

CANADIAN

MINING REVIEW

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VOL. 3.—No. 7

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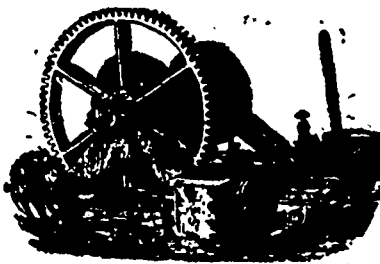
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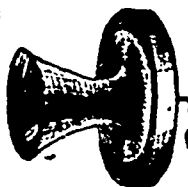
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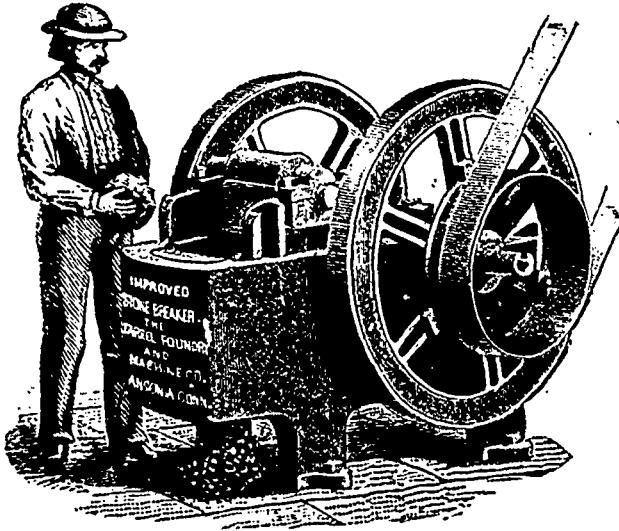
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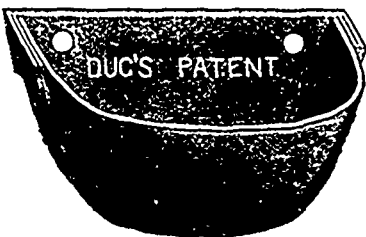
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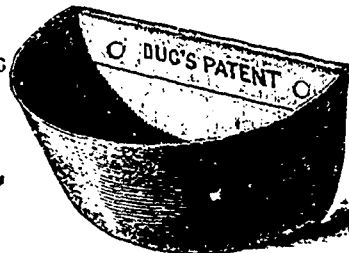
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 A sealed pattern may be seen at the office of the undersigned.
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Canadian Mining Review

OTTAWA.

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UNION CHAMBERS, 14 Metcalfe Street.

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

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

Mining news and reports of new 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.

In the money centres of the world the mining industry is beginning to be regarded with more favor than it has been for years past, and the time is now opportune to say a word to prospectors and owners of mining claims who, we deem it, are much in need of a little friendly advice. We do not feel that we can advise more forcibly, or place before our readers the relative positions of *mines and capital* in a more common-sense light than by quoting from the editorial columns of the *Chicago Mining Review* whose editor appears to take in the present situation and to realize the value of capital, its necessity to the development of mining industries the world over, and the price that must be paid for it. He says:—

"It is admitted on all sides that lack of capital is one of the greatest needs of thousands of localities where there is undoubted evidence of satisfactory ore bodies; hence it is certainly most unwise to place such exorbitant prices upon mere prospects, which will require the expenditure of thousands of dollars to make of them producing and profitable mines, that capitalists seeking investment turn away and put their money into more inviting fields.

The great demand for the establishment and vindication of the mining industry now is production. This can only come from mines, never from prospects. Hundreds of localities are rich in the most promising prospects but they add no tangible evidence of value to the district, which in many instances is practically deserted. These prospects, which represent an investment of labor, enormous in the aggregate, will never become mines, never add anything to the wealth of the

country, or reimburse those who have given so much to them, without capital.

The millions in sight are not so attractive when the cost of turning them into a marketable commodity has been thoroughly demonstrated. The rich veins of high grade mineral that the prospectors' toilsome shaft has revealed, requires long and costly expenditure of well directed capital before its value can be changed into money.

A critical time is approaching in the history of our mining industry, and the question of its future is largely in the hands of miners and prospectors. The existence of immense mineral resources of wonderful extent and variety has been fully demonstrated and confirmed, but the permanent and regular production depends upon extensive operations requiring large expenditure of capital. Those holding claims must, therefore, form a new standard of value, based more nearly upon the cost of acquisition and less upon the estimated value of the unknown probabilities at a cash price, allowing nothing for cost of producing; otherwise the surplus idle capital which is flooding every money centre, will seek other channels and follow them."

We give an account elsewhere of what is being done at some of the more important mining locations in the silver district on the north shore of Lake Superior. We will be glad to receive some statistical information concerning the working of these properties; such as, the number of men employed, the amount of capital invested, what machinery has been erected, and the estimated value of the ore that has been raised on each location. In addition to the very encouraging reports of progress that reach us regularly, statistical information would be of much interest to our readers.

We are indebted to Professor Wm. Boyd Dawkins for a copy of a lecture, in pamphlet form, entitled "Canada and the Great North-West," delivered by that celebrated gentleman at the Salford Town Hall on 28th April last. Professor Dawkins in the course of his lecture, after referring to the important lumbering interests of the Ottawa district, drew attention to our phosphate industry in the following words:

"Another point in regard to Ottawa is that there exist in the neighborhood valuable deposits of phosphate of lime (apatite), in which a large and important trade is being developed. It was not a little interesting to me to go some distance up one of the wonderful rivers, which form the highway in that part of the world, and examine some of the phosphate mines near Buckingham; and it was still more interesting to me to see the same material in process of manufacture at Widnes, in Lancashire. There is an important trade between this district and the mineral districts of Ottawa."

The extent of the gold fields of Nova Scotia is not generally known. They

stretch along the Atlantic coast from Yarmouth to the Straits of Canso, varying in width from 10 to 40 miles, and cover an area of about 7,000 square miles. Gold was not discovered in the province until 1858, although Sir Charles Lyell proclaimed its presence in 1842. Some of the mines have proved very rich. The most prosperous operations in the province are now being carried on by the New Albion Company at their Montague mines in Halifax county. What is needed for the development of other mines is more capital. The production of all the gold mines in Nova Scotia in 1884 amounted to 16,059 oz., 18 dwts., 17 grs., being an average of \$2.40 per day, per man.

In another column will be found some facts in connection with alluvial gold mining on Slate Creek, in Beauce. Latest news from the St. Onge Company's mines is very satisfactory and proves that we were not astray in our predictions of a year ago. All obstacles have now been overcome, and as a reward for the labor that has been expended this company have the intense satisfaction of seeing coarse gold and large nuggets being washed from the gravel at the bottom of the shaft in sufficient quantity to pay handsomely, and yet they are one hundred feet from the middle of the river bed.

We have learned with much gratification that the grand jury of the Antwerp International Exhibition has awarded a silver medal to Mr. W. A. Allan, of this city, for his exhibit of Canadian Apatite and Mica. The official document conveying this order of merit was received from the Belgian authorities by Sir Charles Tupper, High Commissioner in London, and transmitted by him to the Government of Canada, with his personal congratulations upon the award.

Mr. Eugene Coste, M.E., Mining Geologist of the Geological Survey, is at present in the Lake Superior gold and silver district. Mr. Coste's recognized ability as a mining engineer makes his visit to the North Shore district a matter of much interest, and as his opinion of the mines will be awaited with eagerness, it is to be hoped that his report will be made public without unnecessary delay.

Mr. W. de L. Benedict, M.E., of New York, is making a flying trip, professionally, to the Black Hills, Dakota, in the interest of New York capitalists. Mr. Benedict has identified himself with the mineral resources of Canada, particularly the phosphate industry, and is capable of giving a professional report on mining properties from a business standpoint as well as scientifically.

Mr. J. Obalski, M.E., under instructions from the Quebec Government, has begun an inspection of the phosphate lands in Ottawa county. Mr. Obalski is the government Mining Engineer and his report will be looked for with much interest.

THE PHOSPHATE TRADE.

One of the greatest industries in Canada today, and the one that is developing most rapidly, is phosphate mining. The product of our mines is attracting the attention of all the fertilizer markets of the world, and is now more sought after than at any period since the mines were opened and Canadian apatite was offered to manufacturers of super-phosphate. So far, this season, England, Scotland and Germany have taken the entire output of our mines, but it is not unlikely that direct shipments will be made to France next year and that the United States will demand a certain supply. Our phosphate trade, it may be said, is now on a firm basis, though in some respects producers are yet dissatisfied with the system in vogue for the disposition of the product of their mines, but as this great industry is only now in its infancy, it will be found, no doubt, that as the annual output of the mines increases and producers become more experienced in dealing with the various markets where their trade lies, a satisfactory custom, governing purchase and sale, will be arrived at.

The number of visitors to the mines in the Lièvre river district is steadily increasing. During the months of August and September a number of English and American mining engineers and capitalists passed over the district and critically inspected some of the mines that were most developed and would give them an idea of the permanent character of the deposits. The *Emerald*, *Little Rapids*, *North Star*, *High Rock* and the Union Company's mines did much to open their eyes to the vast proportions of the phosphate beds and veins and the enormous production of which these mines are capable. Of the deposits the visitors have nothing to say except in terms of the highest praise, but many of them have expressed some doubt as to whether the system of mining now followed is the correct one. As phosphate mining is a comparatively new industry in Canada, and as similar deposits are not elsewhere found, we can only look to experience to teach us how our mines can be worked to best advantage and the output raised and dressed most profitably. Mine owners appear to have given a good deal of attention to these important considerations during the past three years, and many radical changes and improvements have been introduced with most satisfactory results.

It will be seen by our statement of shipments for the month of September that 17,853 tons of phosphate had gone forward this season up to date. There is now at the mines and shipping points several thousand tons awaiting transportation, a great portion of which will go forward before the close of navigation.

The mines are giving employment to a large number of men and are yielding a steady output of ore. Among the most productive are the *Emerald*, *North Star*, *High Rock* and Union Company's mines. These employ a force aggregating 338 men, and their joint output for the month of September reached 2,285 tons, distributed as follows:—*Emerald*, 75 men, 780 tons; *North Star*, 70 men, 580 tons; *High Rock*, 115 men, 565 tons; *Union Company*, 78 men, 360 tons. This output for the four mines as compared with August shows a slight falling off, which is accounted for by there having been a considerable amount of dead work done.

Other mines throughout the phosphate district are being steadily worked and are contributing their quota to the year's production. Several new properties have been opened within recent date, notably the *Cold Hill* mine in the

Gore of Templeton, the *Lily* and the Glasgow Canadian Phosphate Company's mine in the Township of Derry, all of which are said to be developing very satisfactorily, but we have received no particulars of progress.

At the *Little Rapids* mine there is a fine showing of ore in the veins that have been opened up and other veins are being vigorously prospected on the property. This mine has been highly spoken of by every one who has visited it, and especially by Dr. T. Sterry Hunt, who has pronounced it to be as valuable a property as any that has been yet discovered in Canada. He says of it that with a proper force of miners the *Little Rapids* mine is capable of yielding high grade ore as abundantly as any one of the heavy producers in the phosphate district.

The Phosphate of Lime Company are opening up lot No. 2, in 1st range of Portland, and it is said to be developing satisfactorily. This same company are constructing a tramway from their High Rock mine to the Lièvre River and expect to have it completed about the middle of November.

Mr. G. H. Bacon has completed his mill at the Basin du Lièvre and will now proceed to grind phosphate. The progress of this new industry will be watched with much interest.

Phosphate Quotations.

There has been no variation during the month in prices. We quoted 1s. 1d. for 75 per cent. in August, which we find, by report of sales during that month, was 1d. a unit higher than the market ruled. The market is now firm at 1s. for 75 per cent., a fifth of a penny rise, ex-ship London and Liverpool.

Ocean Freight.

Steamship rates, from Montreal to Liverpool and London, are now at 6 to 7 shillings per ton. Seven shillings is the highest reported to us for September.

PHOSPHATE SHIPMENTS FROM MONTREAL FOR SEPTEMBER.

Date.	Vessel.	Destinat'n.	Shippers or Agens.	Tons.
Aug. 26	S. Barcelona	London	Lomer, Rohr & Co	282
31	S. Oxenholme	Liverpool	Wilson & Green	715
Sept. 1	S. Carnora	London	Lomer, Rohr & Co	195
11	S. Carnora	London	Irwin & Hopper	22
4	S. Escalona	Bristol	Lomer, Rohr & Co	273
11	S. Scotland	London	Lomer, Rohr & Co	155
5	S. Juliet	London	Wilson & Green	178
12	S. Mayo	Liverpool	Wilson & Green	100
18	S. Benhope	Liverpool	Millar & Co	118
22	S. Benona	Barrow	Millar & Co	190
25	S. Colina	Glasgow	Lomer, Rohr & Co	275
24	S. Merciano	Liverpool	Wilson & Green	525
20	S. L. Superior	Liverpool	Wilson & Green	126
20	S. L. Superior	Liverpool	Wilson & Green	79
Total for September				3,263
Previously reported				14,590
Total to September 30th				17,853

The Phosphate Industry of South Carolina

It will be interesting to many of our readers to know how vastly phosphate mining has increased in importance in South Carolina during the past fifteen years, and we therefore give some facts and figures from which they may form an idea of the proportions to which this industry may attain in Canada when her phosphate belt has been more extensively opened and the mines developed.

The following report, forwarded to us from Charleston, S. C., gives the history of phosphate mining in that State:

"South Carolina has been wonderfully enriched by this extensive industry, which, in

connection with the manipulation of phosphates, it is estimated by the State Agricultural Department, has brought \$50,000,000 into that State since 1868. There are at present in operation in the State 14 companies engaged in mining phosphate on land, 11 river mining companies, and 11 fertilizer manufacturing companies. There have been mined and shipped, from 1868 to 1884, 2,699,000 tons of phosphate rock, equivalent to about \$16,000,000; there have been manufactured from 1871 to 1884, 2,000,000 tons of fertilizers, equivalent to about \$34,000,000, giving a total of \$50,000,000, which has been brought into the State by the phosphate industry in the last 17 years. Of this amount the State has received as revenue \$1,200,000, which was paid as royalty, besides the heavy taxes levied on the products of the land companies and fertilizer manufacturers. The production of phosphates for 1884 was 409,000 tons of rock and 236,884 tons of fertilizers.

In 1880, according to the United States census, there were 28 fertilizer companies in South Carolina, having an aggregate capital of \$3,993,300. In the amount of capital invested in this industry South Carolina stood second in the list of States. Maryland ranking first, with a capital in fertilizer manufacture of \$4,271,870, or not quite \$300,000 more than South Carolina. The third State on the list was New York, which had over \$1,000,000 less employed in the manufacture of fertilizers than South Carolina. In the number of hands employed South Carolina ranked first, having more than twice as many engaged in the fertilizer industry as Maryland, and nearly three times as many as New York.

Since 1880 there has been a rapid development of this important industry in South Carolina, as may be readily seen from the fact that in that year only 190,000 tons of phosphate rock were mined; while in 1884 the amount was 409,000 tons, or largely more than double. The increase since 1880 has been steady, the amount mined in 1881 being 265,000 tons; in 1882, 330,000 tons; in 1883, 355,000 tons; and in 1884, 409,000 tons.

The total amount of phosphate rock mined in South Carolina since the discovery of these deposits has been as follows:

YEARS.	TONS.
1868-70	20,000
1871	50,000
1872	60,000
1873	90,000
1874	100,000
1875	115,000
1876	135,000
1877	165,000
1878	210,000
1879	200,000
1880	190,000
1881	265,000
1882	330,000
1883	355,000
1884	409,000

Total	2,699,000
Of this amount there was—	
Of river rock	1,229,170
Of land rock	1,469,830
Total	2,699,000

Of this amount, 1,359,000 tons, or more than one half, has been mined during the last four years.

As already stated, the aggregate capital invested in the manufacture of fertilizers in South Carolina in 1880 was \$3,493,300. At the present time over \$6,500,000 is actually invested in this industry. This, of course, does not include the unpaid capital stock of incorporated

companies, but only the actual investments in money.

The list of phosphate mining and manufacturing companies, not including several companies engaged in manufacturing fertilizers from cotton seed, is as follows:

Name.	Location.	Capital.
Hammond, Hull & Co., Beaufort	Beaufort	\$ 500,000
Hume Bros. & Co., Limited, Beaufort	Beaufort	250,000
Phosphate Mining Co., Beaufort	Beaufort	500,000
Sea Island Chemical Co., Beaufort	Beaufort	50,000
Ashepo Phosphate Co., Charleston	Charleston	100,000
Ashley Phosphate Co., Charleston	Charleston	200,000
Atlantic Phosphate Co., Charleston	Charleston	1,000,000
Bolton Mines (Wyllie & Gordon), Charleston	Charleston	125,000
Charleston Mining and Manufacturing Co., Charleston	Charleston	200,000
Cousaw Mining Co., Charleston	Charleston	200,000
C. H. Drayton & Co., Charleston	Charleston	300,000
Edisto Phosphate Co., Charleston	Charleston	400,000
Etiwan Phosphate Co., Charleston	Charleston	1,000,000
Julius Fishbourne, Charleston	Charleston	100,000
Marine and River Phosphate Mining and Manufacturing Co., Charleston	Charleston	500,000
Oak Point Mines, Charleston	Charleston	100,000
Pacifi Guano Co., Charleston	Charleston	305,800
C. C. Pinckney, Charleston	Charleston	125,000
Rose Mining and Manufing Co., Charleston	Charleston	100,000
South Carolina Phosphate and Phosphatic River Mining Co., Charleston	Charleston	500,000
Stono Phosphate Co., Charleston	Charleston	100,000
Wando Phosphate Co.	Charleston	305,800
Wileox & Gibbs Guano Co.	Charleston	125,000
Port Royal Fertilizer Co., (near Port Royal)	Charleston	100,000
Gregg's Phosphate Mines, Charleston	Charleston	100,000
St. Andrew's Phosphate Mining Co., on Stono River	Charleston	100,000
Bradley's Phosphate Mines, near Charleston	Charleston	100,000
Pon-Pon Phosphate Mines, on Edisto River	Charleston	100,000
Dotterer's Phosphate Mines, near Charleston	Charleston	100,000
Farmers' Phosphate Co., Charleston	Charleston	100,000
David Roberts, on Wimbee Creek	Charleston	100,000
J. W. Seabrook, on Morgan River	Charleston	100,000
J. M. Crofut, on Beaufort River	Charleston	100,000
J. D. B. & J. Seabrook, on Parrot Creek	Charleston	100,000
J. G. Taylor, on Parrot Creek	Charleston	100,000

One of these companies has a surplus of exactly three times its total capital, and another has a surplus of more than double its paid-up capital.

The successful mining of phosphate rock under water requires a very liberal outlay of money and the best machinery that can be devised, while for grinding and pulverizing the rock after being mined, costly machinery of the most improved character is essential. Constant experiments are being made to devise new and better machinery for this purpose, and many inventions that promised well at the start have proved a failure when tested in regular steady work."

Ottawa Colonization Railway.

The construction of this line of railway would be a boon to the section of country through which it would pass. It is not only much needed by the settlers throughout the valley of the du Lièvre, but would be an appreciable acquisition in the development of the phosphate mining and lumbering interests of the district. It would stimulate mining in the localities where mines are now being extensively worked, and would foster an augmentation of the industry by opening up new fields where mineral is plentiful, but, owing to their inaccessibility, are valueless and neglected. It would be the means also of inducing immigrant farmers to take up and cultivate the many stretches of fertile land lying between the mountain ranges and on their slopes, which for agricultural purposes is unsurpassed in any part of this Dominion, and it would encourage present settlers to enlarge their farms and to engage extensively in agricultural pursuits, for it would enable them to reach a market for their produce, an advantage of which they are now deprived. In addition

to these benefits to be afforded by the construction of the Ottawa Colonization Railway, we have the very best authority for saying that the road, when completed, will afford a safe and remunerative investment for capital. The line, as located, starting from the village of Buckingham, takes a northerly and westerly direction, running in proximity to the important phosphate mines on the east side of the du Lièvre, and crossing the river at a favorable point penetrates the very heart of a rich phosphate-bearing region. For many miles it traverses a cleared and well cultivated section of country, and throughout its entire length no obstacle in the location of a favorable route was encountered and not one engineering difficulty was presented. As the plans and profiles show, the construction of the road from end to end would be inexpensive and much below the average cost of railway construction in this country. The Quebec Government has granted 4,000 acres of land per mile, the present value of which should be sufficient to at least grade the line and put on ties and rails, and with the construction of the railway the value of this land would be very much enhanced. There exists no reasonable doubt that as soon as any responsible company or individual can satisfy the Minister of Railways and Canals of their *bona fides* and ability to carry the construction of the road to completion, so soon will the Dominion Government also subsidize the Ottawa Colonization Railway as it has done in the case of innumerable other provincial railway enterprises, notably, her sister road, the Gatineau Valley Railway. This is a matter of much interest to the inhabitants of that portion of Ottawa county through which the road will pass, and they would like to know how soon they may expect to see a movement towards its construction. Whoever undertakes the work can rely upon receiving whatever co-operation and assistance is necessary from them to insure its successful accomplishment. The charter holders might give us some information on this subject.

VILLENEUVE MICA MINE.

This valuable property has developed into a steady producer of the highest grade of *muscovite*, and the crystals that are now being taken out are found to yield plates of the average sizes required by dealers and stove manufacturers. As has been before stated in these columns, in reference to this mine, plates of unusually large dimensions have been taken out, some measuring as high as 12 x 14 inches, and many very large crystals are being constantly met with, but the average yield of those taken from the vein is improving with each week's work in point of size, and the presence of discoloration has noticeably decreased. The mine has been visited during the past month by many practical and scientific men, all of whom have been highly pleased with its appearance and promise. Mr. L. H. Shirley, C. & M. E., of Montreal, in company with English capitalists, inspected the property last month and was much impressed with the permanent character of the vein, and the large number of mica crystals that are visible in all directions on the surface, and in the workings on the vein. The micaceous lead extends for many hundred feet, and has a width of from 50 to 60 feet. The tunnel which has been driven into the mountain has proved its continuity downwards, and from this tunnel, which is the only working yet started on the property, all the mica has been taken, of which several tons have accumulated

ahead of the cutters. The composition of the vein, in which the mica crystals occur, is chiefly feldspar and quartz, in which, besides mica, crystals of tourmaline are numerous. The formation at Villeneuve is similar to that in which the best mica mines of North Carolina have been opened, and the quality of the mica may be said to be identical.

Of the North Carolina mines, Mr. Arthur Winslow, M.E., in a letter to the *Engineering and Mining Journal*, of recent date, says:—"While recently on a trip to Mitchell County, a few of the mines in that important mica section were visited. The mica occurs there as a constituent of veins that traverse a highly feldspathic granite. The veins themselves may be regarded as granite dikes, of extremely coarse composition, made up of ill-defined mammoth crystals of mica, feldspar, and quartz. The distribution of the mica in the veins is irregular, but at those localities visited the larger crystals seemed to be in the central portion of the vein. A distinction of importance to the miner is made between what are called 'fluken veins' and 'rock veins.' The former are veins that have suffered from the disintegrating effects of weathering, and the rock is comparable to the 'brown ores' of the gold miner. The feldspar has been so decomposed in these veins that they can be easily worked with a pick, and the mica, which has remained almost intact, is extracted without much expense. It is to these veins that the work of the mound-builders, with their crude appliances, was confined. Such veins are limited in extent downward, and pass by degrees into rock veins, which latter are very hard and difficult to work. The mica is generally taken out in blocks an inch or two thick and a foot or so in diameter. The color of the sheets, when split, is white, a pale green, or a rum color. They are frequently spotted and blurred with stains of manganese or iron, and this very much lowers the market value. The white mica is always valuable, and the rum-colored is much sought after."

"The mines are often worked by the owners of the land or by companies. Leases on mica properties are generally given for one-sixth of the product with fluken veins, and for one-seventh with rock veins. The preparation of the mica for market is a very simple process, consisting in splitting it into sheets of about one-sixteenth of an inch in thickness, and in cutting these, according to patterns, into squares with a pair of ordinary timber's shears. One man can split and cut many pounds in a day. The squares range in size from 3 by 4 inches upward. And the prices vary, according to size and color, from \$1 to \$5 and more a pound. The mining of this product is in many cases very crude, and is carried on on a small scale. Yet, with a good, average vein, the profits are large. The difficulty, of course, lies in securing a good vein. As with all veins, the material varies in composition, and the rich finds are generally in pockets that often contain, within a few cubic yards of vein rock, several hundred dollars' worth of mica."

It will be seen, from what Mr. Winslow says of the North Carolina Mica Mines, that, with the exception of the "fluken veins," the mica of Villeneuve is found in precisely the same rock composition, the vein at the Villeneuve mine, however, being much larger and more productive than those of Mitchell County, N.C., and other localities in the State. Here the quantity of merchantable mica appears to be unlimited, and under proper management the Villeneuve mine is capable of producing it at a larger margin of profit.

Gold Mining in Beauce.

The result of the past summer's work in the alluvial gold deposits of Beauce has been very encouraging to those who have been actively engaged in working them.

In many parts of the district gold has been found in paying quantity in the gravel beds, and prospecting has been successfully carried on among the quartz ledges which will no doubt lead to extensive quartz mining in the near future. But the most encouraging work that has been reported to us has been done by the St. Onge Gold Mining Company, on Slate Creek. After patient and determined prospecting, this company has at last hit upon the old bed of the river in their No. 8 shaft, at a depth of 180 feet, and are now being richly rewarded for their perseverance and large outlay. For several feet above bed-rock the ground carried more or less gold, and what is now being raised is washing quite \$10 per man, although the disintegrated surface of the bed-rock, where the coarse gold is deposited, and the gravel for six inches above it, has not yet been touched, and the bottom of the shaft is fully one hundred feet from the true bed of the river. This is certainly a marvellously rich showing, and there now exists no shadow of doubt that the coarse gravel and the bed-rock in the middle of the channel will contain large gold in quantity to pay enormously. These recent developments have greatly increased the value of ground along the lead, and it is anticipated that gold mining on Slate Creek will be extensively engaged in within the next few months. Such results as have attended the operations of the St. Onge Company were never met with in any other part of the Beauce district—not even on the Gilbert river in its palmiest days, when the gold excitement ran so high there. We will await with much interest the reports of the yield of the gravel on bed-rock, and will keep our readers informed from time to time of the results of future operations in this field.

A report has just reached us by telegraph that the gravel on bed-rock at bottom of shaft No. 8, on the St. Onge Gold Mining Company's property, is now being raised, and is found to carry coarse gold and nuggets in quantity, and that the week's *wash-up* has exceeded the most sanguine expectations.

THE ASBESTOS MINES.

The past summer has been one of more than usual activity at the asbestos mines of the Eastern Townships and an increased output over that of any former season has been the result. The most productive mines of the district are those in the Townships of Tretford, Colemine and Broughton. Several of these mines are being vigorously worked and all are yielding a very high grade of mineral. It is estimated that the output for the district for this season will aggregate about 1,400 tons, and the prices obtained for the different grades have been:—first quality, \$80; second quality, \$60; third quality, \$40; and the lowest grade, suitable only for pulp, \$10 per ton, at the mines. The force employed by the various operating companies aggregates 350 men, distributed as follows: King Brothers, 40; Boston Asbestos Packing Company, 100; the Johnson Company, 100; Ward Brothers, 20; Lionais & Company, 40; and Kennedy & Company, 50 men. A small additional force of men are engaged in desultory mining in the district, but neither their number nor the amount of asbestos mined by them has been taken into account in the foregoing statements. There is every conveni-

ence afforded for shipping the product of the mines, and those engaged in this industry are well pleased with the result of their summer's work. It is the opinion, however, of many practical men who have recently visited the mines that economical management is totally disregarded, and that under a better system much larger profits might be realized.

GRANITE WORKS.

The Canadian Granite Company have purchased a valuable property on the Canal Basin at Ottawa, where they are erecting extensive buildings to be used as a polishing mill. The granite, which is of excellent quality and of a pleasing salmon-red shade, will be brought from the company's quarry at Kingston to Ottawa in barges and dressed and polished at their new mill. The company will soon be ready to supply an unlimited demand of ornamental polished granite and monuments in every variety. The quarry is capable of furnishing an unlimited quantity of magnificent stone, and the machinery in the mill will be the most modern and complete in Canada.

THE NORTH SHORE MINES.

Lake Superior District.

There are few, if any, sections on this continent where such rich and massive deposits of silver ores have been discovered as those of the Lake Superior silver district. Native silver, like copper on the south shore of the lake, has been taken from many veins, and the average vein of the district is found to carry silver in sufficiently large quantity to insure profitable mining. Some of the veins that have been opened have produced such extraordinary rich specimens that prospectors have become excited and in their eager search for "bonanzas" will no doubt pass by extensive deposits of low grade ore which could be mined at a large profit. There is no certainty that the veins which have shown such very rich outcrops will continue to carry ore of so high a grade, and it is not to be expected that they will, but if they are found to yield ore in large quantity, that it will pay to work, then it will be seen that the profits of this mining industry can be regulated with much greater certainty by increasing the capacity of the machinery, and making it adequate to the productiveness of the mines, than by relying upon the continuance of high grade ores.

SILVER MOUNTAIN MINE.

This mine is attracting more attention at the present time than any other mining location in the new silver district. Prospect shafts have been sunk, from which very rich ore has been raised, and the vein is being thoroughly prospected by practical men of large means. The mine is a comparatively recent discovery, the location having been taken up by Messrs. Danna, Richards and Trethewey a little more than a year ago. These gentlemen did some development work, sufficient to partially test their property, and then succeeded in inducing Cleveland capitalists to become interested with them. This syndicate have now an option on the mine, under which they are vigorously engaged in making further tests with a view to proving the continuity of the vein. A tunnel is being driven towards the vein, and if the result of this and other development work is satisfactory, preparations will at once be made for permanent and extensive

mining. Everybody is hopeful that the expectations of the owners and the syndicate will be realized, and those who are interested in the future of this mineral district are closely watching the result of each week's work at the Silver Mountain mine.

TWIN CITY MINE.

This mine was discovered in 1883, and the first development work was undertaken by gentlemen from St. Paul and Minneapolis, in which they expended upwards of ten thousand dollars. Their work produced a considerable quantity of native and black silver and a high grade of argentiferous zinc blende. This work, as far as it was prosecuted, proved most satisfactory to all concerned; but it was found, that operations could not be profitably continued without a mill and reduction works, and as the condition of the roads rendered the transportation of machinery practically impossible, operations were suspended. It is to be hoped that this obstacle will soon be removed. Meanwhile a promising property is neglected.

BEAVER MINE.

This is likely to develop into a very productive mine. It has been continuously worked during the past year, and what has been accomplished in the way of development warrants preparation for permanent work. The vein has been pronounced a true fissure and can be seen cutting the formation across two bluffs, one of them two hundred feet high, on either side of which it can be worked without the expense of hoisting or pumping. The vein carries some very rich ore and some of lower grade, and in the hands of a powerful company would no doubt pay largely if extensively worked.

SILVER CREEK MINE.

Like the *Twin City* and *Beaver* mines, this one was discovered in 1883. Work was not begun here, however, until a few months ago. It is in the same geological formation as the other important mines in the silver region, and the vein, which is about three feet wide, carries native silver and argentite. It is supposed to be a continuation of the *Twin City* vein, or one running parallel to it, and is steadily producing good stamp ore, which awaits being treated, and this will be done when roads have been opened that will enable the owners of the mine to take in machinery for that purpose.

On other three properties, known as *R. 48, 140 T.* and *57 T.* mines, work was also begun during the past summer, but has been suspended and will not be resumed until something definite has been done towards locating the new government road which has been so much talked about, and of which the district is seriously in need. These three properties are in the immediate vicinity of the *Rabbit Mountain*, the *Silver Creek* and *Beaver* mines, and give promise of developing into mines of not a little importance.

A party of Michiganders have organized under the title of the Peerless Mining Company for the purpose of operating in this new and attractive field and have taken up four locations within two miles of *Silver Mountain* mine. It is expected that this company will now organize under the laws of Canada and proceed to open up some of the ground they have recently acquired.

Many other American capitalists have come into the silver district during the past few months, to look for claims in which to invest, and the citizens of Port Arthur are beginning to open their eyes to the fact that it is quite possible all the choice locations may be taken up by their enterprising neighbors before they

have quite realized the richness of the mineral deposits by which they are immediately surrounded.

In the gold district work is being most successfully pushed at the famous

HURONIAN MINE

under the able superintendence of Mr. Charles Eschweiler, M.E., whose staff has been reinforced by the arrival of Mr. F. C. Smith, a prominent assayer of Milwaukee, and Mr. Richard Crow, of Boulder, Colorado, who has taken charge of the company's mill. With a competent staff of miners and workmen Mr. Eschweiler and his new assistants are carrying on operations at this mine with most satisfactory results. The vein is an unusually large true fissure, and the ore that is now being taken from the shaft, drifts and cross-cuts is so rich in gold that five stamps are paying all the running expenses of the mine. As the number of miners now employed could keep twenty stamps busy this is indeed a very satisfactory showing. The vein has been prospected to a depth of nearly 200 feet and drifted on for upwards of 400 feet at the 50 and 150 feet levels and has been found to carry high grade ore at all points in these workings. All the experts and miners who have visited the *Huronian* mine have predicted great results, under good management, and present appearances lead us to think that their predictions are about to be realized. The miners have been working in rich ore in both levels, and it may be said that wherever the vein is opened it is with the same encouraging result. Other discoveries have been made on the property, the most recent of which promises to be one of importance.

Iron Trade Depression.

The boom which has been predicted by some enthusiasts and anxiously awaited by everybody interested in this important trade has not yet begun to show itself. The *Hardware Trade Journal*, of Manchester, England, thus speaks of the continued depression:—

"There seems to be no silver lining yet visible to the cloud that hangs over the condition and prospects of the iron trade. In every direction the complaints are pitched in the same key—that of overproduction, and a consequent recession in prices. The home trade has not been so quiet for several years, through the limited ship building and railway making; and the export trade each month shows a smaller tonnage and value of the iron sent abroad. This depression has existed, with one or two brief intervals of sunshine, for seven or eight years—the result, it is to be feared, of the overproduction and the high prices of the ever-to-be-remembered years of 1872, 1873 and 1874."

The *Bulletin of the American Iron and Steel Association*, after reviewing the improved condition of business at the beginning of September says:—"The feeling of confidence that did not exist two months ago, and which is now everywhere visible, can be directly traced to the increased business which these two months have brought. In our iron and steel industries, however, candor compels us to say that the revival has not equally affected all branches. There is an increased demand for best grades of foundry and forge pig iron and a decided hardening in prices, but common grades remain as they were."

The *Iron Trade Review*, of Cleveland, O., writes editorially on September 5th, in a somewhat incredulous way, as follows:—

"The improvement in the iron market con-

tinues, but it won't do to crow much yet. If better times are coming, the best thing is to let them come and not make any fuss about it. One of the wisest things that can be done at the present juncture is to put a cold compress on the head of the exuberant Associated Press reporter at Pittsburgh."

THE HALIFAX MEETING

OF THE

American Institute of Mining Engineers.

FIRST SESSION HELD ON SEPTEMBER 15.

Address by Sir A. G. Archibald.

REVIEW OF NOVA SCOTIA'S GOLD FIELDS.

The Apatite Deposits of Canada, etc., etc.

The meeting of the Institute, which opened in Halifax, N.S., on the 15th September, was not so largely attended as had been anticipated, not more than 120 members being present. The arrangements for the meeting and for the entertainment and comfort of the members were perfect, and the hospitality and cordiality with which the Institute was received and entertained has made the meeting memorable.

The first session was held in the Legislative Council Chamber on Wednesday, the 16th of September, at which there was a large attendance of ladies and citizens. Mr. Jamme, chairman of the local executive committee after welcoming the visiting engineers, introduced Sir Adams G. Archibald, K.C.M.G., who opened the meeting with an eloquent address, cordially welcoming the members of the Institute, from which we quote the following paragraphs, want of space preventing us from publishing the address *in extenso*. After expressing his gratification that the Institute should have honored Halifax by appointing a meeting of their body there, Sir Adams continued:—

"We welcome you on various grounds. If you had come on the visit merely as citizens of a friendly country, we should have been delighted to see you. You are connected with us by so many ties, the ties of a common lineage and a common language, a common literature and common traditions. You are sharers with us and the parent country in common political and judicial institutions, and in a fullness of freedom such as exists nowhere else in the world. Had you come, therefore, with these claims only on us, we should have been delighted with the opportunity of showing the gratification your visit would confer. You come, indeed, with all these claims on our regard, but you have others still. We welcome you on these grounds, but we welcome you also—some of you as representative of great industries in your own country—others as men of special skill and science, who have made your names household words everywhere. All of you are welcome as connected with a profession which has done more, perhaps, than any other to promote improvements in the material condition of the world."

"It has been the task of that profession to

grope in the bowels of the earth for the treasures that nature has hidden there, to clear them from the dross with which they are associated, to prepare and purify them for the use and comfort of man. You have had to organize inert matter, to put it into shapes and forms by which it could be utilized—so as first to create and then to direct a motive power—and thus making matter the slave of mind, to perform prodigies of power and endurance and speed which have revolutionized the world. We welcome you, therefore, as gentlemen connected with this great profession."

"But besides all this, we may have an *arrière pensée* not quite unselfish. We know that your visit will give us pleasure. May we be pardoned for entertaining the idea that it may also profit us in the result?"

"We claim in this province to be possessed of large mineral treasures. I do not refer to the gold and the silver, the royal minerals, because whether we have them or not is a matter of comparatively small importance to our country. But as regards those minerals which everywhere form the basis of national prosperity, those which are of absolute necessity and universal use—iron and coal; these we have unquestionably in great abundance and of excellent quality."

Sir Adams then gave a sketch of the familiar history of the grant of all the minerals of Nova Scotia and Cape Breton to the Duke of York, or, more properly, to his creditors, in 1826.

"For thirty years (half the term of the original grant or lease), the Mining Association held the minerals of the province back from development, and it was only in 1857, after years of wordy war, that the Association gave up its claim to all the minerals except the coal in certain small areas. The Legislature then vested in the owners of the lands all the minerals except gold and silver, lead, copper, coal, iron, tin, and precious stones. Under this agreement, mines have been opened in every part of the province. There are collieries actually worked in six of the eighteen counties into which the province is divided. Gold mines have been opened in twelve proclaimed districts in six counties, and in other districts, not proclaimed, in other counties. Already over one hundred coal leases have passed the Great Seal, and the leases of gold mines are innumerable."

"The royalties reserved are 10 cents a ton on coal; iron, 3 cents a ton on the ore; gold 2 per cent. and all other minerals 5 per cent. These royalties go to form a fund for the support of the local government, which derives in one way or another over \$100,000 a year from this source."

"While the freeing of our mines from the monopoly of the association gave an immense impulse to them, the fiscal policy which had governed our relations with the United States has tended to retard the development of our coal interests. From 1854 to 1866, our coal was admitted into the United States free of duty. When the reciprocity treaty was repealed, two-thirds of our entire sales were made to that country. After that, the States imposed a duty of \$1.25 a ton. This soon reduced our exportations to that country. The trade in six years dwindled from two-thirds to one-fifteenth of our whole sales. Then the duty was reduced to seventy five cents. But the trade continued to dwindle till in 1884, instead of being two-thirds, it fell to one twentieth of our entire sales. But in the meantime our total sales, notwithstanding the reduction in, or rather the extinction of, the sales to the United States, have gone on increasing from year to year, and last year we

sold well on to 500,000 tons more than we did when our trade with the States was in the most flourishing condition. It would seem, therefore, that our coal trade is not dependent on the United States market. But when the time comes, as doubtless it will, when the laws of nature prevail, when they are not overridden by fiscal restrictions, and the trade is allowed to flow in its proper channels, it will be found that the opening of American markets to provincial productions will not only greatly extend our industries, but will add to the comfort and convenience of the large classes in the neighboring country to whom cheap fuel, cheap light, and cheap mechanical power are unquestionable blessings."

Mayor Mackintosh followed with an appropriate speech, in which he cordially welcomed the visitors to Halifax and briefly referred to the more important mineral features of Nova Scotia.

President Bayles, on behalf of the institute, gracefully responded, and referred to the interest the American engineers and capitalists have in Nova Scotia's great mineral resources, more especially in its magnificent coal and iron deposits, from which, he intimated, closer commercial relations may enable them to draw supplies of fuel and ore for their eastern works.

In his opening address President Bayles discussed, in a very able manner, the relations of the engineer to labor, calling attention to the danger of the socialistic tendency of the times, and the necessity for guiding the movement into safe channels. The following extracts from his address contain the pith of Mr. Bayles' expressed views on this important subject:

"However blind we may be to the spread and influence of socialistic teachings, there is little excuse for persistence in cherishing the idea that the wage-earner has no cause for dissatisfaction with the present unequal and inequitable distribution of the products of industry. More general education, a free press, and organization for resistance or aggression, have been the agencies by which the working classes have gained clearer ideas of their power and opportunities. The dull despair of mediæval servitude has given place to an intelligent and profound discontent with a situation which every year seems to make them more hopeless; and I do not hesitate to venture the opinion that, unless strong and willing hands are extended to lift them up they will again and again reach from the mire to pull down and destroy that to which they cannot attain unaided."

"The wage-earner's future, in all but exceptional instances, promises nothing better than continuance in the labor he has learned, as a competitor with machinery which may at any time displace him and force him to seek some other and perhaps less congenial employment, or starve."

"The hopelessness of the position of the average wage-earner consists in his ignorance. The progress of the arts has been so rapid that few men starting in life without education are able to keep pace with them, or, indeed, to acquire such familiarity with principles that they can hope to attain to responsible positions of management. While the sphere of those born to serve has been thus steadily narrowing, the sphere of those so fortunately situated that they have been able to acquire liberal education is steadily broadening. The capitalist is rarely safe in intrusting his interests in mining or manufacturing to the merely practical man. Success in business enterprises of every kind now depends upon so many things of which the merely practical man knows little or nothing, that management is usually intrusted to the

man who combines education and experience, and his staff of responsible assistants is made up of young men of education who take subordinate positions to gain experience."

"But for industry and thrift there should be something better than our present industrial system gives. Arbitration should decide fairly and impartially the issues between workman and employer, and some part of the profits of production should seek investment in ways which will react favorably upon the interests of labor. Participation should be established on an equitable basis as the reward of faithful service, and co-operation should be promoted wherever and whenever it can benefit the wage-earners."

Upon the conclusion of the addresses, the remainder of Wednesday's session and that of Thursday were devoted to the reading and discussion of papers. Owing to the time set apart for this purpose being limited, only a few of the large number of papers presented were read. The following is a list of those that were heard and discussed:

The Nova Scotia Gold Mines, by E. Gilpin, Inspector of Mines, Nova Scotia. Studies in the Apatite Region of Canada, by Dr. T. Sterry Hunt, Montreal, Canada. The Picton Coal Field, by J. S. Poole, Stellarton, Nova Scotia. Our Glacial Problem, by Rev. D. Honeyman, Halifax, Nova Scotia. Steel Castings, by A. V. Abbott, New York City. Topographical Models and their Uses, by E. A. Lehman, Philadelphia, Pa. An Electrical Furnace for Reducing Refractory Ores, by Dr. T. Sterry Hunt, Montreal, Canada. A New Method for the Determination of Phosphorus in Iron and Steel, by J. B. Mackintosh, New York City. The Specific Gravity of Low-Carbon Steels, by G. S. Miller, Denwood, West Va. The Manufacture of Iron in Canada, by J. H. Bartlett, Montreal, Canada. The Coal Fields of Cumberland County, Nova Scotia, by R. G. Leckie, Springhill, Nova Scotia. The Homogeneity of Open-Hearth Steel, by H. H. Campbell, Steelton, Pa. Improvements in Ore-Crushing Machinery, by S. R. Krom, New York City. Note on a Self-Dumping Water-Tank, by W. Ide Pierce, Tangier, Nova Scotia. The Estimation of Manganese, Carbon and Phosphorus in Iron and Steel, by Prof. Bryan W. Cheever, Ann Arbor, Mich. E. D. Campbell's Colorimetric Process for Estimating Phosphorus in Iron and Steel, by Prof. Bryan W. Cheever, Ann Arbor, Mich. The Oil Regions of Pennsylvania and New York, by A. C. Ashburner, Philadelphia, Pa. The Contraction of Iron under Sudden Cooling, by H. M. Howe, Boston, Mass. The Philosophy of Fire-Brick Hot-Blast Stoves, by Frederick W. Gordon, Philadelphia, Pa. The Wolf Benzine-Burning Safety-Lamp, by E. J. Schmetz, Columbia, S. C. The Cape Breton Coal Field, by W. Routledge, Sydney, Cape Breton. The Amalgamation of Gold Ores and the Loss of Gold in Chloridizing-Roasting, by C. A. Stetefeldt, New York City. Lixiviation and Amalgamation Tests, by F. W. Clarke, Boston, Mass. The Geology of Natural Gas, by C. A. Ashburner, Philadelphia. Notes on the Treatment of Gold Ores, by William Pruekner, Marysville, Mont. Basic Bessemer Materials, by Prof. T. Egleston, New York City. The Blast-Furnaces of the North Chicago Rolling-Mill Company, by Frederick W. Gordon, Philadelphia, Pa.

The Apatite Region of Canada.

Dr. T. Sterry Hunt, in presenting a verbal abstract of his paper, entitled "Studies of the Apatite Deposits of Canada," alluded to his published communication on the Canadian Apatite Deposits made to the Institute in February, 1884,

and proceeded to describe some of the later results of mining apatite in the Lièvre district, to the north of the Ottawa river, where the mines are as yet confined to a small area in the townships of Buckingham, Portland, Templeton and Derry; earlier workings having been along the Rideau Canal to the south of the Ottawa. The large mining operations recently undertaken in the Lièvre district show that the crystalline phosphate of lime or apatite belongs to lodes of great size, which traverse the ancient gneiss of the region. These lodes include granitoid feldspathic and pyroxene rocks with large masses of quartz, of carbonate of lime, of pyrites and of apatite. All of these often show a banded structure not unlike that of the gneiss, to which they are evidently posterior, and of which they often contain fragments. Their study is full of interest to the geologist. The mining operations on these great lodes, which are often over one hundred feet in breadth, are in part by open cuts and in part by shafts, and have reached depths of a little over 200 feet. The production of some three or four of these mines in 1884 was from 4,000 to 5,000 tons each of commercial apatite. The improved machinery, and the better system now being introduced here, is greatly increasing the yield of these mines, some of which during the past summer have put out 600, 700, and even 1,000 tons in a month. The mineral, yielding on an average eighty per cent. of phosphate of lime, is now worth in Montreal eighteen dollars per ton, and is mined with great profit. It is chiefly shipped to Great Britain, where it is used for the manufacture of high grade superphosphates; but it is believed that in the near future a larger market will be found for the apatite in the United States and Canada. The growing demand for high fertilizers on this continent, and the fact that the apatite of Canada may be shipped to the valleys of the Ohio and Mississippi at much cheaper rates than the phosphate rock of South Carolina, gives a great importance to these Canadian mines. The output from those of the Lièvre district this year will probably exceed 30,000 tons. Works on a large scale are now in construction at the lower falls of the Lièvre on the line of the C. P. R., for the grinding of phosphates and the manufacture of fertilizers. While the productiveness of the Lièvre mines has caused the neglect of the earlier discovered deposits of the Rideau district, there are among these some which, in the speaker's opinion, will be found, when properly developed, not inferior to those of the Lièvre, and he believes that these two districts of phosphate-bearing veins in Canada will soon become an important source of revenue to the country, and a great benefit to the agriculture of the continent.

Nova Scotia's Gold Mines.

BY

EDWIN GILPIN, JR., A.M., F.G.S., F.R.S.C.

The reading of this paper was listened to with much attention. Mr. Gilpin dwelt at some length upon the composition of the auriferous veins and the geological features of the formation in which they occur, and gave some interesting information on the mining and milling systems in vogue in the province, and the cost of production of the precious metal. Want of space prevents us from publishing now the full text of Mr. Gilpin's paper, but it is our intention to do so in our next number.

In the afternoon of Wednesday the visitors enjoyed a delightful cruise in the Halifax harbour under the auspices of the executive committee, and in the evening they attended a promenade concert and fireworks in the public

gardens given in their honour. On Thursday evening the members of the Institute attended a reception in the Province building, tendered them by the citizens of Halifax, and on Friday morning the visitors took their departure, having been divided into three parties, one of which, the largest, going to Pictou and Cape Breton to inspect the coal mining industries of those districts. Another party made a tour of Grand Pre and the Annapolis Valley, stopping at Windsor to view the extensive gypsum quarries, while the third party visited the Spring Hill and Joggins' coal mines and the famous Londonderry iron mines.

THE MONTAGUE GOLD MINES

were visited by one of the parties and at the *New Albion* mine the engineers saw one of the most remarkable collections of gold ore ever seen in America. The samples of quartz were so filled with strings of gold that the pieces of rock were held together by the precious metal.

Professor G. H. Torrey, United States Assayer at New York, was with the visitors, and has an intimate knowledge of the Nova Scotia gold mines, of which he holds a high opinion. He says that gold mining in the province may be considered as hardly yet in its infancy, and thinks that mining success in Nova Scotia in the future will be found largely, if not altogether, in her low grade ores, from slate belts, and in deep mining. In conversation, Prof. Torrey pointed to the history of the Black Hills, which shows that the mining of low grade ores will pay when found in large seams. And, he remarked, if it will pay there—two hundred and fifty miles from railway communication, where every pound of supplies has to be carried, with wood scarce and labour \$3 per day—how much more will it pay in Nova Scotia, where the gold fields are close to the railway or seaboard, where there is an abundance of ore, and labour at \$1.50 per day. In reply to a question as to why, in the face of these manifold advantages, American capital is not more liberally invested in our mines, Mr. Torrey, pertinently replied: "If your people show their faith in your own country by their works and investments, you will find our people willing to put in perhaps an equal amount of faith and cash."

THE DRUMMOND MINE

at Westville was visited, and the Acadia mines. Those who went to the *Drummond* were shown over the works, and several of the ladies went down the shaft. This colliery is running on full time, giving employment to 450 men and boys, and has a daily output of 600 tons. It is now owned by Montreal parties, who have a capital of \$750,000, and is famous on account of the great explosion of 1873, when the mine was destroyed by fire and sixty-five men and boys perished. The present workings have reached a depth of 2,800 feet.

Sir George Elliott, the wealthiest colliery owner in the north of England, was with the visitors to the *Drummond* and has laid before Montreal capitalists a scheme for pooling or amalgamating the four Pictou colliers under one powerful syndicate with increased capital and more economic management, with a view to putting an end to the existing competition. Sir George inspected the *Albion*, *Vale* and *Acadia* mines as well as the *Drummond*, and was particularly struck with the vast quantity of coal available. He declared that, considering the depth, there is three times more coal in Nova Scotia than in any similar area in the world, and that this vast deposit had not yet been even "scratched."

GYPNUM QUARRIES.

Those of the members of the Institute who formed the Annapolis party were entertained at Windsor and inspected Mr. Dimock's gypsum quarries on the banks of the river Avon. These are among the finest white gypsum quarries on this continent and were inspected with much interest by the visitors.

AT GRAND PRE

this party made a short halt and were given an opportunity of visiting the forge of Basil, the blacksmith, the cottage of Evangeline, the grave of Evangeline's father, and several other points of interest in the locality.

During the excursions of the different parties the more important coal, iron and gold mines in operation were inspected by the Mining Engineers, as well as the gypsum quarries. The visitors saw a great deal that was new and interesting to them and no doubt gathered much information. The Halifax meeting of the American Institute of Mining Engineers is pronounced to have been in every way successful, and it will probably have the effect of giving an impetus to the mining industries throughout the Province of Nova Scotia.

GOLD IN BRITISH COLUMBIA.

Rich Mines on the Columbia River—Placers that in 1862 Yielded 300 Ounces of Dust a Day—Crumbling Red Quartz with Yellow Veins and Flakes of Pure Gold.

It will be remembered that about twenty-five years ago enormously rich discoveries of gold in placers were made in the northern interior of British Columbia, or "the Fraser River country," as it was then more popularly known. It was no uncommon thing in 1862 to take from one claim on the southern or eastern slopes of the Caribou Mountains 250 or 300 ounces of gold a day, equalling a coin value in New York (at that period of high premiums) of from \$5,000 to \$8,000. The lavish and riotous waste which ensued during the season that this continued was never exceeded in the romantic annals of gold mining.

Further prospecting in that region led to the discovery, in 1866, of good placers upon Gold and McCullough Creeks, near the Big Bend of the Columbia, and some working was done there under almost insurmountable difficulties for one or two seasons. The great expense and hardship to be encountered by miners in that remote and inclement region caused its early abandonment, however, though it was well known that valuable mines would be opened there as soon as the advance of civilization rendered them accessible.

The approaching completion of the Canadian Pacific Railway has now brought about this result by opening communication into these mineral-bearing mountains, and the miners are again flocking to the deserted creek beds and rehabilitating the abandoned camps. Though the present summer has witnessed the beginning only of the new era of prospecting and mining, there is every promise that the movement will be continuous and increasing until a large and prosperous mining population shall enliven the solitudes that are now rarely penetrated by the most daring Indian.

The Rocky Mountains trend so rapidly westward, north of the boundary line, that in latitude 52°, about where the new railway crosses, they lie considerably west of the meridian of

Salt Lake, and, instead of being 600 miles wide, as in Colorado and Utah, they are not over 150. They consist in that region of three parallel masses or ranges. The easternmost is the Rockies proper, the watershed between the Atlantic and the Pacific. It is here a broken and disordered range of uplifted metamorphic rocks covered with ice and snow, and formed, by their original rupture and the subsequent effects of the weather, into snapes of the most fantastic, yet gigantic, beauty. Next westward, is the equally grand and lofty, but more orderly, range, called the Selkirks, whose glacier-capped summits bristle with innumerable black pinnacles, making most striking scenery. Beyond the western foothills these rises a third and lesser uplift, known as the Gold Range, in which, no doubt, may be traced the geological, if not the geographical, backbone of the continent and beyond which the land falls away to the plateaus of British Columbia.

These three ranges are separated from one another by the Columbia river.

This great water-course rises in some lakes lying near the international boundary between the Rockies and the Selkirks. Thence, a strong swift stream, it flows northward for 100 miles before it can find its way past the huge wall of the Selkirks on its left; then it makes a sudden sharp sweep westward around the northern end of this range, and begins a course straight southward, between the western flank of the Selkirk and the eastern foothills of the Gold Range, and continues this until it has descended to the mouth of the Snake River in Idaho, when it turns westward to the sea, dividing Oregon from Washington Territory. The sharp sweep which the river makes around the northern end of the Selkirks is called the Big Bend, and it is there that the new gold excitement finds its present focus, though Farwell is the entrance point and supplying centre.

The placer deposits worked by the miners of '66 in Gold and McCullough Creeks, which enter the river near the Big Bend (whose landings, Boat Encampment and La Porte, will be recalled), showed that in the Gold range, whence they came, there must be other ledges of auriferous quartz; but when it was found impossible to supply themselves even with provisions, any thought of the introduction of machinery needed for the working of quartz was, of course, futile. Now, however, prospectors are finding quartz ledges and the construction of the railway, to be completed in November of the present year, will furnish a means for the introduction of needful machinery and supplies.

The course of the railway through Kicking Horse Pass in the Rockies, Beaver Pass in the Selkirks, and Eagle Pass in the Gold Range, leads it to make its second crossing of the Columbia at Farwell, only forty-five miles below the two placer-bordered creeks mentioned. Next year, doubtless, a steamboat will be put on between Farwell, the town now growing up at the crossing, and the Big Bend, but at present a trail for pack-horses, which is to be extended into a waggon road next spring, is the only means of ingress. This lack of a road for only forty-five miles may seem a trivial obstacle to some readers, but those who have ever seen the roughness of those foothills and the amazing density and the gloom of the forests will readily understand the vital importance of a road. The trail is being cut by the Provincial Government, which will also build the waggon road. It is impracticable to pull an ordinary boat up the river.

This work would not be done, of course, had not recent explorations confirmed the old information and added much that is new. Several

ledges which have long been known on McCullough and Gold Creeks are now being thoroughly examined by means of shafts and tunnels in order to determine their extent and probable value. On another stream, French Creek, close by, quartz rich in both gold and silver has been opened, and it is thought to be abundant. Every day brings word of some new "find" in the neighbourhood, and the expectations of every one who has seen the specimens brought back are roused to the highest pitch.

That it is reasonable to suppose that good mines will be developed in that region is indisputable when one studies the relation between this Big Bend district and the other gold and silver producing districts of the North-West. The line of uplift, continuous with the Gold and the Selkirk ranges, and extending to Grace River and beyond, is that upon which, in 1862, the fabulously rich Caribou placers were found, implying, of course, quartz in the heights behind. Along the Canon River, between the Caribou and the Big Bend districts, every little snow-fed stream yields more or less of the precious metal, and at Big Bend the deeper the mountains are penetrated the more encouraging are the reports. Following southward along these ranges, creek after creek pours into the Columbia its tribute of golden gravel, in many places destined to attract miners now overlooking anything less than the extraordinary. The valley of the Illecillewaet, by which the railway descends the western slope of the Selkirks, shows that it is worth while to prospect the whole of that range on account of its exhibition of lodes yielding rich assays in silver, galena, chlorides, and sulphurets. Farther down in the Kootenay district are mines now well advanced that are yielding ores which pay a fine profit after being carried on horseback or in waggons for 200 miles, and then shipped to Omaha or San Francisco for smelting. The same line of mountains traced still further southward leads to the mining regions of Montana and Idaho, to the richest regions of Utah, and so on to Arizona and Mexico.

Moreover, the appearance of the ores produced in this far North-West is similar to that of the rock found to be rich in Kootenay, Montana and Utah. Silver specimens closely resemble the ores at Butte City, Montana, while the gold-bearing rock from Big Bend would be easily mistaken for that coming from the Summit district of Colorado, where some ore is worth \$20,000 a ton. This gold ore is a rusty, reddish, half decomposed quartz, through which the gold is distributed in thin streaks, where it lies crowded in flakes easily visible to the naked eye, and often in places as large as the head of a lead pencil. Some small pieces of quartz are more than half their weight in pure gold.

It is quite certain that next spring will see a great rush to the Big Bend, and that after the inevitable boom of noise, success, failure, and experiment passes by, a residuum of solid and increasing value will remain, of which a very productive gold and silver district will be made to yield its much-needed addition of coin.

James W. Marshall, the discoverer of gold in California, died on the 10th of August at his home in Kelsey. He was seventy-four years old and died a poverty-stricken and disappointed man.

The lime cartridge, for use in coal mining, seems to be growing into general favor in England. The London *Mining Journal* reports that it is proving a decidedly economical substitute for dangerous shot firing.

CALUMET AND HEOLA.

This world renowned copper mine is now opened for fifteen years ahead. That is, if not another stroke of development work were made, or if the mine "petered" at the bottom, fifteen years of copper product at the present rate of annual production could be taken out of the mine. If the Tamarack shaft demonstrates the continuance of the Calumet vein throughout its property, President Agassiz says that the company has then sixty years of copper production in its territory. At the recent annual meeting President Agassiz told the stockholders that the mine was now producing 500 tons more of mineral per month than last year, at very little increased cost. Five hundred tons per month means 6,000 tons per year, which, assaying seventy-five per cent. pure copper, means 4,500 tons of ingot, which, at \$200 per ton, or ten cents per pound, is \$900,000 per annum.

THE TREADWELL MINE.

Sixty thousand dollars in bullion was forwarded in September from this wonderful quartz mine on Douglas Island, Alaska, and represents a considerable profit to those interested.

With the machinery used the cost of mining and milling the ore will not exceed at the utmost \$1.50 per ton, while Mr. Treadwell states that he can mine and mill it for \$1.10. The ore pays about \$8.50 to the ton, so it can readily be summed up to the amount of profit that is made from the mine. Considering the inexhaustible quantities of paying ore there is in this phenomenal deposit, the owners have a constant source of wealth, and the development has been done by a very few California capitalists.

The mill at the mine is probably the largest and best constructed stamp-mill in the world. It has 120 stamps, runs day and night, and requires 250 miners and other employees to keep it working. The machinery is all of the latest and most approved pattern, and there is ore enough in sight to run the 120 stamps for fifty years.

Senator Jones, of Nevada, one of the parties interested, has recently visited the mine and pronounces it the *biggest thing on record*.

MINING NOTES.

NOVA SCOTIA.

A deposit of copper ore has been discovered near Pugwash, situated close to the main road and within a short distance of the coast.

The gold mine at East Rawdon continues to yield good returns. During the month of August gold to the value of \$8,350 was taken out.

A brick of gold weighing 51 ounces was taken to Halifax in September from the Caribou mine. The brick was valued at \$950 and was the result of three weeks' labor of six men.

A manganese property in East Onslow, Colchester County, has passed into the hands of a New York firm, who have the necessary means and practical knowledge to work it to advantage.

The largest bar of gold ever seen in Nova Scotia was taken to Halifax last month from the New Albion mine at Mentague. It weighed 1,054½ ounces and was the product of fourteen days' crushing in a twenty-stamp mill. It was valued at \$20,610.

The Cowan mine at Kemptville, 23 miles from Yarmouth, is doing good work. From the last crushing gold to the value of \$1,600 was obtained, and there is every prospect that the next crushing will yield a still better return. Thirty men are employed at this mine and the force will be increased so soon as provision can be made for additional accommodation.

Returns from the Nova Scotia gold mines, received up to September 15th, show the following production:—

Districts.	Tons Quartz	Oz. Gold.
Salmon River.....	960	725
Sherbrooke.....	112	16
Lake Catcha.....	214	217
East Rawdon.....	136	420½
Uniacke.....	76	12

PROVINCE OF QUEBEC.

The Albert Mining Company are about to introduce steam drills in their copper mine at Capelton.

Six asbestos mines in the Eastern Townships give employment to 350 men, and the yearly output aggregates 1,200 to 1,400 tons.

The Orford Copper and Sulphur Company are stacking their surplus ore near the Passumpsic Railway track so that it can be conveniently loaded into cars when wanted.

The only mica mine that is being worked in the province is the Villeneuve mine. With a small force employed this property is yielding abundantly and the mica is of the very highest grade.

The phosphate mines of Ottawa County are turning out more ore now than at any previous period since they were opened. Four mines give employment to 333 men, from which the September output aggregated 2,555 tons.

The St. Onge Gold Mining Company have penetrated wonderfully rich gravel at the bottom of their shaft on Slate Creek, and are now washing gold in quantity. This company have no doubt hit upon the richest alluvial gold deposit in the Beauce district.

PROVINCE OF ONTARIO.

A company at Lake Linden, Michigan, have secured important mining property in the Silver and Rabbit Mountain regions of Canada.

A deposit of copper ore near Sudbury is being prospected by New York parties under a bond from the owners. An equitable arrangement has been entered into by the parties concerned by which the owners receive a royalty on ore extracted while the property is being tested. The lessees have bound themselves to extract a certain number of tons of ore quarterly or pay the royalty on the specified amount. The lease is for one year with option to purchase, and renewable under certain conditions.

Mr. Charles F. Eschweiler, superintendent of the Huronian mine, Lake Superior district, recently forwarded a sample of ore taken from the vein to Ledoux & Ricketts, assayers, New York, and has received the firm's report of assay, as follows:—138.49 ounces of gold and 1,057.22 ounces of silver per ton of 2,000 lbs. Taking gold at its value of \$20.67 per ounce and silver at \$1.07 per ounce, the assay shows a value of \$2,852.58 in gold and \$1,131.33 in silver, or a total of \$3,983.91 per ton.

BRITISH COLUMBIA.

Gold has been struck on Finley Creek, Kootenay district, and a great many Chinese are moving in from the Wild Horse country to work the placers.

Men working on the government trail from Goat river to the Fort Shepherd trail have found gold quartz on the route. The news has drawn many prospectors thither.

Work in the galena mines at Upper Kootenay is at a standstill. The Ainsworth Company have only a few men employed, and the Connecticut Company are nearly idle.

It is rumoured that the iron mine at Socke, owned by F. G. Richards & Co., of Victoria, has been sold to English capitalists and that it will soon be opened and smelting works established.

The mines at Kootenay are developing well, according to report of Gold Commissioner Vowell, and are giving every appearance of yielding an abundant supply of good ore. The "Ella" and "New Jerusalem" claims are giving rich indications.

A large party of eastern gentlemen, connected with the Kootenay Mining and Smelting Company, having a mining expert from Germany with them, came over the Northern Pacific line and passed up to the lake on Sept. 1st, their object being to locate a smelter and erect plant.

Great complaints are heard on all sides from miners and others in the Kootenay district on account of the uncertainty which prevails with reference to the Ainsworth land grant. It is said that unless something is done shortly in this matter it will very much retard the progress of mining in that section.

It is said that petroleum has been discovered in British Columbia. It was observed floating on a small creek about 100 miles from Victoria. It is opaque and nearly as thick as molasses; poured on paper it burns freely and emits the odor of coal oil. It is supposed that near this spot will be found a large supply of native petroleum.

A large number of miners from Loino Creek arrived in Victoria in September. They report the mines have been worked out, and none of those who came down had any more than they went up with. There has been some gold taken out, but the money expended in getting it will nearly balance this. A few, however, have taken out somewhat more than expenses.

At the Shuswap Silver Mine a tunnel has been driven for 50 feet, and some cross-cuts have been made. The company are now sinking a shaft and report the ore improving as work progresses. There is an almost inexhaustible quantity of ore, and if it is found to carry silver in paying quantity it is expected that Montreal capitalists will immediately commence the development of the mine.

The Kootenay Mining and Smelting Company are very active and persevering in their efforts to get to work this year. They have completed their work in so far as getting communication with the Northern Pacific railroad, having now a direct route from thence to the mines. Parties going to the mines can now go

from Sand Point, on the Northern Pacific railroad, direct to any part of the lake in twenty-four hours by taking the new road from Mud slough to the river at Bonner's Ferry, and the company's steamer to the mines.

The representatives of a company of eastern and Chinese capitalists have been in negotiation with the government of British Columbia for some time with the object of introducing the manufacture of iron and steel on a large scale. It is proposed to erect extensive smelting works near the iron deposits on the east coast, and proceed to open them and manufacture steel and iron for export to China and Japan. The company have unlimited means.

The gold strike on Granite Creek, a branch of the Semilkameen River close to the American boundary, is attracting wide attention. Upwards of 1,000 men are in the district, whose success varies from food to \$100 a day per man. Access to the diggings is gained via Hope and Fraser river, and provisions are plentiful. Benches on the upper part of the creek are said to prospect well, nuggets worth from \$8 to \$10 are being taken out. The creek is staked off for two and a half miles from its mouth. There is also reported a rich quartz strike on Kettle River, but as yet little is known of it.

UNITED STATES.

The Calumet and Hecla product for the month of August was 2,575 tons, 1,285 pounds.

The output of the mineral products of the United States, in 1884, were valued at \$403,104,620.

The production of phosphates in South Carolina for 1884 was 409,000 tons of rock and 236,884 tons of fertilizers.

The total amount of assessments levied by the Eureka Silver Mining Company, of Nevada, is \$350,000. The total amount paid in dividends aggregates nearly \$5,000,000.

Of gold and silver the mint authorities estimate the production in the United States, in 1884, at \$30,800,000 gold, and \$48,800,000 silver (coining rate); total, \$79,600,000.

The Plymouth Consolidated Mining Company, California, have paid their twenty-eighth successive monthly dividend of fifty cents a share, aggregating \$50,000 and making \$450,000 paid to their shareholders this year.

Unified Diamond Mines (Limited).

This company has been organized in London, England, with a capital of £10,000,000, with the view to purchasing as large a number as possible of the diamond mining properties, situated in the four mines, Kimberley, De Beers, Dutoitspan, and Bultfontein. These four mines, since their discovery in 1870, have produced more than £40,000,000 worth of diamonds. According to the official statistics of the Cape Colony, the product of the four mines added together exceeded during the last two years the respective figures of £2,680,000, and £2,480,000, even at the actual low price of diamonds. At a meeting of directors held August 7th, the note upon the purchase scheme was amended. Indebted companies are to pay fifteen shares of £20 each for eight debentures of £20 each.

A Large Piece of Amber.

A piece of amber weighing eight pounds is at present being exhibited in the Mark Museum at Dantzig, for which the owner has refused £1,500. It is probably the largest piece in the world without blemish. Frederick the Great, more than a century ago, paid the same sum for a piece weighing 13lbs., which is preserved in the mineralogical museum at Berlin; but it has gaps and cavities. Two beautiful pieces of work in amber are also to be seen in Berlin. One is a flute, which also was an acquisition of Frederick the Great. The other is a complete tobacco-pipe, belonging to Frederick William III., the father of the present Emperor; it bears an admirably carved likeness of that monarch.

NOTES.

The exports of iron ore from Spain during the first five months of 1885 were 1,226,377 tons.

Four thousand five hundred and sixty feet is the depth recently reached by a Prussian diamond drill.

The opinion is now entertained that the art of making artificial stone is pre-historic, and that the Pyramids were built of that material.

Spain exported during the first five months of 1885, 51,235 tons of pig lead compared with 52,119 tons during the same period in 1884.

From a report of the Commissioner of Lands of British North Borneo it appears that gold exists in considerable quantities in that territory.

The total value of all minerals raised in the United Kingdom in 1884 is reported as £61,232,028 at the mine, as against £64,635,834 in 1883.

The exportation of ingot copper from Spain during the first five months of 1885 amounts to 11,688 tons compared with 6,223 tons during the same period in 1884.

The deepest mines in Great Britain are in Cornwall and Devon, the three deepest being Dolcoath, 2,416 feet; Clifford Amalgamated, 2,232 feet; and Tresavean, 2,100.

El Callao: this famous Venezuelan gold mine produced 10,518 ounces of gold during July, worth about \$203,786. It paid a dividend of \$2.40 per share, aggregating \$77,280.

C. G. Hussey & Co., at Pittsburg, Pa., have just made six sheets of copper that are believed to be the largest ever rolled. Each sheet is 13 feet 9 inches long and 9 feet 7 inches wide.

The deepest boring in existence is for coal near the village of Schladebuch, between Corbetta and Leipzig, which has reached a depth of 4,559 feet. This boring is 1,872 inches at the bottom and 11 inches at surface.

The New South Wales Gold Product for 1884: according to the annual report of Mr. C. S. Wilkinson, F.G.S., F.I.S., Inspector, was 104,932.68 ounces (\$2,100,000), being 16,844.70 ounces (\$316,000) less than product of 1883. Thus it is apparent that the annual product of the Australian gold fields continues to decrease steadily year by year.

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

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 decline to enter into a contract to do so, or if he fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

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

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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.



CONTRACT FOR SUPPLY OF MAIL BAGS.

SEALED TENDERS addressed to the Postmaster General, (for Printing and Supply Branch), and marked "Tender for Mail Bags" will be received at Ottawa until 12 o'clock, noon, on MONDAY, the 2nd NOVEMBER, 1885, for the supply of the Post Office Department of Canada with such Cotton Duck, Jute and Leather Mail Bags as may from time to time be required for the Postal Service of the Dominion.

Samples of the Bags to be furnished may be seen at the Post Offices at Halifax, N.S., St. John, N.B., Charlottetown, P.E.I., Quebec, Montreal, Ottawa, Toronto, London, Winnipeg, Man., Victoria, B.C., or at the Post Office Department at Ottawa.

The Bags supplied, both as regards material and manufacture, to be fully equal to the samples, and to be delivered from time to time in such quantities as may be required at Ottawa.

The contract, if satisfactorily executed, shall continue in force for the term of four years, provided always the workmanship and material be satisfactory to the Postmaster General.

Each tender to state the price asked per bag in the form and manner prescribed by the form of tender, and to be accompanied by the written guarantee of two responsible parties, undertaking that in the event of the tender being accepted, the contract shall be duly executed by the party tendering for the price demanded. Undertaking also to become bound with the contractor in the sum of two thousand dollars for the performance of the contract.

Printed forms of tender and guarantee may be obtained at the Post Offices above named, or at the Post Office Department, Ottawa.

The lowest or any tender will not necessarily be accepted.

WILLIAM WHITE,
Secretary.

Post Office Department, Canada,
Ottawa, 1st October, 1885.



GRAND COLONIAL

Exhibition in London, Eng.,
1886.

FIFTY-FOUR THOUSAND FEET RESERVED
FOR CANADA.

First Royal Exhibition Com-
mission 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 earnest in assisting, it having been already demonstrated that extension of trade always follows such effort.

By order,

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

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