 to 100 per cent, according to work to be performed. We would refer our readers to the company's advertisement, which appears in another column.



A petrified tooth, twelve inches long and six inches in diameter, supposed to belong to a mastodon, has been unearthed in a gravel pit at St. Catharines, Ont.

**GRANITE WORKS.**

Ottawa has a new industry that is likely in the near future to prove of much importance. The Canadian Granite Company has completed the improvements and additions that were being made to the mill recently purchased at the canal basin, and the machinery, which has arrived from the manufacturers in the United States, is now being put in place. The polishing mill is a commodious structure, with excellent provision for light, and is substantially built from foundation to roof. The sheds in which the stone cutters will be employed in summer cover an immense area, and for the winter an excellent cutting shed has been provided for them adjoining the mill. The machinery is all of the most modern patterns, and of greater capacity than any now in use in Canada. The company's red granite quarry, at Kingston, has been described before in the Review. It also owns a serpentine quarry convenient to Ottawa, from which very handsome stone can be obtained, and a marble quarry as well. The gentlemen composing the Canadian Granite Company possess the enterprise and business capacity to insure its success. They have shown their wisdom in securing the services of so competent a manager as Mr. P. A. Taylor, under whose supervision the works at Ottawa will be conducted. The polishing mill will be in operation before the end of the month, after which the company will be in a position to turn out monumental and architectural work of all conceivable designs, in granite and marble, and ornamental designs in stone of any description.

**ASBESTOS.**

The total shipments of asbestos from Canada for the season of 1885 will aggregate 1,400 tons, or thereabouts, and the prices received for the various grades have been very encouraging to mine owners. The principal operators have been King Brothers, the Johnson Company, Ward Brothers, Lionais & Company, Boston Asbestos Packing Company, and Irwin & Hopper. In the October number of the REVIEW the name of Kennedy & Co., was mentioned, by mistake, among the mine owners of the district. Mr. Kennedy is employed as manager of the mine owned by Messrs. Irwin & Hopper, of Montreal. The quality of asbestos from the mines in Coleraine, Thetford and Broughton is of a quality that is not excelled in any part of the world. We have recently seen blocks of the mineral of the very finest quality, from the Eastern Townships mines, some of which weighed nearly two hundred pounds, with the fibre not less than four inches in length. Those who are engaged in the asbestos mining industry express themselves well satisfied with the result of the past season's operations.

An asbestos mine exists on the spur of a hill about two miles from Gundagai, New South Wales, in which the lode has been driven upon for a distance of ninety feet, and a shaft 100 feet deep has also been sunk. The mineral occurs in a serpentine formation similar to quartz veins, and is mined in the same manner. The material is very abundant and is stated to be of as good quality as any in the world. The shareholders have started an asbestos manufactory, in which they propose to work up asbestos for various purposes, among others for the manufacture of a fire-proof paint. On the same property another class of asbestos has been discovered and worked in connection with gold. The lode is peculiar in character, and with one

or two minor exceptions is almost identical with the famous Lucknow lode, which has proved so rich in gold.

**A New Use for Asbestos.**—In the processes connected with the dyeing and printing of cotton cloth it is frequently necessary to hang the fabric in loops from parallel rods for the purpose of exposure to steam, air or ammonia. In order that the cloth should hold upon the rods without slipping or being strained, it is necessary to wind rope or strips of cloth around the rods; but this only mitigates the difficulty without accomplishing its removal; for the heat and corrosive action of the vapors rot any covering in a few weeks, and the first notice of any deterioration is generally the appearance of small pieces of roll covering among the cloth in process of finishing. Recently asbestos rope and asbestos cloth have been used for this purpose and prove to be very durable. Larger ropes of this refractory material have been used for the transmission of power over places exposed to heat.

**MINERAL WOOL.**—This material is nothing more nor less than the slag of blast furnaces converted into a fibrous state and, in appearance, resembles the fibres of fleecy wool or cotton, and for this reason it has been given the names of *mineral wool* and *silicate cotton*. It possesses excellent non-conducting qualities and is well adapted for all practical purposes to retain or exclude heat in connection with steam boilers, pipes or refrigerators, and is also useful as an incombustible lining or protection in cases which admit of its application. In many of the uses to which it is applied *mineral wool* serves the same purpose as asbestos, but does not possess some of the properties which make this latter mineral so valuable for the great variety of uses to which it is adapted.

In the next issue of the REVIEW will appear a description of the methods employed in the manufacture of *mineral wool* and more particulars as to the character of the article itself.

**NOVA SCOTIA'S GOLD MINES.**

By EDWIN GILFIS, A.M., F.R.S., F.R.S.C.

Read before the Halifax Meeting of the American Institute of Mining Engineers, Sept, 16th.

It has fallen to my lot on this occasion to endeavor to convey to your Institute an idea of our gold fields. I can assure you that I am quite sensible of the well capped apex of a smile when I speak of an annual production of gold valued at \$300,000 to an Institute whose members dig and refine annually over \$30,000,000 of the precious metal. But possibly before you leave us you will endorse the golden forecasts of our politicians and revivalists, and not only express yourselves in the words of one of your most eminent financiers that "there are millions in it," but also show us how to carry on our mining more profitable.

**OUR GOLD FIELDS**

stretch along the Atlantic shore of the province from Yarmouth to the Strait of Canso, a distance of over 200 miles, and is in some places forty miles wide. The country underlaid by the auriferous strata and associated rocks is rough, and generally unfitted for farming, so that it is comparatively unexplored. The Geological Survey has begun to map out the district, but several years must be spent before a complete survey can be made. It is therefore difficult to give any exact estimate of the number of square miles underlaid by the auriferous

measures. The total area has been estimated at from 6,000 to 7,000 square miles, about one-half of which is occupied by "granite." The exact age of these measures has long been a vexed question among the provincial geologists, and is perhaps not yet positively settled. They may be roughly divided into two sections. The upper one is composed principally of black slates, frequently pyritiferous, with beds of quartzite and veins of quartz. The lower section is made up of alternating beds of quartzites, fine and coarse and frequently feldspathic, and gray and bluish black slates, sometimes magnesian, and holds numerous veins of quartz. The thickness of the upper section has been estimated at 3,000 feet, and that of the lower section at 9,000 feet. The veins in the upper section, though frequently auriferous, have not yet proved of economic value. The following opinions as to their age are those advanced by Sir William Dawson, and appear, in the opinion of the writer, to be based on the only available data:—

#### CAMBRIAN.

England— Fremadoc slates and Lingula Flags, Menevian series, Longmynd series, Harlech grits and Llanberis slates.	Nova Scotia and New Brunswick. Mira and St. Andrews series in Cape Breton, Acadian series, St. John, N.B. Quartzites and slates of the At- lantic coast of Nova Scotia.
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#### THE ACADIAN SERIES

of St. John, New Brunswick, so carefully examined by Professor Hartt, forms with its well characterised fauna the typical representative on the western continent of the formation known in England as the menenan of Barande's etage C, of the primodial in Bohemia. The Atlantic coast series of Nova Scotia, with the two divisions of quartzites and clay slates so divided from the respective predominance in each of the rocks named, are considered by Sir William Dawson, Dr. Selwyn and Professor Hynd to precede these. It is to be regretted that hitherto the light thrown on the subject by fossil evidence has been of the most meagre kind. Dr. Selwyn has recognised in the Lunenburg slates markings of the nature of these named in Sweden, *Eophyton*. Sir William Dawson, however, considers them the trails of aquatic animals named by him *Rhabdichnites*, which are characteristic of the Acadian series. Professor Hynd discovered at Waverley nodular bodies and markings, which Mr. Billings referred with doubt to the genus *Eospongia* and casts of orthis. Dr. Dawson states that they may be compared with the problematical object from the Eophyton sandstone of Sweden, described by Linnarson under the name of *Astylospongia Rudata*, but considers them fucoids with radiating fronds, and allied in form to Hall's *Phytopsis* from the birdseye limestone, or to Linnarson's *Scotolithus* from the Eophyton sandstone, and has given them the name of *Astropolithon*.

#### THE ONLY OTHER FOSSIL FORMS

observed are tubes from St. Mary's river resembling scolithus. So far as the above fossils give any information, they serve to confirm the supposition that the measures in question are to be referred to the Cambrian period. Within that period the fossils may be compared with those of the Fucoidal or Eophyton sandstones of Sweden, which underlie the equivalent of the Acadian series. They may, therefore, be regarded as probable equivalents of the Lower Cambrian or Longmynd series of Europe. The "granite" rocks extend in irregular patches and belts throughout all the gold fields. So far as they have been studied in their relation to the auriferous and newer strata they appear to be intrusive masses. At Cochran's Hill, in the Sherbrooke district, the auriferous measures close to the granite are penetrated by veins of

granite from one inch to six feet in thickness, and have become highly metamorphosed. Sir William Dawson similarly describes the granite of Nictaux as altering the Devonian beds and converting them for a short distance away from the junction into gneissoid rocks holding garnets.

#### THE NOVA SCOTIA GRANITE

has all the characteristics of a plutonic rock in its want of stratification, its frequent porphyritic appearance, its passage into graphic granite, etc., and closely resembles in lithological characters the intrinsic granites of the eastern townships of Quebec and of New England, some of which belong to the Montalban series of Dr. Hunt, while others are later than the Upper Silurian, and it differs materially from the typical Laurentian of Canada. In the latter the gneiss is usually hornblende, laminated and interstratified with diorites, pyroxene rock, limestone, serpentine, etc. The granites are older than the oriskany sandstone which they penetrate and alter at Nictaux. The auriferous strata are now presented to the miner in a series of undulations having a general east and west course roughly parallel to the trend of the shore. Wherever the anticlinal crests have been severely denuded, the upper division being swept away, the beds of the lower section are presented in concentric layers, forming four elliptical curves with north and south dips. In some cases the movement has caused an overturn and northerly dips only are seen. These denuded crests are sometimes two miles in width and several miles long. In these strata and pursuing a course parallel to them are found the veins, more particularly the subject of this paper. At the first glance they seem to be contemporaneous beds of quartz, and were so considered for some time. They, however, present the characteristics of veins such as "horses," country rock inclusions, banded structure, etc. In addition, feeders frequently radiate from them and connect two or more veins, and the veins themselves break across from bed to bed. I presume that we are to look to the forces which produced the great folds for

#### THE ORIGIN OF THE SPACES

now filled with quartz. The action which introduced the quartz possibly partook of the nature of a leaching out of the metallic constituents of the surrounding beds, and this idea is supported by the fact that the richness of the veins is frequently seen to be connected with the contact of feeders or cross veins which cut the enclosing strata. The forces producing the great east and west folds, and possibly incidentally forming the spaces for the veins, were succeeded by numerous other disturbances. The effects of these are now chiefly shown in dislocations varying in amount up to many hundreds of feet both along and across the run of the strata and enclosed veins. These faults when running across the country rocks sometimes present large fissure veins frequently auriferous; and in the openings they make parallel to the measures are found false veins also sometimes auriferous, and frequently affecting the gold values of the veins they impinge upon. The exact date of the vein filling cannot now be determined. It may be said that it preceded the carboniferous period, for at Gay's River, in the county of Halifax, the lower carboniferous conglomerate (the basal rock of the carboniferous system) resting on slates, generally considered to represent the auriferous strata, carries water work gold.

#### A PARALLEL OF MODERN DATE

is now presented near Lunenburg, where the waves of the Atlantic are breaking up the

slates and concentrating the gold on the beach. In this connection it may be remarked that we have no regular alluvial workings. The surface soil of several of the gold districts is in my opinion quite rich enough to work, by sluicing and crushing. Several old river courses, and the brooks flowing from the gold districts, deserve exploration in a systematic manner, especially where they form small lakes or 'still waters.' The veins worked in this province vary in width from one-half an inch to six feet, the most common thickness being from four to six inches. The quartz is usually crystalline and fairly friable, but also oily and compact. The gold occurs in coarse sights and in minute grains and films in the associated pyrites. The miners rarely crush quartz unless it shows free gold. The minerals associated with gold are iron pyrites, mispickite, galena, copper sulphides and blends. Calcespar is also found, but in some cases it has been observed that the gold diminishes as the proportion of spar increases. Galena and copper pyrites are considered by many miners to hold out the best promise of economic amounts of gold. The veins afford many good examples of chimneys or pay streaks. It is to be regretted that no pains have ever been taken to map out these pay streaks, in order to gain information which might show some rule governing their mode of occurrence and extent. Their width, dip and downward extension are of the most varied form, and we have yet no rule beyond the caprice of the miner's goddess to disclose a clue to their whereabouts.

#### THE GREATEST DEPTH OF A PAY STREAK

that has been worked here is 600 feet, and a horizontal length of 300 feet may be considered a maximum. No attempt has yet been made to sink below an exhausted pay streak; although the fact of more than one having been observed at the surface in the same vein would show that the conditions favoring their deposition were not isolated. It is to be regretted that no attempts have been made to find out if such ore bodies do come in again at a lower level—for in many cases the pay streaks have become exhausted before a depth of 200 feet was reached. This problem once answered in the affirmative, there would be an inducement held out to more systematic mining—and fewer abandoned shafts and crumbling mills would dot the landscape. In several districts a zone from 300 to 900 feet wide has been observed extending across the general run of the measures. The veins in this zone do not appear to be affected in their gold values, but the enclosing slate and the irregular feeders found in them carry gold in amounts as high as 9 dwts to the ton. Several times considerable quantities of these low grade ores have been profitably crushed in small mills of 8 to 20 stamps, but

#### NO SYSTEMATIC ATTEMPT

has yet been made to work them on a large scale, and as a regular operation. In the opinion of many persons acquainted with our gold fields these low grade belts are well worth attention, and they consider that in the future they will prove highly profitable. In most of the gold districts the presence of valuable veins is indicated by surface boulders of auriferous quartz, and the labor of the prospector is frequently lessened by following them to the north along the course of the striation of the rocks. The boulders are carried various distances up to 1,800 feet, and in some instances the striae on the underlying rocks pointed like an arrow to the portion of the vein which yielded them to nature's great plough. The extent of the transportation of the quartz

boulders is limited and strongly marked, for outside the narrow belt lying south of a system of auriferous veins hours of search will fail to show a boulder yielding a sight of gold. Some years ago in a paper read before the North of England Mining Institute I drew attention to this local transportation and to its presence side by side with a more extensive system. At numerous localities through the auriferous district of the province are met hills and mounds having a general north and south course, and made up of clay mixed with gravel and boulders of every size and degree of attrition. Many of the boulders can be traced to the granitic ranges, often several miles distant, and the fragments of carboniferous and of later traps, and of sandstones resembling none now known here in measures older than the carboniferous, must have been carried over a far greater interval. These hills have been observed surrounded by and merging into the districts already alluded to as distinguished by auriferous veins and a detritus carried but a few yards. If the reason for this varying cover is to be sought for in a single cause, there must first have been in the district under consideration conditions permitting the deposition of material derived from distant sources, the principal condition being a depth of water; then with a rising land the impact of ice would give stirring and limited transportation; or else a more or less general covering derived from distant sources has, through a change of level, been subjected to a force gouging through it, and scattering fragments and masses of quartz and rock on the line of its impact. As I am afraid I have trespassed already too much on your time I will merely refer to

#### THE MINING AND MILLING SYSTEMS

of our gold fields. There is little novel about them, and they may, speaking generally, be described as rough and ready methods adapted to small veins and a corresponding capital. The shafts are invariably sunk on veins which dip at all angles, from 45° to the perpendicular; stopes are started at all depths and carried direct from the shaft, underhand, in steps, and part of the rock stowed on following scaffolds. Usually the vein is left standing on one side of the slope, and is taken down in lots of several tons at one operation. By this plan the ore is kept separated from the dead rock, and is less exposed to handling, an important item in coarse gold ores. Shafts are left at scaffold ends at frequent intervals, and through them the hoisting and pumping is done by every imaginative device an ingenious man can invent. Few shafts exceed 200 feet in depth, and the workings seldom extend much beyond the pay-streak. The mills claim no striking originality in pattern; one of the best in the province was built by Messrs. Fraser & Chalmer, of Chicago. The milling merits no particular notice, the dependence being on the amalgamation in the batteries by free mercury, lining plates not being used. Copper aprons and plates are amalgamated by hand, and many miners consider them better than any so called 'patent' arrangements. Exact figures of the amount of gold saved cannot be given. About 15 per cent. of the free gold is lost, and little of the gold held in the sulphides, etc., is saved. The amount of the sulphides, etc., varies from one to 60 per cent. in the quartz veins, and their gold values sometimes run \$4,000 to the ton, but I presume that from \$40 to \$50 would represent their average value. A few small lots have been concentrated and shipped to Swansea, but the problem of the tailings has not yet been solved in Nova Scotia.

THE COST OF MINING VARIES GREATLY per ton with the hardness of the encasing rock and the size of the vein. It may be put down at 50 to 70 cents for the open cast low grade workings, and from 95 cents in narrow slate belts up to \$15 in narrow veins. The value of the ore crushed varies from 3 dwts. to 4½ ounces per ton; the average annual value has fluctuated between 10 dwts. and 1 oz. 2 dwts.; the total amount crushed since the year 1862 is, from official returns, 495,923 tons, yielding 366,976 ounces, an average value of about 14 dwts. In conclusion, I may remark that the gold ores are the property of the crown, and are leased for revenue purposes. The areas are 150 by 250 feet in size, and any number can be leased on payment of a fee for the execution of the papers. The royalty is at the rate of 2 per cent. on the gold, valued at \$18 an ounce, and is paid by the mill owner, who is obliged to take out a license and to make regular return of his work to the Mines' Department. The areas are bounded by vertical lines, and laid out as nearly as possible along the general course of the veins of the locality they are applied for. Attempts have been made to substitute the apex law, and other well proved distinguishing marks of the American mining law, but the department cling tenaciously to their old methods, and think there can be few changes except for the worse.

The Nova Scotia meeting was a memorable one, and, with the exception of the Colorado meeting, probably the largest, as it was one of the most agreeable, in the history of the Institute.

#### Tests of Coxheath (N.S.) Copper Ore.

"Coxheath," in a letter to *E. and M. Journal* of a recent date says:—

"Some ten tons or more of ore from the Coxheath mine, of Cape Breton, owned by the Eastern Development Company, were smelted at the Bay State Smelting and Refining Works, in East Boston, on the 6th and 7th of October.

The ore, which is reported to be the average run of the mine, consists of copper pyrites in a silicious gangue, accompanied by a small percentage of iron pyrites, and assayed between six and seven per cent. But the peculiar interest of the test arises from the fact that both the fuel and flux, consisting, respectively, of coke and limestone and iron ore, were all brought from Cape Breton, being the same as would be used in smelting on the spot.

The run was made under the management of Dr. E. D. Peters, in a blast furnace belonging to the works, and produced a *matte* assaying about 38 per cent. of copper, while the slag carried less than one-third of one per cent. of that metal. The present aspect of the copper market offers little encouragement for the development of new copper enterprises; but with coke at 75c. a ton, and labor and fluxes at very low prices, it certainly seems that copper can be produced about as cheaply at Cape Breton as at any place on the continent, provided the quality and quantity of the ore supply are satisfactory.

Dr. Peters reports the *matte* free from all deleterious substances and certain to make copper of excellent quality.

Quite a number of Boston gentlemen interested in copper matters visited the works during the two days' run of the little cupola-furnace and expressed much satisfaction at seeing such

a fair test of the quality of the coke and the suitability of the fluxes."

If the quality and quantity of the ore supply is satisfactory, and the developments at the Coxheath mine prove that it can be relied on, it would appear that everything is favorable to the successful and profitable production of copper in Cape Breton.

#### EL CALLAO.

This South American gold mine for the eight months ended with August, 1885, has shipped gold to its London bankers and paid monthly dividends as follows:

	Product.	Dividends.
January .....	\$166,000	\$103,000
February .....	175,000	103,000
March .....	150,000	64,000
April .....	175,000	77,000
May .....	135,000	51,000
June .....	150,000	64,000
July .....	208,000	77,000
August .....	205,000	77,000
Totals .....	\$1,559,000	\$616,000

EL CALLAO, in the State of Guayana, in the Republic of Venezuela, is assuredly the most productive gold quartz mine in the world. Its product between 1875 to 31st December, 1884, amounted to \$10,526,000. Last year the value of the gold shipped to London was reported by its bankers at \$3,475,000, and this year, to include August, as will be seen by the above statement, the shipments have been valued at \$1,559,000. From 1879 to 1881 the average yield of gold was three ounces per ton of quartz milled; in 1882 it was 4½ ounces; in 1883 six ounces; and in 1884 as high as seven ounces. Of course, such a mine has paid handsome dividends upon 32,000 shares into which the property is subdivided. Last year the dividends aggregated \$1,932,000, or \$8.60 per share.

Another productive quartz mine in the same field, says the *Financial and Mining Record*, in a recent article, "Venezuela as a future source of gold supply," is the Chili, also the Potosi, the Nacupai and the Venezuela, Panama, which four properties employ 190 stamps, though, assuredly, not to such profit as El Callao, but in the aggregate have produced in 1884 \$1,150,000. One great drawback is the remoteness of this promising gold field. As described by an English Australian miner who has recently visited them:

"They are situated on the south bank of the Oronoco river, about 250 miles up from the English island of Trinidad, and 130 miles inland from the landing place. As the crow flies they are about 300 miles from Trinidad, and about 130 miles from Demerara; yet the bad policy of their Government compels you to travel nearly 600 miles from Trinidad to reach the fields. The first and nearest port on the river to the gold fields is Las Tablas; the steamer stops here four hours to land mail and take in passengers, but passengers going to the gold fields are not allowed to land there. The Government and their confederates (the shopkeepers) must first pick and fleece them all they can by compelling them to go 100 miles further up the river to the old Spanish town of Angustora, Bolivar. Then they must purchase another passport and pay another passage down the river to Las Tablas. From this place to the fields the road is good and very level nearly the whole distance (130 miles), yet you are charged from \$250 to \$300 per ton for freight. I came down the whole distance in a two-mule cart in 28 hours. There are about 7,000 people on this field; 6,000 of them are the native race of the



West Indies, and about 1,000 Corsicans and Germans. The whole of the mining work on this field is done by colored people. The miners get 4 pesos per day of six and eight hours, which is \$3.30 of American money."

The same miner remained at the mine, he states, for three months and examined it thoroughly in all directions, finding scores of quartz veins that had never been prospected; also many alluvial tracts formerly worked but left idle at present owing to the high wages given by the working companies which take up all the good labor, for the natives will not work. We also append the prices of food which he gives: tea, \$2 per pound, sugar 50 cents, butter \$1, cheese 75 cents, ham 75 cents, beef 16 cents, and bread 31 cents per pound, \$20 per barrel of 65 lbs.; salt pork \$20 per barrel of 65 lbs. Barley ale \$1 per bottle and brandy \$2.50. Indian corn 25 cents per quart, and clothing 300 per cent. dearer than in England. He adds:

"After all I have seen of this field I think it will yet prove itself to be one of the richest and most extensive gold fields in the world. There seems to be no end to the reefs in these mountains; but the Government must try to be a little more liberal to the capitalists who are willing to risk their capital to develop the gold mines of Venezuela. At the El Callao mine there is a strong detective force traveling around the mine night and day, underground and at surface, each one having a revolver slung round his neck."

#### GOLD VEINS IN WALES.

Mr. W. Lewis, in a recent letter to the *Financial and Mining Record*, says:—"There are many in this country not aware that there are any gold mines in Wales, or that the Welsh people have had experience in gold mining in their native country."

As one who was there for years as second superintendent in charge of one of the leading gold mines in Merionethshire I can testify that I have seen as rich ore taken out there as any I have seen in America.

When I left for this country, in 1863, the following mines were in operation and producing well:—

The Vickre & Clogan mine was considered the first on the list; it has been worked more extensively than any of the others. The vein was quartziferous, containing small amount of bismuth, galena, and bi-sulphuret of iron, and varied in width from two to four feet—product about 15 dwt. of gold to the ton, although some of the ore was much richer that was selected and treated in amalgamating pans, on small scale the result from these pans was astonishing. The Cambrian mine was in full bloom. The ore of the Prince of Wales mine was more refractory than the commoner of the veins there; but as they concentrated the tailings and shipped it to Swansea, the mine paid handsomely for years. The Foel and Cefn'och were also in operation, and several small mines in the Gantwyd are working with good results and the reports from Gwynfynydd were very flattering.

The formation of the country that these auriferous veins traverse is the silurian rock, which is very fossiliferous in some parts there. The Cambrian group also makes its appearance on the northeast boundary of the silurian."

The Russian papers confirm the statement that gold has been discovered on the Chinese side of the Amoor, and thousands of Siberian gold-diggers have gone to the spot.

#### GOLD MINING IN MICHIGAN.

Announcement was recently made of the discovery of a vein of gold-bearing sugar quartz on section 35, town 48, range 28 west, Michigan. The property on which the discovery has been made belongs to the Lake Superior Iron Company. The correspondent of the *Detroit Free Press* says that this gold boom is no heedless clamor of inexperienced men. The men who are backing it are miners of experience. Assays have been made which show well. Average pieces taken from among the best specimens gave \$8,965 in gold and silver, nearly all being gold. These choice specimens varied in weight from six ounces to as many pounds, and this was their average value. The second assay was made from the leanest piece of quartz which could be found in the rock taken from the vein. In this there was no free gold visible to the naked eye or distinguishable with the aid of an ordinary prospector's pocket glass. It gave \$62.64 to the ton, nearly all in gold also. It is stated that a vein of this quartz four feet wide has already been traced over 700 feet.

#### VICTORIA (Australia) GOLD FIELD.

The yield of this field is officially reported for the second quarter of 1885 at 185,037 ozs. 15 dwts. 10 grs. as against 192,438 ozs. 11 dwts. 15 grs. for the March quarter, and making the half year's product 377,476 ozs. 7 dwts. 1 gr. The product for the half year may be set down at \$5,549,000.

The gold yield of Victoria continues to decrease, that for the quarter ended June 30th being less than the corresponding quarter of any year since 1876. The decrease is chiefly in alluvial mines. The yield is increasing in quartz mining and great depths have been reached—Lansell's 180 mine, Sandhurst, having attained a depth of 2,011 feet, the deepest shaft in the colony.

The quantity of quartz crushed during the last quarter reported above, was 211,643.3 tons, averaging 10 dwts. 8.9 grs. in gold per ton. No district averaged as much as one ounce per ton, and the lowest average for a large quantity was 7 dwts. 10.9 grs.; in the Ararat district 8,586 tons averaged but 4 dwts. 9.4 grs. The pyrites and blanketings treated amounted to 1,509 tons, with an average yield of 2 ozs. 1 dwt. 15.78 grs. per ton; and 8,785 tons of quartz tailings and "Mullock" yielded but 1 dwt. 11.88 grs. per ton.

The official reports show that the gold mining industry is not in a booming condition, though no less than £189,059 19s. 4d. were paid in dividends during the quarter ended June 30th, which means that about \$5 were paid in dividends for each ounce of gold produced, or 25 per cent of the gross product—a creditable showing on ores yielding as low as \$10 per ton.

#### QUEENSLAND (Australia).

Two quartz mining districts of this part of Australia, produced for the seven months ended July 31st, 1885, as follows:—

	Ounces.	Value.
Charters Towers	77,122	\$1,518,000
Gympie	50,182	1,063,000
Totals	127,304	\$2,581,000

**THE GREAT NORWEGIAN GOLD-BEARING QUARTZ VEIN.**—In one of the galleries of the *Oscar* gold mine, on the Bömmel Island, on the west coast of Norway, a block of auriferous quartz was recently broken out, the value of which is estimated at £70,000. The deposit has now been worked for a year and a half, and the working has, according to the reports of the

owners, already returned the sum invested. The work is pushed on with all dispatch, and it has been found that the quartz increases in gold downward.

#### The Gold Product of the World.

The world's production of gold for the year 1884 is estimated, in round numbers, by the *Financial and Mining Record*, as follows:

United States	\$25,500,000
Russia	13,000,000
Australia	21,500,000
Venezuela	3,000,000
Columbia	3,000,000
Mexico and other Spanish American States	1,500,000
Austria and Hungary	1,000,000
Africa	1,750,000
Canada	1,250,000
European States	500,000
Japan and Brazil	870,000
Total	\$82,250,000

As for the consumption of gold in the industrial arts alone, during the last nine years, it has averaged annually, at least, \$60,000,000, as a little investigation must show. The director of U. S. mints in his last annual report placed the amount of gold consumed during 1883, by India (\$18,965,635), the United States (\$13,000,000), France (\$11,000,000) and Great Britain (\$10,000,000) at \$52,965,635, out of a total gold production for that same year that did not exceed \$86,000,000.

#### The Way Mines are Sold in England.

It will be interesting to our readers to know to what extent swindling has attained in connection with the sale of mining properties to English capitalists, and the *modus operandi* employed by the professional manipulators to dispose of worthless properties at fabulous prices, or to effect sales of mines at figures that are out of all proportion to their intrinsic value. The *N.Y. Engineering and Mining Journal* makes a praiseworthy effort to enlighten unsuspecting and unsophisticated investors by publishing the following:

"The process by which the public on this side of the Atlantic is inveigled into investing in worthless mining schemes are nefarious enough; but they have not been systematized and codified, so to say, as have been the methods in vogue in England, nor is the formation of public companies here reduced to so exact a science as on the other side.

Among the congressional documents for the year 1876 is a bulky volume that exposes those methods. It contains the history of the sale of the Emma mine in London. This is an old story, but worthy of repetition; for it is constantly re-enacted by different people with only slight differences of detail.

The Emma silver mine, in Utah, had begun to yield profits in 1871, when, as usually happens in the west, claimants to the property at once sprang up to contest the title of the occupants. In the Emma case, litigation ceased on the understanding that the mine should be sold and the profits distributed in stipulated proportions. Mr. Lyon, who claimed a one-third interest, agreed to take \$500,000 for his share. Mr. Trenor W. Park, the largest owner, and Hon. Mr. Stewart, acting as counsel for Lyon, went to London. For some months previous, as much ore as the mine could be stripped of had been sent forward and sold in England with as much publicity as possible. Arrived in London, Messrs. Park and Stewart were introduced by a banker, who is always a prominent member of such bands of conspirators, to Messrs. Coates and Hankey, brokers. The terms of the plot—for it can hardly be called

a sale—were now arranged; but Messrs. Coates and Hankey, being too weak to carry them out, resigned in favor of Albert Grant, the most astute company-monger of the age.

When once a broker undertakes a job of this nature, he becomes arch-conspirator. Vendors and all others are expected either to be quiescent or to obey his injunctions, and to say and do, without question or compunction, what he commands. The broker finds directors, concocts the prospectus, fees newspapers, manipulates the stock, and generally, as *deus ex machina*, makes what is worthless appear as of untold value, and a swindling extortion looks like a generous gift to the public. When, however, a man as notable or notorious as Baron Grant is secured, he never appears upon the stage.

In the Emma affair, Grant was fortunate in having the assistance of two such able and skilled operators as Park and Stewart. While he selected names for his long list of available directors (all prominent brokers are supposed to have at command a number of influential directors' familiarly called 'guinea pigs,' including a fair sprinkling of M.P.'s and of needy noblemen, to whom the fees are a consideration and who are too ignorant to be inquisitive), Messrs. Park and Stewart went in search of a man ostensibly to protect the interests of the American shareholders of the company, and by a happy accident they secured the services of the American Minister.

Having selected a strong board of well known men, whom the unwary public supposed to be heavy investors, but who, in fact, besides receiving a salary of £500 a year each, had been duly qualified by a donation of stock, the prospectus was issued. The property, which by transactions among themselves the sellers had valued at \$1,500,000, was offered at \$5,000,000. A dividend of  $1\frac{1}{2}$  per cent. a month, equal to 18 per cent. on the capital, was guaranteed, and was to be paid out of resources on hand and out of ore in sight, said to be of the net value £357,750. The public, however, were not informed that of the £1,000,000 they were asked to give for the mine, Baron Grant, of whom they had never heard in that connection, was to get, as his fee, almost as much as the mine was deemed by the vendors to be really worth; that the lawyers, who drew up the prospectus so cunningly that the public would have no redress when they should discover themselves swindled, were to receive a comfortable fortune; and that the bankers, who had merely introduced Messrs. Park and Stewart to Messrs. Coates and Hankey, were to have what would serve many a small banking firm as capital; that the brokers who had been too weak to engineer the scheme should receive, nevertheless, a consideration for handing it over to the baron; and that even the metal brokers who had previously sold the ore on a good commission were to be richly recompensed for the loss they might sustain should they not continue to be employed by the new organization. These and other equally significant facts were kept carefully concealed; the public rushed to subscribe, and the amount demanded was offered twice over.

The subsequent history of the mine is curious. Although the public paid £1,000,000 for it, not a farthing was reserved for working capital. The mine was productive when purchased, and the ore on hand was sold with the mine. Enough, therefore, was extracted to pay working expenses and twelve  $1\frac{1}{2}$  per cent. dividends. A thirteenth was paid, but the amount was borrowed from Mr. Park on the security of the ore in transit. The ore did not cover the advances, and the company remained in debt to Mr. Park. There being no more productive

ground within reach, and no money wherewith to make explorations, mining was stopped and litigation begun, for which stockholders were willing to furnish the means, though they had declined subscribing a penny for exploratory work in a mine that had apparently yielded £180,000 profit in a twelvemonth.

When such large sums are realized with so little labor, of course the broker can afford to be liberal, and to throw about thousands of pounds more lavishly than most men would their pennies. Thousands are used to bribe newspapers, a fact proved in a court of justice to the disgrace of British journalism; bankers are paid to lend their names; brokers in all parts of the kingdom are paid to make fictitious bids for the stock; men in the highest standing in the community are paid to serve on the board; and when the trap to catch the public has by such means been well baited, prospectuses are showered over the kingdom by hundreds of thousands, and are supplemented by special articles of leading newspapers. One copy is sure to reach every widow with a small income, and every needy clergyman. Both these classes being pinched for means and credulous, are liable to be tempted to buy shares. The broker counts that among so many hundred thousands there is sure to be a given proportion of fools who will be duped; therefore the more dubious the speculation, the greater the number of prospectuses, and the more extravagant the promises.

Carlyle classified the population of Great Britain as 'forty million, mostly fools,' but the great English promoters have graded the British fools according to degrees of gullibility. They have in their offices bookcases filled with bound volumes containing a directory of the whole kingdom, every possible subscriber, male or female, taking rank either in a superior class *a*, if possessed of both wealth and penetration, or in one of the large lower classes, *b*, *c*, etc., which comprise the credulous and needy. A very small edition of a prospectus privately issued to class *a*, offering a sound investment, insures its acceptance. But an issue of half a million prospectuses, bulky as a volume, may be necessary to catch enough credulous subscribers of small sums to yield the grand total. Thousands and thousands of dollars are spent on printing and postage. The risk is therefore great, but the stakes are heavy.

There can be little doubt but that this system of raising joint-stock companies and afterward so manipulating them as to conceal the fraud, to which all concerned have been knowingly or inadvertently parties, has done more than anything else to corrupt commercial morality in England. The chief conspirator, the broker, may be the chief criminal; but the man who bonds to him knowing that he will use his property to perpetrate a fraud, is not innocent; the director who accepts qualification shares, which he is supposed to have paid for, or who sells or lends his name to be used to assist in floating an enterprise on more or less false or fraudulent statements, of the character of which he is aware or even willingly ignorant, is an accomplice to a swindle, whatever his title may be.

Even if the property be intrinsically good, when sold above its value and all the money subscribed has been grabbed by the broker and his satellites, so that little or nothing is left to develop its resources, it may become unprofitable; while if it prove valueless, a stigma attaches, not only to those who sold it, but to the whole community where it is situated.

This is an outline of the manner in which a vast number of mining properties situated in all parts of the world have been sold in London,

and the English palate has become so accustomed to these highly seasoned prospectuses, lies and exaggerations that it is said, by those who are well informed on the subject, to be almost impossible to sell a mine in London at a fair and honest valuation. Under these conditions, it is not at all strange that English investors in mines, for the most part, lose their money; it is almost a miracle when, through extraordinary richness, the mine withstands this method of floating and the additional load of the usual English management sent out by such a company, and pays a fair return to its stockholders."

## MINING NOTES.

### NOVA SCOTIA.

The Oxford Gold Mining Company has declared a dividend of two cents per share.

At the last cleaning up at the Cowan mine, Yarmouth, 9 tons of quartz produced 53 ounces of gold.

The discovery of a valuable seam of coal on the banks of Salt Spring Brook, near London-derry, is reported.

Advices from Boston are to the effect that public confidence in Nova Scotia mining enterprises is fast being restored.

A New York firm has purchased a manganese property in Colchester County, near Truro, and will proceed at once to develop it.

The output of coal at Spring Hill, for the week ended the 10th October, was 330,000 tons, the largest on record in Nova Scotia.

It is reported that rich gold bearing leads have been discovered near Calidonia, which may prove to be as important as any in the province.

It is not unlikely that the Renfrew Gold Mining Company will declare a dividend in November, but no mention has been made of the amount.

The final clean-up at the New Albion Gold Mine, for September, produced another bar of gold, making the total product for the month 1,369 ounces.

An argentiferous galena deposit discovered at Ohio, Antigonish county, will be developed by a syndicate composed principally of gentlemen of New Glasgow.

New steam-hoisting gear has been added to the machinery at the Albion mines, Montague. The owners of this property, during the month of September, netted a profit of \$21,000.

Coal miners in Nova Scotia have arrived at the conclusion that the Government will have to forego the royalty which is proving too serious a tax on the coal mining industry.

A subscriber to *The Critic* reports to that paper that the largest and most promising gold-bearing quartz vein ever discovered in the province has been uncovered in the Gold River District.

Some specimens of copper taken from a mining property on the Granville side of Digby Gut, Annapolis county, by Prof. Ken-

nely of King's college, have proved, by analysis, to be rich in copper.

The September yield of the Archibald and Motts gold mine was \$8,000. The lead extends nearly two miles and is two feet wide, seven hundred feet of which has been opened, and it is found that the vein improves in richness and width in descending. One hundred men are employed.

The Block-house Coal Mine at Cow Bay, Cape Breton, was to have been sold on 28th October, for non-payment of \$12,000 taxes due the Government. The total liabilities of the mine are said to be about \$200,000, and the value of the property has been estimated at \$400,000.

In the Supreme Criminal Court at Halifax, in the trial of Smith & McLeod, for "salting" a gold mine at Chezzetcook, which they afterwards sold to a company formed in New York for a good price, the jury, on the 17th October, rendered a verdict of guilty. An appeal will probably be made, and meanwhile, McLeod and Smith have been admitted to \$6,000 bail.

The Acadia Coal Company, the Halifax Company (Limited), and the Vale Coal, Iron and Manufacturing Company, whose principal offices are respectively in New York, London and Montreal, consolidated on the 16th October, at a meeting of the different managers held in New York, and will be operated from Nov. 1st under a temporary board of directors. The Intercolonial Coal Mining Company has been asked to enter the syndicate and will probably do so. The scheme was inaugurated by Sir George Elliott.

The annual meeting of the Cumberland Railroad and Coal Company was held in Montreal last month, at which the following directors were elected: John McDougall, G. A. Drummond, R. Cowans, R. G. Leckie, L. A. Senical, D. Morrice, J. S. Clouston, James Corssen, C. C. Colby, M.P., Staustead, and J. B. Renaud. At the subsequent meeting of the directors, officers were appointed as follows: John McDougall, President; R. Cowans, Vice-President; R. G. Leckie, Managing Director; J. R. Cowan, Secretary.

#### NEW BRUNSWICK.

The Markhamville Manganese Company has made a shipment of two hundred tons of ore to Liverpool.

A company is being formed at Dorchester to mine and reduce copper, gold and silver ores and minerals, with a capital of \$500,000.

#### QUEBEC.

The Phosphate mines of the Lièvre district, Ottawa County, have produced 2,500 tons during the month of October.

Operations for this year will cease at the asbestos mines of the Eastern Townships, as mining cannot be successfully continued during the winter months.

Late shipments of mica from the Villeneuve mica mine have surprised some of the dealers who were not aware of the existence in Canada of anything approaching it in quality.

The last day's washing from the St. Onge company's shaft on Slate creek, Beauce, that has been reported to us, produced 9½ ounces of

coarse gold; some of the nuggets weighing from ½ oz. to 1 oz. 12 dwt.

Work has been suspended for some time past at the Bristol iron mine, in the county of Pontiac. The property is owned by the Roberts' Iron Company, of Charlotte, New York State, and the suspension of operations is owing to the death of Mr. Roberts, its President.

St. Onge Gold Mining Company is doing good work on Slate Creek, Beauce, and is washing a large quantity of gold. The gravel that is now raised from this shaft is very rich in coarse gold, and many large nuggets are constantly found. The company, during the past month has been giving attention to the erection of buildings and machinery, and is now fairly equipped for permanent work.

#### ONTARIO.

The New York gentlemen who had been prospecting a copper location in Drury Township, on the line of the Algoma branch of the Canadian Pacific Railway, have abandoned it and relinquished their lease on the recommendation of their manager who scouted the probability of finding copper in paying quality in the formation of the locality. It is stated that this same manager made application for adjoining locations and went to not a little trouble before he succeeded in securing one. It is not unlikely he will now change his opinion of the geological features of the district. Those who know whereof they speak pronounce this abandoned location to be a most promising property and one that would develop into a valuable copper mine in the hands of competent miners.

#### Thunder Bay District.

Port Arthur District has made its first shipment of marble for monumental purposes.

It is expected that a shipment of ore will be made from the Silver Creek mine before the close of navigation.

Last month a consignment of machinery was shipped to the Rabbit mountain mine and work will be immediately started on ore.

Machinery necessary for further development of the Silver Mountain mine has been ordered. Cross-cutting is still progressing at this mine, and work in the tunnel is going on favorably.

E. N. Riotte, manager of the New York Metallurgical Works, with other gentlemen, visited the Port Arthur silver region during last month. Mr. Riotte is interested in a location at the west end of Silver mountain.

The Huronian gold mine is working day and night shifts and the mill is doing good work. The ore in both levels from the original shaft, and that from the shaft started on the recently discovered vein, is averaging an ounce of gold to the ton and a fair quantity of silver.

One of the Cleveland company engaged in testing the Silver Mountain mine arrived in Port Arthur from the mine last month and reported that the new strike in the lower tunnel of the Beaver mine is rich in silver. At this mine they are working three shafts and making good progress.

#### BRITISH COLUMBIA.

Williams Creek, Cariboo District, afforded as rich gold-diggings as any in the world, and yielded \$45,000,000 in gold from its bed and banks.

The news from Lorne Creek mines is very discouraging, and miners are leaving the diggings in numbers, being thoroughly disheartened.

Rich specimens of gold-bearing quartz have been found in the Semilkameen district, and iron ore has been discovered a few miles off the Hope trail.

The Tularmen river, in the vicinity of Granite Creek, embracing an area of about 50 square miles is being explored, and is thought by practical miners to hold out encouraging prospects.

A new creek has been struck in the Semilkameen valley, and it is now known as Bear Creek. It is said to hold out good prospects, and miners are already at work in considerable number.

A correspondent of the *Mainland Guardian* says there is, no doubt, some gold in Granite Creek, but not sufficient to warrant a man in leaving other employment to go to the diggings. Mining is practicable in but a few places and only at very low water.

At Cariboo, in the years 1861-62, provisions could scarcely be had at any price—freight being \$2,000 a ton. It is not strange that with labour at \$16 for an eight hour shift, and flour at \$150 a barrel, few of the many who went to those diggings brought out with them as much as they took in.

There are now upwards of 1,000 men in the Granite Creek district, and contradictory rumors are current as to their prospects. Some Montana miners pronounce the "Granite" the best creek they have ever been on for good, even pay. The gold is obtained by wing-damming the bed of the creek.

The *Island Sentinel* says: The Semilkameen gold fever is spreading, but, while some wonderful stories are printed and crowds are rushing to the diggings, we occasionally see parties coming this way from the Semilkameen. While listening to reports we can hardly reconcile the action of parties leisurely leaving the mines, even for a short time.

The deposits of auriferous black sand on the North Coast of Vancouver are very extensive. If the report from Oregon of the discovery of a method for saving the gold be confirmed, these deposits will become very valuable. Attempts to separate the gold have hitherto proved unprofitable, but it is stated that by this new process 95 per cent. of the gold contained in the sand can be saved.

#### UNITED STATES.

California, from 1849 to 1861, produced about \$700,000,000 in gold.

During the past thirty-five years the product of gold and silver in the United States alone has been \$2,246,000,000.

\$70,000 in gold, the result of 15 days' work at the Tradwell mine on Douglass Island, Alaska, was forwarded to Victoria, B.C., in September.

The Plymouth Consolidated G. Mining Co., California, paid a dividend on the 5th of October of fifty cents a share, aggregating \$50,000. With that dividend this property will have paid the stockholders \$14.50 per share.

The Calumet and Hecla Mining Company declared a dividend of \$5 a share, or \$500,000 on the capital stock, payable November 2nd. This makes \$17 a share paid this year, and a total of \$28,850,000 divided among the stockholders to date.

### The Griffin Pulverizer Company.

This Canadian enterprise was referred to by the *Eureka Sentinel*, Sept. 26, attention being directed to the organization of a company in Montreal, under the above title, in the following paragraph:—

"Some time ago mention was made in these columns of the Griffin pulverizer, a new invention which, if it accomplishes what its owners believe it able to do, and if no unforeseen difficulties are encountered by it when put to work, will prove a great acquisition to the economical working of ores in the West. The patentee is a brother of W. E. Griffin, Wells, Fargo & Co.'s agent at this town. From an exchange we learn a company known as the Griffin Pulverizer Company has been organized, with a capital stock of \$50,000, with headquarters at Montreal, Canada. It is intended to manufacture machinery for the pulverizing of phosphates and ores generally."

In connection with the foregoing the following notice appeared in *The Canada* (official) *Gazette* of November 7th:—

"Public notice is hereby given that, under 'The Canada Joint Stock Companies' Act, 1877,' letters patent have been issued under the great seal of the Dominion of Canada, bearing date the 6th day of November, 1885, incorporating Alexander W. Morris, manufacturer, Robert C. Adams, gentleman, and Chas. B. Morris, gentleman, all of the city and district of Montreal, in the Province of Quebec, in the Dominion of Canada, and Edwin Packard, gentleman, and James R. Griffin, patentee, both of the city of Brooklyn, State of New York, United States of America, for the purpose of the manufacture and sale of machinery for the pulverizing of ores, phosphates, quartz and other hard substances throughout the Dominion of Canada, by the name of 'The Griffin Pulverizer Company,' with a total capital stock of fifty thousand dollars, divided into five hundred shares of one hundred dollars."

"Dated at the office of the Secretary of State of Canada the 6th day of November, 1885."

In the list of incorporators of this company we are pleased to see the name of Robert C. Adams, who is so well and favorably known among operators in the Canadian phosphate industry. The company has our best wishes for a successful career.

### A HAND CRUSHER.

A convenient little hand crusher, for use in laboratories, is manufactured in San Francisco. Both jaws are faced with hard white iron, the lower parts of which are plain surfaces, and between them the ore is crushed. An ingenious arrangement of corrugations forces the ore down at each stroke of the lever, and the whole can be quickly taken apart for cleaning after each lot is worked. The lever has a rubber covering where grasped by the hand, and a rubber cushion where it strikes the bed-piece to prevent jar and noise. The height to which the lever can be raised is regulated. The jaws are 3 inches wide and open at the top

1½ inch, consequently, a piece of rock 3 x 1½ inches can be crushed. With the lower part of the jaws set at one-tenth of an inch apart, 40 pounds of the hardest rock can easily be crushed in one hour, and 20 per cent. of this will then go through a No. 60 sieve. Then the machine is set closer and the remainder is run through. This hand crusher is very complete and is not expensive.

### A Possible Future Market for American Iron and Steel.

There are strong influences at work that are quite likely to lead the Chinese Government to begin the construction of an extensive system of railways with a view to provide for military exigencies as well as for commercial ends—military exigencies to grow possibly out of the habitual tendency of Russia to trench upon the territory of her Oriental neighbors. It is reported that the plan for such a system of railroads has been so far advanced that already the Chinese are negotiating for the means in Europe for its execution, and it seems to us that with such a plethora of idle money as there is, such a government as that of China should have no difficulty in placing a loan to be thus employed to ends that are creative and not destructive.

In that event, a demand for a vast quantity of iron and steel will be created which, with proper management, should be turned to the material advantage of our iron and steel industry. We certainly should be able to compete favorably with Europe in a very great deal of the material and appliances used in the building of Chinese railroads. Every exertion should be made in this country to win a liberal share of the industrial advantages to the West that are sure to be the result of an extensive construction of railroads in China.—*N. & M. Record*.

### Work of the London Mint.

The recently issued report of the Deputy-Master of the Mint, giving an account of the operations of that department for the year 1884, is a more than usually interesting document. From it we learn that the amount of gold coined during the year exceeded by more than a million the amount coined in 1883, while the silver coinage was but little in excess of the average. The coinage of bronze, however, was larger than in any year since 1875.

The total weight of metal melted down during the twelve months was 470 tons, made up as follows: A certain proportion of alloy being of course included—gold, 67 tons; silver, 198 tons; and bronze, 205 tons. The total number of coins struck out of this metal was 65,295,332, giving an average of more than 1,200,000 pieces per week throughout the year. Out of these, however, 8,932,081 pieces did not come within the limits of the standard legal weight, so that the number of pieces available for issue was reduced to 56,363,301, the value of these good pieces being, real or nominal, £3,157,966 10s. 1d. Of this amount, £3,070,292 10s. 5d. (41,093,301 pieces) consisted of imperial coinage, the remaining £87,673 19s. 5d. (15,270,000 pieces) being colonial coinage for Canada, Jamaica, Hong Kong, etc. All this coinage, both imperial and colonial, has been executed at the mint, its increased coining power rendering it unnecessary that any portion of the work of coinage should be intrusted to private firms.

The greatest number of coins struck of any

denomination was about 11,700,000, consisting, as will readily be supposed, of pence. Half-pence came next in point of numbers, nearly 7,000,000 of this coin being struck. The number of farthings struck was over 5,700,000, a seemingly large number considering the present small general circulation of this coin. Of shillings, nearly 4,000,000 were coined; sixpences, over 3,400,000; threepences, over 3,300,000. Sovereigns and half-sovereigns were coined to the number of over 1,700,000 and 1,100,000 respectively. Of colonial coinages, that of bronze half-cents for the Straits settlements was numerically largest, 4,000,000 of this coin being struck during the year.

### NOTES.

Six-tenths of the gold produced is yielded along with silver.

The iron age is passing away and is being superseded by the age of steel.

Economy, enterprise and free use of capital are indispensable for successful mining.

The excessive import of copper into England and France this year has been almost entirely from America and Japan.

A smoke stack for a smelting works at Pueblo has recently been completed, measuring 10ft. in diameter and 319 ft. high.

Exaggeration misrepresentation of the richness of mineral districts have a tendency to work them permanent injury.

India, which has, heretofore, bought her copper from England, has now a supply at hand in Japan which yields six thousand tons annually.

At Newcastle-upon-Tyne it is announced that the steel plate industry is now fairly well employed, and that there is every prospect of increased work.

The iron product of the United States in 1860 amounted to 900,000 tons of ore; to-day it foots up 8,000,000 tons a year, almost a nine-fold increase.

A new gold-like alloy, valuable in the arts and certain mechanical channels, has been discovered, and is of interest to the copper trade, as its composition contains 66 per cent. of copper.

The Russian Government proposes sending experts to Turkestan to study the turquoise 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.

AN IMMENSE LODE OF SILVER-BEARING IRONSTONE.—A lode has been discovered at Carow station, about sixty miles from Silverton, South Australia. It has been traced for over twelve miles, and in one place is 400 yards broad. A surface assay gives from 2 ounces to 24 ounces of silver a ton.

The exiles who live in the mines in Siberia are exiles of the worst type and political offenders of the best. They never see day-light, but work and sleep all the year round underground, extracting silver or quick-silver under the supervision of task-masters, who have orders not to spare them.



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**Notice to Contractors.**

**SEALED TENDERS** addressed to the undersigned, and endorsed "Tenders for Iron Roofs of Trusses and Girders for Armories, Drill Hall, Montreal," will be received at this office until **THURSDAY**, the 12th day of November, next, inclusive, for the construction of  
**Iron Roof Trusses and Girders,**  
 FOR  
**Armories at the Drill Hall**  
 MONTREAL.

Plans and specifications can be seen at the Department of Public Works, Ottawa, and at the office of A. Raza, Architect, Montreal, on and after **THURSDAY**, the 22<sup>nd</sup> instant. Tenders must be made on the printed forms supplied. Each tender must be accompanied by an accepted bank cheque, made payable to the order of the Honorable the Minister of Public Works, equal to five per cent. of the amount of the tender, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails 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 tender.  
 By order,  
 A. GOREIL,  
 Secretary.

Department of Public Works,  
 Ottawa, 14th October, 1885.

**TIMBER LIMIT**

ON LAKE WINNIPEG  
**FOR SALE.**  
 50 Square Miles.

This limit will be very valuable. Apply at the office of the **MINING REVIEW** for price and particulars.

**FOR SALE,**  
**White Marble Quarry on Calumet Island.**

At this quarry there is an inexhaustible supply of most beautiful white marble. Samples to be seen and information obtained at the office of the **MINING REVIEW.**

**PHOSPHATE PROPERTY**

*In the Township of Portland West,*

**FOR SALE.**

Lots 25, 26, 27 and 28, in the 3rd range. Some excellent surface shows have been uncovered on these lots and only require capital for developing. Price and particulars given at the office of the **MINING REVIEW.**



**NOTICE.**

**TENDERS** will be received at the Department of Inland Revenue until Monday, 16th November, prox., from parties desirous of leasing the privilege of ferrying across the River Ottawa between Buckingham and the County of Ottawa, in the Province of Quebec, and Cumberland, in the County of Russell, in the Province of Ontario, in accordance with the terms and under the conditions set forth in the regulations, copies of which can be procured from the Inland Revenue Department at Ottawa or postmasters at Buckingham and Cumberland. Each tender must state the amount which the party tendering is willing to pay per annum for the privileges referred to, which amount will be payable in advance, the terms of the lease being for five years from the 1st May, 1885.

Each tender must be accompanied by a cheque marked "Good" on one of the chartered banks doing business at Ottawa, for one-half the amount of the per annum tender. This amount will be credited on account of the first year's rent in the case of the accepted tender, and all other cheques will be returned, except in the event of withdrawals, in which cases no refunds will be made. All communications must be addressed to the undersigned and endorsed on the envelope "Tender for the Buckingham and Cumberland Ferry."

WM. HIMSWORTH,  
 Secretary.  
 Department of Inland Revenue,  
 Ottawa, October 29th, 1885.



**GRAND COLONIAL**

**Exhibition in London, Eng.**  
 1886.

**FIFTY-FOUR THOUSAND FEET RESERVED FOR CANADA.**

**First Royal Exhibition Commission Since 1862.**

THE Colonial and Indian Exhibition to be held in London, England, commencing May 1st, 1886, is intended to be on a scale of great magnitude, having for object to mark an epoch in the relations of all the parts of the British Empire with each other.

In order to give becoming significance to the event, a Royal Commission is issued for the holding of this Exhibition, for the first time since 1862, and His Royal Highness the Prince of Wales has been appointed President by Her Majesty.

The very large space of 54,000 square feet has been allotted to the Dominion of Canada by command of the President, His Royal Highness.

This Exhibition is to be purely Colonial and Indian, and no competition from the United Kingdom or from foreign nations will be permitted, the object being to exhibit to the world at large what the Colonies can do.

The grandest opportunity ever offered to Canada is thus afforded to show the distinguished place she occupies, by the progress she has made in Agriculture, in Horticulture, in the Industrial and Fine Arts, in the Manufacturing Industries, in the Newest Improvements in Manufacturing Machinery and Implements, in Public Works by Models and Designs; also in an adequate display of her vast resources in the Fisheries and in Forest and Mineral wealth, and also in Shipping.

All Canadians of all parties and classes are invited to come forward and vie with each other in endeavoring on this great occasion to put Canada in her true place as the premier colony of the British Empire, and to establish her proper position before the world.

Every farmer, every producer, and every manufacturer, has in erecting in assisting, it having been already demonstrated the extension of trade always follows such efforts.

By order,  
 JOHN LOWE,  
 Sec. of the Dept. of Agriculture,  
 Ottawa, 1st. Sept., 1885.

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