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CANADIAN MINING REVIEW

Vol. V.—No. 2.

1887.—OTTAWA, APRIL—1887.

Vol. V.—No. 2.

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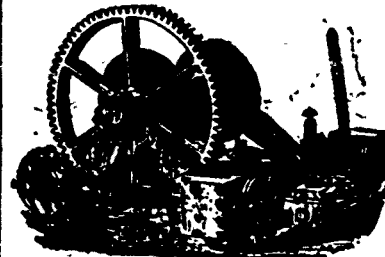
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NOTICE.

SEALED TENDERS, addressed to the undersigned, and endorsed "Tender for Indian Supplies," will be received at this office up to noon of SATURDAY, 30th April, 1887, for the delivery of Indian Supplies during the fiscal year ending 30th June, 1888, consisting of Flour, Bacon, Groceries, Ammunition, Twine, Oxen, Cows, Bulls, Agricultural Implements, Tools, &c., duty paid, at various points in Manitoba and the North-West Territories.

Forms of tender containing full particulars relative to the Supplies required, dates of delivery, &c., may be had by applying to the undersigned, or to the Indian Commissioner at Regina, or to the Indian Office, Winnipeg.

Parties may tender for each description of goods (or for any portion of each description of goods) separately, or for all the goods called for in the Schedules, and the Department reserves to itself the right to reject the whole or any part of a tender.

Each tender must be accompanied by an accepted Cheque on a Canadian Bank, in favour of the Superintendent General of Indian Affairs for at least five per cent. of the amount of the tender which will be forfeited if the party tendering declines to enter into a contract based on such tender when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

Tenders must make up in the Money column in the Schedule the total money value of the goods they offer to supply, or their tender will not be entertained.

Each tender must, in addition to the signature of the tenderer, be signed by two sureties acceptable to the Department, for the proper performance of the contract.

When implements of a particular make are mentioned it is because the articles so designated suit the Department for the purpose required better than others; in such cases the competition between tenderers must, of course, be in the transportation to the place of delivery.

In all cases where transportation may be only partial by rail, contractors must make proper arrangements for supplies to be forwarded at once from railway stations to their destination in the Government Warehouse at the point of delivery.

Tenderers will please note carefully the following conditions:-

- 1. Supplies will not be paid for until the Department has been assured of the satisfactory delivery of each article for which payment is claimed.
2. No tender for supplies of a description different to that given in the index will be considered, and supplies which are found, on delivery, to be of a kind or quality different to those described, will be rejected by the agents of the Department; and the contractor and his sureties will be held responsible for any loss entailed on the Department through failure to deliver in accordance with terms of contract.
3. It must be distinctly understood that supplies are to be delivered at the various points for the prices named in the tender; that no additional charge for packing or any other account will be entertained, and that an invoice must accompany each separate delivery of supplies. An invoice for each separate delivery must also be sent to the Department of Indian Affairs at Ottawa, and one to the Indian Commissioner at Regina, if the supplies are for the North-West Territories. When the supplies are for points in the Manitoba Superintendency the triplicate invoice should be sent to E. McCall, Winnipeg.
4. Prices must be given for articles to be delivered at each point of delivery named in the Schedule for each article for which a tender is submitted, and not an average price for each article at all points of delivery; no tender based on a system of averages will be considered.
5. Tenderers should understand that they must bear the cost, not only of sending their samples to the Departments of Indian Affairs but also freight charges incurred in returning such samples to the tenderer.
6. When supplies are to be delivered "equal to sample," tenderers should understand that the sample is to be seen either at the Department of Indian Affairs, at the office of the Indian Commissioner at Regina, at the office of the Inspector in charge at Winnipeg, or at any one of the undermentioned Indian Agencies.

MANITOBA.

Table with 2 columns: Agent and Agency. Lists agents like H. Martineau and agencies like The Narrows, Lake Manitoba.

NORTH-WEST TERRITORIES.

Table with 2 columns: Agent and Agency. Lists agents like J. A. Markle and agencies like Birle, Moose Mountain, Crooked Lakes.

L. VANKOUGHNET,

Deputy to the Superintendent-General of Indian Affairs

Department of Indian Affairs, Ottawa, February, 1887.



TENDERS.

SEALED TENDERS, marked "For Mounted Police Provisions and Light Supplies," and addressed to the Honourable the President of the Privy Council, Ottawa, will be received up to noon on Monday, May 30th, 1887.

Printed forms of tenders, containing full information as to the articles and approximate quantities required, may be had on application at any of the Mounted Police Posts in the North-West, or at the office of the undersigned.

No tender will be received unless made on such printed forms.

The lowest or any tender not necessarily accepted. Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the service contracted for. If the tender be not accepted the cheque will be returned.

No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

FRED. WHITE,

Comptroller, N. W. M. Police. Ottawa, March 25th, 1887.



Department of Inland Revenue.

An Act respecting Agricultural Fertilizers.

The public is hereby notified that the provisions of the Act respecting AGRICULTURAL FERTILIZERS came into force on the 1st of January 1886 and that all Fertilizers sold thereafter require to be sold subject to the conditions and restrictions therein contained--the main features of which are as follows:

The expression "fertilizer" means and includes all fertilizers which are sold at more than TEN DOLLARS per ton, and which contains ammonia, or its equivalent of nitrogen, or phosphoric acid.

Every manufacturer or importer of fertilizers for sale, shall, in the course of the month of January in each year, and before offering the same fertilizer for sale, transmit to the Minister of Inland Revenue, carriage paid, a sealed glass jar, containing at least two pounds of the fertilizer manufactured or imported by him, with the certificate of analysis of the same, together with an affidavit setting forth what each jar contains a fair average sample of the fertilizer manufactured or imported by him; and such sample shall be preserved by the Minister of Inland Revenue for the purpose of comparison with any sample of fertilizer which is obtained in the course of the twelve months then next ensuing from such manufacturer or importer, and which is transmitted to the chief analyst for analysis.

If the fertilizer is put up in packages, every such package intended for sale or distribution within Canada shall have the manufacturer's certificate of analysis placed upon or securely attached to each package by the manufacturer; if the fertilizer is in bags it shall be distinctly stamped or printed upon each bag; if it is in barrels, it shall be either branded, stamped or printed upon the head of each barrel or distinctly printed upon good paper and securely pasted upon the head of each barrel, or upon a tag securely attached to the head of each barrel; if it is in bulk, the manufacturer's certificate shall be produced and a copy given to each purchaser.

No fertilizer shall be sold or offered or exposed for sale unless a certificate of

analysis and sample of the same shall have been transmitted to the Minister of Inland Revenue and the provisions of the foregoing sub-section have been complied with.

Every person who sells or offers or exposes for sale any fertilizer, in respect of which the provisions of this Act have not been complied with--or who permits a certificate of analysis to be attached to any package, bag or barrel of such fertilizer, or to be produced to the Inspector, to accompany the bill of inspection of such inspector stating that the fertilizer contains a larger percentage of the constituents mentioned in sub-section No. 11 of the Act than is contained therein--or who sells, offers or exposes for sale any fertilizer purporting to have been inspected, and which does not contain the percentage of constituents mentioned in the next preceding section--or who sells or offers or exposes for sale any fertilizer which does not contain the percentage of constituents mentioned in the manufacturer's certificate accompanying the same, shall be liable in each case to a penalty not exceeding fifty dollars for the first offence, and for each subsequent offence to a penalty not exceeding one hundred dollars. Provided always that deficiency of one per centum of the ammonia, or its equivalent of nitrogen, or of the phosphoric acid, claimed to be contained, shall not be considered as evidence of fraudulent intent.

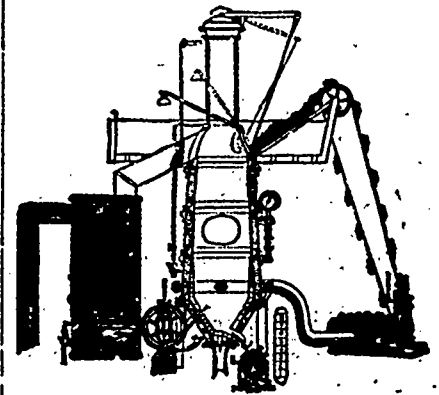
The Act passed in the forty-seventh year of Her Majesty's reign, chaptered thirty-seven and entitled, "An Act to prevent fraud in the manufacture and sale of agricultural fertilizers," is by this Act repealed, except in regard to any offence committed against it or any prosecution or other act commenced and not concluded or completed, and any payment of money due in respect of any provision thereof.

A copy of the Act may be obtained upon application to the Department of Inland Revenue.

E. MIALl,

Commissioner.

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SEALED TENDERS, marked "For Mounted Police Clothing Supplies," and addressed to the Honourable the President of the Privy Council, Ottawa, will be received up to noon on Monday, 2nd May, 1887.

Printed forms of tender, containing full information as to the articles and quantities required, may be had on application to the undersigned.

No tenders will be received unless made on such printed forms. Patterns of all articles may be seen at the office of the undersigned.

Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to 10 per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted the cheque will be returned.

No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

FRED. WHITE,

Comptroller, N. W. M. Police. Ottawa, March 25th, 1887.



NOTICE RESPECTING PASSPORTS.

PERSONS requiring passports from the Canadian Government should make application to this Department for the same, such application to be accompanied by the sum of four dollars, in payment of the official fee upon passports as fixed by the Governor-in-Council.

G. POWELL,

Under Secretary of State. OTTAWA, 19th Feb., 1886.

Canadian Mining Review,

OTTAWA.

PUBLISHED MONTHLY.

ANNUAL SUBSCRIPTION \$1.00

ADVERTISING RATES 15c. per line (12 lines to 1 inch).

OFFICE:

UNION CHAMBERS, 14 Metcalfe St.

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 17th of the month.

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

Advertising Space.

The circulation of the CANADIAN MINING REVIEW, which has steadily been going up since its first publication, more than five years ago, has now more than doubled the estimate upon which we had reckoned, and its value as an advertising medium to business men who wish to reach the best classes of mine owners and operators, and the mining centres and camps of every province in the Dominion, is consequently very greatly enhanced. The REVIEW is in the widest sense a Canadian journal belonging to all provinces alike; it is the only journal published in Canada wholly devoted to the interests of her mining industries and mineral resources. We would simply draw the attention of those who have hitherto overlooked it, to this matter, promising our best attention and most reasonable terms on any application for advertising space.

A National Museum.

That there is a necessity for a National Museum has long been conceded, and the consensus of public opinion points to the present as a fitting season to press upon the Dominion Government the urgency of its speedy erection. It might be worth while to view the matter both from an economic and scientific standpoint. We place the former first, as, to the great mass of the people, this is of the first importance, the scientific aspect being chiefly for the few, although absolutely necessary as a basis for the proper working of the institution. Many suggestions have been made regarding the scope of the proposed institution, and many places have been named as suitable for its site at Ottawa, but it is not our intention to enter into these points other than to say that such a National Museum should be an extension of the

present Government Geological and Natural History Survey Museum at Ottawa, and should be kept strictly within the lines of that excellent Department. According to Act of Parliament this Survey now includes within the range of its operations the three kingdoms of nature as represented in our Dominion, and necessarily the new National Museum must include all these branches of its work. Keeping in view the objects of the Government when the Act was passed, Dr. Selwyn, the Director of the Survey, has steadily kept this in view in the arrangement of the present Government building, and although the space is very much cramped, both the economic and the scientific aspects have been carefully kept in view. Visitors to the museum can see a double arrangement of the mineral sections showing an economic and a scientific aspect, and the same arrangement in the animal, vegetable and other sections would have been carried out had space permitted. At the recent Indian and Colonial Exhibition our exhibitors were able to show the economic value of our resources by their wonderful collections of food fishes, large mammals and birds suitable for food. There too were shown the products of our mines, of our forests, and of our fields. Here in our own Capital we cannot show even to our members of Parliament the wealth of our country, and many of them are as ignorant of our great national resources as the veriest stranger who comes within our gates.

We do not want a building to cover acres of ground and cost millions of money, but we do want one large enough to exhibit the whole natural products of the country, and on such a scale as will make it possible to bring together from every portion of our great Dominion, as well as from foreign countries, such a collection as would be of great practical benefit to all Canadians engaged in industrial and scientific pursuits. To do this properly would require at least a building of three stories. The ground floor for minerals; the middle for fossils, and the top flat for botany and zoology. On this plan the heavy exhibits would be placed at the base and the lighter at the top. With the exception of offices, a building one-third larger than the present museum would be amply sufficient for many years.

Many reasons might be adduced in favor of the project but we only advance a few. The principal one is the insecurity of the present building. It may be destroyed by fire at any time. At present it holds the most precious collection of minerals, fossils, and botanical specimens contained in any one building on the American continent. The loss of such a valuable collection would be irreparable.—In a monetary sense they represent more than a million of dollars. They include much of the life work of Sir William Logan, Billings, Whiteaves, and Macoun, besides the gatherings of over forty years of the various other members of the staff. Surely these are worthy of a better fate.

Throughout the world to-day the cry is arising give us food for the mind as well as for the body, and the answer has been given almost everywhere, except Canada, by the erection and equipment of national museums for the enlightenment of the people. New South Wales, with a population less than that of Ontario, gave £15,000 last year to its museum in Melbourne. In the United States the practical aspect of the case has taken hold of the people, and in every State economic and scientific museums are being established, and specialists appointed to arrange and keep them in order. While the new Departmental and other public buildings, of which any nation might feel proud, were in course of construction, it was hardly proper to press this matter upon the government, but now that these are nearing completion it is both right and proper that the facts should be placed before the representatives of the people, and that they should be asked to assist the government, by their support, in projecting a scheme that will place Canada abreast of the other nations of the civilized world in the march of improvement.

The Yukon Expedition.

In a few days Dr. Dawson, Assistant Director of the Geological and Natural History Survey, accompanied by a small party, will start out on his expedition to the Yukon country. There he is to personally conduct the work relating to the Geological and Natural History of the country, and also to supervise that section of the exploration necessary to the topographical work. Mr. William Ogilvy, D.L.S., and astronomer, Ottawa, is to take charge of the topographical work, and will make an accurate survey and measurement of as much of the Yukon as lies within British territory. It is thought that Mr. Ogilvy will remain in the district during the whole of the winter of 1887, but Dr. Dawson is to return next fall by the Chilkoot Yukon route, which will enable him to obtain accurate geological data of the whole route to be traversed by the expedition. It is likely that the portion of the expedition under Dr. Dawson's charge will be able to make an exploratory and track survey, with astronomical determination of points on the Stickeen River, and the remainder of the route, until he joins Mr. Ogilvy, which will materially add to the geographical and geological knowledge of the whole region. The expedition will leave Victoria, British Columbia, early in May, and it is calculated that Mr. Ogilvy will reach the summit of the Perrier Pass about the 1st of June, and that after a junction has been effected there he will have a clear month within which to explore the surrounding country and yet enable Dr. Dawson to get out in the fall before the rivers are frozen. A great deal has been said and written about the mineral resources of this section of that great northern land, and it has been

announced that gold exists there in abundance. During the past summer we are informed that on a bar of the Stewart river as high as \$150 per day to the haul was made for 28 consecutive days. On the Salmon River from \$25 to \$50 per day was taken out, and many other districts are mentioned where the efforts of the miner have met with more than average success. These are cited to prove that a great mining future is in store for that section of the North-West that is drained by the waters of the mighty Yukon. Some again do not speak so favourably of it. They say that the mining which is almost entirely Placer has been very largely exaggerated, and that many after undergoing extreme hardship and privation have been glad to get out of the country alive. Provisions, and food of any kind are so scarce and difficult to obtain that those adventurous spirits who have penetrated within the lines of that great lone land have but barely existed. In the absence of any information that is absolutely trustworthy, a great rush to the country at present is to be avoided. Such would only result in disaster to the parties themselves and to the industry which they would seek to cultivate. Dr. Dawson's expedition will do much to reveal the true state of affairs. From a practical as well as a scientific standpoint the expedition is of the utmost importance to the country.

Our Geological Survey.

The Federal Government of the United States appropriated in 1884, for this branch of the State surveys, the sum of \$339,640, being an increase on the amount voted in former years. The following Local or State Governments set apart for their local Geological Survey, or in the interests of the mining development in these states, the following sums: California, \$15,000 a year for State Mining Bureau; Indiana, \$5,000 a year; New York, \$16,000. The following states have in former years made similar appropriations for this purpose, and are now in receipt of the benefits to be received from so safe an investment of the public funds as the sure result of the most complete knowledge of the mineral resources within the State, viz: Ohio, Wisconsin, Michigan, Minnesota, Iowa, Illinois, Tennessee.

The latest Report on the Mineral Resources of the United States by Albert Williams, Jr., for the year 1882, gives the total mineral production during that year for all the States at \$453,912,406. In round numbers the large sum of four hundred and fifty-four millions of dollars, it having increased from 1882 till this time.

The total mineral production of Canada cannot be ascertained from the census of 1880-81 as the number of tons of each class of product only is given, and value per ton is not mentioned, and hence the necessity that this matter should receive attention when the proposed Labor Bureau is organized.

The Dominion of Canada expends annually about \$100,000 for Geological Survey purposes, including Natural History, but this must not be understood to be for exploration of Dominion Lands alone, as the larger proportion or almost all of the sum is annually expended in the interests of the respective Provinces. This small appropriation is devoted to the Geological investigation of an extent of country covering an area of 3,500,000 square miles, and is territorially about equal in extent to the continent of Europe and larger in area than the United States and territories, but exclusive of Alaska. The Provincial or Local Governments at present do no Geological work, but in Newfoundland, which is not yet a Province of the Dominion, the sum of several thousand dollars has been of late years expended, and the minerals are retained by the Government for lease.

The Scientific and Educational uses of Geological work are of the highest importance, dealing with questions such as the origin of rocks and minerals, the changes that have taken place in the crust of the earth and are now taking place, these are the processes of formation and disintegration and result in the building up or destruction of continents, and many other subjects of interest not only to men of science but to the human race—the true order and condition of things as they were and are now, reduced as Professor Huxley expresses it “to one long chain in the ceaseless causation of nature.” The economic uses, however, interest us most and may be divided into four parts for purposes of illustration. The first necessity for the Geologist is a correct map or plan of the country to be examined; and this Dominion, as we have seen, is a rather large country and only partly surveyed, in which case the geologist has to first survey and map out the region. Certain rocks are found in the locality under examination and the question arises as to their age or period of formation, that is, do they contain evidences of animal or plant life? The Palaeontologist is the judge in this case, and according to the evidence produced is the verdict. It is, therefore, seen that the study of Palaeontology is of the first and highest importance to arrive at the correct stratigraphical and economic value of the rocks discovered and of the district under examination. In the event of no organic remains being discovered, and for the determination of such minerals and ores as may occur, their chemical composition has to be ascertained. This is the duty of the Mineralogist or Chemist. Ores having been found the question arises: are they of commercial value and in quantity to warrant the district being classed as a mining location? The settlement of this question is the province of the mining engineer, whose duty ought to be, under proper mining regulations or laws, the examination and inspection of the region, with the end in view, the full development of the minerals it contains. The notes taken in the field being disjointed or un-

connected as it were, have to be put in form so as to make an intelligible continuous readable account of the physical features, strata, &c., of the district. The work already mentioned is printed and published, and so to speak, tells its own story, but the geologist has of necessity a value to the public which does not show in print; it is that of giving information or explanation in writing, or by interview, of the district so reported on as a natural outcome of that publicity, and is often not by any means the least important duty to perform, and one that occupies much time and for which due credit ought to be given.

The map or plan can serve the double purpose of recording strata and indicating the occurrence of such minerals or ores as are of economic importance or scientific interest, including building materials, fertilizers, ores, coal, gas, oil, and mineral products used in the arts and manufactures. It can thus be clearly seen how great is the importance of geological work to the prosperity and happiness of the inhabitants of any country.

The advanced condition of Canadian geology will bear comparison with that of other countries and is highly creditable to so young a country and one of so extensive an area, but the great progress made in the early years was wholly due to the philanthropic spirit and a devotion to the science carried on at much personal expenditure and labor by the late Sir Wm. E. Logan, in whose praise it is not possible to pay too high a tribute. Since Confederation the Dominion has undertaken the work for the several provinces, and it is to be regretted that economically and financially the Provinces of New Brunswick, Quebec and Ontario have not made the best use of the mineral resources of these provinces, while Nova Scotia and British Columbia have retained the minerals and are now and will continue to receive benefits and income for so sure a course.

The large extent of territory only suitable for mining under Dominion and Provincial Governments makes it obligatory on these Governments that the best laws be enacted to encourage pioneer or individual exploration or prospecting with the view of the full development of the mineral wealth, and to receive in return a revenue to compensate for geological survey which is the certain and permanent result of such work.

In the Australian colonies where this industry is not neglected as it is in Canada, a minister of mines is the representative of the important industry of mining when the laws are such as to develop to the best advantage this source of national wealth of which we have a sufficiency in Canada for home and exportation use.

Mayor Stewart and Mr. W. A. Allan of Ottawa have received the bronze medal of the Indian and Colonial Exhibition for exhibits of coal and phosphates and other minerals sent by them.

The Cost of a Strike.

There is considerable monotony in repeating, time after time the story of what a great strike costs those who engage in it; but the lesson is sufficiently valuable to warrant infinite repetition in hope of ultimate conviction. Here is the latest tale of the kind:—

It is calculated that the total losses in wages by the recent strikes among the "Longshoremen" and other working people in New York and New Jersey, from January 1 to February 10, are 2,650,000 dollars, while the estimated loss of pay by 38,000 employees thrown out of work through scarcity of coal, or cognate cause, is 350,000 dollars. In addition to these figures we have:—Total extra amount paid for coal through strikes, 700,000 dollars; total losses incurred by steamship companies through delay, 100,000 dollars; total losses to coal-shippers, 100,000; total estimated losses of the export trade of New York in two weeks, 3,380,000 dollars. Persons interested in promoting strikes nearer home than New York or New Jersey might profitably employ some of their leisure in calculating how much, if any, profit has accrued by way of counterpoise to these figures.

We have received the second volume of the Journal of the Iron and Steel Institute of London, England, for 1886. This valuable and ever welcome work is edited by Mr. J. S. Jeans, and is largely made up of the transactions of the Institute at the last meeting held at London in October last. It contains verbatim reports of the many valuable papers read before the society then. These were "The Erosion of Gun-Barrels by Powder Products," by Sir F. Abel, C.B., F.R.S., and Col. Maitland; "The Iron-making Resources of the Colonies, as illustrated by the Colonial and Indian Exhibition," by Mr. P. C. Gilchrist and Mr. Edward Riley; "Some early forms of Bessemer Converters," by Sir Henry Bessemer, F.R.S.; "Modifications of Bessemer Converters for small changes," by Mr. John Hardisty; "On Combustion with Special Reference to Practical Requirements," by Mr. Frederick Siemens; "The Removal of the Metalloids in the Basic Open-Hearth Process," by Mr. F. W. Harbord; "The Casting of Chains in Solid Steel," by M. F. Gautier; "The Process employed in casting brass chains in Jeypore, Rajputana," by Surgeon-Major T. H. Hendley and Mr. C. H. Pardon Clarke, C.E.; "On Silicon in Foundry Iron," by M. F. Gautier; "The Chemical composition and mechanical properties of Chrome Steel," by M. Brastlein; "American Blast Furnace Practice with special reference to the works of the North Chicago Rolling Mill Company," by Mr. F. W. Gordon. One of the most attractive features of the volume is the very carefully compiled "Notes on the Progress of the Home and Foreign Iron and Steel Industries" classified under the heads of iron ores, fuel, refractory materials, production of

pig iron, production of malleable iron, forge and mill machinery, production of steel, &c., &c. In these a vast amount of useful information is included. Altogether the publication is of great worth and interest.

Iron, Steel and Coal in Canada.

The development of the coal and iron industries of the Dominion of Canada is at the present time a duty imperative upon the Dominion Government. Since Confederation the Dominion has incurred a large national debt abroad on which interest only has been paid, and the burden has therefore been light upon the people. Otherwise, the country would never have been able to bear the strain imposed by the excess in value of imports over exports, which, to July 1st, 1884, amounted to \$312,036,663.

To meet this excess of expenditure abroad Canada had only the annual revenue from her mercantile shipping, and the balance is represented by the national debt held abroad and a portion of the foreign capital invested in this country. The greater part of this excess of imports over exports is also represented by the importations into Canada of iron and steel to the value of \$230,741,434 since 1867. It thus becomes apparent that if Canada is to prevent the possibility of commercial bankruptcy, she must produce at home the iron and steel which has hitherto been imported from abroad for home consumption. It was wise and prudent to increase the national debt by constructing vast and necessary public works throughout the Dominion, at a comparatively small annual interest charged to the people; but as soon as Canada would attempt to live within herself and make her annual exports pay for her imports, then must she undertake to produce her iron and steel at home, rather than depend upon foreign nations for her annual consumption. The best way to do this is the problem, to the solution of which the statesmen of Canada must at once address themselves.

We use the statistics for 1884, as we have them compiled to hand. In that year Canada had about 10,000 miles of railway in operation; or an investment in railroads of \$.04 per head of the inhabitants which was only exceeded by that of Great Britain averaging \$107 per head, and that of the United States averaging \$112 per head; and at the same time it must be remembered that there is no other country in the world, which has such investments in railroads as those of Canada, that does not manufacture its own rails; while on the other hand there is no country in the world which has in its possession such natural advantages for the manufacture of iron and steel as those of this same Dominion. Yet what do we find? Instead of manufacturing our rails, we have imported in one year rails to the value of \$6,891,861, and in the same year iron to the value of \$9,456,189, which, together with the imports of iron and steel manufactures, aggregated an importation for Canadian consumption in one year of \$26,791,152. The question for Canadians to answer is how long can Canada afford to do this, with iron, coal, limestone, etc. offering unsurpassed advantages for the production of iron and steel, and the manufactures thereof, lying useless and worthless at her feet. At the same time, we have not only lost a home market for the coal which would have been consumed in the production of this iron and steel, but we have imported from abroad nearly \$60,000,000 of coal and coke for home

consumption. Certainly these facts are startling indeed.

The average annual excess of imports over exports into Canada to 1867-83, was \$20,119,804; the average importation of iron and steel and the manufactures thereof was \$13,573,600. In order to compare this showing with that of the United States, we produce the following per capita statistics:—

Year.	CONSUMPTION PER CAPITA OF IRON AND STEEL IMPORTATIONS.	
	Canada. cents.	United States. cents.
1867.....	—	69.03
1868.....	201.17	61.21
1869.....	216.78	74.37
1870.....	224.89	84.26
1871.....	301.00	109.35
1872.....	454.85	130.26
1873.....	701.41	137.47
1874.....	577.16	80.99
1875.....	515.33	16.47
1876.....	345.76	28.40
1877.....	289.38	21.92
1878.....	210.38	17.77
1879.....	199.57	19.62
1880.....	248.88	90.66
1881.....	297.69	99.99
1882.....	404.63	102.27
1883.....	455.80	74.40
1884.....	332.26	—

It will thus appear that while Canada has been importing iron and steel to the amount of \$7.01 per head in one year, the highest importation into the United States has only been \$1.37 per head. It is equally noteworthy that in Canada in the one year, the average rate of duty on the dutiable importation was 11.05 per cent; while in the United States in the other year the average rate on the dutiable importation was 31.81 per cent. The highest rate of duty levied in Canada in those seventeen years was 21.08 p.c., the lowest was 10.98 p.c. In the United States, the highest was 49.21 p.c.; the lowest was 31.46 p.c. These facts are suggestive as indicating that the United States have protected the home producers by tariffs ranging from 31 p.c. to 49 p.c., and have thereby encouraged home production and decreased the foreign importations. Canada has simply levied a revenue tariff ranging from 11 p.c. to 21 p.c. which has failed to encourage home production, while the country has sent \$230,741,434 (1867-83) out of the country to purchase these iron and steel products abroad.

No country in the world has developed its iron interests except by a policy of protection. England, United States, Germany, France, Russia, Sweden have all fostered this industry by special legislation. Canada has thus far done but little toward this end. About 20,000,000 tons of pig iron and 6,000,000 tons of steel are now annually produced, together with 100,000,000 tons of coal. With unsurpassed facilities for their production should Canada remain careless and indifferent?

From 1867 till 1880 pig iron was on the free list in Canada. What wonder that its production was not successfully attempted?

In 1880, a specific duty of \$2.60 per ton was levied; and from July 1st, 1883, to July 1st, 1886, a bounty of \$1.50 per ton was granted. In the latter year the bounty was reduced to \$1.00.

The United States levy a duty of \$10.00 per ton on pig iron; and \$12.50 per ton on scrap iron. These are fair samples of the different policies of the two countries. Shall Canada continue to give a duty and a bounty, combined,

of \$3 00, or shall the duties be removed from raw sugars and other raw imports, and from \$10.00 to \$15.00 be levied on pig and scrap iron, for instance, in order to foster the iron industries at home?

PHOSPHATE.

Latest English Quotations.

MINERAL PHOSPHATES.—The business done in Canadian has been principally on Continental account, and this has been restricted by a demand on the part of the Raisers for an increased price, and also by their unwillingness to sell until their prospects of output are more assured. Last season the quantity was several thousand tons less than the previous year, and Raisers are now endeavouring not only to recover their shortage, but to swell the shipments during the approaching season. There is some enquiry for Ground Canadian, but as the American Buyers can pay a higher price for this article, there will probably be less shipped to this Market. South Carolina Phosphates are unchanged. The new French Phosphate increases in popularity, and must henceforth be considered as an element in the trade. Shippers are getting over their difficulties, and are now able to deliver with greater rapidity. Belgian Phosphate has been quiet since our last, Manufacturers mostly being stocked for their immediate requirements. The present appears to be a good time to secure next season's supplies. Latest price for Canadian eleven pence three farthings for 80 p.c. Cambridge and Bedford Coprolites are unchanged, and quoted at 43s. f.o.r., or Ground at 50s. in Bayer's bags, or 52s. in lent bags, f.o.r., the latter at 26s., f.o.r., or 31s. 6d., f.o.b., Thames.

The first Annual meeting of the shareholders of the Templeton and Blanche River Phosphate Mining Company (limited) was held at Montreal on the 31st ultimo. The following directors were elected:—President, Mr. Wm. Cassils; Vice-President, Mr. Honore Beauregard, ex-Mayor of Montreal; Sec. Treasurer, Mr. Philip S. Ross.

Recent reports from the Buckingham district would seem to indicate that phosphate mining is moving northwards. Several hundreds of tons having lately been taken out of a mine on River du Sier, a tributary of the Du Lievre River, some forty miles above Buckingham. The mineral is said to be of excellent quality. It is hauled at present to the foot of the Long Rapids by sleighs, and as soon as the ice breaks up will be conveyed from that point to the village by scows.

Messrs. Poupere & Co., contractors, have completed their arrangements for the construction of the new stone lock and dam some 12 miles above Buckingham. The present advanced state of the phosphate industry has made the construction of these works an absolute necessity. The increased facilities for moving the ore now to be provided will reduce the cost of its transportation, and will enable miners to sell the ore at a lower figure than heretofore.

It is estimated that the output from the various mines in the Buckingham district for the season ending 1st May will be as follows: High Rock Mines about 6,000 tons; Union, about 5,000; North Star, 3,500; Little Rapids, 1,200; Emerald, 5,000; Anglo-Canadian, 1,000; Glasgow Phosphate Company, 500; McLaurin & Blackburn, 1,000.; sundry smaller properties

about 300 tons. In all, it is thought, close in the vicinity of 25,000 tons will be mined. Of this quantity three fourths will be high grade ore, averaging from 75 to 85.

In view of the immediate opening of navigation, work on the various properties is being pushed vigorously forward. Additional hands are being employed, and new machinery operated by steam power is being largely adopted in preference to the old *modus operandi*.

Notwithstanding its very steep grade the tram line constructed on the High Rock property last season has proved most satisfactory, and at Little Rapids, the one now in course of construction, will be completed and in running order by the first week in June. We understand that the North Star and Emerald mines will shortly follow suit in the same direction.

The output from the High Rock mine for the month of March was the largest ever mined from any one phosphate property in the Dominion, and was as follows:—829 tons first quality, or all over 80%, and 39 tons of second quality which will yield over 70%. This was with an average of 135 men. This most gratifying result is in very large measure due to the superior mining plant at present in operation at this property. Nothing is done by hand that can be done by machinery, every particle of which is first-class.

The output from the Emerald mine for the same month figures close upon 500 tons with an average of 60 men.

It is understood that Mr. S. P. Franchot, the popular manager of the Ottawa Phosphate Mining Company, has recently acquired a half interest in 4 lots, formerly owned by Captain McNaughton at the High Falls, in the 10th Range of Portland, and that it is his intention to commence work early in the spring.

The shaft at the North Star is now down some 500 feet, and the management report a good show at the bottom. The output from this property and from the Union mine for the past month will be fully up to their ordinary monthly output.

At Little Rapids the output for March was 120 tons with an average of 21 men. This number of hands however includes woodchoppers, teamsters and other outside employees.

The Du Lievre Mining and Manufacturing Company are making extensive improvements on their property at Bassin du Lievre. A very large and powerful new water wheel is to be put in. Altogether the company will push for a large output from their mine.

We learn that the Glasgow Phosphate Company have suspended operations at their mine, pending the settlement of some difficulty between the management and the Scotch Board.

It is expected that navigation on the Lievre will be resumed about the 25th of the month. The steamers *Agnes*, *Evie* and *High Rock* have been in the stocks all winter, and have been fully prepared for the season's work.

California has produced in gold between 1843 and 1886, one billion, two hundred million dollars in coin value.

MINING NOTES.

Nova Scotia.

A decision of much importance to gold miners in the Maritime Provinces has just been made by Judge Smith, at Halifax, in an Appeal against the decision of the Commissioner of Public Works and mines for the Province of Nova Scotia, in which an application for a gold prospecting license was refused to two parties named Cameron and McLeod. McLeod's application was as follows:—

"Please find \$1.50 for a prospecting license of three areas described as follows: Beginning at a stake marked W. M. L., standing about one mile westerly from Malaga Lake, in the County of Queens, thence southerly 250 feet, thence easterly 450 feet thence northerly 250 feet to the place of beginning, containing three areas."

Judge Smith in his verdict says:—

"I do not regard the decision appealed from as deciding any conflicting claims of parties applicant, as the Commissioner does not appear, as far as we can gather from the papers before us, to have granted a license to any one; but simply to have decided that the application of McLeod was not in accordance with the provisions of sections 16 and 39 of Chapter 7 of the Revised Statutes 'of Mines and Minerals.' On referring to these sections it certainly does appear to my mind that they were framed by the legislature for the purpose of preventing mistakes or misapprehensions, and to compel applicants for prospecting licenses clearly to define the exact locality of the area or areas upon the ground; at least, that, at the time the application was made, some definite stake or starting point should be given, from which the areas could be ascertained. The two sections referred to, and upon the provisions of which the Commissioner alleges that he based his decision, seem to be very clear. The 16th section says, 'every application shall be in writing, defining the area or areas applied for.' The 39th section refers especially to prospecting licenses, and provides that 'all applications for prospecting licenses shall accurately define by metes and bounds the lands applied for.' It can hardly, I think, be reasonably urged, that if it appears as it does in this case, that when the stake or spot indicated in the application as the starting point from which those metes and bounds are to be ascertained does not exist on the ground, the areas are accurately defined, as required by the express words of the statute. One cannot read the whole of the statute without perceiving how careful the Legislature was in striving to avoid difficulty or confusion with reference to the rights of applicants. It must be evident if the application of McLeod can be held to be such a valid one as would compel the Commissioner to grant him a license, the words I have designated requiring an accurate definition of the areas, may be struck out of the statute as being useless verbiage. If this application could be held to be a legal one, it would have been equally good if the application stated the areas to lie near Malaga Lake, and the party would only have to find some areas anywhere near the lake, put a stake down, and claim a prospecting license starting from that point, and which may cover an entirely different area than he first intended when he made his application. I think it would be contrary to the policy of the Legislature, and most unwise to uphold such a contention. Therefore, I think, the appeal should be dismissed with costs."

The iron, steel and coal interests of the Maritime Provinces are asking modifications in the tariff to further protect and develop them.

We are informed that Mr. George Forsythe, of Halifax, has purchased the gold mine at Cochrane Hill, Guysboro, formerly owned by Messrs. McKenzi, Archibald and Caffrey.

The old Hall-Anderson mine is now run by the Egerton Gold Mining Company. Work has been started on the McMilligan lead which is 2 feet thick.

New Brunswick.

Albertite, which was at one time worked somewhat extensively at the Albert mines, Albert County, was first discovered by accident about the year 1850. The vein which was worked out about six years ago occupied an irregular and nearly vertical fissure, and varied from 1 inch to 17 feet in thickness. It was mined to a depth of nearly 1,500 feet, gradually running out as it descended. This remarkable mineral, occurring in connection with calcareo-bituminous shales or pyrochists, has been regarded by some as true coal, by others as a variety of jet and by others again as more nearly related to asphaltum. It resembles the latter closely in appearance, being very black, brittle and lustrous, with a broad conchoidal fracture, and like asphaltum is destitute of structure, but differs in fusibility and in its relation to various solvents. It differs from true coal in being of one quality throughout, in containing no traces of vegetable tissues, and in its mode of occurrence, which is that of a vein and not of a bed. It is estimated that the total amount of albertite raised was not far from 200,000 tons, the price of which varied at different times from \$15 to \$20 per ton. It was principally used for admixture with ordinary bituminous coal in the preparation of illuminating gas. For this purpose it was admirably adapted, yielding per ton 100 gallons of crude oil or 14,500 cubic feet of gas of superior illuminating power.

Satisfactory reports continue to be received from the Manganese districts.

Quebec.

A meeting of the Anglo-Canadian Asbestos Company was held at Montreal on Monday the 14th inst., but all information as to what transpired has been refused by the company.

We understand that signs of vigorous activity once more prevail at the British Iron mines. Furnaces for the smelting of the ore are presently in course of erection, and when completed it is estimated that steady employment will be found for a large number of men. It is also currently reported the management contemplate the erection of a tramway from the mines to the Ottawa River. This will be operated by horsepower and will greatly facilitate the transportation of the ore from the mines to the Canadian Pacific Railway.

A new shaft is to be sunk on the St. Onge gold mining company's property. The find of gold during the winter has been sufficiently encouraging to the proprietors to stimulate their search higher up on the river bed. Some of the gold taken out is very large and nuggets weighing from 1 dwt to 1½ ozs have been found.

There is very little doing as yet at the Asbestos Mines. Within the last few days the Thetford people have put on some men to clean up and shovel out snow from the open cuts, and they anticipate starting mining operations in a week or two.

At the Anglo-Canadian Asbestos Company's mines about 25 men are presently at work, and the daily output is about two tons per day. In a week or two the hands will be increased and operations pushed vigorously. The machinery and drills at these mines continue to give every satisfaction to the management.

It is anticipated that this season the output of asbestos at the various mines will be somewhat in excess of that of last year. There are indications of an increased demand and prices remain steady. An advance on last year's figures is predicted. Miners report that they have already sold considerable quantities of their prospective output for the ensuing season.

Development work is being vigorously pursued on the property of the Vileneuve Mica and Mining Company near Buckingham. Machinery of the latest and most approved pattern is in operation and the deposit which is of the purest and clearest Muscovite is apparently unlimited in extent. Six good strong veins are to be found on the side of the hill. The value of this property with its many fine buildings and improved machinery is inestimable.

Ontario.

The Anglo-American Iron Company which owns about 200,000 acres in the County of Hastings, largely mineral land, and by whom it will be remembered the Central Ontario Railroad, running some 100 miles northward from Lake Ontario, was constructed, has decided to extend the Road north-westward from Coe Hill for a distance of 150 miles until it meets the C.P.R. at North Bay. The country thus to be opened up is said to contain large deposits of Bessemer ore and to be well timbered.

The Syndicate which is largely composed of Canadian and American capitalists has an authorised capital of \$10,000,000. \$5,000,000 of which is for the railroad. The ore already taken from the principal mine at Coe Hill has not proved altogether satisfactory, being too high in sulphur and requiring to be calcined before using, with the result that shipments from Weller's Bay last year were very much reduced. The work of construction of the new line will be commenced early next month, and will be pushed through to completion.

A local exchange announces that Mr. Martin Conroy, of Sudbury Point, owner of one of the copper mines to the north of that village, is negotiating the sale of his interest in the mine to Mr. Richey, of New York, for the sum of \$20,000. The property, which is some six miles north of Sudbury, was discovered last fall.

Mr. Richey has now a gang of about 70 men busily engaged in excavating copper ore out of mines purchased some time ago, and has immense quantities on the ground ready for a crusher which he is importing.

The Royal Society of Canada have submitted a memorial to Sir John Macdonald praying for the consideration of increased museum facilities at Ottawa. Prof. R. Bell states that the number of papers already promised for the Society's Annual Conference in May is largely in excess of former years.

The Kingston and Pembroke Iron Mining Company has been organized, with a capital of \$5,000,000, for the purpose of developing the iron ore district on the line of the Kingston & Pembroke Railway Company. The company owns 8,000 acres of mineral land between Kingston and Renfrew. It has three mines in active operation, and other openings will be made within a short time. Henry Siebert is President of the company, and among the principal stockholders are Samuel Thomas, Calvin S. Brice, J. O. Moss, Alexander J. Smith, H. H. Porter, R. R. Cable, S. P.

Flower, H. H. Hollister, James Tillinghast, George A. Kirkpatrick and Charles F. G. Ider-sleeve, of Kingston; William Polluck, of Cleveland, and John S. George, of Milwaukee. The entire amount of stock has been subscribed, but the formal organization will not be announced until the company has been chartered at Kingston under the Canadian law.

The C. C. Mining Company have introduced into its works at the Cliff, and also at the Stobie mine, machinery worked by steam for the purpose of extracting the ore.

The silver mines on the Sturgeon river in Nipissing district, are attracting considerable attention among mining speculators as spring approaches. James Hulditch, Esq., the owner of the Temogawing Mine has employed James McAvoy, P.L.S., to proceed with his staff to execute survey and plan. Mr. Walter Cockburn will probably take steps to develop his mine at Cross Lake as soon as the snow disappears.

PORT ARTHUR DISTRICT.

Work has been resumed at the Silver Creek Mine.

The *Miner* states that there are persistent rumours that Silver Islet will be once more placed in operation in the course of a few weeks, but they cannot be traced to any reliable source.

The Heron Bay Mine will be worked as soon as the spring opens.

We learn that Mr. B. W. Harris, for some time editor of the *Miner*, has been compelled to sever his connection with the paper through pressure of other work.

Operations are to be immediately resumed at the Huronian mine, and new machinery has been shipped from New York and Chicago. It is expected that the mill will commence work about the 1st of May. Chlorination works are to be erected during the summer.

The proprietors of R.51, situated near Silver Mountain, Messrs. P. M. French, W. C. Dobie and others, have announced their intention of driving an adit level on their property during the summer and putting it in a proper state of development to ascertain the value of the location.

Manitoba and North-West Territories.

A meeting of the Board of Directors of the Canadian Anthracite Coal Company was held at St. Paul on the 31st ulto. It was reported that as soon as work on the pockets at the mines was completed a commencement would be made with the shipment of coal for the season. 1,500 tons will be shipped to San Francisco at an early date. It is proposed to increase the number of men, and during the summer it is expected that between two and three hundred men will find employment at the mines.

At Anthracite Station the Canadian Pacific Railway have constructed a new siding for the company, a post-office has been established, and a large number of new buildings have been erected. The Annual general meeting of shareholders will be held at Banff in August.

British Columbia.

A new Hydraulic Mining Company has been started on the Fraser River about eleven miles above Lillooet, called the Fraser River Cable Mining Company. The system they intend working it on is new in this part of the country. They take the water out of the creeks by means of hose or pipes suspended from a cable stretched across the river.

At a general meeting of the shareholders of the Quesnelle Quartz Mining Company, held on the 10th ult., Messrs. James Reid, R. J. Skinner, Joseph Mason, J. F. Hawks, W. A. Johnston, George E. Filmore and William Morrison were elected directors. The secretary and manager's reports were very satisfactory. Several vein specimens of quartz taken from the shaft were shown by the president at the meeting.

The Big Bend region is practically unprospected, but the mineral claims recorded, lie for the most part, around the headwaters of McCulloch and French Creeks. The numerous gulches and ravines generally run in an easterly and westerly direction and have cut the ore in the belt often at right angles. In other places there are outcrops on the hillsides. Specimens from both these occurring ores have proved to be rich; some show gold to the eye. Most of the ore seems to be auriferous milling ore, but whether it will preserve that character when sunk into or turn to less tractable ore, or, as some conjecture, to silver bearing ore of some kind, possibly argentiferous galena, cannot be stated at present. Nor is it known, of course, yet, how many, or whether any, of these recorded mineral claims are veins of a kind and quality that would pay for working. Very remarkable results are obtained in this business from the improved methods of modern days. For instance, it is found that in the colony of Victoria, Australia, crushing auriferous quartz pays if it contains as much as 5 dwts. of free gold per ton—that is of gold not associated with pyrites. When it is associated with the less tractable forms of pyrites 1½ oz. to 3 oz. are required; but speaking broadly Victoria has made its fortune out of gold deposits which yield on an average less than half an ounce a ton.

There are apparently mineral veins at Big Bend; small parcels have assayed from \$50 to \$150 a ton; the mining region is near a great navigable river crossed by the Canadian Pacific Railway; the climate is not severe; there are arable and hay lands and three months summer hill pasture, also abundance of wood. With a steamer on the Columbia the mines would be within two days' reach of the above railway. Under these circumstances, every effort should be made to ascertain the true character of the ores and the size of the mineral veins in a district in which all mining conditions are so good.

The following is a copy of an assay of ores from a group of veins at the Ille-cille-waet section, made by an American capitalist, who proposes to return in the spring:—

No. 1.....	\$126.25	Silver per ton.
" 2.....	175.82	" "
" 3.....	31.05	" "
" 4.....	50.00	" "
" 5.....	84.08	" "
" 6.....	60.80	" "
" 7.....	59.00	" "
" 8.....	609.00	" "
" 9.....	41.68	" "
" 10.....	384.77	" "

Mr. F. Jones, Gold Commissioner at Clinton, estimates the gold yield taken from the Lill ovel district during the past year thus:—

A. W. Smith.....	\$57,900
F. W. Foster.....	16,517
E. Bell.....	13,700
All other sources.....	43,883

\$132,000

Work is to be immediately resumed at the Foster Quartz mine. The mill is now completed and a number of experienced miners from California have gone to the scene of operations.

The Big Slide mines which comprise the properties of this company were discovered through the enterprise of Mr. F. W. Foster, of Clinton. A piece of heavy sulphuret ore was given him by an Indian, in 1872, which assayed \$28.50. Mr. Foster sent an old miner to try and find the ledge and locate it; this he was successful in doing; work was begun, and tunnels run to tap the ledge. In the lower tunnel this was done at a distance of 243 feet, and in the upper tunnel at 80 feet, at each point of contact a strong ledge of good quality was found. Mr. Chenhall, a practical Cornish miner, erected an anastra, with which to work the ore; it was not built correctly and the limited supply of quicksilver was lost. 900 pounds of the ore were crushed at this time, the small portion of remaining quicksilver and amalgam yielded in gold \$12.50, and a prospect could be got of the tailings nearly as good as before milling.

Of the work done during the past year, Mr. Geo. Henderson, the Superintendent of the Company, writes:— "During the past summer I put a few men to work taking out ore for shipment to San Francisco for treatment to determine the value and best modes of working. The tests made in San Francisco were deemed sufficiently encouraging to organize a company and go to work in earnest. The approach to the mine being very difficult, a large outlay of money was necessary to build a road, over which to haul machinery, &c. This road is now completed, and the machinery for a modern ten stamp gold mill and corination works are now on the ground; by the new year, if no unforeseen delays occur, the mill will be erected and running. The mines are now being opened up for permanent work. The levels are being connected by upraises to insure a good circulation. Drifts are being driven on each level. In all parts of the mine so far worked, fine paying ore has been found, which improves as the mountain is pierced. Everything gives promise of an immense body of ore. The main vein is from 15 inches to 5 feet in width. The average value per ton is about \$20 gold and \$2.50 silver. By the method of reducing that will be used, 90% of the gold and silver in the ore will be saved, at a cost of mining and milling of about \$5 per ton. Work goes on in the mine day and night, and by the time the mill is ready, the mine will be sufficiently opened to furnish all the ore necessary to keep the mill constantly at work. It is the intention of the company to enlarge the mill as soon in the spring as possible—the grading for the additional stamps is completed. Two desulphurizing furnaces are now in course of construction. There are on the pay roll of the company fifty men, employed as miners, carpenters, and men employed at the saw-mill. We have burnt a kiln of 67,000 brick; they are of a very fair quality, and will be used in the construction of our furnaces. &c."

The Canadian Anthracite Coal Co.

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OTTAWA, CANADA. EAU CLAIRE, WIS.
A. PUGH, General Manager. W. B. SCARTILL, Secretary,
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O. H. INGRAM, Treasurer,
EAU CLAIRE, WIS.

Mines at Anthracite,
N. W. T., CANADA. v-1-1y

Personal.

Mr. R. W. Ellis, M.A., of the Geological and Natural History Survey, has been granted the L.L.D. degree by the corporation of the university of McGill. Ever since his graduation as a Bachelor of Arts at the same university when he carried off the Logan gold medal, Mr. Ellis has been actively and successfully engaged in Geological work in Canada, so that not only is the honour which has been conferred upon him by that university a deserved one, but one which makes a crowning point in the successful issue of his arduous labours in developing so important a branch of research in the country. The subject of Dr. Ellis' thesis to the corporation was "The History of the Geology of New Brunswick," a subject which his long experience in that section of the Dominion eminently fitted him to handle in a masterly manner. We extend to Dr. Ellis our hearty congratulations.

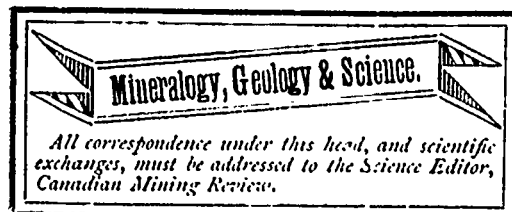
Professor Macoun, of the Geological and Natural History Survey staff, has gone to British Columbia, where he will be located during the summer.

Mr. C. B. Wright and other gentlemen interested in the establishment of smelting works, in connection with the mines in British Columbia, have had an interview with the Customs Department at Ottawa. They want admission free of duty of the peculiarly constructed machinery required for this purpose in the Province. The works are to be erected in the Selkirk range and other parts of British Columbia, which are rich in minerals.

CHESTNUT.

[Iron Trade Review.]

We observe an article now going the rounds of the papers regarding "A Cat on a Fly-wheel." This time the venturesome feline is located in an electric lighting station at Brooklyn. Isn't it about time to give poor Tom a rest? With only slight changes as to locality and circumstances the same item has been a staple article for clipping for the past ten years or more. One week, in Cincinnati, he travels 300 miles at the rate of 45 miles an hour and drops off in a limp and sell-me-out-for-five-cents condition; the next week finds him in Chicago, clinging for ten hours to the rim of the wheel and then hopping off at night as chipper as ever; anon he gets a free ride in Detroit and, when attempting to take a leap for life, strews the engine floor with yowls and violin strings; next he turns up in Denver with a sore throat and watery eyes, ready to go to sleep on the rim of the first fly-wheel that offers. If this thing doesn't stop, we shall next hear of his taking a trip from New York to Chicago on the drive-wheel of a locomotive and yet surviving to tell an admiring feline audience of his wonderful achievement.



Omitted.

Through the unfortunate illness of Professor Marsan we are unable this month to furnish our readers with the concluding portion of that gentleman's paper on "The Chemical Aspect of the Metallic Minerals." We hope to do so in our next issue.

The Great Ice Age and Subsequent Formations at Ottawa, Ontario.

By H. M. Ami.

Of the Ottawa Field Naturalists' Club

Among the most interesting and captivating subjects which attract the attention of even a casual observer in the realms of geological science, few of them are as full of interest and afford as much information as the researches in the most recently deposited or newer overlying strata. Besides this interest, there is carried with it the fact of its practical importance, so that the economic aspects of the question have likewise to be taken into consideration.

They are numerous, the questions which press themselves one upon the other in examining the marls, sands, gravels, clays, boulders and kindred materials of a district, and as this region which it is the province of the O. F. N. C. to examine, is particularly rich both in the extent and the distribution of such materials as have just been enumerated, the questions arising out of these Post-Tertiary deposits are themselves likewise rich in diversity, and scope. The following are some of the more important of these which we will attempt to consider and which naturally present themselves to one's mind:—

I. At what period in the Earth's History did the Glacial Epoch or the Great Ice Age make its appearance?

II. What were the causes which led to this extensive reduction in the temperature?

III. What features characterized it and how long did it last? What, the phenomena of glaciation?

IV. What traces did it leave behind?

V. What was the condition of things subsequent to this epoch?

VI. To what extent was the continent submerged?

VII. For what period of time did this subsidence last?

VIII. What features characterized this period of submergence?—(marine life, etc.)

IX. What are the unquestionable proofs of the subsidence which was followed by a period of elevation? Besides these,

X. It will likewise be necessary to consider this period of elevation which carries us on to the present day, during which time numerous and varied lacustrine or alluvial deposits were laid, and in the lapse of which, man—aboriginal man—made his appearance; and, the questions which press themselves round this last point are exceedingly numerous indeed, and would of themselves form a worthy theme for a voluminous work.

XI. Then, in which of the newer deposits are these traces of the existence of certain tribes of the American Indians found? What are these traces? To what extent do they assist in forming an estimate of the degree of civilization to which these aborigines attained? What customs, manners and modes of life are exemplified by the implements of various kinds found in what has been very appropriately termed in various countries the *Human Period*? At what time and how long did these inhabitants occupy the land before the intrusion by the whites, the causes which led to their disappearance in certain portions of the country and what was their history? All these, are only a few of the more salient problems suggested, and to which reference will be made.

* * * * *

But before entering upon these fascinating studies it may not be thought amiss to note what has already been done in the particular field of research with which we have to deal. In the "Geology of Canada," 1863, a report by Sir Wm. Logan and staff—there is incorporated in that admirable work a lengthy chapter on "superficial geology" in which a number of interesting notes are recorded from Ottawa and its environs, an examination of which had been entrusted to Dr. R. Bell. Then comes the work done in the Post-Pliocene geology of Ottawa by Dr. J. A. Grant which produced a number of valuable papers, some of which were published in the United States and others here in Canada. At the mouth of and along *Green's Creek*, but six miles distant from the city, and a favourite resort for students of Post-Tertiary geology, not only has Dr. Grant, but Sir William Dawson himself also has investigated and reported important discoveries. The collections of the late Dr. E. Van Cortland show that he too, devoted considerable attention to these interesting deposits, whilst the late Mr. E. Billings in his Canadian "Naturalist and Geologist" published notes on the same subject, in that valuable record of science. The above mentioned work and workers have been previous to the inauguration of the Field Naturalists Club in this city, and since its organization we have no hesitation in saying that it has been instrumental in carrying on successful excursions and sub-excursions over the district. Nearly a score of members, have at least taken a more or less active part in these researches, whilst the abundance of work and material at hand likely to be there for years and years of close examination—make it all probable that greater attention will continue to be paid to the deposits in question. The work done already is considerable; the work that is being done is not great, whilst there remains a hundred-fold more to do than has been done up to date. As many are well aware, our worthy "City Engineer" Surtees has been carrying on an extensive series of excavations in all parts of the city, from Sandy Hill to Ashburnham Hill, and from Stewarton to the Ottawa River, on one side, or from Sandy Hill to the Ottawa and Rideau Rivers on the other side of the canal, and that for the past two years. These excavations or trenches are dug or blasted out to a depth varying from seven feet to eighteen feet six inches, so that not only have deep but also interesting sections been afforded the writer and others, exhibiting the different kinds of strata and the material which compose them together with the fossil remains which occur entombed in the same.

Now, to begin with the description of these Post-Tertiary or Post-Pliocene (Pleistocene) deposits in this part of the country, as in any other portion, it is first necessary to ascertain,

whence the material came which composes them, and in order to do this it is obviously necessary to examine the older rocks of the district, see of what nature of rock their measures consist, and know the stratigraphical relations existing between the various members of these older underlying series.

Just as we have a great diversity of formations about Ottawa, so also have we a great diversity of substances in the material which makeup the rock of the Post-Tertiary deposits, (and let it be borne in mind, that in using the word "rock" it is used in its true geological sense, so that a handful of sand, a lump of clay, a mass of boulders, cemented or not by finer detritus, are all as much "rock" as a pillar of freestone, a block of limestone or a column of granite). Most of the materials which are found in these newer deposits were derived from the older formations of the district, whilst erratic blocks, and the like, may have come from great distances. To go into details as to what are all the various kinds of rocks met, would necessitate a long and protracted study of a great quantity of material which years of labour could not exhaust, and which would form the constituent elements of all the formations from the *Laurentian* to the *Hudson River* as they are developed in the "Ottawa Basin;" from the gneissoid, granitic and hornblendic rocks of the former, to the shaly magnesian and arenaceous measures of the latter. There would be included; the crystalline limestones, serpentines, dolomites and diorites of the *Middle Laurentian*, occurring at Chelsea in the Laurentide Hills, there would also be included portions of the conglomerates and quartzites and calc-bearing sandrock materials peculiar to the unconformably overlying *Potsdam* and *Calceiferous formations*, whilst the sandstones, shales and limestones of the *Chazy* followed upwards without a break by the impure calcareous strata of the *Black River* and *Trenton formations* would all be mixed together with the likewise conformably overlying bituminous schists of the *Utica*.

The materials which compose the series of formations just mentioned and newer than the *Laurentian* were themselves derived from the *Laurentian System*, for this latter contains all the elements necessary for the formation of the sandstone, shales and limestones of the newer overlying Cambro-Silurian strata.

Having thus ascertained the series of strata whence the material was obtained which constitutes the various beds or divisions of the strata in the Post Tertiary deposits, let us consider the condition of affairs previous to and at the coming in of the Glacial Epoch.

(To be Continued.)

The Yukon Country.

Interesting Sketch of Previous Surveys.—The Mineral Resources of that Vast Canadian Inheritance in the Extreme North-West.

Until the United States of America acquired that western portion of this continent, known as Alaska, its topography, to a great extent, had been neglected, except along its shore lines, and for a short distance inland in some places; the Yukon River Valley being the only portion of the country known, and that only imperfectly. Alaska at that time was to the outside world a veritable *terra incognita*. Simultaneously with the descent of the Imperial Eagle of Russia and the hoisting of the Stars and Stripes at Sitka, in 1867, was the idea of exploring

that "land of the midnight sun" promulgated. Many will remember the long and fierce debates, both in the Senate and Congress, upon the wisdom of paying to Russia the sum of \$7,200,000 for that north land. The opponents of the purchase characterised the country as a "useless pile of mountains and glaciers which possibly might, at some future day, supply the United States with ice quarries." However, that far seeing statesman, Secretary Seward, secured for Uncle Sam that valuable tract of country, which, from its position, ought to belong to the Dominion of Canada, and by many termed "Seward's folly." There are living to-day some of his brother legislators who are ready to acknowledge that, at least, there was "wisdom in his madness." Take, for instance, into consideration the acquisition of the valuable sealing grounds leased from the Government by the Alaska Commercial Company for \$350,000 per annum, a sum sufficient to pay interest and contribute towards the Government of the territory. Then again there is valuable mining interests being developed. At present one of the largest and most complete quartz mills to be found on the continent is there in successful operation—both mechanically and financially. And it is gratifying to the inhabitants of that new country to be able to point to developments which prove that there is scope for many more.

Although many exploring parties have, from time to time, been fitted out and sent by the United States Government, yet but little of a valuable character had been collected up to the time that "the special agent," Ivan Petroff, made his report in August, 1882. That gentleman has given a deal of information in regard to Alaska and its people. But when we take into consideration the extent of country drained by the great Yukon, it can be at once understood that one or two parties can do but little in a year or so in the way of giving the public a correct topographical description of that far distant country. Since Petroff's time Lieut. Schwatka and latterly Lieut. Stoney have done much, coupled with the expeditions under them, to furnish desired information. These travellers and explorers have received from private sources,—gentlemen, resident in the interior of the country for a number of years—much detail of a valuable and practical nature.

A few traders have established a trading post at the confluence of the Stewart and Yukon which they have named Fort Nelson. No doubt the advent of quite a number of miners, and the amount of gold which they were obtaining from the bars on the Stewart River induced the establishment of this trading post, which is about 70 miles east from the Alaska boundary. In order that the reader may better understand the relative positions and distances of points of importance along the mighty drainage artery, flowing at least 1,000 miles in British Territory, thence 1,000 miles through Alaska, with in places of 20 miles, embouching by a number of mouths into Norton Sound, a part of Behring Sea. As few facts regarding its mightiness may be mentioned. It has been stated, and it may appear incredible to those who have been taught to believe that the Mississippi is the father of waters, to be told that the Yukon River discharges every hour one-third more water than rolls by New Orleans during the same time. Strange as it may appear sea-going vessels cannot get nearer the mouth of the river than some 50 miles, on account of the immense quantities of silt carried down by the freshets. The port of St. Michael, situated some 60 miles north from the river, is the depot for the Yukon River and

Arctic Trade, and is visited by the Alaska Commercial Company's steamers two or three times during the summer. At this point the company's river steamer loads cargo for the interior, taking on board 40 axe men to cut fuel on the trip up, whose mission it is, as soon as the steamer touches the bank, to rush, axe in hand, to the nearest drift pile, so that the craft may be detained as short a time as possible. Reaching Fort Yukon, a distance of about 1,200 miles from Saint Michael, in 22 or 23 days, and Fort Reliance, 400 miles further up the stream, in 6 or 8 days more, makes the length of the average trip 30 days. Notwithstanding the number of hands employed, and the length of time occupied in delivering goods at Fort Reliance, the freight rate charged is remarkably low, viz.: \$80 per ton, so that Harper & Co. are supplying provisions to the miners at Fort Nelson at a very reasonable price. There are about 70 wintering at and near that point at present. Last fall flour was sold at \$14 per 100 lbs., bacon at 30 cents per lb. and other staples in proportion. By the aid of a small steamer, which Harper & Co. bought from Scheffel Bros., who took it from San Francisco to Yukon for the purpose of using it in prospecting for gold, the owners are thus enabled to distribute and furnish supplies to miners at considerable distances from their depot.

It is scarcely creditable to our Federal and Provincial Governments to have to depend upon the exploration pushed forward by a foreign power to obtain information of one's own country; but so it is. It may be asked what is the country good for if explored tomorrow and a topographical description published? Commencing some six years ago a small stream of gold hunters flowed into the north-west portion of the Yukon country, and every summer since miners have visited it in search of the precious metal with more or less success. During the early part of last spring and summer over 200 miners purchased supplies in Alaska and went by way of Chilkoot to different streams where gold had been discovered, but principally to the Stewart River where the best pay had been found. For a portion of last summer Harper & Co.'s steamer, *New Bickell*, was used in raising water for a mining claim situated on this stream, and although tailings were being worked a third time, by the aid of sluices over \$20 per day to the hand for all employed was the result up to the end of the season. Others were mining on the Salmon below Lake Lelarge, while it is reported that on the Lewis River there were but few flanks drawn in that camp during last season. Some 70 men took up winter quarters at Fort Nelson and Stewart River, expecting to take out gold in the fall and early spring. The writer was informed by several gentlemen who had examined a very large bar of about four miles in length, some 30 feet deep and of considerable width, that it prospected throughout the whole gravel from 1 to 5 cents to the pan. This bar is on the main Yukon below the mouth of Stewart River, but the difficulty of working is the lack of water. That necessary agent can be obtained some 25 miles distant at a large outlay, but as wood is plentiful it might be less expensive to employ steam power to raise the required water. At any rate it is agreed that there is a big thing in the bar if water was only brought upon it. It is said that there are many other bars that prospect well, and that at no distant date will be worked profitably. It is believed that inside of the next two years over 1,000 men will be mining and doing well on White River. A great mining future is predicted for this great unknown land.

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Mining Regulations

TO GOVERN THE DISPOSAL OF

Mineral Lands other than Coal Lands, 1886.

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

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

QUARTZ MINING.

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

Any person having discovered a mineral deposit may obtain a mining location therefor, in the manner set forth in the Regulations which provides for the character of the survey and the marks necessary to designate the location on the ground.

When the location has been marked conformably to the requirements of the Regulations, the claimant shall within sixty days thereafter, file with the local agent in the Dominion Land Office for the district in which the location is situated, a declaration or oath setting forth the circumstances of his discovery, and describing, as nearly as may be, the locality and dimensions of the claim marked out by him as aforesaid; and shall, along with such declaration, pay to the said agent an entry fee of FIVE DOLLARS. The agent's receipt for such fee will be the claimant's authority to enter into possession of the location applied for.

At any time before the expiration of FIVE years from the date of his obtaining the agent's receipt it shall be open to the claimant to purchase the location on filing with the local agent proof that he has expended not less than FIVE HUNDRED DOLLARS in actual mining operations on the same; but the claimant is required, before the expiration of each of the five years, to prove that he has performed not less than ONE HUNDRED DOLLARS' worth of labor during the year in the actual development of his claim, and at the same time obtain a renewal of his location receipt, for which he is required to pay a fee of FIVE DOLLARS.

The price to be paid for a mining location shall be at the rate of FIVE DOLLARS PER ACRE, cash, and the sum of FIFTY DOLLARS extra for the survey of the same.

No more than one mining location shall be granted to any individual claimant upon the same lode or vein.

IRON.

The Minister of the Interior may grant a location for the mining of iron, not exceeding 160 acres in area which shall be bounded by north and south and east and west lines astronomically, and its breadth shall equal its length. Provided that should any person making an application purporting to be for the purpose of

mining iron thus obtain, whether in good faith or fraudulently, possession of a valuable mineral deposit other than iron, his right in such deposit shall be restricted to the area prescribed by the Regulations for other minerals, and the rest of the location shall revert to the Crown for such disposition as the Minister may direct.

The regulations also provide for the manner in which land may be acquired for milling purposes, reduction works or other works incidental to mining operations.

Locations taken up prior to this date may, until the 1st of August, 1886, be re-marked and re-entered in conformity with the Regulations without payment of new fees in cases where no existing interests would thereby be prejudicially affected.

PLACER MINING.

The Regulations laid down in respect to quartz mining shall be applicable to placer mining as far as they relate to entries, entry fees, assignments, marking of localities, agents' receipts, and generally where they can be applied.

The nature and size of placer mining claims are provided for in the Regulations, including bar, dry, bench, creek or hill diggings, and the RIGHTS AND DUTIES OF MINERS are fully set forth.

The Regulations apply also to

BED-ROCK FLUMES, DRAINAGE OF MINES AND DITCHES.

The GENERAL PROVISIONS of the Regulations include the interpretation of expressions used therein; how disputes shall be heard and adjudicated upon; under what circumstances miners shall be entitled to absent themselves from their locations or diggings, etc.

THE SCHEDULE OF MINING REGULATIONS

Contains the forms to be observed in the drawing up of all documents such as:—

"Application and affidavit of discoverer of quartz mine." "Receipt for fee paid by applicant for mining location." "Receipt for fee on extension of time for purchase of a mining location." "Patent of a mining location." "Certificate of the assignment of a mining location." "Application for grant for placer mining and affidavit of applicant." "Grant for placer mining." "Certificate of the assignment of a placer mining claim." "Grant to a bed rock flume company." "Grant for drainage." "Grant of right to divert water and construct ditches."

Since the publication, in 1884, of the Mining Regulations to govern the disposal of Dominion Mineral Lands the same have been carefully and thoroughly revised with a view to ensure ample protection to the public interests, and at the same time to encourage the prospector and miner in order that the mineral resources may be made valuable by development.

COPIES OF THE REGULATIONS MAY BE OBTAINED UPON APPLICATION TO THE DEPARTMENT OF THE INTERIOR

A. M. BURGESS,

Deputy Minister of the Interior.

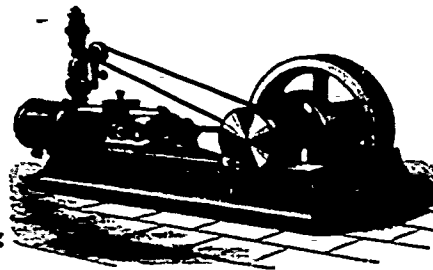
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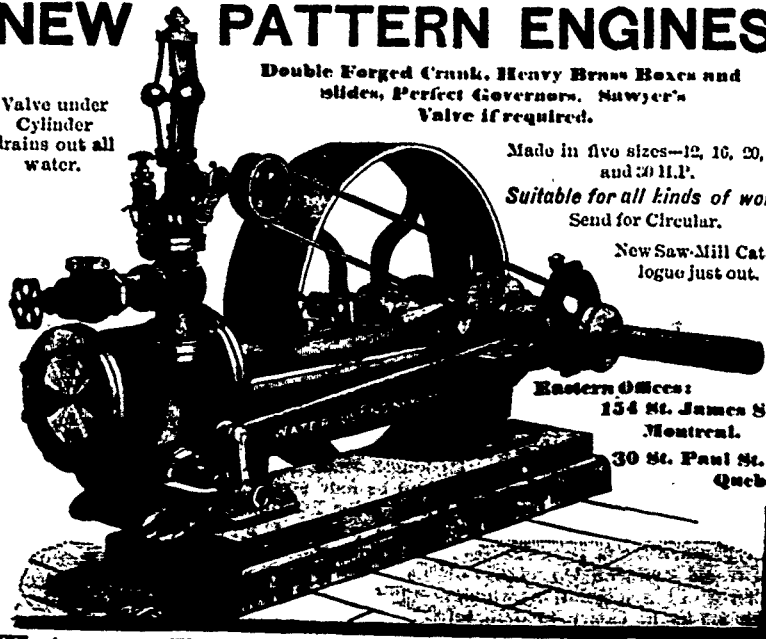
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