GEOLOGICAL SURVEY OF CANADA

G. M. DAWSON, C.M.G., LL.D., F.R.S., DIRECTOR

SECTION OF

MINERAL STATISTICS AND MINES

ANNUAL REPORT

FOR

1896

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OTTAWA

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1897 No 625

ERRATA.

P. 108 s, PETROLEUM article :—line 5, *for* 25 per cent *read* 4 per cent.

Table 1. Petroleum. Paraffine wax, 1896. Value: *for* $466,978 *read* $76,249 and total below: *for* $2,267,642 *read* $1,876,913.

To Dr. G. M. Dawson, C.M.G., F.R.S.,
Director Geological Survey of Canada.

Sir,—Herewith permit me to hand you the detailed statistical report of the mineral industry of Canada for 1896. The preliminary summary statement for that year was completed on the 13th February, 1897, and issued in pamphlet form, as usual, soon after.

The report for 1895, contained only the figures relating to the different mineral industries, as it was found impossible, as therein explained, to find time for the preparation of a more complete statement with the then lessened staff of the section.

In the present report, many of the tables of figures have been revised in the light of more complete information which has of late become available, and the vacancies left by the resignation of Messrs. Brumell, and Brophy having now been filled by Messrs. Cole and McLeish, a beginning has been made in the direction of adding the explanatory matter necessary for an intelligent annual review of the various mineral industries of the country. It is felt, however, that this cannot be accomplished completely and thoroughly until the arrears of office work have been overcome and the officers of the section can become more personally familiar with many of the localities with which they have to deal.

It is gratifying to be able to state that already the strengthening the staff of the section has borne fruit, and our report will not only be fuller, but will be ready earlier than last year, thus fulfilling the promise then made.

Besides the annual report above alluded to, the work of the section has included, as in past years, the preparation of numerous memoranda in reply to inquirers on various points relating to Canada's mineral resources and industries and general technical matters.

I desire to make special acknowledgment of the efficient and careful work done by Mr. A. A. Cole, as well as by Mr. J. McLeish, since his accession to the staff in July.

Although too numerous to mention, thanks are due also to those who individually have, by answering our circulars or letters, provided much valuable material for the report. Our acknowledgments are also due to the provincial mining departments of Nova Scotia, Quebec, Ontario and British Columbia and to the Dominion Customs and Inland Revenue departments for aid received.

I am, sir, your obedient servant,

ELFRIC DREW INGALL.

Section of Mineral Statistics and Mines.

EXPLANATORY NOTES.

YEAR AND TON USED.

Except for the figures of imports, which refer to the fiscal year ending 30th June in the current calendar year, the year used throughout this Report is the calendar year. The ton is that of 2000 pounds, unless otherwise stated.

EXPORTS AND IMPORTS.—TARIFF.

The figures given throughout the Report referring to exports and imports are compiled from data obtained from the books of the Customs Department, and will occasionally show discrepancies, which, however, there are no means of correcting.

The exports and imports under the heading of each province, do not necessarily represent the production and consumption of the province, *e.g.*, material produced in Ontario is often shipped from Montreal and entered there for export, so falling under the heading, Quebec.

N.E.S.= Not elsewhere specified.

The rates of duty given in the tables of imports throughout this Report, are those of the tariff ruling during the fiscal year 1895-6. This was replaced during the Parliamentary Session of 1896-7 by the present tariff, which came into force 23rd of April, 1897, and which may be obtained, at 15c. per copy, by application to the Queen's Printer, Ottawa.

VALUES ADOPTED.

The values of the metallic minerals produced, as per returns to this Department, are calculated on the basis of their metallic contents at the average market price of the metal for the current year. Spot values have been adopted for the figures of production of the non-metallic minerals.

GENERAL NOTES.

As in the past, care is taken to avoid interference with private interests in the manner of publishing results, and all returns of production of individual mines are treated as confidential unless otherwise arranged with those interested. The confidence of the mining com-

munity thus gained, has resulted in an increasingly general response to our circulars, although to complete our data personal application is still necessary in a small number of instances, and a yet more prompt response on the part of all applied to, will help still further towards an earlier publication of the material.

In view of criticisms of these statistics which have been made recently, and from time to time in the past, it may be well to take this opportunity to explain the working methods adopted, in order to prevent the misunderstandings which underlie such criticisms and suggestions, and to correct the impression thereby conveyed to the public that the reports are unreliable.

The figures given throughout the reports are based, as far as possible, upon returns obtained direct from the various operators, and the totals have for some years been checked by comparison with railway shipments, exports, and all other available sources of information. It can be therefore fairly claimed, that they are as accurate as it is possible to make such figures.

After investigation of the subject we have, however, found that in the nature of things, export and railway figures can only be taken as approximately correct in most instances. In the case of the export figures, entries are made as a rule by those having no technical knowledge of mineral substances, and in the case of the railways, but few of the shipments are actually weighed, so that car-load lots, for instance, may differ considerably from the theoretical load of the car.

CORRECTIONS—ALTERATIONS.

Corrections and alterations have been made throughout this Report wherever they seemed to be called for, according to more complete and reliable data available since previous issues.

The tabulated statement given in the folded sheet at the beginning of the Report, represents a compilation of all the similar statements found in previous reports, re-modelled and further revised wherever possible.

NOTE.

Natural Gas.—Attention having lately been drawn to the question of the production of natural gas in Canada, it may be mentioned that the figures given in this Report represent the estimated value of the gas where produced, as in the case of all other non-metallic minerals.

INTRODUCTION.

In examining the attached table of the Mineral Production of Canada for the past eleven years, the following important features relating to Canada's mineral development will be noticed.

In 1886, the total mineral production of the country, as per direct returns, supplemented by close estimates where complete returns could not be obtained, was valued at a little over ten million dollars. In 1896, the value of Canada's mineral production had increased 125 per cent or to over twenty-two and a half million dollars. Taking the data given for the United States in the volume of the "Mineral Industry," issued by the Engineering and Mining Journal of New York, we find that in a similar period the increase there has been only about 40 per cent. The mineral production of the United States, however, is of course vastly greater than that of Canada, the latter amounting in 1896 to but 3½ per cent of the former. The relative per capita production of minerals for the two countries is as follows, viz., for Canada about $4.50 and for the United States about $8. The rapid growth noted above is, however, a most encouraging feature, and the present outlook for mineral discovery and development in Canada would seem to promise a rapid rate of increase for many years to come. The main part of this increase must of course be in those minerals which permit of being exported and sold in foreign markets, as the home market is necessarily limited and grows slowly in a country with so small a population, and in which the population is scattered over so large an extent of territory. This also influences in an important way the question of distribution, enhancing considerably the cost of carriage from producer to consumer, and even rendering many of our deposits of the lower priced minerals unworkable at a profit at present. Great improvements have been made in this respect of late years, and others are contemplated in the near future which will bring some of the most promising mineral districts within economically reachable distance of extensive markets and help considerably towards the expected general growth of the industry.

It is interesting to note the proportions contributed by the various minerals towards the grand total, and their arrangement according to importance, as in the following table, brings out some instructive points.

MINERAL PRODUCTION OF CANADA.

MINERAL PRODUCTION OF CANADA, 1896.

Proportionate Value of different Mineral Products.

Product.	Contributing over 10 p.c.	Contributing between 10 and 5 p.c.	Contributing between 5 and 1 p.c.	Contributing under 1 p.c.	Total.
Coal	31·94				
Gold	12·30				
Silver		9·50			
Bricks (estimated)		7·10			
Nickel		5·25			
Petroleum		5·11			
Copper			4·52		
Building stone (estimated)			4·43		
Lead			3·20		
Lime (estimated)			2·88		
Asbestus			1·90		
Salt			1·50		
Natural gas			1·22		
Gypsum				0·76	
Iron				0·65	
Sundry under 1 p.c.				7·74	
Totals	44·24	26·96	19·65	9·15	100·00

From the above it will be seen that, in the year under consideration, coal is to be credited with almost a third, while gold comes second at about 12 per cent. In the five to ten per cent class come silver, bricks, nickel and petroleum; whilst in the one to five per cent class we find copper, building stone, lead, lime, asbestus, salt and natural gas, in the order named. Gypsum and iron contribute less than one per cent. Over 90 per cent of the total is thus accounted for under the above fifteen headings out of a total number of fifty-four minerals mentioned.

Taking the different classes of minerals, we find that the metallic group contributed 35·63 per cent; the miscellaneous non-metallic 44·12 per cent; the structural materials 19·14 per cent, with an allowance of 1·11 per cent for estimated value of mineral products unreturned.

In studying a comparative statement such as the tabulation given, it must be remembered that the above percentages are of the gross values, which vary from year to year, not only by reason of varying amounts produced, but also on account of the fluctuations in the price. This latter factor has affected some minerals more than others. The heavy decline in the price of silver, for instance, in the past few years, has very greatly affected its place in the scale, and copper, nickel and asbestus have also suffered heavily in this respect, as can be seen by comparison of 1896 with earlier years in the main table. In order to facilitate this use of the table, the features of increase and decrease have been brought out the use of differing type as explained in the foot notes.

MINERAL PRODUCTION OF CANADA.

EXPORTS.

MINERALS AND MINERAL PRODUCTS MINED OR MANUFACTURED IN CANADA DURING CALENDAR YEAR 1896.

EXPORTS.

Products.	Value.	Products.	Value.
Asbestus, first class	$ 107,527	Mica	$ 47,756
" second class	320,842	Mineral pigments	5,459
" third class	139,598	Nickel	658,213
Bricks	5,678	Oil, crude	101
Cement	1,328	" refined	999
Chromite	31,411	Phosphate	2,995
Clay, manufactures of	752	Platinum	225
Coal	2,388,735	Plumbago, crude	9,126
Coke	151	" manufactures of	354
Copper	281,070	Pyrites	33,837
Felspar	2,583	Salt	899
Gold	1,318,545	Sand and gravel	80,110
Grindstones	19,139	Silver	2,271,959
Gypsum, crude	186,589	Slate	8,913
" ground	21,267	Stone, unwrought	32,897
Iron and steel	284,295	" wrought	4,934
Iron ore	1,911	Other articles	15,273
Lead	462,095		
Lime	70,820	Total	8,822,360
Manganese ore	3,975		

EXPORTS

OF PRODUCTS OF THE MINE, WITH DESTINATIONS, DURING THE FISCAL YEAR 1895–1896.

Destination.	Value.	Destination.	Value.
United States (and Alaska)	$7,437,814	China	$ 13,051
Newfoundland	183,080	France	12,115
Great Britain	175,512	Hayti	5,640
Germany	128,652	Central American States	5,600
Hawaiian Islands	25,909	Spanish West Indies	3,865
British Guiana	20,085	Hong Kong	2,143
" West Indies	16,315	Argentine Republic	750
Belgium	15,375		
St. Pierre	13,744	Total	$8,059,650

IMPORTS. IMPORTS.

MINERALS AND MINERAL PRODUCTS, FOR FISCAL YEAR 1895-1896.

Products.	Value.	Products.	Value.
Alum and aluminous cake.	$ 28,375	Iron and steel—mfrs. of—	
Aluminium	7,537	machinery,	
Antimony	9,557	hardware, &c	$ 5,943,912
Arsenic	27,523	Lead—pig, bars, bl'ks, old	
Asbestus and mfrs. of	23,900	scrap, &c	193,331
Asphaltum	33,875	" manufactures of	42,778
Bismuth	188	Lime	7,331
Borax	35,255	Lithographic stone	4,964
Bricks	33,321	Manganese, oxide of	4,075
" bath	1,655	Marble—blocks, slabs, &c.	21,970
" and tiles, fire	129,024	" mfrs. of	68,095
Buhrstones	2,049	Mercury	32,343
Building stone	54,130	Metallic alloys — brass,	
Cement	12,620	bronze, german silver,	
" Portland	242,409	pewter, &c	505,076
Chalk	6,467	Mineral and bituminous	
Clay, china	33,836	substances, N.E.S	28,754
" fire	19,729	Mineral and metallic pig-	
" pipe	955	ments	426,651
" all other, N.E.S	8,464	Mineral waters	55,864
Coal, anthracite	5,667,096	Nickel	4,787
" bituminous	3,299,025	Ores of metals, N.E.S	24,038
" dust, &c	53,742	Paraffine wax	10,042
" tar and pitch	31,209	" candles	4,072
Coke	203,826	Petroleum and products of.	735,913
Copper, pigs, precipitate,		Platinum	6,185
scrap, &c	9,226	Precious stones	380,279
" ingots and mfrs. of	285,220	Pumice	3,721
Copperas	3,178	Salt	363,438
Cryolite	2,699	Saltpetre	55,628
Earthenware	575,493	Sand and gravel	24,604
Emery	27,740	Slate	24,176
Felspar, quartz, flint, &c.	8,750	Stone and granite, N.E.S.	51,499
Fertilizers	45,334	Spelter	40,548
Fuller's earth	1,834	Sulphate of copper	57,380
Graphite, crude	2,865	Sulphur	63,973
" mfrs. of	37,931	Sulphuric acid	1,430
Grindstones	26,561	Tiles, sewer pipes, &c.	19,296
Gypsum, crude	848	Tin—pigs, bars, &c.	213,710
" plaster of Paris, &c.	2,198	" mfrs. of	1,023,974
Iron and steel—Pig, scrap,		Whiting	27,322
blooms, &c.	675,811	Zinc—pigs, bars, dust, &c.	81,488
" ferro-silicon, ferro-		" mfrs. of	6,290
manganese, &c.	12,811		
" Rolled—bars, plates, &c. including chrome steel.	3,339,568	Total	25,581,771

ABRASIVE MATERIALS.

The production under this heading includes grindstones, wood-pulp, stones, spindlestones, polishing grit, whetstones, buhrstones, &c., and for the year was as follows :— Grindstones.

New Brunswick.....	2,263	tons, valued at	$18,810
Nova Scotia.....	1,450	" "	14,500
Total.....	3,713		$33,310

TABLE 1.

ABRASIVE MATERIALS.

ANNUAL PRODUCTION OF GRINDSTONES.

Calendar Year.	Tons.	Value.
1886.....	4,000	$46,545
1887.....	5,292	64,008
1888.....	5,764	51,129
1889.....	3,404	30,863
1890.....	4,884	42,340
1891.....	4,479	42,587
1892.....	5,283	51,187
1893.....	4,600	38,379
1894.....	3,757	32,717
1895.....	3,475	31,932
1896.....	3,713	33,310

As in former years, the quarries which have supplied this product are situated in the provinces of New Brunswick and Nova Scotia, those of the former province being situated chiefly in Westmoreland, Northumberland and Gloucester counties, and in the latter in Pictou and Cumberland counties.

Grindstones.—Mr. Hugh Fletcher writes as follows about the Atlantic Stone Company's quarries at Lower Cove, Cumberland, which he visited during the autumn of 1896 :—" The product sold is all manufactured ; *grindstones* for all kinds of edge tools (including scythes, &c., from 84 inches in diameter by 14 inches thick, to 6 inches in diameter and 1½ to 3 inches thick, supplied in dimensions as ordered, not manufactured haphazard ; *whetstones* (for field use for scythes, &c.) These are from the gray sandstones of the quarry at Lower Cove, the fine-grained waving stone being best adapted for scythes, the coarser varieties for other purposes."

" A red 'oil-stone,' with gray and greenish fine stripes and spots, is also here made from a quarry near Mill Cove, about five miles higher

ABRASIVE MATERIALS.

up the bay, also on the property of the Atlantic Stone Company. The stone used is taken from tide-water."

Grindstones.

"The quarries of gray stone are near the reefs on the shore, also a short distance inland. The thick fine layers are exposed in a face thirty feet high, and twenty feet of good stone is to be quarried below. A horse-winch is used to raise from this upper quarry blocks ten tons in weight, and a stone-winch on the ground is capable of lifting sixteen tons. The large blocks are sawn into the required thickness."

Pulpstones.—There have been several inquiries at this office about stones for grinding wood-pulp. Mr. C. E. Fish, of Newcastle, N.B., writes in this connection that wherever his product has been tried it is very well liked. He states that the Canada Paper Company, of Montreal, are using these stones at three of their mills, and find them entirely satisfactory.

Mr. Fish says further: "We are furnishing two stones free to any of the mills that will give them a trial, and we have in every case succeeded in getting a share of their order and in overcoming their preference for foreign stones."

Messrs. Read & Clark, of Sackville, N.B., also made some sample stones for grinding wood-pulp, and reports, so far, say they are proving very good for that purpose.

TABLE 2.

ABRASIVE MATERIALS.

EXPORTS OF GRINDSTONES.

Calendar Year.	Value.
1884	$28,186
1885	22,606
1886	24,185
1887	28,769
1888	28,176
1889	29,982
1890	18,564
1891	28,433
1892	23,567
1893	21,672
1894	12,579
1895	16,723
1896	19,139

TABLE 3.

ABRASIVE MATERIALS.

EXPORTS OF GRINDSTONES.

Provinces.	CALENDAR YEAR.			
	1893.	1894.	1895.	1896.
Quebec	$ 625	$ 1	.....	.....
Nova Scotia	11,317	10,048	$ 8,723	$ 12,145
New Brunswick	9,730	2,530	8,000	6,994
Totals	$ 21,672	$ 12,579	$ 16,723	$ 19,139

TABLE 4.

ABRASIVE MATERIALS.

IMPORTS OF GRINDSTONES.

Fiscal Year.	Tons.	Value.
1880	1,044	$11,714
1881	1,359	16,895
1882	2,098	30,654
1883	2,108	31,456
1884	2,074	30,471
1885	1,148	16,065
1886	964	12,803
1887	1,309	14,815
1888	1,721	18,263
1889	2,116	25.564
1890	1,567	20,569
1891	1,381	16,991
1892	1,484	19,761
1893	1,682	20,987
1894	1,918	24,426
1895	1,770	22,834
*1896 Duty, $1.75 per ton.	1,862	26,561

* Not mounted and not less than 12 inches in diameter.

Table 5.

Abrasive Materials.

Imports of Buhrstones.

Abrasive Materials.

Buhrstones.

Fiscal Year.	Value.
1880	$12,049
1881	6,337
1882	15,143
1883	13,242
1884	5,365
1885	4,517
1886	4,062
1887	3,545
1888	4,753
1889	5,465
1890	2,506
1891	2,089
1892	1,464
1893	3,552
1894	3,029
1895	2,172
*1896—Duty free	2,049

* Buhrstones in blocks, rough or unmanufactured, not bound up or prepared for binding into mill-stones.

Pumice stone. As no pumice-stone stone is produced in Canada, the figures of imports given below constitute all the information on the subject.

Table 6.

Abrasive Materials.

Imports of Pumice Stone.

Fiscal Year.	Value.
1885	$ 9,384
1886	2,777
1887	3,594
1888	2,890
1889	3,232
1890	3,003
1891	3,696
1892	3,282
1893	3,798
1894	4,160
1895	3,609
*1896—Duty free	3,721

* Pumice and pumice stone, ground or unground.

ABRASIVE MATERIALS.

Corundum is known to occur in Canada, but so far the deposits have not been worked, and there is therefore nothing to report in the way of production of either that mineral or of the granular form known as emery.

Corundum.

The recent discoveries of corundum in Hastings and Renfrew counties in eastern Ontario are located along a belt of country varying from one and a half to three miles in width, extending from the German Settlement, south of the village of Rockingham, in the township of Brudenell, for about sixteen miles W.S.W. into the township of Carlow. The mineral occurs as a very important and at times abundant constituent in pegmatite, cutting biotite-granite-gneiss; in a very felspathic granite or syenite gneiss and in a light-gray or whitish albite-gneiss and nepheline-syenite. It is also sparingly present in small crystals disseminated through the more felspathic bands of the ordinary biotite-gneiss but seems to be rarely if ever present in the dark-coloured basic portions interbanded with these rocks. Over certain limited areas the mineral is more concentrated, in many instances constituting from 30 to 60 per cent of the rock mass. Some of the deposits at present known, especially those in the north-western part of Raglan are easy of access.*

Emery

Table 7 below, giving the imports of emery, illustrates the home market for this class of abrasive materials :—

TABLE 7.

ABRASIVE MATERIALS.

IMPORTS OF EMERY.

Fiscal Year.	Emery. *a.*	Mfrs. of Emery. *b.*
1885	$ 5,066	$ 4,920
1886	11,877	5,832
1887	12,023	4,598
1888	15,674	4,001
1889	13,565	3,948
1890	16,922	5,313
1891	16,179	6,665
1892	17,782	6,492
1893	17,762	5,606
1894	14,433	2,223
1895	14,569	7,775
1896	†16,287	*11,913

a. Emery, in bulk, crushed or ground.
b. Emery wheels and manufactures of emery.
† Duty free.
* Duty, 25 per cent.

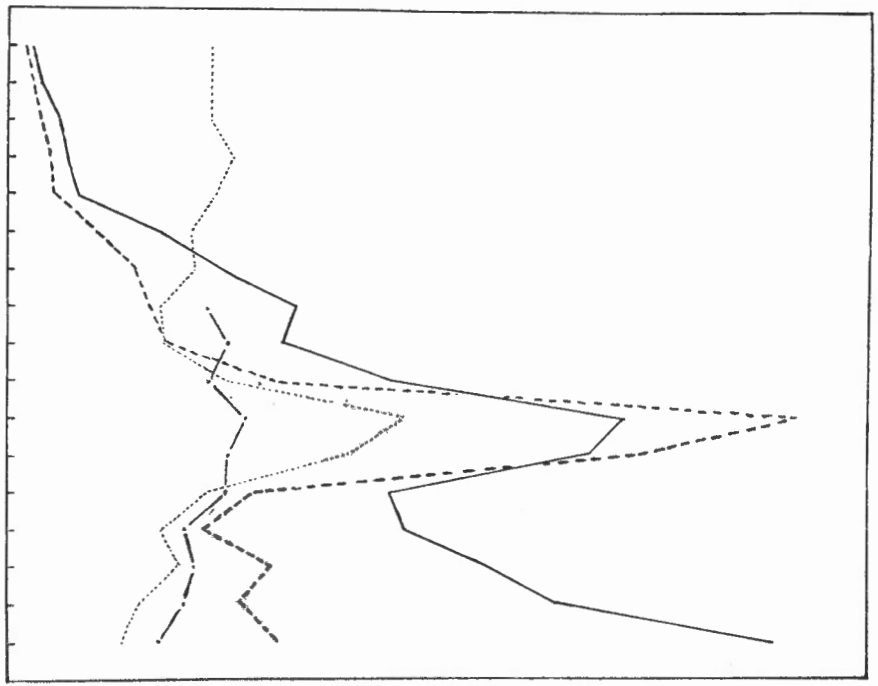
*Further particulars regarding the discovery, &c., of this mineral will be found in the Summary Report of the Director of the Geological Survey for 1896, pp. 116–118A, and in the forthcoming Geological Report of Mr. A. E. Barlow on the district.

ASBESTUS.

ANNUAL PRODUCTION.

Table A.

Calendar Year	Production. Tons (2,000 lbs.)	Production. Value.	Production. Average Value per ton.	Exports Average Value per ton.
		$	$ cts.	$ cts.
1880	380	24,700	65 00	Exports taken as Production.
1881	540	35,100	65 00	
1882	810	52,650	65 00	
1883	955	68,750	71 98	
1884	1,141	75,097	65 80	
1885	2,440	142,441	58 37	
1886	3,458	206,251	59 64	
1887	4,619	226,976	49 14	63 25
1888	4,404	255,007	57 90	70 56
1889	6,113	426,554	69 77	64 44
1890	9,860	1,260,240	127 81	75 52
1891	9,279	999,878	107 75	70 07
1892	6,082	390,462	64 19	69 35
1893	6,331	310,156	49 02	57 24
1894	7,630	420,825	55 15	59 82
1895	8,756	368,175	42 05	56 66
1896	12,250	429,856	35 09	47 96



Production, tons. – – – – Production, value. .... Production, average value per ton. .—.— Exports, average value per ton.

ASBESTUS.

Production.

The production of asbestus in Canada during 1896, amounted to 12,250 tons, valued at $429,856, as compared with 8,756 tons, valued at $368,175, for the previous year, an increase of 3,494 tons, or about 40 per cent. The total value of the production increased $61,681, or only about 17 per cent, indicating a much lower average value. This is due to the much larger proportion of the lower grades in the sales and shipments for the year.

The development of this industry is well illustrated in the accompanying graphic table, where the production from 1880 to 1896 is shown by the heavy solid line, the heavy broken line showing the total value of the same and the light broken line the average value of the shipments for each year as deduced from the last two. The most interesting feature thus brought out is the great rise in production and value in 1890. In a description of the industry, given by Mr. Klein, printed in the report for 1890, he attributes the high prices, to which this great increase in both production and value was due, to the operation of speculators who bought up and held all the stocks of the mineral, and to the eagerness of the manufacturers to buy owing to their belief in the limited capacity of the mines. In the following three years, 1890 to 1893 the inevitable reaction brought values down to about what they had been in the earlier history of the industry. An examination of the average value curve shows a decrease of about 60 per cent between 1890 and 1896. This is to be accounted for partly by the drop in prices and partly by the increase in the proportion of the lower grades of mineral in the shipments made, as compared with previous years.

TABLE 1.

ASBESTUS.

EXPORTS.

Exports.

Calendar Year.		Tons.	Value.
1892		5,380	$373,103
1893		5,917	338,707
1894		7,987	477,837
1895		7,442	421,690
1896	1st class	1,834	$107,527
	2nd "	5,428	320,842
	3rd "	4,580	139,598
	Total, 1896	11,842	$567,967

Asbestus.

It had been intended to show the relative proportions of the three grades, as given in the export figures (see Table of Exports of Asbestus in this and previous reports), but on taking out the percentages and average values for the different grades, the results in the latter case showed that the division into 'firsts' and 'seconds' has been merely nominal during the past five years. It was found that the average price of the asbestus entered for export as 'firsts' was often much lower than that entered as 'seconds' and sometimes about the same. This arises from the fact that the practice of the producers with regard to grading has varied very much, so that the best grade from one mine has often been only equivalent in length of fibre to that ranked as 'seconds' by another operator. The grade of the 'thirds,' however, has probably been more uniform than that of the firsts and 'seconds.' A comparison of the two curves in the graphic table representing the average value per ton of the production, and that of the exported asbestus, as per customs returns, shows a great discrepancy in the years from 1888 to 1891 inclusive; while for the years 1892 to 1896 inclusive, the value curves mentioned are seen to conform very fairly, although the average value of the exported mineral is considerably higher than the value of the produce as per direct returns. This is about as it should be, as the exports, especially to Europe, would be of the higher grades. For the rest, the figures in Table 1 must be taken for what they are worth. The customs officers can only take the entries of the shippers as the basis of their compilation, and these are undoubtedly very often lacking in accuracy, for various reasons.

Table 2 gives all the figures there are available regarding imports of asbestus and needs no further explanation.

Table 2.

Imports.

Asbestus:—Imports.

Fiscal Year.	Value.
1885	$ 674
1886	6,831
1887	7,836
1888	8,793
1889	9,943
1890	13,250
1891	13,298
1892	14,090
1893	19,181
1894	20,021
1895	26,094
*1896—Duty 25 p.c	23,900

* Asbestus, in any form other than crude, and all manufactures of.

In the autumn a visit was made to the asbestus mining districts of Black Lake, Thetford and Danville, of which Mr. Ingall speaks as follows (see Annual Report of the Geological Survey for 1896, vol. ix., p. 120A):— ASBESTUS. Discovery and development.

"The eastern trip was undertaken by myself, and a short visit was made to the asbestus mining centres of Black Lake, Thetford and Danville. In this industry the low prices ruling for the past few years have caused all but the larger producers to suspend operations, and have resulted, in the case of those still operating, in a much larger use of machinery and the extraction of much fibre that used to be considered too short to be worth treatment. The processes in use consist, in a general way, of some method that, while crushing the rock, frees the fibre without breaking it; followed generally by the passage of the crushed material over travelling picking tables, where the longest fibre is selected out, and then over shaking screens having a slight slope. The effect of these screens is to sort out the remaining shorter fibre into lengths, and also by reason of a funnel with strong up-draught, overhanging the lower end of the screen, to lift the fibre away from the rock particles, the latter then passing off over the ends of the screens. At Danville this latter material is being stored outside the mill in dump, as it is now coming into use to replace ordinary sand and hair in wall plastering. It is claimed that this 'Asbestic,' as it is called, takes a better finish than ordinary plaster, does not crumble under the action of fire, and that it will not crack or crumble when nails are driven into it."

At this mine very considerable developments have been made in the last few years, and a very large and well appointed mill is in operation for the crushing of the mineral and the separating of the fibre from it. This has a capacity of 400 to 500 tons per day, and is driven by a 600 h. p. engine. The rock is first crushed in large Blake rock breakers, and then passes to revolving screens having a jolting as well as a rotary motion. The sorting out of the lumps of long fibred material to go into the first and second grade, is done by hand as the material passes a row of pickers seated on either side of a travelling picking table. The rest of the material is more finely crushed and passes over the series of flat shaking screens above described. The "asbestic" which passes away out of the mill, consists of the rock material crushed to the consistency of sand intermixed with a proportion of very short asbestus fibre. Its value is about $5 per ton, f.o.b., at Danville, and it is hoped that an extensive market can be worked up for this material, which should in that case become an important factor in the

ASBESTUS. Discovery and development.

future prosperity of this industry. This company employs some 300 men.

Besides the above-described mills, visits were made to those at Thetford, where assistance was kindly given by Mr. George R. Smith, manager for the Bell's Asbestus Company, and by Mr. R. J. Bennet, manager for Messrs. King Bros. Both these mines have fully equipped mills in operation, as have also the Johnson Asbestus Co. At Black Lake, the mill of the American Asbestus Co., under the management of Mr. L. A. Klein, and that of the Glasgow and Montreal Co., under the direction of Mr. J. S. Costigan, were in operation. The latter company, however, was not working its pits, the mines having been idle for about four years, and operations only recommenced in October. At this time the plant was increased by the addition of a 100 h. p. Corliss engine, cyclone pulveriser, fans, screens, etc., for extracting the asbestus fibre from the mineral. A rotary dryer is also in process of construction for drying the lower grades of material.

Although no shipments of asbestus were made by the Brompton Lake Asbestus Co. during the year, development work was in progress.

The above comprise the chief operators in this industry, but some of the mines which used to work in the days of higher prices, although now idle, have contributed to the production from old stock.

Outside the original asbestus district in the Eastern Townships of Quebec, the only work prosecuted was that by the Non-Magnetic Asbestus Co. at Point au Chene, Argenteuil county, and by the Armitage Co. of Newark, New Jersey, U.S.A., in Lowe township, Ottawa county, both points situated in the province of Quebec. At the first-mentioned place a mill has been erected for the separation of the asbestus from the rock, and the company, besides treating their own product, have put through, from other mines in the Eastern Townships as well as the Ottawa Valley, some 600 tons or more of mineral which has been fibreized and cleaned for the European and American markets. The conditions at these two last mentioned mines are different from those found in the Eastern Townships, the asbestus in the former occurring in connection with the serpentinous limestones of the Laurentian system, whilst in the latter it occurs in a range of intrusive serpentine rocks of much later age.

In Ontario nothing was done at the actinolite deposits in Elzevir township, Hastings county, but it is hoped that financial arrangements can be made to start in the near future. A few tons of actinolite were, however, shipped at Tweed on the Canadian Pacific Railway from the Bridgewater actinolite deposits. It has been suggested that

the actinolite of this vicinity be quarried and sawn for making fire-brick for furnace linings, stoves, etc., the débris being ground and utilized for paper filling, boiler coatings, etc., and such uses as are found for fibrous talc and the lower grades of chrysotile. ASBESTUS. Discovery and development.

CHROMITE. CHROMITE.

The mineral chromite, also known as chromic iron or chrome iron ore, has a composition represented by the formula $FeCr_2O_4$. If pure it would be compose of 68 per cent of chromium sesquioxide (Cr_2O_3) and 32 per cent of iron protoxide (FeO). Analyses of the commercial chrome ore usually show considerable quantities of magnesia, alumina and silica, derived in most cases from the serpentine in which ore occurs. (See analyses given below). The value of the ore depends on the percentage of chromic oxide contained. In order to make it readily marketable, the ore should contain at least 50 per cent of chromic oxide. In the use of chromite for the production of chromium salts, the cost of treating low- and high-grade ores is the same, but there is a decided difference in the quantity of the finished product, so that unless the smaller initial cost of the low-grade ore will counterbalance the value of this difference of the finished product, its use is unprofitable. These factors therefore fix the price of low-grade ore, and circumstances such as labour and cost of shipment, will determine whether it can be worked at a profit or not.

The principal producers of the world's supply of chromite are Russia and Turkey. Turkey produces about 40,000 tons of chromite annually, or about one-half the total production of the world. New Caledonia is also an important producer, having exported in 1896, 17,887 metric tons, valued at 967,942 francs. Chromite is produced in the United States, in California, but the ores are for the most part low-grade, and the production small, being for 1896, only 786 long tons valued at $6.667.

Canadian chromite comes from the Eastern Townships in the province of Quebec, the points of shipment being Black Lake, D'Israeli and Broughton on the Quebec Central Railway.

The Canadian production of chromite for 1896 shows a decided decline, both in quantity and value, when compared with the previous year. The prices received ranged from $8.00 to $18.00 per ton, depending on the percentage of chromic oxide contained in the ore. More low-grade ore than usual was shipped this year, thus lowering the average price of the shipments to $11.53 per short ton.

CHROMITE. Production.

Table 1 gives the production of chromite from the year 1886. Test shipments were made in 1886 and 1887, but it was not until 1894 that the industry was firmly established.

TABLE 1.

CHROMITE.

ANNUAL PRODUCTION.

Calendar Year.	Tons, (2000 lbs.)	Average Price per ton.	Value.
		$ cts.	$
*1886	60	15 75	945
1887	38	15 00	570
.....	.....	.....	.....
1894	1,000	20 00	20,000
1895	3,177	13 00	41,300
1896	*2,342	11 53	27,004

* Railway shipments.

Analyses.

The following analyses will indicate what may be expected in the composition of a chrome ore :—

ANALYSES OF CHROME ORES.

Number.	Cr_2O_3.	FeO.	Al_2O_3.	SiO_2.	MgO.	CaO.	Total.
	%	%	%	%	%	%	%
1	45·90	35·68	3·20	.....	15·03	.....	99·81
2	49·75	21·28	11·30	.....	18·13	.....	100·46
3	52·82	.....	.....	.....	.....	.....	.....
4	35·46	.....	.....	.....	.....	.....	.....
5	39·15	27·12	7·00	7·00	16·11	3·41	99·79
6	51·03	13·06	12·16	5·22	16·32	2·61	100·40
7	53·07	15·27	8·01	6·44	16·08	1·20	100·07
8	50·65	13·93	12·70	3·35	15·04	.....	95·67
9	55·04	11·57	10·81	3·80	16·10	1·13	98·45
10	51·80	24·72	13·90	2·05	7·81	0·41	100 69
11	55·54	14·50	15·43	1·30	12·85	0·80	100·42
12	42·40	12·28	20·23	5·69	16·52	1·40	98·52
13	42·45	14·83	16·75	6·48	16·42	1·21	98·14

No. 1, Tp. Bolton, Que. G. S. C. Report, 1863, p. 504.
" 2, Lake Memphremagog. G. S. C. Report, 1863, p. 504.
" 3, Tp. Coleraine, Megantic Co., Que. Coleraine Mining Co. G. S. C. Report, 1894, p. 67 R.
" 4, 17. IV. Thetford, Megantic Co., Que. G. S. C. Report, 1887-88 pt. II, 56 T.
" 5, 6 and 7, Canadian Mining Manual, 1896, p. 342.
" 8, Canada
" 9 and 10, Turkish (Asia) } "Mineral Industry," 1895, p. 101.
" 11, New Caledonia } Scientific Pub. Co., New York.
" 12 and 13 California

The principal producers of chromic iron in Canada for 1896 were the following :— CHROMITE. Producers.

Name.	Shipping Station, Quebec Central Railway.	Address.
Anglo-Canadian Asbestus Co.	Black Lake.	314 Board Trade, Montreal, Que.
Blondeau & Roberge.	"	Black Lake, Que.
L. J. Frechette.	"	St. Ferdinand "
W. H. Lamblay.	"	Inverness "
Victoria Mining Co. (P. P. Hall).	"	Quebec "
J. O. Brousseau.	D'Israeli.	D'Israeli "
Leonard & Morin.	"	" "
James Reed, M.D.	Broughton.	Reedsdale "

COAL.

COAL.

The total production of coal for the Dominion is shown in graphic Table A. From the figures there given, it will be seen that the increase over last year amounted to 267,372 tons and $487,309, or 7·69 and 7·23 per cent respectively. The increase since 1886 has been $3,486,622, equal to about 93 per cent, and 1,629,063 tons, equal to about 77 per cent.

Coal. Annual Production.

COAL.

ANNUAL PRODUCTION.

Table A.

Calend'r Year.	Tons.	Value.
		$
1886	2,116,653	3,739,840
1887	2,429,330	4,388,206
1888	2,602,552	4,674,140
1889	2,658,303	4,894,287
1890	3,084,682	5,676,247
1891	3,577,749	7,019,425
1892	3,287,745	6,363,757
1893	3,783,499	7,359,080
1894	3,847,070	7,429,468
1895	3,478,344	6,739,153
1896	3,745,716	7,226,462

The relative proportions contributed by the different provinces to the grand total are graphically exhibited in Table B, and the below given figures in Table I show the increase or decrease for the different provinces in 1896 as compared with 1895 :—

Coal.
Production by provinces.

COAL.
CALENDAR YEAR, 1895.
PRODUCTION BY PROVINCES.
Table B.

Province	Tons, 2,000 lbs.	Value.
		$
N. S.	2,225,145	3,476,790
B. C.	1,058,045	2,834,049
N. W. T.	185,654	414,064
N. B.	9,500	14,250

COAL.
CALENDAR YEAR, 1896.
PRODUCTION BY PROVINCES.
Table B.

Province.	Tons, 2,000 lbs.	Value.
		$
N. S.	2,508,579	3,919,655
B. C.	1,003,769	2,688,666
N. W-T.	225,868	606,851
N. B.	7,500	11,250

COAL.
Production by provinces.

TABLE 1.

COAL.

PRODUCTION. COMPARISON OF 1895 AND 1896.

Province.	INCREASE OR DECREASE.			
	Tons.	Per cent.	Value.	Per cent.
Nova Scotia	283,434	12·74	442,865	12·74
New Brunswick	2,000	21·05	3,000	21·05
North-west Territories	40,214	21·66	192,827	46·57
British Columbia	54,276	5·13	145,383	5·13
Dominion	267,372	7·69	487,309	7·23

NOTE.—The figures underlined in this table represent increases, the others decreases.

The export trade for the Dominion is illustrated by graphic Table C. From this it will be seen that the increase in the amount of coal exported from 1886 to 1896 is about 112 per cent, whilst the difference between the first year given, viz., 1873 and 1886, represents an increase of about 163 per cent.

Graphic Table D is given as supplementing Table C, although it has hardly any bearing upon the mineral industry.

COAL.
EXPORTS.
PRODUCE OF CANADA).
Table C.

Calendar Year.	Tons.
1873	420,683
1874	310,988
1875	250,348
1876	248,638
1877	301,317
1878	327,959
1879	306,648
1880	432,188
1881	395,382
1882	412,682
1883	486,811
1884	474,405
1885	127,937
1886	520,703
1887	580,965
1888	588,627
1889	665,315
1890	724,486
1891	971,259
1892	823,733
1893	960,312
1894	1,103,694
1895	1,011,235
1896	1,106,661

Coal. Exports.

COAL.

EXPORTS.

(NOT THE PRODUCE OF CANADA.)

Table D.

Calendar Year.	Tons.
1873	5,403
1874	12,859
1875	14,026
1876	4,995
1877	4,829
1878	5,468
1879	8,468
1880	14,217
1881	14,245
1882	37,576
1883	44,388
1884	62,665
1885	71,003
1886	78,443
1887	89,098
1888	84,316
1889	89,294
1890	82,534
1891	77,827
1892	93,988
1893	102,827
1894	89,786
1895	96,836
1896	116,774

Table 2 below gives the export by provinces and explains itself, except that it should be borne in mind that the entries made under the heading of any given province do not necessarily or always represent coal produced in that province, for some coal is undoubtedly shipped to other provinces and exported thence, thus appearing under the head of the exporting rather than the producing province. Coal. Exports by provinces.

Table 3 of exports not the produce of Canada is given as supplementing the previous one.

TABLE 2.

COAL.

EXPORTS. THE PRODUCE OF CANADA.

Provinces.	Calendar Year					
	1894.		1895.		1896.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
Ontario.....	104	$ 115	.....	.....	.....	.....
Quebec	7,600	22,995	148	$ 382	.....	.....
Nova Scotia ...	310,277	633,398	241,091	534,479	380,149	$ 787,270
New Brunswick	919	2,948	4,445	13,343	1,075	3,364
P. E. Island...	1,221	2,850	150	450	.....	.....
N. W. Ter.....	13,134	24,293	37,118	77,015	45,638	90,349
Brit. Columbia.	770,439	2,855,216	728,283	2,692,562	679,799	2,507,752
Total.....	1,103,694	$3,541,815	1,011,235	$3,318,231	1,106,661	$3,388,735

TABLE 3.

COAL.

EXPORTS. NOT THE PRODUCE OF CANADA.

Provinces.	Calendar Year.					
	1894.		1895.		1896.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
Ontario.....	83,599	$ 184,314	93,027	$ 191,783	112,539	$ 222,484
Quebec	5,338	11,378	2,956	6,139	28	160
Nova Scotia....	631	1,374	472	1,791	546	2,064
New Brunswick	218	577	380	1,019	3,661	9,432
Manitoba	.....	.....	1	13	.....	.....
Total.....	89,786	$ 197,643	96,836	$ 200,745	116,774	$ 234,140

Table 4 gives the exports of coal from Nova Scotia and British Columbia from 1874 to 1896. An examination of the figures will show that the export trade for the former province, while varying considerably from year to year, has yet remained fairly uniform on an average. On the other hand, the exports from British Columbia have, with the exception of occasional years, maintained a steady and con-

Coal. Exports. British Columbia and Nova Scotia.

siderable increase. Thus the tonnage in 1896 was over thirteen times that of 1874.

TABLE 4.

COAL.

EXPORTS. NOVA SCOTIA AND BRITISH COLUMBIA.

Calendar Year.	Nova Scotia		*British Columbia.	
	Tons.	Value.	Tons.	Value.
1874	252,124	$647,539	51,001	$ 278,180
1875	179,626	404,351	65,842	356,018
1876	126,520	263,543	116,910	627,754
1877	173,389	352,453	118,252	590,263
1878	154,114	293,795	165,734	698,870
1879	113,742	203,407	186,094	608,845
1880	199,552	344,148	219,878	775,008
1881	193,081	311,721	187,791	622,965
1882	216,954	390,121	179,552	628,437
1883	192,795	336,088	271,214	946,271
1884	222,709	430,330	245,478	901,440
1885	176,287	349,650	250,191	1,000,764
1886	240,459	441,693	274,466	960,649
1887	207,941	390,738	356,657	1,262,552
1888	165,863	330,115	405,071	1,605,650
1889	186,608	396,830	470,683	1,918,263
1890	202,387	426,070	508,882	1,977,191
1891	194,867	417,816	767,734	2,958,695
1892	181,547	407,980	599,716	2,317,734
1893	203,198	470,695	708,228	2,693,747
1894	310,277	633,398	770,439	2,855,216
1895	241,091	534,479	728,283	2,692,562
1896	380,149	787,270	679,799	2,507,752

*See foot note table 16.

The imports of the various grades of coal are to be found in the Tables Nos. 5, 6 and 7 below. From the figures in Table 5 it will be seen that since 1880 the imports of bituminous coal have increased 335 per cent. From 1886 there was a continual increase in the amount up to 1892, since which year the figures show a certain amount of rise and fall. The per capita consumption of imported bituminous coal has risen from a little over $\frac{1}{10}$th of a ton to nearly $\frac{3}{10}$ths in 1896.

GEOLOGICAL SURVEY OF CANADA.

SECTION OF MINERAL STATISTICS AND MINES.

Mineral Production of Canada, Calendar Years 1886 to 1896.

PRODUCTS.	1886.		1887.		1888.		1889.		1890.		1891.		1892.		1893.		1894.		1895.		1896.		PRODUCTS.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
METALLIC.		$		$		$		$		$		$		$		$		$		$		$	
Antimony ore ... Tons.	665	31,490	584	10,860	345	3,696	55	1,100	26½	625	10	60											Antimony ore.
Copper (c) ... Lbs.	3,505,000	385,550	3,260,424	366,798	5,562,864	927,107	6,809,752	936,341	6,013,671	947,153	8,928,921	1,149,598	7,087,275	818,580	8,109,856	871,809	7,737,016	739,659	8,789,162	945,714	9,393,012	1,021,960	Copper.
Gold (d) ... Oz.	66,061	1,365,496	59,884	1,237,804	53,150	1,098,610	62,658	1,295,159	55,625	1,149,776	45,022	930,614	43,908	907,601	47,247	976,603	54,605	1,128,688	92,485	1,911,676	134,498	2,780,086	Gold.
Iron ore (a) ... Tons.	69,708	126,982	76,330	146,197	78,587	152,068	84,181	151,640	76,511	155,380	68,979	142,005	103,248	263,866	125,602	299,368	109,991	226,611	102,797	238,070	91,906	191,557	Iron ore.
Lead (e) ... Lbs.			204,800	9,216	674,500	29,813	165,100	6,488	105,000	4,704	88,665	3,857	808,420	33,064	2,135,023	79,636	5,703,222	187,636	16,461,794	531,716	24,199,977	721,159	Lead.
Mercury ... "																			5,431	2,343	4,437	1,940	Mercury.
Nickel (f) ... "							(l) 830,477	498,286	1,435,742	933,232	4,626,627	2,775,976	2,413,717	1,399,956	3,982,982	2,071,151	4,907,430	1,870,958	3,888,525	1,360,984	3,397,113	1,188,990	Nickel.
Platinum ... Oz.			1,400	5,600	1,500	6,000	1,000	3,500		4,500		10,000		3,500		1,800		950		3,800		750	Platinum.
Silver ... "	*210,141	*209,090	349,330	341,645	395,377	371,654	383,318	358,785	400,687	419,118	414,523	409,549	310,651	272,130	422,158	330,128	847,697	534,049	1,775,683	1,159,166	3,205,343	2,149,503	Silver.
Total value, Metallic.		*2,118,608		2,118,120		2,588,948		3,251,299		3,614,488		5,421,659		3,698,697		4,630,495		4,688,551		6,153,469		8,055,945	
NON-METALLIC.		(a)		(a)		(a)		(a)		(a)		(a)		(a)		(a)		(a)		(a)		(a)	
Arsenic (white) ... Tons.	120	5,460	30	1,200	†30	†1,200			25	1,500	20	1,000					7	420					Arsenic.
Asbestus ... "	3,458	206,251	4,619	226,976	4,404	255,007	6,113	426,554	9,860	1,260,240	9,279	999,878	6,082	390,462	6,331	310,156	7,630	420,825	8,756	368,175	12,250	429,856	Asbestus.
Chromite ... "	*60	*945	38	570													1,000	20,000	3,177	41,300	2,342	27,004	Chromite.
Coal ... "	*2,116,653	*3,739,840	2,429,330	4,388,206	2,602,552	4,674,140	2,658,303	4,894,287	3,084,682	5,676,247	3,577,749	7,019,425	3,287,745	6,363,757	3,783,499	7,359,080	3,847,070	7,429,468	3,478,344	6,739,153	3,745,716	7,226,462	Coal.
Coke (g) ... "	*35,396	*101,940	40,428	135,951	45,373	134,181	54,539	155,043	56,450	166,298	57,084	175,592	56,135	160,249	61,078	161,790	58,044	148,551	53,356	143,047	49,619	110,257	Coke.
Felspar ... "									700	3,500	685	3,425	175	525	575	4,525				(k) 2,545	972	(k) 2,583	Felspar.
Fire clay ... "		(b)		(b)		(b)	*400	*4,800			250	750	1,991	4,467	540	700	539	2,167	1,329	3,492	842	1,805	Fire clay.
Graphite ... "	500	4,000	300	2,400	150	1,200	242	3,160	175	5,200	260	1,560	167	3,763			69	223	220	6,150	139	9,455	Graphite.
Grindstones ... "	*4,000	*46,545	5,292	64,008	5,764	51,129	3,404	30,863	4,884	42,340	4,479	42,587	5,283	51,187	4,600	38,379	3,757	32,717	3,475	31,932	3,713	33,310	Grindstones.
Gypsum ... "	162,000	178,742	154,008	157,277	175,887	179,393	213,273	205,108	226,509	194,033	203,605	206,251	241,048	241,127	192,568	196,150	223,631	202,031	226,178	202,608	207,032	178,061	Gypsum.
Limestone for flux ... "		(b)	*17,171	*17,500	16,857	16,533	22,122	21,909	18,478	18,361	11,376	11,547	22,967	21,492	27,797	27,519	35,101	34,347	34,579	32,916	37,462	36,140	Limestone.
Lithographic stone. ... "																	180	30,000		2,000			Lithographic stone.
Manganese ore ... "	1,789	41,499	1,245	43,658	1,801	47,944	1,455	32,737	1,328	32,550	255	6,694	115	10,250	213	14,578	74	4,180	125	8,464	123½	(k) 3,975	Manganese ore.
Mica ... Lbs.	*20,361	*29,008	22,083	29,816	29,025	30,207	36,529	28,718	770,959	68,074		71,510		104,745		75,719		45,581		65,000		60,000	Mica.
Mineral pigments—																							
Baryta ... Tons.	3,864	19,270	400	2,400	1,100	3,850			1,842	7,543			315	1,260			1,081	2,830			145	715	Baryta.
Ochres ... "	*350	*2,350	485	3,733	397	7,900	794	15,280	275	5,125	900	17,750	390	5,800	1,070	17,710	611	8,690	1,339	14,600	2,362	16,045	Ochres.
Mineral waters ... Galls.		(b)		(b)	*124,850	*11,456	424,600	37,360	561,165	66,031	427,485	54,268	640,380	75,348	725,096	108,347	767,460	110,040	739,382	126,048	706,372	111,736	Mineral waters.
Molybdenite ... Lbs.	150	*156																					Molybdenite.
Moulding sand ... Tons.		(b)	*160	*800	169	845	170	850	320	1,410	230	1,000	345	1,380	4,370	9,086	6,214	12,428	6,765	13,530	5,739	11,478	Moulding sand.
Natural gas ...														150,000		376,233		313,754		423,032		276,301	Natural gas.
Petroleum (h) ... Brls.	584,061	525,655	713,728	556,708	695,203	713,695	704,690	653,600	795,030	902,734	755,298	1,010,211	779,753	984,438	798,406	874,255	829,104	835,322	726,138	1,086,738	726,822	1,155,647	Petroleum.
Phosphate (apatite) ... Tons.	20,495	304,338	23,690	319,815	22,485	242,285	30,988	316,662	31,753	361,045	23,588	241,603	11,932	157,424	8,198	70,942	6,861	41,166	1,822	9,565	570	3,420	Phosphate.
Precious stones ...										700		1,000		†1,000		1,500		†1,500					Precious stones.
Pyrites ... Tons.	42,906	193,077	38,043	171,194	63,479	285,656	72,225	307,292	49,227	123,067	67,731	203,193	59,770	179,310	58,542	175,626	40,527	121,581	34,198	102,594	33,715	101,155	Pyrites.
Quartz ... "									200	1,000					100	500					10	50	Quartz.
Salt ... "	62,359	227,195	60,173	166,394	59,070	185,460	32,832	129,547	43,754	198,857	45,021	161,179	45,486	162,041	62,324	195,926	57,199	170,687	52,376	160,455	43,960	169,693	Salt.
Soapstone ... "	*50	*400	100	800	140	280	195	1,170	917	1,239			1,374	6,240	717	1,920	916	1,640	475	2,138	410	1,230	Soapstone.
Structural materials and clay products—																							
Bricks ... M.	*139,345	*873,600	181,581	986,689	165,818	1,036,746	200,561	1,273,884	211,727	1,266,982	176,533	1,061,536	202,147	1,251,934	290,000	1,800,000		†1,800,000	308,836	1,670,000		1,600,000	Bricks.
Building stone ... c. yds.	*165,777	*642,509	262,592	552,267	411,570	641,712	341,337	913,691	382,563	964,783	187,685	708,736		609,827		1,100,000		1,200,000		1,095,000		1,000,000	Building stone.
Cement, natural ... Brls.		(b)	*69,843	*81,909	50,668	35,593	90,474	69,790	102,216	92,405	93,473	108,561	88,187	94,912	126,673	130,167	108,142	144,637	128,294	173,675	70,705	60,500	Cement, natural.
" Portland ...													29,221	52,751	31,924	63,848					78,385	141,151	" Portland.
Flagstones ... sq. ft.	*70,000	*7,875	116,000	11,600	64,800	6,580	14,000	1,400	17,865	1,643	27,300	2,721	13,700	1,869	40,500	3,487	152,700	5,298	80,005	6,687		6,710	Flagstones.
Granite ... Tons.	*6,062	*63,309	21,217	142,506	21,352	147,305	10,197	79,624	13,307	65,985	13,637	70,056	24,302	89,326	22,521	94,393	16,392	109,936	19,238	84,838	18,717	106,709	Granite.
Lime ... Bush.	*1,535,950	*283,755	2,269,087	394,859	2,216,764	339,951	2,948,249	362,848	2,501,079	412,308	1,829,824	251,215	2,260,640	411,270	6,750,000	900,000		†900,000	5,225,000	700,000		650,000	Lime.
Marble ... Tons.	*501	*9,900	242	6,224	191	3,100	83	980	780	10,776	240	1,752	340	3,600	590	5,100			200	2,000	224	2,405	Marble.
Miscellaneous clay products (i) ...		*112,910		182,150				239,385															Miscellaneous clay products.
Pottery ...		(j)		(j)		*27,750		(j)		195,242		258,844		265,811		213,186		162,144		151,588		163,427	Pottery.
Roofing cement ... Tons.		(b)		(b)		(b)	(b)	*1,171	*6,502	1,020	4,810	800	12,000	951	5,441	815	3,978		3,153	86	430	Roofing cement.
Sands and gravels (k) ... "	*124,865	*24,226	180,860	30,307	260,929	38,398	283,044	52,647	342,158	65,518	243,724	59,501	297,878	85,329	329,116	121,795	324,656	86,940	277,162	118,359	224,769	80,110	Sands and gravels.
Sewer pipe ...		(j)		(j)		*266,320		(j)		*348,000		227,300		367,660		350,000		250,325		257,045		153,875	Sewer pipe.
Slate ... Tons.	*5,345	*64,675	7,357	89,000	5,314	90,689	6,935	119,160	6,368	100,250	(l) 5,000	65,000	5,180	69,070	7,112	90,825		75,550		58,900		53,370	Slate.
Terra-cotta ...		(j)		(j)		*49,800		(j)		*90,000		113,103		97,239		55,704		65,600		195,123		83,855	Terra-cotta.
Tiles ... M.	*12,416	*142,617	14,658	230,068	7,518	114,057	10,526	134,265	10,521	140,877	11,839	141,399	15,689	190,857	100,000	200,000		†200,000	19,200	210,000		225,000	Tiles.
Tripolite ... Tons.																					664	9,960	Tripolite.
Whiting ... Brls.	*400	*600	†400	†600	160	240			500	500							500	750					Whiting.
Total structural materials and clay products.		*2,225,376		2,707,579		2,798,001		3,247,674		3,761,271		3,074,534		3,603,455		5,133,946		5,004,408		4,726,368		4,327,542	
All other non-metallic.		*5,627,271		6,290,006		6,842,601		7,264,940		9,137,594		10,230,423		9,076,265		10,020,641		9,990,898		9,585,482		9,976,338	
Total value, non-metallic.		*7,852,647		8,997,585		9,640,602		10,512,614		12,898,865		13,304,957		12,679,720		15,154,587		14,995,306		14,311,850		14,303,880	
" metallic.		*2,118,608		2,118,120		2,588,948		3,251,299		3,614,488		5,421,659		3,698,697		4,630,495		4,688,551		6,153,469		8,055,945	
Estimated value of products unspecified or not reported (m).		*250,000		†250,000		†250,000		†250,000		†250,000		†250,000		†250,000		†250,000		†250,000		†250,000		†250,000	
Grand total		*10,221,255		11,365,705		12,479,550		14,013,913		16,763,353		18,976,616		16,628,417		20,035,082		19,933,857		20,715,319		22,609,825	

(a) Value at mine, quarry or works.
(b) Not reported.
(c) Copper contents of ore, matte, etc., at the average market price for the year.
(d) Ounces, fine, calculated at value of $20.67 per oz.
(e) Lead contents of ore, matte, etc., at average market price for year.
(f) Nickel " "
(g) Oven coke.
(h) Calculated from official inspection returns and computed at average yearly price per barrel (of 35 imp. gallons)
(i) Includes (for the years given) terra-cotta, pottery, sewer pipe and earthenware.
(j) Included in miscellaneous clay products.
(k) Exports only.
(l) Railway shipments.
(m) Mostly structural materials.

NOTE.—The above figures represent the summary statements incorporated in the annually issued reports of the Section, those for the earlier years being corrected and revised to make the method of statement conform with that adopted for recent years.
The differing type shows the increases, decreases, etc., as compared with the previous year as follows:—Heavy faced type, increase; ordinary type, decrease; ordinary type with †, same as previous year; ordinary type with *, neither increase nor decrease to record, the figures for previous years not being available.

TABLE 5.
COAL.
IMPORTS OF BITUMINOUS COAL.

COAL. Imports.

Fiscal Year.	Tons.	Value.
1880	457,049	$1,220,761
1881	587,024	1,741,568
1882	636,374	1,992,081
1883	911,629	2,996,198
1884	1,118,615	3,613,470
1885	1,011,875	3,197,539
1886	930,949	2,591,554
1887	1,149,792	3,126,225
1888	1,231,234	3,451,661
1889	1,248,540	3,255,171
1890	1,409,282	3,528,959
1891	1,598,855	4,060,896
1892	1,615,220	4,099,221
1893	1,603,154	3,967,764
1894	1,359,509	3,315,094
1895	1,444,928	3,321,387
1896 Duty, 60c. per ton.	1,538,489	3,299,025

A study of the figures in Table 6 brings to light the following interesting facts. Since 1880 there has been a steady increase in the importations of anthracite coal, with the exception of the years 1888 and 1895, in the former of which there was a very exceptional increase† and in the latter a slight falling off. The ratio of importation of anthracite coal per capita of the population of the country increased from about $\frac{12}{100}$ths of a ton in 1880 to a little over $\frac{80}{100}$ths of a ton in 1896.

TABLE 6.
COAL.
IMPORTS OF ANTHRACITE COAL.

Fiscal Year.	Tons.	Value.
1880	516,729	$1,509,960
1881	572,092	2,325,937
1882	638,273	2,666,356
1883	754,891	3,344,936
1884	868,000	3,831,283
1885	910,324	3,909,844
1886	995,425	4,028,050
1887	1,100,165	4,423,062
1888	2,138,627	5,291,875
1889	1,291,705	5,199,481
1890	1,201,335	4,595,727
1891	1,399,067	5,224,452
1892	1,479,106	5,640,346
1893	1,500,550	6,355,285
1894	1,530,522	6,354,040
1895	1,404,342	5,350,627
*1896 Duty free.	1,574,355	5,667,096

* Coal, anthracite, and anthracite coal dust. †There is some reason to believe this is due to typographical error in the Trade and Navigation Report.

Coal. Imports.

There is a yearly importation of small coal, classified by the Customs Department as "coal dust," as shown in Table 7, and in this also there has been a general increase since 1881.

Table 7.

Coal.

Imports of Coal Dust.

Fiscal Year.	Tons.	Value.
1880..	3,565	$ 8,877
1881..	337	666
1882..	471	900
1883..	8,154	10,082
1884..	12,782	14,600
1885..	20,185	20,412
1886..	36,230	36,996
1887..	31,401	33,178
1888..	28,808	34,730
1889..	39,980	47,139
1890..	53,104	29,818
1891..	60,127	36,130
1892..	82,091	39,840
1893..	109,585	44,474
1894..	117,573	49,510
1895..	181,318	52,221
1896.. Duty 20 p.c.	210,386	53,742

Taking the data given in the above tables and assuming that the figures of imports for the fiscal year as given in Tables 5, 6 and 7 above represent closely enough the importation of coal during the calendar year we have the consumption of the country for 1896 as follows:—

Home consumption.

	Tons.	
Production, Table A	3,745,716	
Exports of coal the produce of Canada, Table C.	1,106,661	
Home consumption of Canadian coal		2,639,055
Imports of bituminous, anthracite and coal dust, Tables 5, 6 and 7	3,323,230	
Exports of coal not the produce of Canada	116,774	
		3,206,456
Total consumption of coal in Canada, home and imported		5,845,511

Table 8, following, calculated on the same basis, gives the figures for the past ten years:— Coal. Home consumption.

TABLE 8.

CONSUMPTION OF COAL IN CANADA.

Calendar Year.	Tons.
1886	3,480,111
1887	4,040,625
1888	5,328,278
1889	4,483,919
1890	4,941,383
1891	5,586,712
1892	5,546,441
1893	5,933,649
1894	5,661,194
1895	5,400,861
1896	5,845,511

From the eleven years covered by the figures given above, it will be seen that the consumption of coal in Canada has increased about 67 per cent. Calculating from estimates of the population furnished by the Census Department for the years 1886 and 1896 it will be found that the per capita consumption for the two years dealt with is as follows:—

TABLE 9.

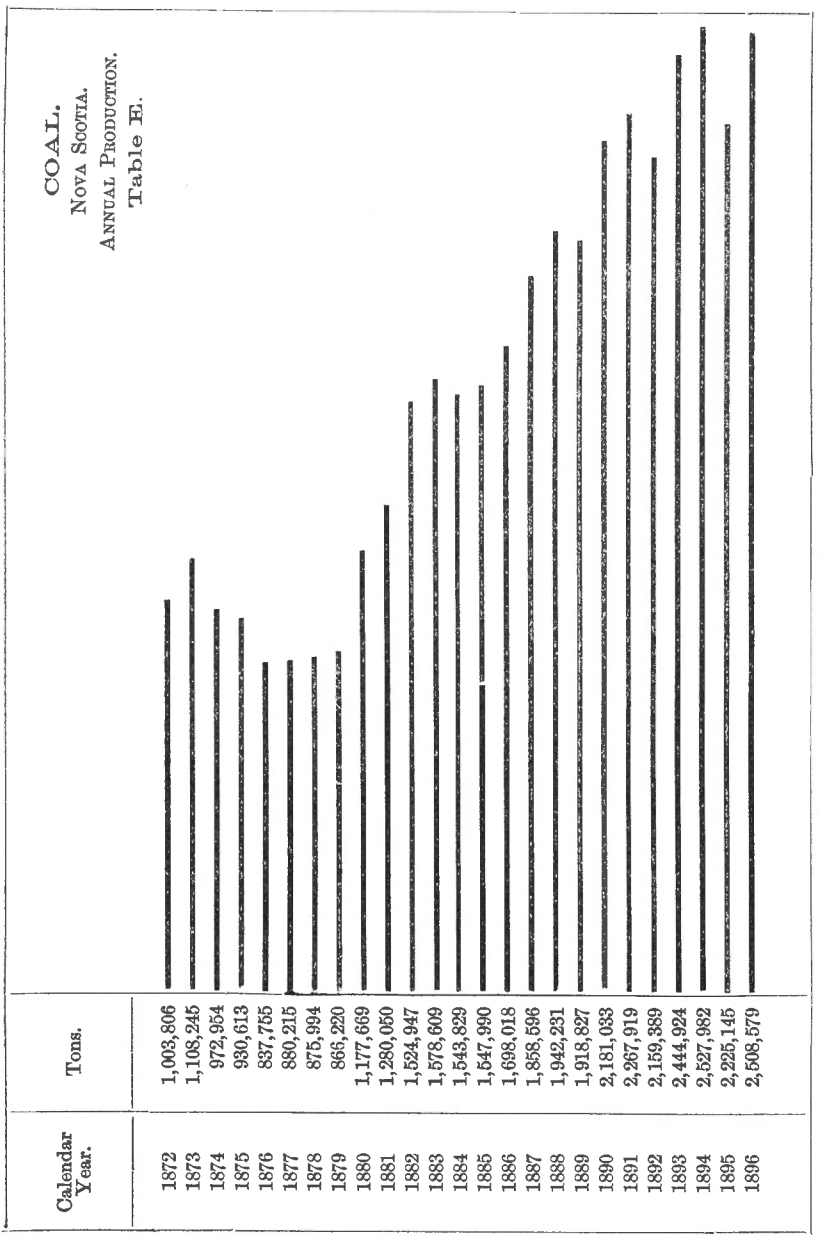
PER CAPITA CONSUMPTION OF COAL IN CANADA.

——	1886.	1896.	Increase over 1886, per cent.
	Tons.	Tons.	
Home product	0·347	0·514	48·1
Imported	0·411	0·626	52·3
Total	0·758	1·140	50·4

NOVA SCOTIA.

The growth of the coal mining industry of this province is well illustrated in Graphic Table E, below. Comparing 1896 with 1872, the first year given, we find an increase in the production of this province of 1,564,773 tons or almost 150 per cent.

Coal. Nova Scotia.



Calendar Year.	Tons.
1872	1,003,806
1873	1,103,245
1874	972,954
1875	930,613
1876	837,755
1877	880,215
1878	876,994
1879	866,220
1880	1,177,669
1881	1,280,050
1882	1,524,947
1883	1,578,609
1884	1,543,829
1885	1,547,990
1886	1,698,018
1887	1,858,596
1888	1,942,231
1889	1,918,827
1890	2,181,033
1891	2,267,919
1892	2,159,389
1893	2,444,924
1894	2,527,982
1895	2,225,145
1896	2,508,579

Table 10 gives the detail of the production for past years as well as the total values for each, which it will be seen is based on an average value taken at $1.75 per ton. This table represents a thorough revision of the subject and comparison with the original data in the provincial reports.

Table 10.

Coal.

Nova Scotia:—Output, Sales, Colliery Consumption and Production.

Calendar Year.	Output, Tons, 2,240 Lbs.	Sales, Tons, 2,240 Lbs.	Colliery Consumption, Tons, 2,240 Lbs.	Production* Tons, 2,240 Lbs.	Output, Tons, 2,000 Lbs.	Sales, Tons, 2,000 Lbs.	Colliery Consumption, Tons, 2,000 Lbs.	Production* Tons, 2,000 Lbs.	Price per Ton, 2,240 Lbs.	Value of Production.
1872	880,950	785,914	110,341	896,255	986,664	880,224	123,582	1,003,806	$1.75	$1,568,446
1873	1,051,467	881,106	108,398	989,504	1,177,643	986,839	121,406	1,108,245	1.75	1,731,632
1874	872,720	749,127	119,582	868,709	977,446	839,022	133,932	972,954	1.75	1,520,240
1875	781,165	706,795	124,110	830,905	874,905	791,610	139,003	930,613	1.75	1,454,084
1876	709,646	634,207	113,788	747,995	794,804	710,312	127,443	837,755	1.75	1,308,991
1877	757,496	687,065	98,841	785,906	848,396	769,513	110,702	880,215	1.75	1,375,339
1878	770,603	693,511	88,627	782,138	863,075	776,732	99,262	875,994	1.75	1,368,741
1879	788,271	688,624	84,787	773,411	882,863	771,259	94,961	866,220	1.75	1,353,469
1880	1,032,710	954,659	96,831	1,051,490	1,156,635	1,069,218	108,451	1,177,669	1.75	1,840,108
1881	1,124,270	1,035,014	107,888	1,142,902	1,259,183	1,159,216	120,834	1,280,050	1.75	2,000,079
1882	1,365,811	1,250,179	111,381	1,361,560	1,529,708	1,400,200	124,747	1,524,947	1.75	2,382,730
1883	1,422,553	1,297,523	111,949	1,409,472	1,593,259	1,453,226	125,383	1,578,609	1.75	2,466,576
1884	1,389,295	1,261,650	116,769	1,378,419	1,556,011	1,413,048	130,781	1,543,829	1.75	2,412,233
1885	1,352,205	1,254,510	127,624	1,382,134	1,514,470	1,405,051	142,939	1,547,990	1 75	2,418,735
1886	1,502,611	1,373,666	142,421	1,516,087	1,682,924	1,538,506	159,512	1,698,018	1.75	2,653,152
1887	1,670,830	1,519,684	139,777	1,659,461	1,871,330	1,702,046	156,550	1,858,596	1.75	2,904,057
1888	1,776,128	1,576,692	157,443	1,734,135	1,989,263	1,765,895	176,336	1,942,231	1.75	3,034,735
1889	1,756,279	1,555,107	158,131	1,713,238	1,967,032	1,741,720	177,107	1,918,827	1.75	2,998,167
1890	1,984,001	1,786,111	161,240	1,947,351	2,222,081	2,000,444	180,589	2,181,033	1.75	3,407,864
1891	2,044,784	1,849,945	174,983	2,024,928	2,290,158	2,071,938	195,981	2,267,919	1.75	3,543,624
1892	1,942,780	1,752,934	175,092	1,928,026	2,175,913	1,963,286	196,103	2,159,389	1.75	3,374,046
1893	2,223,042	1,977,543	205,425	2,182,968	2,489,807	2,214,848	230,076	2,444,924	1.75	3,820,194
1894	2,250,631	2,060,920	196,206	2,257,126	2,520,707	2,308,231	219,751	2,527,982	1.75	3,949,970
1895	1,999,756	1,793,098	193,639	1,986,737	2,239,727	2,008,270	216,875	2,225,145	1.75	3,476,790
1896	2,292,675	2,046,828	192,975	2,239,803	2,567,796	2,292,447	216,132	2,508,579	1.75	3,919,655

* This Production is obtained by adding Sales and Colliery Consumption. For Sales previous to 1872, see report of the Department of Mines, Nova Scotia, 1883, page 68.

COAL. Nova Scotia.

Table 11 following, illustrating the production by districts, is self explanatory. In Table 12 the year's production is given for the different collieries which are again grouped under the heading of the districts where they are located :—

TABLE 11.

COAL.

NOVA SCOTIA :—COAL TRADE BY COUNTIES.

Calendar Year, 1896.	Cumberland.		Pictou.		Cape Breton.		Other Counties.	
	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Rais'd	Sold.
	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.	Tons, 2000 lbs.
1st quarter..	148,397	130,881	94,029	92,930	122,340	67,786	1,198	470
2nd " ..	129,156	113,548	107,391	116,622	455,735	405,488	6,574	5,442
3rd " ..	107,920	94,289	118,133	97,363	643,553	631,101	8,016	7,941
4th " ..	132,678	113,597	106,015	67,975	382,016	342,833	4,743	4,181
Totals, 1896.	518,151	452,315	425,568	374,890	1,603,644	1,447,208	20,531	18,034
" 1895	542,202	470,520	455,956	405,203	1,229,146	1,123,689	12,423	8,857

TABLE 12.

COAL.

NOVA SCOTIA :—OUTPUT BY COLLIERIES DURING THE CALENDAR YEAR 1895.

Colliery.	Tons 2000 lbs.	Colliery.	Tons 2000 lbs.
Cumberland Co.		*Cape Breton Co.*	
Chignecto.....	202	Sydney.....	312,069
Joggins.....	57,741	Dom. Coal Co.—	
Minudie.....	2,971	Old Bridgeport.	1,291,127
Scotia.....	1,196	Caledonia.....	
Cape Breton.....	19,518	Glace Bay.....	
Springhill.....	455,942	Gowrie	
Pictou County.		International...	
		Reserve.....	
		Victoria.....	
Acadia.....	223,219	Hub.....	
Intercolonial.....	202,349	Dominion No. 1	
Inverness County.		Greener.....	448
		Total.....	2,567,796
Broad Cove.....	529		
Mabou.....	485		

Nova Scotia coal, as one would suppose, finds its chief market in the eastern provinces of Canada and the adjacent colony of Newfoundland, from five to ten per cent only going to the United States and about

one-half per cent to the West Indies. The exact figures for 1895 and 1896 are given in Table 13 below :— Coal. Nova Scotia.

TABLE 13.

COAL.

NOVA SCOTIA :—DISTRIBUTION OF COAL SOLD.

Market.	Calendar Years.	
	1895.	1896.
	Tons 2000 lbs.	Tons 2000 lbs.
Nova Scotia, transported by land	388,625	378,500
" " sea	307,196	359,231
Total, Nova Scotia	695,821	737,731
New Brunswick	248,198	284,144
Prince Edward Island	73,706	69,547
Quebec	818,675	882,672
Newfoundland	86,919	104,048
West Indies	9,070	11,324
United States	75,881	202,981
Other countries	Nil.	Nil.
Total	2,008,270	2,292,447

NEW BRUNSWICK. New Brunswick.

The production of coal in New Brunswick shows a falling off of from 20 to 25 per cent in 1896 as compared with 1895. From a study of the figures in Table 14 following it will be seen that the industry is small, and while varying somewhat from year to year, has remained on the average in practically the same condition for the past ten years.

TABLE 14.

COAL.

NEW BRUNSWICK :—PRODUCTION.

Calendar Year.	Tons.	Value.
1887	10,040	$ 23,607
1888	5,730	11,050
1889	5,673	11,733
1890	7,110	13,850
1891	5,422	11,030
1892	6,768	9,375
1893	6,200	9,837
1894	6,469	10,264
1895	9,500	14,250
1896	7,500	11,250

Coal. Manitoba and North-west Territories.

Manitoba and North-west Territories.

The statistics of the coal mining industry of Manitoba and the North-west Territories are given in Table 15 following. They show an increase in the production of 1896 of about 22 per cent over 1895 and of about 205 per cent over 1887.

Table 15.

Coal.

North-west Territories :—Production.

Calendar Year.	Tons.	Value.
1887	74,152	$ 157,577
1888	115,124	183,354
1889	97,364	179,640
1890	128,953	198,498
1891	174,131	437,243
1892	184,370	469,930
1893	238,395	598,745
1894	199,991	488,980
1895	185,654	414,064
1896	225,868	606,891

British Columbia.

A glance at Table F will show the fluctuations in the growth of the coal mining industry of this province for the past 60 years. It will be evident that on the average there has been a steady and considerable growth since the beginning, although in the last five years there is shown a falling off of about five per cent as compared with 1891. Comparing 1896 with 1876 there is shown an increase of about 540 per cent in the period of 20 years.

COAL.
BRITISH COLUMBIA.
ANNUAL PRODUCTION.
Table F.

Calendar Year.	Tons. 2000 lbs.
1836–52	11,200
1852–59	28,444
*1859	2,228
1860	15,956
1861	15,427
1862	20,292
1863	23,906
1864	32,068
1865	36,757
1866	28,129
1867	34,988
1868	49,286
1869	40,098
1870	33,424
1871	166,274
1872	
1873	
1874	90,788
1875	109,361
1876	157,007
1877	156,455
1878	213,750
1879	260,277
1880	305,045
1881	257,056
1882	323,201
1883	240,075
1884	441,130
1885	372,987
1886	375,415
1887	486,142
1888	539,467
1889	636,439
1890	767,586
1891	1,130,277
1892	937,218
1893	1,093,980
1894	1,112,628
1895	1,058,045
1896	1,003,769

*Two months only.

Table 16, following, gives the details of the output, production, &c., for the same period of 60 years compiled from data contained in the "Mineral Wealth of British Columbia," by Dr. G. M. Dawson,* and in the reports of the Minister of Mines of the province. It represents a

*Part R. Ann. Rept., Geological Surv., Canada, 1887.

Coal British Columbia.

revision of the figures according to the latest data available. Similar details for each colliery for the past two years will be found in Table 17.

TABLE 16.

COAL.

BRITISH COLUMBIA:—PRODUCTION.

Calendar Year.	Output Tons, 2,240 lbs.	Home Consumption, Tons, 2,240 lbs.	Sold for Export, Tons, 2,240 lbs. ‡	Production.* Tons, 2,240 lbs.	Production.* Tons, 2,000 lbs.	Price per ton, 2,240lbs.	Value.
						$	$
1836-52..	10,000				11,200	4 00	40,000
1852-59..	25,398				28,446	4 00	101,592
**1859....	1,989				2,228	4 00	7,956
1860.....	14,247				15,957	4 00	56,988
1861.....	13,774				15,427	4 00	55,096
1862.....	18,118				20,292	4 00	72,472
1863.....	21,345				23,906	4 00	85,380
1864.....	28,632	From 1836 to 1873 inclusive the output is taken as production.			32,068	4 00	114,528
1865.....	32,819				36,757	4 00	131,276
1866.....	25,115				28,129	4 00	100,460
1867. ..	31,239				34,988	4 00	124,956
1868.....	44,005				49,286	4 00	176,020
1869.....	35,802				40,098	4 00	143,208
1870.....	29,843				33,424	4 00	119,372
1871-2-3.	148,459				166,274	4 00	593,836
1874.....	81,547	25,023	56,038	81,061	90,788	3 00	243,183
1875.....	110,145	31,252	66,392	97,644	109,361	3 00	292,932
1876.....	139,192	17,856	†122,329	140,185	157,007	3 00	420,555
1877.....	154,052	24,311	115,381	139,692	156,455	3 00	419,076
1878.....	170,846	26,166	164,682	190,848	213,750	3 00	572,544
1879.....	241,301	40,294	192,096	232,390	260,277	3 00	697,170
1880.....	267,595	46,513	225,849	272,362	305,045	3 00	817 086
1881.....	228,357	40,191	189,323	229,514	257,056	3 00	688,542
1882.....	282,139	56,161	232,411	288,572	323,201	3 00	865,716
1883.....	213,299	64,786	149,567	214,353	240,075	3 00	643,059
1884. ...	394,070	87,388	306,478	393,866	441,130	3 00	1,181,598
1885.....	365,596	95,227	237,797	333,024	372,987	3 00	999,072
1886.....	326,636	85,987	249,205	335,192	375,415	3 00	1,005,576
1887....	413,360	99,216	334,839	434,055	486,142	3 00	1,302,165
1888.....	489,301	115,953	365,714	481,667	539,467	3 00	1,445,001
1889.....	579,830	124,574	443,675	568,249	636,439	3 00	1,704,747
1890.....	678,140	177,075	508,270	685,345	767,586	3 00	2,056,035
1891.....	1,029,097	202,697	806,479	1,009,176	1,130,277	3 00	3,027,528
1892	826,335	196,223	640,579	836,802	937,218	3 00	2,510,406
1893.....	978,294	207,851	768,917	976,768	1,093,980	3 00	2,930,304
1894.....	1,012,953	165,776	827,642	993,418	1,112,628	3 00	2,980,254
1895.....	939,654	188,349	756,334	944,683	1,058,045	3 00	2,834,049
1896.....	894,882	261,984	634,238	896,222	1,003,769	3 00	2,688,666

*This production is obtained by adding "Home Consumption" and "Sold for Export."

†52,935 of this amount was reported as sales without the division into home consumption and sold for export.

‡The figures in the "Sold for Export" column do not agree as they should with those given in Table 4, the only explanation being that the data in the two cases are from different sources, and there is no possibility of finding out the cause of the difference.

**Two months only.

TABLE 17.

COAL.

BRITISH COLUMBIA :—PRODUCTION, SALES, &c., CALENDAR YEAR 1896.

Name of Colliery.	Coal raised.	Sold for Home Consumption.	Sold for Exportation.	On hand Jan. 1st, 1896.	On hand Jan. 1st, 1897.	Number of men employed.
	Tons.	Tons.	Tons.	Tons.	Tons.	
Nanaimo	359,044	102,375	260,328	7,094	3,435	981
Wellington. ...	380,684	115,504	264,226	15,549	16,390	959
Union.....	261,643	74,646	185,791	14,933	16,139	798
W. Wellington.	896	896	.....	.....	.....	15
Total	1,002,267	293,421	710,345	37,576	35,964	2,753

PRODUCTION, SALES, &c., FOR CALENDAR YEAR 1895.

Name of Colliery.	Coal raised.	Sold for Home Consumption.	Sold for Exportation.	On hand Jan. 1st, 1896.	On hand Jan. 1st, 1897.	Number of men employed.
	Tons.	Tons.	Tons.	Tons.	Tons.	
Nanaimo	378,782	113,287	262,440	4,039	7,094	1,087
Wellington....	377,334	57,214	330,263	25,692	15,549	1,024
Union.....	296,296	40,450	254,390	13,477	14,933	813
Total	1,052,412	210,951	847,093	43,208	37,576	2,924

From the figures given in Table 16 it will be seen that the proportion of the production to be credited to home consumption is very small varying since 1874 by calculation between 20 and 30 per cent. This is of course as might be expected in view of the comparatively small population of the province and the prohibitive distance of the eastern home markets. With the advent, however, of increased activity in metal mining, accompanied by the use of steam power in mining and milling, the future should see a much larger home consumption, a condition which will be assisted by the contemplated construction of railway communication between the present mining centres in Kootenay and the coast.

About 60 per cent of the coal exported by the mines of the province went to the Californian market, the remainder being sold in the States of Oregon and Washington, and in Alaska, Petropaulovski and the Hawaiian Islands. The following figures give the consumption of coal

Coal. British Columbia.

in the Californian market for the year ending 31st December, 1896, and the sources from which it is supplied. From these it is evident that British Columbia coal occupies a prominent place, supplying as it does about 36 per cent of the total.

	Tons of 2,000 lbs.
British Columbia	618,074
Australia	306,707
English and Welsh	175,132
Scotch	9,359
Eastern (Cumberland and Anthracite)	20,056
Seattle, Franklin and Green River	144,387
Carbon Hill and South Prairie	285,928
Mount Diablo and Coos Bay	123,465
Japan	2,516
Total for the year 1896	1,685,624
" " 1895	1,653,520

Coke.

COKE.

The production of coke in 1896 shows a decrease of 3,737 tons, or nearly 7 per cent, whilst the decrease in value amounts to $32,790, or nearly 23 per cent. The figures for the current and past years are set forth in Table 1, below, from a study of which the progress of this industry can be seen. There is found to have been a steady increase in the production from 1886 to 1893, since which each subsequent year has shown a falling off. Future years should, however, show an increase in view of the possible demand for use in smelting the ores of the rapidly developing British Columbia mining districts.

Another reason for expecting an increased activity in coke production in the future lies in the recent organization of the People's Light and Heat Company of Halifax, N.S., which proposes to operate a coking plant at that place with a capacity of 15,000 to 20,000 tons, using Otto-Hoffmann ovens with some modifications, and besides other by-products, utilizing the gas for heating and lighting purposes in the city, working in conjunction with the electric light and street car service.

A similar effort will also be made in St. John, N.B.

TABLE 1.
COKE.
ANNUAL PRODUCTION.

COAL.
Coke.
Production.

Calendar Year.	Tons.	Value.
1886	35,396	$101,940
1887	40,428	135,951
1888	45,373	134,181
1889	54,539	155,043
1890	56,450	166,298
1891	57,084	175,592
1892	56,135	160,249
1893	61,078	161,790
1894	58,044	148,551
1895	53,356	143,047
1896	49,619	110,257

Table 2, below, taken in conjunction with Table 1, illustrates the demand for oven coke in Canada. It will be seen that there was a continuous increase in the use of foreign coke until 1893, after which year the importations were smaller until 1896, which witnessed not only a large actual increase, but also a reversal of the relative proportions of the home product and imported, the latter being for the first time greater than the former. This has been due to the greatly increased importations into Ontario, probably for use at the Hamilton smelter, and into British Columbia for use in smelting the sulphuretted ores of West Kootenay. The imports for the fiscal year 1896 into the former province shows an increase of about 30 per cent, and those of the latter are about ten times what they were in 1895.

TABLE 2.
COKE
IMPORTS OF OVEN COKE.

Imports.

Fiscal Year.	Tons.	Value.
1880	3,837	$ 19,353
1881	5,492	26,123
1882	8,157	36,670
1883	8,943	38,588
1884	11,207	44,518
1885	11,564	41,391
1886	11,858	39,756
1887	15,110	56,222
1888	25,487	102,334
1889	29,557	91,902
1890	36,564	133,344
1891	38,533	177,605
1892	43,499	194,429
1893	41,821	156,277
1894	42,864	176,996
1895	43,235	149,434
1896 Duty free	61,612	203,826

Coal. Coke.

The customs figures for exports of coke during the calendar year show 57 tons, valued at $151. As, however, 52 tons of this are credited to Ontario and three tons to New Brunswick, where no oven coke is produced, it is evidently all gas coke, except perhaps the two remaining tons credited to British Columbia.

There is nothing particular to note about this industry apart from the continuance of the Nova Scotia operations, except the recent inauguration of coke manufacture by the Union Colliery Company of British Columbia. This company have now a plant of 100 ovens, having a double front, 50 on each side. The gas generated in the process is used for raising steam. According to the statement of the Inspector of Mines in the report of the Minister of Mines for the province, the coke made is of good quality, with about 8·5 per cent of fixed ash, and the company is finding a ready market for its product in the California market, and has good reason to believe it can successfully compete with coke from the United States in the rapidly growing home market.

The "screenings" obtained from the Luhrig coal washer recently installed by the company supply the material used in making the coke.

Copper.

COPPER.

In Table 1 below will be found the figures for 1896 and previous years illustrative of the copper production of the country. This statement shows the fluctuation in production, both in amount, value and percentage. In this way the variations are clearly brought out, as well as their connection with the activity of the industry and fluctuation in the prices. It will be seen that at times decreases in the quantity produced have been more than made up by increases in the price. In comparison with 1895, the production for 1896 showed increases of 603,850 lbs. or 6·87 per cent in the quantity, and $76,246 or 8·06 per cent in the value, there having been a slight increase in the average market price.

TABLE 1.

COPPER.

ANNUAL PRODUCTION.*

COPPER. Production.

Year.	Lbs.	Increase or Decrease.		Value.	Increase or Decrease.		Average Price per Pound.
		Lbs.	%		$	%	Cts.
1886.....	3,505,000	... .	.....	$ 385,550	.....	.....	11·00
1887.....	3,260,424	244,576	6·99	366,798	18,752	4·86	11·25
1888.....	5,562,864	2,302,440	70·60	927,107	560,309	152·70	16·66
1889.....	6,809,752	1,246,888	22·40	936,341	9,234	0·99	13·75
1890.....	6,013,671	796,081	11·69	947,153	10,812	1 15	15·75
1891.....	8,928,921	2,915,250	48·40	1,149,598	202,445	21·37	12·87
1892.....	7,087,275	1,841,646	20·62	818,580	331,018	28·79	11·55
1893.....	8,109,856	1,022,381	14·40	871,809	53,229	6·50	10·75
1894.....	7,737,016	372,840	4·81	739,659	132,150	15·15	9·56
1895.....	8,789,162	1,052,146	13·59	945,714	206,055	27·85	10·76
1896.....	9,393,012	603, 85	6·87	1,021,960	76,246	8·06	10·88

* The production is altogether represented by the copper contained in ore, matte, &c., produced and shipped, valued at the average market price for the year for fine copper in New York.

NOTE.—In the above table increases are shown underlined and decreases in the ordinary way.

Table 2 gives the figures of exports of copper in copper-bearing material from 1885 to 1896. These figures, however, are given for what they are worth, as they do not agree with the direct returns of production, especially for later years. In regard to the quantities stated as pounds of copper contained in ore, matte, &c., it is supposed that the entries are made in that way by the exporters, but there are evidently many errors, as the figures do not compare at all with those of production, although all the production is exported. Then as to the valuation, the basis adopted is quite different from that followed by this office. For these reasons, no comparison between the two sets of figures is possible.

TABLE 2.

COPPER.

EXPORTS OF COPPER IN ORE, MATTE, ETC.

Calendar Year.	Nova Scotia.		Ontario.		Quebec.		British Columbia.		Total.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$		$		$
1885						262,600				262,600
1886				16,404		232,855				249,259
1887				3,416		134,550				137,966
1888						257,260				257,260
1889						168,457				168,457
1890				2,219		396,278				398,497
1891				64,719		283,385				348,104
1892		100		79,141		198,391				277,632
1893			3,599,066	212,314	1,193,135	56,846			4,792,201	269,160
1894			242,804	25,029	285,009	12,005	1,097,576	54,883	1,625,389	91,917
1895			1,359,684	123,997	412,305	15,692	1,970,363	97,276	3,742,352	236,965
1896			49,000	1,100	290,845	12,368	5,122,207	267,602	5,462,052	281,070

The consumption of foreign copper and of manufactures of this metal in Canada is illustrated by the figures of imports given in Tables 3 and 4. The data taken from the reports of the Customs Department have been divided so as to separate highly manufactured goods from the metal in those cruder forms such as would be produced from smelting works operated in Canada. COPPER.

Taking into consideration, then, the home markets for metallurgical products, as shown in Table 3, we find that from 1880 to 1893 there was a decided growth, since which year the importations have averaged much lower. In the ten-year period—1887 to 1896—the range has been between $2,500 and $16,000, not a large sum. The imports of manufactures of copper in Table 4 are seen to total about $285,000 for last year. In the same period of years the lowest amount recorded was $123,060, in 1880, and the highest $563,522, in 1891.

TABLE 3.

COPPER.

IMPORTS OF PIGS, OLD, SCRAP, ETC. Imports.

Fiscal Year.		Pounds.	Value.
1880		31,900	$ 2,130
1881		9,800	1,157
1882		20,200	1,984
1883		124,500	20,273
1884		40,200	3,180
1885		28,600	2,016
1886		82,000	6,969
1887		40,100	2,507
1888		32,300	2,322
1889		32,300	3,288
1890		112,200	11,521
1891		107,800	10,452
1892		343,600	14,894
1893		168,300	16,331
1894		101,200	7,397
1895		72,062	6,770
1896	Copper, old and scrap.....Duty free.	38,100	3,406
	Copper in pigs..... do	48,600	5,784
	Precipitate of copper, crude..... do	205	36
	Total, 1896.....	86,905	$ 9,226

TABLE 4.

COPPER.

Copper. Imports.

IMPORTS OF MANUFACTURES.

Fiscal Year.				Value.
1880				$123,061
1881				159,163
1882				220,235
1883				247,141
1884				134,534
1885				181,469
1886				219,420
1887				325,365
1888				303,459
1889				402,216
1890				472,668
1891				563,522
1892				422,870
1893				458,715
1894				175,404
1895				251,615
		Duty.	Pounds.	
1896...	Copper, ingots, sheets, plates and sheathing, not planished or coated	Free.	1,461,100	$168,421
	Copper nails, rivets and burrs	30 p. c.	.....	2,132
	" wire	15 "	346,942	46,902
	" wire-cloth	20 "	.....	4,540
	" all other manufactures of, N.E.S.	30 "	.....	24,995
	" seamless drawn tubing	Free.	.....	13,662
	" in bars, rods and bolts in lengths not less than six feet	"	205,100	24,282
	" rollers for use in calico printing	"	.....	286
	Total, 1896	.....	.....	$285,220

Quebec.

QUEBEC.

The production of copper in this province represents, as in the past, the copper contents of the pyritous ores mined at Capelton and Eustis, near Sherbrooke, which are utilized in acid making, partly in Canada but the larger proportion in the United States.

This is an old established industry, the two mines situated one at Eustis and one at Capelton, having been operated for a long period of years. They have each a fully equipped mining plant, and as might be expected the underground developments are considerable. At Capelton they utilize part of the ore on the spot in their acid-making plant.

ONTARIO.

COPPER. Ontario.

There is nothing new to note in this province. The copper contained in the matte output of the nickel mines at Sudbury represents the whole production. These operations will be more fully described under the heading Nickel, so need not be further dealt with here.

There are, of course, other known deposits of copper bearing ores in Ontario, including the sulphuret ores at various points in the west and the native copper bearing rocks on the Canadian shores of Lake Superior, but for various reasons no profitable use has been made of any of these of late years.

BRITISH COLUMBIA.

British Columbia.

The production of this province, as elsewhere, represents the copper contained in the ores, matte, etc., produced from deposits mined primarily for other metals, so that the developments connected therewith will be more fittingly described under the heading of the Precious Metals.

An interesting feature is to be noted, however, in the fact that the province has only recently contributed to the copper production of Canada, and yet last year its output amounted to over 40 per cent of the whole. Taking the figures from the report of the Minister of Mines for the province, given below, we see that the production for 1896, compared with the first year 1894, shows an increase of 3,493,876 pounds, or, that since 1894 the production has increased nearly twelve times in quantity.

Table 5 below gives the details of the production of the province. The figures of the amounts and spot values are taken from the report of the Minister of Mines whilst the items in the last column represent the valuations of the metal on the basis elsewhere adopted in this report:—

TABLE 5.

COPPER.

PRODUCTION IN BRITISH COLUMBIA.

Calendar Year.	Copper contained in ores, matte &c.	Increase.		Spot Value.	Final Value.
	Lbs.	lbs.	%		
1894	324,680	.....	.....	16,234	$ 31,039
1895	952,840	628,160	193	47,642	102,526
1896	3,818,556	2,865,716	301	190,926	415,459

GRAPHITE.

GRAPHITE.

Production.

From the figures of production for this and past years given in Table 1, below, it will be seen that the graphite industry of Canada can hardly yet be said to be well established, both the amounts and value per ton varying greatly.

TABLE 1.

GRAPHITE.

ANNUAL PRODUCTION.

Calendar Year.	Tons.	Value.
1886	500	$4,000
1887	300	2,400
1888	150	1,200
1889	242	3,160
1890	175	5,200
1891	260	1,560
1892	167	3,763
1893	nil.	nil.
1894*	69	223
1895	220	6,150
1896	139	9,455

*Exports.

The average value per ton, for the first three years given in the table, is about $8. After that a considerable rise is evident. The reason for this is to be found in the fact that in 1889 the Quebec mines began to contribute to the total, whilst previously the only production had been that of low grade mineral in New Brunswick. The Quebec product, being in general more highly prepared, brought an average price per ton varying from $60 to $80, thus raising the average value of the whole product.

In Table 2, below, will be found the quantities and values, for a number of years, of the shipments of graphite from Canada. Previous to 1896 the data entered under Ontario would represent altogether material mined in Quebec but entered for export at Ottawa.

TABLE 2.

GRAPHITE. GRAPHITE.

EXPORTS. Exports.

Calendar Year.	New Brunswick		Ontario.		Quebec.		Nova Scotia.	
	Cwt.	Value.	Cwt.	Value.	Cwt.	Value.	Cwt.	Value.
		$		$		$		$
1886	8,142	3,586						
1887	6,294	3,017						
1888	2,700	1,080						
1889	660	422	22	116				
1890	400	160	329	1,369				
1891	464	72						
1892	1,224	449	15	60	4,590	3,443		
1893			12	38				
1894			69	223				
1895	1	8	1,087	4,825				
1896 Crude	270	106	2,285	7,415			160	1,605
1896 Manufactu'd				3		351		
	270	106	2,285	7,418		351	160	1,605

GRAPHITE. Imports.

The imports of graphite, crude and manufactured, into Canada amounted last year to about $40,000 worth. The details of the imports are given below in Table 3 :—

TABLE 3.

GRAPHITE.

IMPORTS OF RAW AND MANUFACTURED PLUMBAGO.

Fiscal Year.		Plumbago.	Manufactures of Plumbago.	
			Black-lead.	Other Manufactures,
1880		$1,677	$18,055	$2,738
1881		2,479	26,544	1,202
1882		1,028	25,132	2,181
1883		3,147	21,151	2,141
1884		2,891	24,002	2,152
1885		3,729	24,487	2,805
1886		5,522	23,211	1,408
1887		4,020	25,766	2,830
1888		3,802	7,824	22,604
1889		3,546	11,852	21,789
1890		3,441	10,276	26,605
1891		7,217	8,292	26,201
1892		2,988	13,560	23,085
1893		3,293	16,595	23,051
1894		2,177	17,614	16,686
1895		2,586	13,922	21,988
1896	Duty.			
	Plumbago, crude	10 p.c.	$2,865		
	Black-lead	25 "		$18,434	
	Plumbago, crucibles	Free.			$ 7,407
	Plumbago, manufactures of, N.E.S.	25 p.c.			12,090
	Total, 1896		$2,865	$18,434	$19,497

During 1896 operations were carried on at the following places :—

Producers.

New Brunswick.—Marble Cove Mine, St. John, N.B., Canada Paint Co., 572 William Street, Montreal.

Quebec.—Buckingham Mine, 25 VI. Buckingham, the Buckingham Co.

North American Graphite Co., Buckingham, H. P. H. Brumell, Elgin Street. Ottawa.

Ontario.—Black Donald Mine, township of Brougham, Renfrew county, Ontario Graphite Co., Ltd., Hector McRae, Queen St., Ottawa.

The list given below gives the localities at which graphite has been reported to occur :— GRAPHITE. Occurrences.

	County.	Township.	Range. Lot.
Quebec	Ottawa	Buckingham	IV., 22, 24,
"	"	"	V., 19, 20, 22, 23, 24, 27.
"	"	"	VI., 22, 23, 24, 25, 26, 27, 28.
"	"	"	VII., 4, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28.
"	"	"	VIII., 20, 21.
"	"	"	IX., 4, 5, 17.
"	"	"	X., 3, 4, 13, 17.
"	"	"	XI., 4, 5.
"	"	Lochaber	VII., 10, 24.
"	"	"	VIII., 23, 24, 25.
"	"	"	X., 28,
"	"	"	XI., 23, 24, 25, 26.
"	"	"	XII., 23.
"	"	Wakefield	I., 7.
"	"	Hull	
"	Argenteuil	Grenville	II., 3.
"	"	"	IV., 13, 14.
"	"	"	V., 10.
"	"	"	VI., 1, 3.
"	"	"	X., 3.
"	"	Wentworth	III., 1, 2.
"	"	Chatham Gore	IX., 5.
"	"	Petite Nation	
"	Pontiac	Litchfield	IX., 25, 26.
Ontario	Frontenac	Loughboro'.	IX., 6.
"	"	"	West side of Mud Lake.
"	"	Bedford	IX., 18.
"	"	"	Bira Lake.
"	Lanark.	South Burgess	I., 10.
"	"	North Elmsley	VI., 21.
"			Near Bob's Lake.
"			Parry Sound, Georgian Bay.
"			Robert's Bay.
Nova Scotia	Inverness	Glendale.	
"	Cape Breton.	French Vale.	
New Brunswick			Dumbarton Station, St. John.
"			Woodstock.
N. W. Territories.			Reindeer Lake.
"			North side of Athabasca Lake.
"			Near Ashes Inlet, Hudson Strait.
British Columbia			Alkow Harbour, Dean's Canal.

QUEBEC. Quebec.

The outlook in this industry is at present uncertain. For many years past the chief interest centred in the operations of the Walker Mining Co., in Buckingham township, Ottawa county, Quebec. These operations were much more extensive and continuous than those of the few other occasional operators, and it was hoped that through them the possibilities of putting Canada's graphite deposits to profitable use might be demonstrated. After a varied career extending over many years, during which the venture can hardly have been said to have passed out of the experimental stage, the mines were closed down in July, 1896.

GRAPHITE. Quebec.

In the summer of 1895, the North American Graphite Company opened on a deposit north of Donaldson's Lake in the same township, about three miles from the last mentioned. They erected a mill, which has been operated, with some idle intervals, during 1896.*

On the adjacent property a mill was erected some years since by Mr. Jacob Weart, of Jersey City, N.J., U.S.A. The intention was to produce graphite for use by the same company in the manufacture of self-lubricating bushings. This mill has only been operated, however, on a small scale and at intervals. It is at present owned by the Buckingham Co.

The operations above described constitute practically all that has been done to utilize the graphite deposits of the province of Quebec, with the exception of limited developments prosecuted from time to time at various points throughout the above-mentioned district.

The business interests of those responsible for the works carried on, of course, stand in the way of the acquirement of accurate details as to the results attained, but from what is publicly known it would seem as if they left the question of utilizing Canadian graphite deposits still in abeyance.

Some of the mineral produced and marketed was undoubtedly of good quality, as evidenced by the exhibits, of the companies mentioned, in the Museum of the Survey. It seems yet doubtful however if profitable results can be expected without a large and extensive plant and a capital sufficient to enable working to be carried on at a loss, perhaps for some years, until the methods of production are perfected, and the difficulties of introduction of the product into a closed market, strongly prejudiced in favour of other brands, can be overcome.

Ontario.

ONTARIO.

Besides those already mentioned in western Quebec a number of occurrences of graphite are known in the adjacent parts of eastern Ontario. Whilst a certain amount of development work was done on these in the past, of late years no attention was paid to them until the discovery of the deposit in Brougham township, Renfrew county, in 1895. The good showing at this place led to an effort being made to utilize it, and a company was formed to work it, known as the Ontario Graphite Company of Ottawa. This company has mined several hundred tons, some of which has been brought to Ottawa, where a small plant has been erected for experimental tests of the

*This company suspended operations in July of the present year (1897).

best methods of preparation for the material, which tests were still progressing at the end of the year. GRAPHITE Ontario.

This deposit is situated on lot 18, in range III., of Brougham township, and has been named the Black Donald. It was visited by Dr. Ells, of the Survey staff in 1896, who in the Summary Report of the department for that year thus describes it :—

"In the 18th lot of range III. of Brougham, at the south end of Whitefish Lake, an important deposit of graphite occurs. The containing rocks are crystalline limestone, but dykes of granite also appear in the vicinity. At the shore of the lake, the deposit has been uncovered to a distance of 150 feet or more, showing a bed of graphite eight to ten feet in thickness. The mineral appears to be, for the most part at least, amorphous, but a flakey structure is seen in certain portions. The mine is about twelve miles distant from the railway at Calabogie, and a new road has been constructed for the purpose of shipment. A small deposit of similar graphite occurs in the township of Darling, near Tatlock."

NEW BRUNSWICK. New Brunswick.

In New Brunswick work has been carried on with some intermissions near St. John, where graphite in a finely divided state is disseminated through the rock, and at a few points is found in beds of economic importance. The product is only hand-picked, and therefore none of the higher grades of mineral are produced.

NOVA SCOTIA. Nova Scotia.

Although there was no production of graphite proper in Nova Scotia, Mr. Hugh Fletcher, in the Summary Report of the Geological Survey for 1896, calls attention to the fact that graphitic shales have been worked near Christmas Island, among quartzites and dark slates underlying soft, red Carboniferous marl and conglomerate and perhaps of Cambrian age.

GYPSUM. GYPSUM.

Gypsum is produced in Canada in Nova Scotia, New Brunswick and Ontario, and deposits of the mineral have been noted in Manitoba, the North-west Territories and British Columbia. Nova Scotia supplies nearly three-fourths of the total output.

Gypsum. Production.

TABLE 1.
GYPSUM.
ANNUAL PRODUCTION.

Calendar Year.	Tons.	Value.
1886	162,000	$178,742
1887	154,008	157,277
1888	175,887	179,393
1889	213,273	205,108
1890	226,509	194,033
1891	203,605	206,251
1892	241,048	241,127
1893	192,568	196,150
1894	223,631	202,031
1895	226,178	202,608
1896 Nova Scotia	136,590	111,251
1896 New Brunswick	67,137	59,024
1896 Ontario	3,305	7,786
Total, 1896	207,032	178,061

The following tables, Nos. 2, 3, 4, 5 and 6, give all the data available regarding exports and imports :—

TABLE 2.
GYPSUM.
Exports. EXPORTS OF CRUDE GYPSUM.

Calendar Years	Nova Scotia.		New Brunswick.		Ontario.		Total.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1874	67,830	$ 68,164	.....	.....	.....	.....	67,830	$ 68,164
1875	86,065	86,193	5,420	$ 5,420	.....	.....	91,485	91,613
1876	87,720	87,590	4,925	6,616	120	$ 180	92,765	94,386
1877	106,950	93,867	5,030	5,030	.....	.....	111,980	98,897
1878	88,631	76,695	16,335	16,435	489	675	105,455	93,805
1879	95,623	71,353	8,791	8,791	579	720	104,993	80,864
1880	125,685	111,833	10,375	10,987	875	1,240	136,935	124,060
1881	110,303	100,284	10,310	15,025	657	1,040	121,270	116,349
1882	133,426	121,070	15,597	24,581	1,249	1,946	150,272	147,597
1883	145,448	132,834	20,242	35,557	462	837	166,152	169,228
1884	107,653	100,446	21,800	32,751	688	1,254	130,141	134,451
1885	81,887	77,898	15,140	27,730	525	787	97,552	106,415
1886	118,985	114,116	23,498	40,559	350	538	142,833	155,213
1887	112,557	106,910	19,942	39,295	225	337	132,724	146,542
1888	124,818	120,429	20	50	670	910	125,508	121,389
1889	146,204	142,850	31,495	50,862	483	692	178,182	194,404
1890	145,452	139,707	30,034	52,291	205	256	175,691	192,254
1891	143,770	140,438	27,536	41,350	5	7	171,311	181,795
1892	162,372	157,463	27,488	43,623	.....	.....	189,860	201,086
1893	132,131	122,556	30,061	36,706	.....	.....	162,192	159,262
1894	119,569	111,586	40,843	46,538	.....	.....	160,412	158,124
1895	133,369	125,651	56,117	67,593	.....	.....	189,486	193,244
1896	116,331	109,054	64,946	77,535	.....	.....	181,277	186,589

TABLE 3.

GYPSUM. GYPSUM.

EXPORTS OF GROUND GYPSUM. Exports.

Calendar Year.	Nova Scotia.	New Brunswick.	Ontario.	Total.
	$	$		$
1890				105
1891				588
1892				20,255
1893				22,132
1894	2,124	17,930		20,054
1895	3,364	18,827	42	22,233
1896	1,270	19,246	751	21,267

TABLE 4.

GYPSUM.

IMPORTS OF CRUDE GYPSUM. Imports.

Fiscal Year.	Tons.	Value.
1880	1,854	$3,203
1881	1,731	3,442
1882	2,132	3,761
1883	1,384	3,001
1884		3,416
1885	1,353	2,354
1886	1,870	2,429
1887	1,557	2,492
1888	1,236	2,193
1889	1,360	2,472
1890	1,050	1,928
1891	376	640
1892	626	1,182
1893	496	1,014
1894		1,660
1895	603	960
1896 Duty free.	1,045	848

Gypsum.

Imports.

TABLE 5.

GYPSUM.

IMPORTS OF GROUND GYPSUM.

Fiscal Year.	Pounds.	Value.
1880	1,606,578	$ 5,948
1881	1,544,714	4,676
1882	759,460	2,576
1883	1,017,905	2,579
1884	687,432	1,936
1885	461,400	1,177
1886	224,119	675
1887	13,266	73
1888	106,068	558
1889	74,390	372
1890	434,400	2,136
1891	36,500	215
1892	310,250	2,149
1893	140,330	442
1894	23,270	198
1895	20,700	88
Duty 15 p.c.	*64,500	198

* 215 brls.

TABLE 6.

GYPSUM.

IMPORTS OF PLASTER OF PARIS.

Fiscal Year.	Pounds.	Value.
1880	667,676	$ 2,376
1881	574,006	2,864
1882	751,147	4,184
1883	1,448,650	7,867
1884	782,920	5,226
1885	689,521	4,809
1886	820,273	5,463
1887	594,146	4,342
1888	942,338	6,662
1889	1,173,996	8,513
1890	693,435	6,004
1891	1,035,605	8,412
1892	1,166,200	5,595
1893	552,130	3,143
1894	422,700	2,386
1895	259,200	1,619
1896 Duty 40c. per 300 lbs.	*297,000	2,000

* 990 brls.

NOVA SCOTIA.

GYPSUM.
Nova Scotia.

Gypsum is very largely developed in Nova Scotia. It occurs in extensive beds associated with Carboniferous limestone. It is abundant in Hants county in the vicinity of Windsor, Cheverie and Walton, and in the counties of Pictou, Colchester and Antigonish, and also throughout Cape Breton Island, notably at Mabou, Lennox Ferry and Baddeck. Large cliffs of gypsum form a very striking feature in several localities on the shores of Bras d'Or Lake. Most of the gypsum produced is exported to the United States in the raw state. The remainder is either burnt for plaster of Paris or used locally as land plaster. It is produced by open quarrying and little or no underground mining is done.

NEW BRUNSWICK.

New Brunswick.

There are abundant deposits of gypsum in New Brunswick underlying the Millstone Grit of the Carboniferous and also occurring at the top of the Lower Carboniferous formation. It is found in the counties of Albert, Westmoreland, King's and Victoria. The principal deposit worked is near Hillsborough, in Albert county, where the thickness of the bed varies from 70 to 100 feet. Part of this, however, is anhydrite.

The associated gypsum is mostly a pure white or slightly clouded alabaster. Calcination works were erected at Hillsborough in 1861, which have been working more or less constantly ever since. Workable beds occur upon the North River, a few miles from Petitcodiac Station on the Intercolonial Railway in Westmoreland county. The gypsum from this locality is highly crystalline. Large beds of gypsum also exist upon the Tobique River, in Victoria county.

ONTARIO.

Ontario.

A small amount of gypsum is mined yearly in Ontario, on the Grand River in the vicinity of Paris in Brant county, and Cayuga in Haldimand county. It is principally manufactured into "alabastine."

OTHER OCCURRENCES.

Specimens of gypsum are exhibited in the Geological Survey Museum from the following localities :—

Moose River, 38 miles above Moose Factory, district of Algoma, Ontario.

Lake St. Martin, about 10 miles west of the outlet of Little Saskatchewan River, Manitoba.

Peace Point, Peace River, N.W.T.

Salmon River, between the South Thompson and head of Okanagan Lake, B.C.

From the vicinity of Spence's Bridge, Thompson River, B.C.

IRON.

IRON.

Production.

During the year 1896 the production of iron ore in Canada shows a falling off of about 10 per cent. in the quantity and nearly 20 per cent. in the value, the output for 1895 being 102,797 tons valued at $238,070 as compared with 91,906 tons valued at $191,557 in 1896. The total output of pig iron, however, shows an increase of 14,814 tons, which is due to the opening of a blast furnace at Hamilton, Ont. The output of this furnace is much greater than the total increase for the year, so that the combined output of the older furnaces has decreased.

IRON.

ANNUAL PRODUCTION OF ORE.

Table A.

Calendar Year.	Tons.	Value.
1886	69,708	$126,982
1887	76,330	146,197
1888	78,587	152,068
1889	84,181	151,640
1890	76,511	155,380
1891	68,979	142,005
1892	103,248	263,866
1893	125,602	299,368
1894	109,991	226,611
1895	102,797	238,070
1896	91,906	191,557

IRON.

Production by Provinces.

In Table 1, following, will be found the contributions of the various provinces to the grand total. It will be seen that Nova Scotia leads with about 64 per cent, Quebec comes next with nearly 19 per cent, and Ontario with about 17 per cent.

TABLE 1.

IRON.

PRODUCTION OF ORE, BY PROVINCES, CALENDAR YEAR, 1896.

Provinces.	Tons.
Nova Scotia	58,810
Quebec	17,630
Ontario	15,270
British Columbia	196
Total	91,906

Nova Scotia.

In Nova Scotia there were two furnaces in blast during 1896. The Nova Scotia Steel Company of New Glasgow had one furnace in operation at Ferrona. About 75 per cent of the ore used was Canadian, while the remaining 25 per cent consisted of Newfoundland and Spanish ores. This is the only company that manufactures steel in Canada. The Londonderry Iron Company also had one furnace in blast, which, however, used Canadian ores entirely. In both of these furnaces the fuel employed is coke. The Canadian ores used by these two companies were supplied principally by the Torbrook Iron Company of Torbrook, Annapolis county, and the Pictou Charcoal Iron Company of Bridgeville, Pictou county. The furnace of this latter company was idle during 1896.

TABLE 2.

IRON.

IRON.

NOVA SCOTIA :—ANNUAL PRODUCTION OF ORE.

Nova Scotia

Calendar Year.	Tons.
1876	15,274
1877	16,879
1878	36,600
1879	29,889
1880	51,193
1881	39,843
1882	42,135
1883	52,410
1884	54,885
1885	48,129
1886	44,388
1887	43,532
1888	42,611
1889	54,161
1890	49,206
1891	53,649
1892	78,258
1893	102,201
1894	89,379
1895	83,792
1896	58,810

No iron is now mined in New Brunswick. A small stone furnace was run for a few years near Woodstock, Carleton county. The ores used were the hæmatites of the locality, mixed with bog ores from Maugerville, Sunbury county, on the St. John River. This furnace has now been out of blast for at least fifteen years. New Brunswick.

In Quebec the furnace of the Canada Iron Furnace Company at Radnor Forges was in blast for eight months. The ores used are principally the bog and lake ores of the St. Maurice district, and the furnace has a daily capacity of about twenty-five tons. At Drummondville, Drummond county, Messrs. John McDougall & Company's furnace was in blast for twenty-one weeks during 1896. The bog iron deposits of this locality supply the ore for the furnace. The fuel used by this furnace as well as that at Radnor Forges is charcoal. Quebec.

The Bristol Iron Company's magnetite mines at Bristol, Pontiac county, were reopened and worked, the output being shipped to the United States.

The opening of a blast-furnace at Hamilton, Ont., by the Hamilton Blast Furnace Company, has revived the mining of iron in that province. Mr. L. L. Brophy, who visited the furnace in the autumn of 1896, writes as follows in the Summary Report of the Survey :—"Their furnace was blown in on the 31st of December, 1895, though no pig Ontario.

IR N. Ontario.

iron was made until some weeks later. Production has, however, been going on continuously ever since. The ore used is derived both from Canada and the United States, the Canadian ore coming from the Wallbridge and other mines in Hastings, from the north shore of Lake Erie, between Port Rowan and Port Dover, and also from the district near Smith's Falls and Merrickville. The United States ore is obtained from Escanaba, Mich., and Two Harbours, Minn. The fuel used is entirely coke, which is procured from the Reynoldsville district in Pennsylvania, and costs, laid down at the works, about $3.60 per ton. The flux is a limestone obtained from Port Colborne, Ont." The amount of Canadian ore used in 1896 was about 37 per cent of the total ore charged.

Deposits of clay ironstone have been noted in many localities in Manitoba and the North-west Territories, but none of these have as yet been worked.

The Glen Iron Mine at Cherry Bluff, near Kamloops, British Columbia, was the only producing iron mine in that province during 1896. The output was used as a flux in the Tacoma smelter.

TABLE 3.

IRON.

EXPORTS OF ORE.

Exports.

Province.	Calendar Years.							
	1893.		1894.		1895.		1896.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
Ontario	1,042	$ 4,083	23	$ 93	.....	.....	*10 33	$ 1,911
Quebec	.....	.....	.....	13,813	.....	.....	.....	.....
Nova Scotia	2	6	.....	.....	.....	.....	.....	.....
Manitoba	30	86	.....	.....	.....	.....	.....	.....
British Columbia	1,345	3,415	878	7,388	1,571	$ 3,909	.....	.....
Total	2,419	$ 7,590	.....	$21,294	1,571	$ 3,909	10 33	1,911

* Probably the product of the province of Quebec, shipped via Ontario.

TABLE 4.

IRON.

PIG IRON PRODUCTION: CONSUMPTION OF ORE, FUEL, &c., CALENDAR YEAR, 1896.

IRON. Production.

Materials made and used.	Canadian.		Foreign.		Totals.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		$		$		$
Pig iron made.... ....Tons	40,720	579,089	26,548	345,040	67,268	924,129
Iron ore consumed.... "	96,560	200,887	46,300	100,205	142,860	301,092
Fuel Consumed. Charcoal. Bush	756,600	32,256	.....	.... .	756,600	32,256
Fuel Consumed. Coke.... Tons	48,660	106,939	33,990	109,253	82,650	216,192
Fuel Consumed. Coal..... "	1,407	2,288	.... ..	... .	1,407	2,288
Flux consumed..... "	37,462	36,140	.....	.....	37,462	36,140

A bounty of $2 a ton (2,000 lbs.) was paid by the Dominion Government on all pig iron made in Canada from Canadian ores. No bounty is paid on pig iron made from foreign ores.*

TABLE 5.

IRON.

EXPORTS OF IRON AND STEEL GOODS, THE PRODUCE OF CANADA, CALENDAR YEAR, 1896.

Exports.

Province.	Scrap Iron.	Iron Stoves.	Iron Castings.	Iron, all other and hardware.	Steel and manufactures of.	Totals.
	$	$	$	$	$	$
Ontario.....	2,167	330	109,502	11,420	18,738	142,157
Quebec.....	1,519	682	42,862	50,521	4,455	100,039
Nova Scotia.....	.....	2,282	1,493	14,851	12,051	30,677
New Brunswick.....	144	.....	.....	7,460	.....	7,604
Prince Edward Island. ...	.....	1	.....	.....	....	1
Manitoba	.....	.....	.....	22	221	243
North-west Territories.....	159	10	8	.....	1,413	1,590
British Columbia.....	1,510	.....	.....	309	166	1,985
Total	5,499	3,305	153,865	84,583	37,044	284,296

* By amendments to the tariff, made in April, 1897, this was altered to $3.00 per ton for pig iron produced from Canadian ores and $2.00 per ton for that produced from foreign ores.

TABLE 6.

IRON.

Iron.

Imports.

IMPORTS OF IRON, PIG, SCRAP, ETC.

Fiscal Year.	Pig Iron.		Charcoal Pig Iron.		Old and Scrap Iron.		Wrought Scrap and Scrap Steel.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$		$
1880	23,159	(a) 371,956	.....	.....	928	14,042	.....	.....
1881	43,630	(a) 715,997	.....	.....	584	8,807	.....	.....
1882	56,594	811,221	6,837	211,791	1,327	20,406	.....	.....
1883	75,295	1,085,755	2,198	58,994	709	7,776	.....	.....
1884	49,291	653,708	2,893	66,602	3,136	44,223	.....	.....
1885	42,279	545,426	1,119	27,333	3,552	46,275	.....	.....
1886	42,463	528,483	3,185	60,086	10,151	158,100	.....	.....
1887	46,295	554,388	3,919	77,420	17,612	220,167	(b) 79	1,086
	Pig Iron, &c. (c)							
	Tons.	Value.						
		$						
1888	48,973	648,012	.....				23,293	297,496
1889	72,115	864,752	.....				26,794	335,090
1890	87,613	1,148,078	.....				47,846	678,574
1891	81,317	1,085,929	.....				43,967	652,842
1892	68,918	886,485	.....				32,627	433,695
	Pig Iron.		Charcoal Pig Iron.		Cast Scrap Iron.			
	Tons.	Value.	Tons.	Value.	Tons.	Value.		
		$		$		$		
1893	56,849	682,209	5,944	84,358	729	9,317	45,459	574,809
1894	42,376	483,787	2,906	34,968	78	771	30,850	369,682
1895	(d) 31,637	341,259	2,780	31,171	643	4,347	23,390	244,388
1896	(d) 36,131	394,591	917	11,726	93	741	(e)13,607	157,996

(a) Comprises pig-iron of all kinds.

(b) From 13th May only.

(c) These figures appear in Customs reports under heading "Iron in pigs, iron kentledge and cast scrap-iron."

(d) Includes iron kentledge. Duty 1896, $4 per ton.

(e) Scrap-iron and scrap-steel, old, and fit only to be re-manufactured, being part of or recovered from any vessel wrecked in waters subject to the jurisdiction of Canada. Duty—Free.

Wrought scrap-iron and scrap-steel, being waste or refuse fit only to be re-manufactured, the same having been in actual use, not to include cuttings or clippings which can be used as iron or steel without re-manufacture, and steel bloom ends and crop ends of steel rails. Duty—$4 per ton.

Iron or steel, being pieces, punchings or clippings of boiler plate or other plates, sheets or bars of iron or steel, whether the same have had the ragged or cropped ends or edges sheared off or not, and crops from iron or steel rails having both ends sawn or sheared off, the same not having been in actual use and being fit for re-rolling or re-manufacturing only. Duty—$4 per ton.

TABLE 7.

IRON. IRON.

IMPORTS OF FERRO-MANGANESE, ETC. Imports.

Fiscal Year.	Tons.	Value.
*1887	123	$ 1,435
*1888	1,883	29,812
*1889	5,868	72,108
*1890	696	18,895
*1891	2,707	40,711
*1892	1,311	23,930
*1893	529	15,858
*1894	284	9,885
†1895	164	5,408
†1896 ..... Duty—5 p. c.	652	12,811

*These amounts include :—ferro-manganese, ferro-silicon, spiegel, steel bloom ends, and crop ends of steel rails, for the manufacture of iron or steel.

†Ferro-silicon, spiegeleisen and ferro-manganese.

TABLE 8.

IRON.

IMPORTS : IRON IN SLABS, BLOOMS, LOOPS AND PUDDLED BARS, ETC.*

Fiscal Year.	Cwt.	Value.
1880	195,572	$244,601
1881	111,666	111,374
1882	203,888	222,056
1883	258,639	269,818
1884	252,310	264,045
1885	312,329	287,734
1886	273,316	248,461
1887	522,853	421,598
1888	110,279	93,377
1889	80,383	67,181
1890	15,041	45,923
1891	41,567	38,931
1892	64,397	56,186
1893	65,269	58,533
1894	50,891	45,018
1895	78,639	67,321
1896 ..... Duty $5 per ton.	128,535	110,757

*Iron in slabs, blooms, billets, loops, puddled bars, or other forms less finished than iron in bars, and more advanced than pig iron, except castings.

IRON.

Imports.

Tables 9*a* and 9*b* following have been compiled from data published in the Government Trade and Navigation Reports. The preceding tables, 6, 7 and 8, cover the importation of the cruder forms of iron and steel. Importations of more highly finished iron and steel goods are given below under a classification intended to show, roughly, the distinction between articles partially manufactured or the result of first processes, and those of a more highly finished character.

TABLE 9*a*.

IRON.

IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
Swedish rolled iron rods, under ½ inch in diameter and not less than 1⅜c. per lb. value	Cwt.	15 p. c	400	$ 916
Swedish rolled iron nail rods under half an inch in diameter, for manufacture of horse-shoe nails	"	15 "	21,064	31,998
Switches, frogs, crossings and intersections for railways	"	30 "	1,873	4,237
Steel rails weighing not less than 45 lbs. per lineal yard, for use in railway tracks	"	Free	1,043,511	1,034,578
Iron or steel railway bars or rails of any form, punched or not punched, N.E.S., for railways which term for the purposes of this item shall include all kinds of railways, street railways and tramways, even although the same are used for private purposes only, and even although they are not used or intended to be used in connection with the business of common carrying of goods or passengers	Tons.	30 p. c	6,692	125,338
Railway fish-plates and tie-plates	"	$10 per ton	2,233	50,535
Rolled iron or steel angles, channels, and other sections, weighing less than 35 lbs. per lineal yard, N.E.S.	Cwt.	35 p.c. but not less than $10 per ton.	50,178	58,867
Rolled iron or steel angles, channels, and special sections, weighing not less than 35 lbs. per lineal yard	"	12½ p. c	87,371	101,504
Rolled iron or steel beams, joists, girders, column sections, trough sections, and other building or bridge structural sections, weighing not less than 25 lbs. per lineal yard and rolled iron or steel bridge plate not less than ⅜ of an inch thick or less than 15 inches wide, and flat eye bar blanks not punched or drilled	"	12½ "	100,941	110,257
Carried forward				1,518,230

TABLE 9a—*Con.*

IRON.

IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
Brought forward.....		.....	.....	$1,518,230
Iron or steel beams, sheets, plates, angles and knees for iron, steel or composite ships or vessels.....	Cwt.	Free.....	16,080	21,250
Locomotive and car-wheel tires of steel in the rough.....	"	"	13,367	32,697
Bar iron, rolled or hammered, comprising rounds, squares, shapes of rolled iron not more than four inches in diameter, and flats not thinner than No. 16 gauge, whether in coils, bundles, rods or bars, N.E.S.....	"	$10 per ton	66,971	120,552
Iron steel plates or sheets, sheared or unsheared, and skelp iron or steel, sheared or rolled in grooves, and iron or steel of all widths thicker than No. 17 gauge, N.E.S.....	"	$10 per ton	33,040	57,462
Iron bridges and structural iron work.	Lbs.	30 p.c. but not less than 1 c. per lb.	1,198,973	48,318
Hoop iron, not exceeding three-eighths of an inch in width and being No. 25 gauge or thinner, used for the manufacture of tubular rivets.....	Cwt.	Free.	265	623
Iron or steel hoops, bands and strips, 8 inches and less in width, No. 18 gauge and thicker....	"	$10 per ton	22,655	32,274
Iron or steel sheets, or other iron or steel of all widths, sheet iron, common or black, smoothed, polished, coated or galvanized and Canada plates, No. 17 gauge and thinner and hoop, band or strip, iron or steel, N.E.S.....	"	5 p. c	377,149	751,705
Plough plates, mould boards, land sides and other plates for agricultural implements, when cut to shape from rolled plates of steel but not moulded, punched, polished or otherwise manufactured, and being of a greater value than 4 cts. a lb..	"	5 "	5,090	29,572
Steel, valued at 2½ cts. per lb. and upwards, for manufacture of skates.	"	Free	2,384	10,185
Steel for saws and straw cutters, cut to shape but not further manufactured	"	"	7,655	63,265
Steel for the manufacture of hammers, augers and auger bits, when imported by the manufacturers of such articles, for use in their factories only	Cwt.	Free.....	2,360	4,758
Steel of No. 24 and 17 gauge, in sheets 63 inches long and from 18 inches to 32 inches wide, for the manufacture of tubular bow sockets, when imported by the manufacturers of such articles, for use in their own factories only..... ...	"	"	1,358	1,630
Carried forward.....		.....	.....	$2,692,521

TABLE 9*a*—*Con.*

IRON.

Imports.

IRON.

IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
Brought forward				$2,692,521
Crucible sheet steel, 11 to 16 gauge, 2½ to 18 inches wide, imported by manufacturers of mower and reaper knives for manufacture of such knives in their own factories	Cwt.	Free	5,182	17,136
Steel, rolled rods of, under ½-inch in diameter, or under ½-inch square, imported by knob or lock manufacturers or cutlers for use exclusively in such manufactures in their own factories	"	"	1,357	4,040
Steel of No. 20 gauge, and thinner, but not thinner than No. 30 gauge, to be used in the manufacture of corset steels, clock springs, and shoe shanks; and flat wire of steel of No. 16 gauge or thinner to be used in the manufacture of crinoline or corset wire and dress stays, when imported by the manufacturers of such articles for use in their factories	"	"	2,703	14,877
Steel of No. 12 gauge and thinner, but not thinner than No. 30 gauge, imported by manufacturers of buckle clasps and ice-creepers	"	"	287	1,332
Steel for the manufacture of files, when imported by file manufacturers for use in their factories	"	"	2,906	10,090
Steel, chrome steel	"	15 p.c.	941	6,218
Steel ingots, cogged ingots, blooms and slabs, or other forms less finished than steel bars, N.E.S.	"	$5 per ton	28,831	31,847
Steel, bars rolled or hammered comprising rounds and squares, shapes of rolled steel not more than 4 inches in diameter, and flats not thinner than No. 16 gauge, whether in coils, bundles, rods or bars, N.E.S	"	$10 per ton	139,283	317,070
Steel plate, universal mill or rolled edge, less than thirty inches wide, and plates or sheets of iron or steel thirty inches wide and over, and one-quarter of an inch and over in thickness	"	12½ p.c.	137,885	155,624
Malleable iron castings and iron or steel castings, N.E.S.	"	25 "	27,304	80,653
Iron sand or globules and dry putty for polishing glass or granite	"	Free	3,353	3,003
Rolls of chilled iron or steel	"	35 p.c.	1,792	5,157
Total				3,339,568

TABLE 9b.

IRON. IRON.

IMPORTS OF IRON AND STEEL GOODS. Imports.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
Wire, covered with cotton, linen, silk or other material	Lbs.	30 p. c.	494,525	$ 41,990
Wire, galvanized-iron, No. 6, 9, 12 and 14 gauge, when imported by makers of wire fencing, for use in their factories only	Cwt.	20 "	28,152	46,674
Steel wire, Bessemer soft drawn spring, of Nos. 10, 12 and 13 gauge, respectively, and homo steel spring wire of Nos. 11 and 12 gauge, respectively, when imported by manufacturers of wire mattresses, to be used in their own factories in the manufacture of such articles	"	Free	1,149	3,385
Wire of all kinds, N.E.S.	"	25 p. c.	93,742	119,683
Wire rope, of iron or steel, N.O.P.	"	25 "	4,317	31,221
Wire of iron or steel, No. 13 and 14 gauge, flattened and corrugated, used in connection with the wire grip and champion nailing machines for the manufacture of boots and shoes and leather belting	Lbs.	"	7,438	1,105
Wire rigging for ships and vessels	Cwt.	"	3,271	10,598
Wire fencing, barbed, of iron or steel	Lbs.	¾c. per lb	440,298	8,854
Wire fencing, buckthorn, and strip of iron or steel	"	½c "	4,688	90
Steel strip and flat steel wire when imported into Canada by manufacturers of buckthorns, plain strip or other fencing, and safety barb wire fencing for use in their own factories in the manufacture thereof	Cwt.	Free	1,260	2,777
Wire, crucible cast steel	Lbs.	"	412,905	26,456
Bar and round rods, galvanized	Cwt.	27½ p. c.	1,072	2,373
Chains, iron or steel, $\frac{5}{16}$ of an inch in diam. and over	"	5 p. c	25,223	62,102
Chains, N.E.S.	"	27½ p. c.	3,466	13,854
Forgings of iron and steel, of whatever shape or size, or in whatever stage of manufacture, N.E.S.	Lbs.	35 p. c. but not less than $15 per ton	719,670	37,240
Nails, spikes and sheating nails, composition	"	15 p. c.	17,907	2,177
Nails and spikes, wrought and pressed, galvanized or not, horse-shoe nails, and all wrought-iron or steel and other nails, N.E.S., and horse, mule and ox-shoes	"	30 "	655,096	20,015
Nails and spikes, cut, including railway spikes	"	¾c. per lb	755,168	15,932
Nails, wire	"	1c. "	268,536	9,008
Tacks, shoe, ½ oz. to 4 oz. to the thousand	M.	1c. per M	12,575	246
Carried forward				455,780

IRON.
Imports.

TABLE 9b—*Con.*

IRON.

IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
				$
Brought forward.....		....	... .	455,780
Cut tacks, brads or sprigs, not exceeding 16 oz. to the thousand....	M.	1½c. per M.....	47,330	1,980
Cut tacks, exceeding 16 oz. to the thousand	Lbs.	1½c. per lb.....	21,285	1,421
Wrought iron or steel nuts and washers, iron or steel rivets, bolts with or without threads, nuts and bolt blanks, T and strap hinges and hinge planks, N.E.S.....	"	1c. per lb. and 20 p. c..	1,086,411	38,638
Wrought-iron or steel nuts and washers, iron or steel rivets, bolts with or without threads, nut and bolt blanks, less than three-eighths of an inch in diameter..... .	Lbs.	1c. per lb. and 25 p.c., but not less than 35 per cent.	105,204	7,685
Screws, iron and steel, commonly called "wood screws":—				
2 inches and over in length.....	"	3c. per lb. but not less than 35 p.c.	23,128	1,841
1 inch and less than 2 inches.....	"	6c. per lb. but not less than 35 p.c.	43,866	4,570
Less than 1 inch...	"	8c. per lb. but not less than 35 p.c.	15,718	2,873
Tubing—				
Boiler tubes of wrought iron or steel, including corrugated tubes or flues for marine boilers.....	Feet.	7½ p. c..... .	2,072,303	127,432
Lap-welded iron or steel tubing, threaded and coupled or not, one and one-quarter to two inches inclusive in diameter, for use exclusively in artesian wells, petroleum pipe lines, and petroleum refineries.....	"	20 "	751,898	40,832
Tubes, not welded, not more than 1½ inches in diameter, of rolled steel.....	"	15 "	857,433	97,285
Tubing, wrought-iron or steel, threaded and coupled or not, over 2 inches in diameter.....	"	15 "	1,867,089	295,390
Other wrought-iron or steel tubes or pipes.....	Lbs.	1⅝c. per lb. and 30 per cent.....	7,632,761	174,450
Rolled iron tubes not welded, under 1½-inch in diameter, angle iron 9 and 10 gauge, not over 1½-inch wide, iron tubing lacquered or brass covered, not over 1½ inch diameter, all of which are to be cut to lengths for the manufacture of bedsteads, and to be used for no other purpose, when imported for the manufacturers of iron bedsteads, to be used for these purposes only, in their own factories.	Cwt.	Free.....	1,724	3,869
Carried forward.....		.....	.....	1,254,046

TABLE 9b—*Con.*

IRON.

IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
				$
Brought forward				1,254,046
Cast-iron pipes of every description	Cwt.	$10 per ton but not less than 35 p.c.	43,776	47,407
Fittings of wrought iron or steel pipe	Lbs.	35 p.c.	1,343,337	68,940
Tools and implements—				
Axes of all kinds, N.E.S.	Doz.	35 "	6,645	31,820
Saws	$	32½ "		84,543
Carpenters', coopers', cabinetmakers' and all other mechanics' tools, N.E.S.	"	35 "		220,745
Files and rasps	"	35 "		65,085
Picks, mattocks, grub hoes, adzes, hatchets and eyes or poles for same	"	35 "		6,043
Tools of all descriptions, N.E.S.	"	35 "		46,297
Track tools, wedges, crow-bars and sledges	"	30 "		3,684
Knife blades, or knife blanks, in the rough for use by electro-platers	"	10 "		1,445
Manufactures, articles or wares not specially enumerated or provided for, composed wholly or in part of iron or steel, and whether partly or wholly manufactured	"	27½ "		696,662
Pen knives, jack knives and pocket knives of all kinds	"	25 "		75,704
Table cutlery, N.E.S.	"	32½ "		77,079
All other cutlery, N.E.S.	"	25 "		113,831
Muskets, rifles and other fire-arms	"	20 "		117,275
Needles, sewing machine, and all other, N.O.P.	"	30 "		27,527
Needles, knitting	"	30 "		4,415
Surgical and dental instruments	"	15 "		46,846
Hardware, viz.: Builders', cabinetmakers', upholsterers', harness makers' and saddlers', including curry combs, carriage hardware, &c.	"	32½ "		291,841
Scales, balances and weighing beams	"	30 "		21,325
Skates, of all kinds	Pairs	10c. per pair and 30 p.c.	39,743	14,539
Stoves	$	27½ p c.		55,390
Butts and hinges, N.E.S.	"	32½ "		10,023
Cast iron vessels, plates, stove plates and irons, sad irons, hatters' irons, tailors' irons	"	27½ "		9,033
Locks of all kinds	"	32½ "		57,351
Safes, and doors for safes and vaults	"	30 "		4,878
Ware—stamped tinware, japanned-ware, galvanized iron ware, including signs made from these materials	"	25 "		27,622
Ware, enamelled iron or steel ware, including signs and letters enamelled on any metal and granite or agate ware	"	35 "		88,535
Carried forward				3,569,931

TABLE 9*b*—*Con.*

IRON. IRON.

Imports. IMPORTS OF IRON AND STEEL GOODS.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
				$
Brought forward				3,569,931
Machines and machinery, &c.:				
Windmills	No.	27½ p.c	446	19,135
Fanning mills	"	35 "	15	166
Portable machines:				
Horse-powers	"	30 "	16	1,017
Portable steam-engines	"	30 "	58	15,640
Portable saw-mills and planing mills	"	30 "	18	2,137
Threshers and separators	"	30 "	91	23,805
All other portable machines	"	30 "	1,487	53,955
Parts of above articles	$	30 "		40,220
Sewing machines, or parts of	No.	30 "	4,283	113,901
Machines, type-writing	"	27½ "	1,243	53,590
All other machinery composed wholly or in part of iron or steel, N.E.S.	$	27½ "		1,092,504
Agricultural implements, N. E. S., viz.:				
Binding attachments	No.	20 "	64	3,766
Cultivators	"	20 "	4,533	21,371
Drills, grain seed	"	20 "	1,628	40,496
Forks, pronged	"	35 "	27,315	6,408
Harrows	"	20 "	22,685	18,684
Harvesters, self-binding and without binders	"	20 "	1,201	131,080
Hoes	"	35 "	4,055	1,052
Horse rakes	"	20 "	747	13,583
Knives, hay	"	35 "	24	7
Lawn mowers	"	35 "	238	977
Mowing machines	"	20 "	2,172	72,338
Ploughs, sulky and walking	"	20 "	3,187	51,443
Rakes, N.E.S	"	35 "	5,765	983
Reapers	"	20 "	33	2,330
Scythes	Doz.	35 "	5,772	22,430
Spades and shovels and spade and shovel blanks, and iron or steel cut to shape for the same	"	50c. per doz. and 25 p.c.	6,273	24,115
Steel bowls, for cream separators	$	Free		35,508
All other agricultural tools or implements, N.E.S.	"	35 p.c.		35,135
Axles, springs and parts thereof, axle bars and axle blanks of iron or steel, N.E.S.	Lbs.	1c. per lb. and 20 p.c.	283,700	18,773
Axles, springs and parts thereof, axle bars and axle blanks of iron or steel, for railway or tram-way vehicles	Cwt.	$20 per ton but not less than 35 p.c.	9,331	19,448
Engines, locomotives and parts thereof, for railways	$	35 p.c.		80,102
Fire	No.	35 "	10	17,003
Other, and boilers, N.E.S.	$	27½ "		26,293
Fire extinguishers	"	35 "		3,595
Carried forward				5,632,921

TABLE 9*b*—*Con.*

IRON. IRON.

IMPORTS OF IRON AND STEEL GOODS. Imports.

Fiscal Year, 1896.		Duty (1896).	Quantity.	Value.
				$
Brought forward				5,632,921
Pumps, N.E.S	"	30 "		70,711
Pumps, steam	No.	30 "	213	39,237
Mining and smelting machinery, which is at the time of its importation of a class or kind not manufactured in Canada	$	Free		193,098
Anchors	Cwt.	"	2,163	7,875
Iron or steel masts for ships, or parts of	"	"	60	70
Total				5,943,912

TABLE 10.

IRON.

IMPORTS OF PIG IRON, IRON AND STEEL GOODS, &c., CALENDAR YEAR, 1896.
RECAPITULATION OF TABLES 6, 7, 8, 9*a* AND 9*b*.

——	Tons.	Value.
		$
Pig iron and iron kentledge	36,131	394,591
" charcoal	917	11,726
Scrap iron, cast	93	741
" steel, wrought	13,607	157,996
Ferro-manganese, &c.	652	12,811
Iron in slabs, blooms, puddled bars, &c	128,535	110,757
Iron and steel goods, manufactured		3,339,568
" highly manufactured*		5,943,912
Total		9,972,102

* Machinery, &c., classed under iron and steel goods, in Customs report.

LEAD.

LEAD.

Production.

The production of lead for 1896 was 24,199,977 lbs., and is greater than that of the previous year by 7,738,183 lbs., or 47 per cent. The above production was entirely from British Columbia, no lead being produced during the year either in Quebec or Ontario.

TABLE 1.

LEAD.

ANNUAL PRODUCTION.

Calendar Year.	Pounds.	Price per Pound.	Value.
		cts.	
1887..	204,800	4·50	$ 9,216
1888..	674,500	4·42	29,813
1889..	165,100	3·93	6,488
1890..	105,000	4·48	4,704
1891..	88,665	4·35	3,857
1892..	808,420	4·09	33,064
1893..	2,135,023	3·73	79,636
1894..	5,703,222	3·29	187,636
1895..	16,461,794	3·23	531,716
1896..	24,199,977	2·98	721,159

The table of exports below gives the figures as per entries made at the various ports by the shippers. They are of values only and it will be seen that they are much lower than those in Table 1, for the same periods. The reason for this is to be found in the different basis of valuation adopted. Table 1 gives, as in the rest of the Report, the full and final value of the lead in the ore, *etc.*, shipped. In Table 2, the lead contents have been valued by the various shippers at their spot value.

TABLE 2.

LEAD.

EXPORTS.

Calendar Year.	Value.
1873	$ 1,993
1874	127
1875	7,510
1876	66
1877	720
1878	
1879	230
1880	
1881	
1882	32
1883	5
1884	36
1885	
1886	
1887	724
1888	18
1889	
1890	
1891	5,000
1892	2,509
1893	3,099
1894	144,509
1895	435,071
1896 Quebec	1,854
1896 Ontario	250
1896 British Columbia	459,991
Total, 1896	462,095

LEAD.
Imports.

TABLE 3.
LEAD.
IMPORTS OF LEAD.

Fiscal Year.	OLD, SCRAP AND PIG.		BARS, BLOCKS, SHEETS.		TOTAL.	
	Cwt.	Value.	Cwt.	Value.	Cwt.	Value.
1880					30,298	$124,117
1881	16,236	$ 56,919	18,222	$70,744	34,458	127,663
1882	36,655	120,870	10,540	35,728	47,195	156,598
1883	48,780	148,759	8,591	28,785	57,371	177,544
1884	39,409	103,413	9,704	28,458	49,113	131,871
1885	36,106	87,038	9,362	24,396	45,468	111,434
1886	39,945	110,947	9,793	28,948	49,738	139,895
1887	61,160	173,477	14,153	41,746	75,313	215,223
1888	68,678	196,845	14,957	45,900	83,635	242,745
1889	74,223	213,132	14,173	43,482	88,396	256,614
1890	101,197	283,096	19,083	59,484	120,280	342,580
1891	86,382	243,033	15,646	48,220	102,028	291,253
1892	97,375	254,384	11,299	32,368	108,674	286,752
1893	94,485	215,521	12,403	32,286	106,888	247,807
1894	70,223	149,440	8,486	20,451	78,709	169,891
1895	67,261	139,290	6,739	16,315	74,000	155,605
1896	*72,433	173,162	†8,575	23,169	81,008	196,331

* Duty, 40c. per 100 lbs. † Duty, 60c. per 100 lbs.

TABLE 4.
LEAD.
IMPORTS OF LEAD MANUFACTURES.

Fiscal Year.			Value.
1880			$15,400
1881			22,629
1882			17,282
1883			25,556
1884			31,361
1885			36,340
1886			33,078
1887			19,140
1888			18,816
1889			16,315
1890			25,600
1891			23,893
1892			22,636
1893			33,783
1894			29,361
1895			38,015
		Duty.	
1896.	Lead, Tea	Free	
	" Pipe	½c. per lb. and 25 p. c.	$ 1,790
	" Shot	" " " "	1,219
	" Manufactures, N.E.S.	30 p. c.	39,769
		Total	$42,778

MANGANESE.

Manganese has been found in Canada in the provinces of Nova Scotia, New Brunswick, Quebec, Ontario and in the North-west Territories. It is only, however, in Nova Scotia and New Brunswick that it has been profitably mined. The most important manganese ore is pyrolusite with which manganite is usually associated. Deposits of wad or bog manganese, an earthy hydrated oxide of manganese, also occur in many localities.

NOVA SCOTIA.

Nova Scotia.

Considerable quantities of wad or bog manganese have been found in Nova Scotia, and many brown hæmatites contain manganese, the peroxide in some running as high as 14 per cent. Pyrolusite, however, is the only ore that has as yet paid for mining. The deposits of this mineral are very irregular. It occurs in small pockets and veins penetrating granite and also in the quartzites of the Lower Cambrian. The most extensive deposits, however, are found in the marine limestone of the Lower Carboniferous.

The small amount of manganese produced in Nova Scotia during 1896 was obtained mainly from Tennycape, in Hants county. Manganese ores were discovered in this locality about the year 1862, and have been worked with more or less regularity ever since. The ore is chiefly pyrolusite with some psilomelane and manganite, and yields from 88 to 95 per cent of available oxide. It has sometimes run in value as high as $125 to the ton. The following analyses of manganese ores from the Tennycape district, are taken from the mineral resources of the United States, 1894 :—

Analyses.

——	Douglas.	Cheverie.
Moisture	1·660	2·05
Water of composition	3·630	.....
Iron peroxide	·603	2·55
Oxygen	7·035	.....
Baryta	·724	1·12
Insoluble matter	1·728	2·80
Phosphoric acid	.....	1·029
Manganese oxides	84·620	.....
Peroxide of manganese	.....	90·15
Lime	.....	Trace.
Total	100·000	99·699

MANGANESE. Manganese has also been found in Nova Scotia in King's county near Cornwallis and Wolfeville, at Musquodoboit and at Ship Harbour. It is found at many localities in Hants and Colchester counties, and occurs in workable quantities at Loch Lomond and Cheticamp in Cape Breton Island. A sample of ore from the Mira Hills, near Loch Lomond in Cape Breton county, gave on analysis 81·52 per cent manganese dioxide (G. S. C. Report, 1879-80, p. 174). Another analysis of ore from the same locality gave :

Manganese dioxide..... ..... 88·98 per cent.
Ferric oxide..... 0·21 "

In a letter received from Mr. H. Fletcher he speaks of the manganese ore of Mr. E. T. Moseley's mine at Loch Lomond, C.B., as follows :—" The quality is good though it is not crystallized or fibrous like that of Tennycape. The quantity is, from its mode of occurrence, uncertain, so that its being profitably worked might depend, as at Tennycape, on the extraordinary purity of the ore. At the latter mines, I understand, the ore cannot be mined at a profit unless it can be sold for about a hundred dollars a ton and one year it brought $140. The cost of mining will depend on the quantity. There is every facility for tramming and shipping."

New Brunswick. NEW BRUNSWICK.

Manganese is found in the southern part of New Brunswick, underlying the Carboniferous Limestone. The most important deposit known in this province was discovered in 1862, at Markhamville, near the town of Sussex, King's county. The ore, which is a very pure pyrolusite, occurs in beds and pockets, as much as 4,000 tons having been produced from one pocket. The following analyses of high-class Manganese ores from Markhamville are taken from the Mineral Resources of the United States, 1894.

Analyses.

	No. 1.	No. 2.	No. 3.
	Per cent.	Per cent.	Per cent.
Manganese peroxide.....	98·70	97·25	96·62
Silica.....	·55	.....	.....
Iron.....	·75	.....	.....
Iron peroxide	.....	·85	·78
Baryta and Silica	Trace.	·95	·85
Water.....	.....	Trace.	Trace.
Loss.....	.....	·95	1·75
Total.....	100·00	100·00	100·00

A small amount of work has been done at Jordon Mountain near Sussex and at Quaco Head opposite St. Martins on the Bay of Fundy. Considerable quantities of ore have been obtained from Shepody Mountain in Albert county. The only locality known in New Brunswick where manganese is found outside of the Carboniferous formation is at Gowland mountain. MANGANESE.

OTHER PROVINCES.

Manganese occurs, principally as wad, along with many of the bog iron ores and ochres in the province of Quebec, and small amounts have been mined from time to time, but the deposits are of comparatively little importance. At Sutton, Brome county, manganese is found in dolomite in the form of a carbonate.

Wad has been noted in Ontario in the township of Madoc, and manganite at Bachewaning Bay, on Lake Superior.

Further details regarding manganese in Canada will be found in the Report of this Section for 1890. (Annual Report, Geol. Surv. Can., N.S., Vol. V., pp. 92 s to 101 s.)

The statistics of the production, etc., are given in Tables 1, 2 and 3 following.

From a study of Tables 1, 2, it will be evident that the industry has been very irregular, with a decided falling off, during the last six years.

There has been a general tendency, however, toward an increased home consumption, as shown by the imports given in Table 3.

TABLE 1.

MANGANESE.

ANNUAL PRODUCTION. Production.

Calendar Year.	Tons.	Value.
1886	1,789	$41,499
1887	1,245	43,658
1888	1,801	47,944
1889	1,455	32,737
1890	1,328	32,550
1891	255	6,694
1892	115	10,250
1893	213	14,578
1894	74	4,180
1895	125	8,464
1896*	123½	3,975

*Exports.

TABLE 2.

MANGANESE.

MANGANESE.

Exports.

EXPORTS OF MANGANESE ORE.

CALENDAR YEAR.	NOVA SCOTIA.		NEW BRUNSWICK.		TOTAL.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
1873	.....	.....	1,031	$20,192	1,031	$20,192
1874	6	$ 12	776	16,961	782	16,973
1875	.....	200	194	5,314	203	5,514
1876	21	723	391	7,316	412	8,039
1877	106	3,699	785	12,210	891	15,909
1878	106	4,889	520	5,971	626	10,860
1879	154	7,420	1,732	20,016	1,886	27,436
1880	79	3,090	2,100	31,707	2,179	34,797
1881	200	18,022	1,504	22,532	1,704	40,554
1882	123	11,520	771	14,227	894	25,747
1883	313	8,635	1,013	16,708	1,326	25,343
1884	134	1,054	469	9,035	603	20,089
1885	77	5,054	1,607	29,595	1,684	34,649
1886	(a) 441	854	1,377	27,484	(a)1,818	58,338
1887	578	14,240	837	20,562	1,415	34,802
1888	87	5,759	1,094	16,073	1,181	21,832
1889	59	3,024	1,377	26,326	1,436	29,350
1890	177	2,583	1,729	34,248	1,906	36,831
1891	22	563	233	6,131	255	6,694
1892	84	6,180	59	2,025	143	8,205
1893	123	12,409	10	112	133	12,521
1894	11	720	45	2,400	56	3,120
1895	108	6,348	$\frac{3}{10}$	3	$108\frac{3}{10}$	6,351
1896	$123\frac{1}{2}$	3,975	.....	.....	$123\frac{1}{2}$	3,975

(a) 250 tons from Cornwallis should more correctly be classed under the heading of mineral pigments.

TABLE 3.

MANGANESE.

Imports.

IMPORTS: OXIDE OF MANGANESE.

Fiscal Year.	Pounds.	Value.
1884	3,989	$ 258
1885	36,778	1,794
1886	44,967	1,753
1887	59,655	2,933
1888	65,014	3,022
1889	52,241	2,182
1890	67,452	3,192
1891	92,087	3,743
1892	76,097	3,530
1893	94,116	3,696
1894	101,863	4,522
1895	64,151	2,781
1896	duty free 108,590	4,075

MERCURY.

Occurrences.

The only deposits of mercury ore worked in Canada are in the vicinity of Kamloops Lake, B.C. The deposit at this locality has already been described in the Report of this Section for 1892. Dr. G. M. Dawson, who visited it in 1894, gives further particulars as follows (Annual Report, Geol. Surv., Can., N.S., Vol. VII., p. 340B.):—"What may prove to be an important deposit of cinnabar has lately been found in the vicinity of Copper Creek, Kamloops Lake, and several contiguous claims have been taken up on this, on the west side of the valley of the creek, near its mouth. The claims, have, I believe, been combined in a single property, but the best looking deposit of ore occurs on the Rosebush claim, where a shaft about fifty feet deep, connecting below with a drift more than fifty feet long, had been opened. The height of this place is about 450 feet above the lake. Other small openings have been made in the same vicinity, as well as a second shaft, thirty-five feet deep, on the Yellow Jacket claim, about a quarter of a mile northward of the Rosebush.

"The cinnabar occurs in irregular, sparry veins, consisting chiefly of calcite and quartz, with some dolomite, traversing zones of a gray felspathic and dolomitic rock, which readily weathers to a yellowish colour. Both these zones and the contained veins, as a rule, run nearly magnetic north-and-south through the main rock of the hills, which is a dark greenish-black, Tertiary eruptive, containing pyroxene and olivine.....but much decomposed. A considerable quantity of rich ore has been taken from the wider portions of the main vein opened on the Rosebush. Although the slopes of the hills are abrupt, they are almost everywhere covered with drift deposits, and much more work is necessary in order that the true value of the deposit may be ascertained. Exploratory trenching in an east and west direction would be the most economical method in the first instance. A little antimony sulphide (stibnite) is observable in some parts of the ore.

"Another claim, upon which very little work has been done, is the Last Chance, No. 2, situated on the east side of Copper Creek, near the junction of the Tertiary volcanic rocks with a small area of decomposed granite. Small quantities of cinnabar are found here, and some narrow seams of molybdenite also occur. In the adjacent granitic mass, minute bright red specks of cinnabar may also be detected, and

MERCURY. Occurrences.

it would appear that the extensive decomposition of the basic volcanic rocks of this region, by heated waters or steam, has led to the diffusion of a certain quantity of cinnabar through some parts of both classes of rocks, and to its concentration in some of the veins.

"Decomposition of a similar character has affected the rocks seen on the opposite side of Kamloops Lake, along the railway, to the east of the mouth of Cherry Bluff Creek. No cinnabar has been observed here, but distinct traces of cinnabar are found in seams cutting some of the rocks at Six-mile Point, also on the south shore, but further to the west.

"I have also been informed that grains of cinnabar have been observed in washing for gold on Criss Creek, to the north.

"These occurrences, taken together, indicate that search for cinnabar may be made with some prospect of success, over a considerable area, in this vicinity."

Since the above was written it was reported that cinnabar had also lately been found in rocks about four miles further up the Copper Creek valley on its west side.

The Rosebush, Yellow Jacket, Blue Bird and Lake View claims were sold in the summer of 1895 to the Cinnabar Mining Company of British Columbia.

During August, 1895, a discovery of cinnabar was made on Hardie Mountain, about three miles north of the Cinnabar Mining Company's property. Another discovery of this mineral was reported in the autumn of 1896 in the vicinity of the Nanaimo lakes.

Other localities from which specimens of cinnabar have been obtained are as follows :—Ebenezer Mine, Hector, Kicking Horse Pass, two and a half miles east of Golden ; north side of Homathco River ; eastern entrance of Seshart Channel, Barclay Sound, Vancouver Island ; Timothy claim, west side of Read Island, north-east coast of Vancouver Island. All the above are in British Columbia.

Tables 1 and 2 following give the production and imports of mercury. From the former it is evident that but little has been done to develop our own deposits, whilst a study of the latter shows that there is a steadily growing demand in Canada. With the growth of the mining industry in the country there should continue to be an increase in the demand for use in the milling of certain classes of ores of the precious metals.

TABLE 1.

MERCURY.

PRODUCTION.

MERCURY. Production.

Calendar Year.	Flasks, (76½ lbs.)	Price per flask.	Value.
1895	71	$ 33 00	$ 2,343
1896	58	33 44	1,940

TABLE 2.

MERCURY.

IMPORTS.

Imports.

Fiscal Year.	Pounds.	Value.
1882	2,443	$ 965
1883	7,410	2,991
1884	5,848	2,441
1885	14,490	4,781
1886	13,316	7,142
1887	18,409	10,618
1888	27,951	14,943
1889	22,931	11,844
1890	15,912	7,677
1891	29,775	20,223
1892	30,936	15,038
1893	50,711	22,998
1894	36,914	14,483
1895	63,732	25,703
1896 Duty free	77,869	32,343

MICA.

MICA.

The three principal varieties of mica that are of economic importance are muscovite, the potash mica, phlogopite, the magnesia mica, and biotite, the magnesia-iron mica. The biotite, however, is found to be less suitable to electrical construction than muscovite and phlogopite.

The value of mica varies greatly with the colour, transparency, cleavability, toughness, and size when cut. A clear mica, roughly split and untrimmed, that will cut 2 in. by 4 in., will be worth at the mine about six cents per pound, while the same mica if cutting 5 in. by 7 in. will be worth sixty cents per pound. By trimming the edges this latter increases in value to $1 or $1.50 per pound of finished product. These were approximately the prices that ruled during 1895 in the Canadian market.

MICA.

Mica is used principally as an electrical insulator. For this purpose there is a constant demand for the best varieties, as no other material has yet been found that will satisfactorily take its place. For some electrical purposes, however, micanite is now employed. This is a sheet mica which is built up from small pieces of mica that would otherwise be discarded as refuse. It can be moulded, and can be made of any size and thickness. There are many other uses to which mica is put, such as the manufacture of stove windows, lamp chimneys, fire screens, spectacles for metal workers, and as a lubricant and ingredient of paints and fire-proof cements. For some of these purposes the inferior grades of mica can often be employed.

Mica was produced in 1896 in the following townships in Ontario :— Levant, South Canonto, Loughboro', in Frontenac county ; Burgess, in Lanark county ; Cardiff, in Haliburton county ; and in Quebec in Templeton and Hull, Ottawa county. Most of the mica from these localities was the phlogopite or amber variety. Deposits of muscovite are found on the north shore of the St. Lawrence east of the Saguenay river, but very little work appears to have been done here during the year. Muscovite was formerly mined in Ottawa county in the townships of Villeneuve and Aylwin, and it has been found in Ontario in Miller township, Frontenac county.

The only available data regarding production, etc., are to be found in Tables 1 and 2 below. It is found very difficult to get complete and accurate figures of production, and those given represent the exports plus the known consumption in the country. It is believed, however, that the exports are very much undervalued, and in fact some of those conversant with the industry claim that the value of the mica marketed from Canadian mines is nearer double what is reported below. As no actual proof of this is available it is considered better to let the figures stand.

TABLE 1.

MICA.

Production.

ANNUAL PRODUCTION.

Calendar Year.	Value.
1886	$ 29,008
1887	29,816
1888	30,207
1889	28,718
1890	68,074
1891	71,510
1892	104,745
1893	75,719
1894	45,581
1895	65,000
1896	60,000

TABLE 2.

MICA.

EXPORTS.

MICA.
Exports.

Calendar Year.	Value.
1887	$ 3,480
1888	23,563
1889	30,597
1890	22,468
1891	37,590
1892	86,562
1893	70,081
1894	38,971
1895	48,525
1896	47,756

MINERAL PIGMENTS.

MINERAL PIGMENTS.

Ochres.—The production of ochres during the year 1896 was 2,362 tons, valued at $16,045, which was an increase of 1,023 tons in quantity, and $1,445 in value over the production of 1895.

Production of ochres.

TABLE 1.

MINERAL PIGMENTS.

ANNUAL PRODUCTION OF OCHRES.

Calendar Year.	Tons.	Value.
1886	350	$ 2,350
1887	485	3,733
1888	397	7,900
1889	794	15,280
1890	275	5,125
1891	900	17,750
1892	390	5,800
1893	1,070	17,710
1894	611	8,690
1895	1,339	14,600
1896	2,362	16,045

Mineral Pigments.

Table 2.

Mineral Pigments.

Imports of Ochres.

Imports of Ochres.

Fiscal Year.			Pounds.	Value.
1880			571,454	$ 6,544
1881			677,115	8,972
1882			731,526	8,202
1883			898,376	10,375
1884			533,416	6,393
1885			1,119,177	12,782
1886			1,100,243	12,267
1887			1,460,128	17,067
1888			1,725,460	17,664
1889			1,342,783	12,994
1890			1,394,811	14,066
1891			1,528,696	20,550
1892			1,708,645	22,908
1893			1,968,645	23,134
1894			1,358,326	18,951
1895			793,258	12,048
		Duty.		
1896	Ochres and ochrey earths and raw siennas	20 p. c.	350,045	$ 2,995
	Oxides, dry fillers, fire-proofs, umbers and burnt siennas, N.E.S.	25 "	809,449	13,959
	Total, 1896		1,159,494	$16,954

Baryta.—The production of baryta in Canada of late years has been of a very intermittent character. The small production reported for 1896, viz., 145 tons was only 13 per cent of the production of 1894, while no production whatever was reported for 1895.

Table 3.

Mineral Pigments.

Annual Production of Baryta.

Production of Baryta.

Calendar Year.	Tons.	Value.
1885	300	$ 1,500
1886	3,864	19,270
1887	400	2,400
1888	1,100	3,850
1889	.....	.....
1890	1,842	7,543
1891	.....	.....
1892	315	1,260
1893	.....	.....
1894	1,081	2,830
1895	.....	.....
1896	145	715

TABLE 4.

MINERAL PIGMENTS.

IMPORTS OF BARYTA.

MINERAL PIGMENTS.

Imports of Baryta.

Fiscal Year.	Cwt.	Value.
1880	2,230	$1,525
1881	3,740	1,011
1882	497	303
1883		185
1884		229
1885	7	14
1886		62
1887	379	676
1888	236	214
1889	1,332	987
1890	1,322	978

TABLE 5.

MINERAL PIGMENTS.

MISCELLANEOUS IMPORTS, FISCAL YEAR, 1896.

Miscellaneous Imports.

—		Duty.	Quantity.	Value.
Paint, ground or mixed in, or with either japan, varnish, lacquers, liquid dryers, collodion, oil finish or oil varnish	Lbs.	25 p. c.	19,781	$ 3,062
Paints and colours, and rough stuff and fillers, N.E.S.	"	25 "	39,786	2,882
Paris green, dry	"	10 "	351,934	34,814
Paints and colours ground in spirits, and all spirit varnishes and lacquers	Galls.	$1.12½ per gall.	787	2,220
Putty	Lbs.	15 p. c.	118,925	1,878
Colours, metallic, viz.: Oxides of cobalt, tin and copper, N.E.S.	"	Free	43,860	9,311
				$ 54,167

Litharge.—Litharge or oxide of lead (Pb O) has not as yet been manufactured in Canada. The following table gives the figures for imports of this material, showing a slight falling off for the year 1896. One third of the total amount brought into the country was absorbed by the Canadian oil refineries being used in the refining of crude petroleum. Litharge.

TABLE 6.

MINERAL PIGMENTS.

IMPORTS OF LITHARGE.

MINERAL PIGMENTS.

Imports of Litharge.

Fiscal Year.	Cwt.	Value.
1880	3,041	$14,334
1881	6,126	22,129
1882	4,900	16,651
1883	1,532	6,173
1884	5,235	18,132
1885	4,990	16,156
1886	4,928	16,003
1887	6,397	21,865
1888	7,010	23,808
1889	8,089	31,082
1890	9,4[illegible]3	31,401
1891	7,979	27,613
1892	10,384	34,343
1893	7,685	24,401
1894	38,547	28,685
1895	11,955	32,953
1896 Duty free.	10,710	32,817

MINERAL WATERS.

MINERAL WATERS.

The production of mineral waters in Canada for 1896 shows a decrease when compared with that of 1895, while the imports show an increase.

The production reported for the year was from the provinces of New Brunswick, Quebec and Ontario.

The following is a list of producers from whom production returns were received for 1896 :—

Producers.

Province.	Name of Company.	Name of Water.	Name of Manager or Secretary.	Postal Address.
New Brunswick	Havelock Mineral Springs Co.	Havelock	C. H. Keith	Petitcodiac.
Quebec	St. Leon Mineral Springs Co.	St. Leon	St. Leon Mineral Springs Co.	Toronto.
"		Richelieu	J. H. M. Hart	Montreal.
"	Radnor Water Co.	Radnor	Radnor Water Co.	"
Ontario	Grand Hotel Co	Caledonian	King Arnoldi	Ottawa.
"		Borthwick	Wm. Borthwick	"
"		Georgian	W. K. Kains	Treadwell.
"		Eastman's	J. Boyd & Sons	Eastman's Springs
"		Ancaster	R. A. Smith	Ancaster.
"	Eudo Mineral Water Co.	Eudo	L. Forrest	Toronto.
"		Winchester	W. J. Anderson, M.D.	Smith's Falls.
"		Wensley's	Mrs. E. Wensley.	Camperdown.

TABLE 1.

MINERAL WATERS.

ANNUAL PRODUCTION.

MINERAL WATERS.

Production.

Calendar Year.	Gallons.	Value.
1888	124,850	$ 11,456
1889	424,600	37,360
1890	561,165	66,031
1891	427,485	54,268
1892	640,380	75,348
1893	725,096	108,347
1894	767,460	110,040
1895	739,382	126,048
1896	706,372	111,736

TABLE 2.

MINERAL WATERS.

IMPORTS.

Imports.

Fiscal Year.		Duty.	Value.
1880			$15,721
1881			17,913
1882			27,909
1883			28,130
1884			27,879
1885			32,674
1886			22,142
1887			33,314
1888			38,046
1889			30,343
1890			40,802
1891			41,797
1892			55,763
1893			57,953
1894			49,546
1895			48,613
1896	Mineral waters, natural, not in bottles	Free	$ 1,306
	Mineral and aerated waters, N.E.S.	20 p. c.	54,558
			$55,864

MISCELLANEOUS.

MISCELLANEOUS.

Production of Antimony.

Antimony.—The most important locality in which antimony has been produced in Canada was at West Gore, Rawdon, Hants county, N.S. In 1887 the industry had assumed considerable proportions, but since that time it has gradually fallen off, and there has been no production since 1891. The production since 1887 is as follows, and is the result of operations in the province of Nova Scotia :—

TABLE 1.

MISCELLANEOUS.

ANNUAL PRODUCTION OF ANTIMONY.

Calendar Year.	Tons.	Value.
1886	665	$31,490
1887	584	10,860
1888	345	3,696
1889	55	1,100
1890	26½	625
1891	10	60

TABLE 2.

MISCELLANEOUS.

Exports of Antimony.

EXPORTS OF ANTIMONY ORES.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
1880	40	$ 1,948	1886	665	$31,490
1881	34	3,308	1887	229	9,720
1882	323	11,673	1888	352½	6,894
1883	165	4,200	1889	30	695
1884	483	17,875	1890	38	1,000
1885	758	36,250	1891*	3½	60

* No exports since 1891.

TABLE 3

MISCELLANEOUS.

IMPORTS OF ANTIMONY.

MISCELLANEOUS.

Imports of Antimony.

Fiscal Year.	Pounds.	Value.
1880	42,247	$ 5,903
1881	.....	7,060
1882	183,597	15,044
1883	105,346	10,355
1884	445,600	15,564
1885	82,012	8,182
1886	89,787	6,951
1887	87,827	7,122
1888	120,125	12,242
1889	119,034	11,206
1890	117,066	17,439
1891	114,084	17,483
1892	180,308	17,680
1893	181,823	14,771
1894	139,571	12,249
1895	79,707	6,131
*1896 Duty free	163,209	9,557

* Antimony, not ground, pulverized or otherwise manufactured, and antimony salts.

Arsenic.—There was no production of white arsenic in Canada during 1896. The following table gives the production in former years :—

TABLE 4.

MISCELLANEOUS.

ANNUAL PRODUCTION OF ARSENIC.

Production of Arsenic.

Calendar Year.	Tons.	Value.
1885	440	$17,600
1886	120	5,460
1887	30	1,200
1888	30	1,200
1889	Nil.	Nil.
1890	25	1,500
1891	20	1,000
1892	Nil.	Nil.
1893	"	"
1894	7	420
1895	Nil.	Nil.
1896	"	"

TABLE 5.

MISCELLANEOUS.

MISCELLANEOUS.

IMPORTS OF ARSENIC.

Imports of Arsenic.

Fiscal Year.	Pounds.	Value.
1880	18,197	$ 576
1881	31,417	1,070
1882	138,920	3,962
1883	51,953	1,812
1884	19,337	773
1885	49,080	1,566
1886	30,181	961
1887	32,436	1,116
1888	27,510	1,016
1889	69,269	2,434
1890	138,509	4,474
1891	115,248	4,027
1892	302,958	9,365
1893	447,079	12,907
1894	292,505	10,018
1895	1,115,697	31,932
1893 .....Duty Free	664,854	27,523

Felspar.—The amount of exports of felspar has been taken to represent the production for 1896, as the direct returns received were known to be incomplete.

TABLE 6.

MISCELLANEOUS.

PRODUCTION OF FELSPAR.

Production of Felspar.

Calendar Year.	Tons.	Value.
1890	700	$3,500
1891	685	3,425
1892	175	525
1893	575	4,525
1894	Nil.	Nil.
1895	.....	*2,545
1896	972	*2,583

* Exports.

Fireclay.—The production of fireclay for 1896 shows a very decided decrease from that of 1895. Returns were received from the provinces of Nova Scotia, New Brunswick and British Columbia. The fireclay is found in the coal measures of these provinces.

TABLE 7.

MISCELLANEOUS.

PRODUCTION OF FIRECLAY.

MISCELLANEOUS.

Production of Fireclay.

Calendar Year.	Tons.	Value.
1889	400	$4,800
1890	nil.	nil.
1891	250	750
1892	1,991	4,467
1893	540	700
1894	539	2,167
1895	1,329	3,492
1896	842	1,805

Magnesite.—Magnesite or carbonate of magnesia ($MgCO_3$) was formerly employed mainly in the production of magnesian salts, such as epsom salts (sulphate of magnesia). Laterly, however, besides being extensively used as a bleaching agent for wood pulp in the manufacture of paper, it has been found to be an excellent refractory material. For hearths of basic steel furnaces, it is superior to anything previously employed. It is also claimed that it is eminently adapted to the manufacture of a Portland cement, which is intended to withstand the corroding action of salt water. Magnesite.

Magnesite has been mined for many years in Austria, Germany and Greece. In America its mining has been confined to California, though its occurrence has been noted in many other parts of the continent.

The principal magnesite deposits of Canada that have yet been discovered, occur in Brome county, in the townships of Bolton and Sutton of the province of Quebec, and are there associated with the dolomites of the Quebec group, in the Lower Silurian.

On lot 17, range IX., of Bolton, there is a deposit of magnesite 20 yards wide, interstratified with steatite and an impure serpentine. It resembles a crystalline limestone, weathers a rusty red, and is marked by light green stains of oxide of chromium.

On lot 24, range IX., of Bolton, magnesite was observed in argillite. A deposite a foot thick was also found on lot 12, range VII., of Sutton.

MISCELLANEOUS.

The following analyses* of magnesite from this district show that the mineral is not pure, but is mixed with considerable quantities of carbonate of iron and insoluble matter, and whether it will become of any economic importance must remain an open question until a practical test be made.

Analyses of Magnesite.

——	No. 1.	No. 2.	No. 3.	No. 4.
Carbonate of magnesia	83·35	33·00	59·13	59·72
" iron.....	9·02	19·35	8·32	10·31
Insoluble matter...	8·03	45·90	32·20	29·90
Alumina.....	....	0·50	.....	.....
	99·40	98·75	99·65	99·93

Nos. 3 and 4 were from lot 17, range IX., Bolton.

In the township of Melbourne magnesitic ophiolites, or rocks consisting of a mixture of serpentine and magnesite, occur.

Magnesite also occurs near Black Lake, Que., and near Illecillewaet B.C., but in neither of these localities has it been found in commercial quantities.

Moulding Sand.—The production of moulding sand given below for the year 1896 is entirely from the province of Ontario.

TABLE 8.

MISCELLANEOUS.

PRODUCTION OF MOULDING SAND.

Production of Moulding Sand.

Calendar Year.	Tons.	Value.
1887.	160	$ 800
1888.	169	845
1889.	170	850
1890.	320	1,410
1891.	230	1,000
1892.	345	1,380
1893.	4,370	9,086
1894.	6,214	12,428
1895.	6,765	13,530
1896.	5,739	11,478

* Geology of Canada, 1863, pp. 457, 458.

Platinum.—As in past years the production of platinum is altogether that of British Columbia. It is obtained from the gravels of the stream beds of the Similkameen division of Yale district. The following table gives the production since 1887 :— MISCELLANEOUS. Platinum.

TABLE 9.

MISCELLANEOUS.

ANNUAL PRODUCTION OF PLATINUM.

Calendar Year.	Value.
1887	$ 5,600
1888	6,000
1889	3,500
1890	4,500
1891	10,000
1892	3,500
1893	1,800
1894	950
1895	3,800
1896	750

TABLE 10.

MISCELLANEOUS.

IMPORTS OF PLATINUM.

Fiscal Year.	Value.
1883	$ 113
1884	576
1885	792
1886	1,154
1887	1,422
1888	13,475
1889	3,167
1890	5,215
1891	4,055
1892	1,952
1893	14,082
1894	7,151
1895	3,937
*1896.....Duty free	6,185

*Platinum sheets and wire, and retorts, pans, condensers, tubing and pipe made of platinum, imported by manufacturers of sulphuric acid.

MISCELLANEOUS.

Quartz.

Quartz.—The quartz industry is very small and unimportant as is shown by the following table :—

TABLE 11.

MISCELLANEOUS.

ANNUAL PRODUCTION OF QUARTZ.

Calendar Year.	Tons.	Value.
1890	200	$ 1,000
1891	.....	.....
1892	.....	.....
1893	100	500
1894	.....	.....
1895	.....	.....
1896	10	50

TABLE 12.

MISCELLANEOUS.

IMPORTS OF "SILEX" OR CRYSTALLIZED QUARTZ.

Fiscal Year.	Cwt.	Value.
1880	5,252	$ 2,290
1881	3.251	1,659
1882	3,283	1,678
1883	3,543	2,058
1884	3,259	1,709
1885	3,527	1,443
1886	2,520	1,313
1887	14,533	5,073
1888	4,808	2,385
1889	5,130	1,211
1890	1,768	2,617
1891	3,674	1,929
1892	1,429	1,244
1893	2,447	1,301
1894	2,451	1,521
1895	2,882	1,881
1896 Duty free	3,289	2,174

Soapstone.

Soapstone.—Steatite or soapstone, the massive variety of talc, is a hydrous magnesian bisilicate. It is formed by the decomposition of such minerals as pyroxene and hornblende. It is characteristic of the magnesian band of the altered rocks of the Quebec group, but is also noted in several localities in Archæan rocks.

It is used in the manufacture of fire-bricks, lubricants, slate pencils and as an adulterant for soap. As it is soft and easily worked it has been employed, when free from impurities, for mantels, hearth-stones, &c. If strongly heated it loses part of its water of composition and becomes harder, and is then capable of receiving a polish. When finely powdered it adheres with great tenacity to stone and metal and for this reason it is sometimes used as a surface coating for protection from weathering.

The only place that it is worked in Canada is on an island in Rideau Lake, in Leeds county, Ontario. An impure soapstone occurs at this locality associated with Archæan crystalline limestones. It is ground up and used in the manufacture of roofing cement.

Soapstone has been found in the following localities in Canada :—

Province.	County, &c.	Township or locality.	Range or Con.	Lot.	Remarks.
Nova Scotia.	C. Breton.	Copper Mine, Eagle, Head, Gabarus Bay	.....	....	
Quebec.....	Brome....	Patton	V	16, 17, 20..	On 20, workable bed 3 ft. thick.
"	"	"	VI	24.....	
"	"	Sutton.....	VII	12.....	In micaceous slates; assoc. with dolomite
"	"	Bolton..	II	26.....	
"	"	"	IV	4, 24.....	
"	"	"	VI	2, 24.....	On 24, assoc. with chlorite and dolomite.
"	"	"	IX	17.....	
"	Wolfe	Garthby.....	I	6.....	
"	"	Wolfestone.....	II	20.....	
"	Vaudreuil	Falls of the Bras; Chaudière Valley.	. .. .	.....	Assoc. with dolomite in argillite.
Ontario.....	Leeds	Elizabethtown.	.....	.....	
"	"	Rideau Lake; islands in.	.....	....	
"	"	Clarendon	II	14.....	
B. Columbia	.....	At the mouth of the Salmon River, between Keefer and N. Bend Stations, C.P.Ry.	.....	.....	

MISCELLANEOUS.

Soapstone.

TABLE 13.

MISCELLANEOUS.

ANNUAL PRODUCTION OF SOAPSTONE.

Calendar Year.	Tons.	Value.
1886	50	$ 400
1887	100	800
1888	140	280
1889	195	1,170
1890	917	1,239
1891	Nil	Nil
1892	1,374	6,240
1893	717	1,920
1894	916	1,640
1895	475	2,138
1896	410	1,230

Tin.

Tin.—No tin has ever been produced in Canada, nor are any deposits of its ores, of economic importance, known to exist. The following table is given to illustrate to a certain extent the local market for tin and tinware.

TABLE 14.

MISCELLANEOUS.

IMPORTS OF TIN AND TINWARE.

Fiscal Year.			Value.
1880			$ 281,880
1881			413,924
1882			790,285
1883			1,274,150
1884			1,018,493
1885			1,060,883
1886			1,117,368
1887			1,187,312
1888			1,164,273
1889			1,243,794
1890			1,289,756
1891			1,206,918
1892			1,594,205
1893			1,242,994
1894			1,310,389
1895			973,397
		Duty.	
1896	Tin crystals	Free	$ 1,483
	Tin in blocks, pigs and bars	"	209,813
	Tin plates and sheets	"	923,279
	Tin foil	"	35,085
	Tin strip waste	"	2,414
	Tin plate in sheets, decorated	25 p.c	3,489
	Tinware and all manufactures of tin, N.E.S.	25 "	62,121
			$1,237,684

Tripolite.—Tripolite is chiefly composed of the minute siliceous shells of diatomacæ. It occurs in deposits often many miles in area, either uncompacted or moderately hard. The earthy variety is known by the names, "infusorial earth," "diatomaceous earth," "earthy tripolite" and "fossil flour." It is a very fine-grained earth, looking often like an earthy chalk, or a clay, but harsh to the touch, and scratching glass when rubbed on it. MISCELLANEOUS. Tripolite.

The production of tripolite in Canada for 1896 was valued at $13,280. This was the production of two companies, viz., The Fossil Flour Company of Bass River, N.S., and The Victoria Tripolite Company of North Sydney. A small amount was ground and used as an abrasive in Canada, but all the rest was shipped to the United States.

Whiting.—No production of whiting was reported for 1896. Whiting.

TABLE 15.

MISCELLANEOUS.

IMPORTS OF WHITING.

Fiscal Year.	Cwt.	Value.
1880	84,115	$26,092
1881	47,480	16,637
1882	36,270	16,318
1883	76,012	29,334
1884	76,268	28,230
1885	67,441	23,492
1886	65,124	25,533
1887	47,246	15,191
1888	76,619	20,508
1889	84,658	22,735
1890	96,243	27,471
1891	84,679	27,504
1892	102,985	26,867
1893	88,835	25,563
1894	103,633	26,649
1895	102,751	25,441
*1896	113,791	27,322

* Whiting or whitening, gilders' whiting and Paris white.—Duty free.

MISCELLANEOUS.

Chalk.

TABLE 16.

MISCELLANEOUS.

IMPORTS OF CHALK.

Fiscal Year.	Value.
1880	$2,117
1881	2,768
1882	2,882
1883	5,067
1884	2,589
1885	8,003
1886	6,583
1887	5,635
1888	5,865
1889	5,336
1890	7,221
1891	8,193
1892	9,558
1893	9,966
1894	11,308
1895	7,730
*1896	6,467

*Chalk, prepared.—Duty 20 p.c.

Zinc.

Zinc.—No production of zinc has been reported in Canada for years, except for 1893, when a trial shipment of ore from the Lawn Mine on Calumet Island, Pontiac county, Quebec, yielded 11,763 lbs. of the metal valued at $470. The following tables give the amount and value of zinc and zinc goods imported into Canada from the year 1880 :—

TABLE 17.

MISCELLANEOUS.

IMPORTS OF ZINC IN BLOCKS, PIGS AND SHEETS.

Fiscal Year.	Cwt.	Value.
1880	13,805	$67,881
1881	20,920	94,015
1882	15,021	76,631
1883	22,765	94,799
1884	18,945	77,373
1885	20,954	70,598
1886	23,146	85,599
1887	26,142	98,557
1888	16,407	65,827
1889	19,782	83,935
1890	18,236	92,530
1891	17,984	105,023
1892	21,881	127,302
1893	26,446	124,360
1894	20,774	90,680
1895	15,061	63,373
1896 Duty Free	20,223	80,784

TABLE 18.

MISCELLANEOUS.

IMPORTS OF SPELTER.

Fiscal Year.	Cwt.	Value.
1880	1,073	$ 5,310
1881	2,904	12,276
1882	1,654	7,779
1883	1,274	5,196
1884	2,239	10,417
1885	3,325	10,875
1886	5,432	18,238
1887	6,908	25,007
1888	7,772	29,762
1889	8,750	37,403
1890	14,570	71,122
1891	6,249	31,459
1892	13,909	62,550
1893	10,721	49,822
1894	8,423	35,615
1895	9,249	30,245
*1896	10,897	40,548

* Spelter in blocks and pigs.—Duty free.

TABLE 19.

MISCELLANEOUS

IMPORTS OF ZINC, MANUFACTURES OF.

Fiscal Year.	Value.
1880	$ 8,327
1881	20,178
1882	15,526
1883	22,599
1884	11,952
1885	9,459
1886	7,345
1887	6,561
1888	7,402
1889	7,233
1890	6,472
1891	7,178
1892	7,563
1893	7,464
1894	6,193
1895	5,581
1896....Duty, 25 p.c.	6,290

NATURAL GAS

NATURAL GAS.

According to direct returns received from the producers, the production of natural gas from the Ontario gas fields for 1896 was valued at $276,301, which compared with that of 1895, viz., $423,032, shows a decrease of $146,731 in value, equivalent to about 34 per cent.

Mr. L. L. Brophy, of this section, visited this district during the autumn of 1896, and writes of it as follows in the Summary Report of the Geological Survey Department for that year :—

"At Windsor, through the courtesy of Mr. S. T. Copus, Secretary-Treasurer of the Natural Gas and Oil Company of Ontario, Ltd., some interesting particulars were obtained regarding the operations of the company up to date (October 12th, 1896). This company, which succeeded to the business and plant of the Ontario Natural Gas Company some three years ago, now practically controls all the principal wells in the Essex field, and is piping large quantities of gas from its main field in the townships of Gosford and Mersea, to Walkerville, Windsor and Detroit. Two lines of pipe have been laid into Windsor, a distance of about 32 miles. Some 2,000 families in Walkerville and Windsor are now supplied with the gas while the number of connections in Detroit is in the neighbourhood of 6,000. The total number of miles of piping laid is about 130, including all branch lines and connections. The gas, which is used almost entirely for fuel purposes, is sold for twenty cents per thousand (M) cubic feet in summer and twenty-five cents in winter ; the extra price in the latter season being due to the increased cost of keeping the regulators, mains, &c., in working order during the cold weather. The total number of wells drilled by both the old and new company, up to the time of my visit, was twenty-six and of these seventeen are still active producers. The rock-pressure at the wells is given at 400 pounds to the square inch, and their estimated output is about 35,000,000,000 cubic feet per annum.

"While no very marked decrease has been noticed in the rock-pressure at the wells in the Essex field no doubt owing to the comparatively recent date at which the consumption began, other than of a local character, a very different condition of things prevails in the Welland field, where the wells have been supplying the city of Buffalo with a considerable portion of its fuel for a number of years past. The reason for this statement will become apparent on a perusal of the following information, kindly furnished by Mr. D. Coste, Manager of

the Provincial Natural Gas and Oil Company, which corporation operates most of the large wells in the Welland peninsula. Their whole output is piped into Buffalo, N.Y., through two large mains running from the field to the Niagara River. The length of pipe laid, including the mains and all connections is about 120 miles. Up to the 20th October, 1896, the number of wells drilled by this company and also by the Erie Company, (whose rights were acquired in 1893) was 124, of which 65 are still producing. When the first wells were bored some years ago, the initial rock-pressure was 520 pounds to the square inch, but the supply of gas in the meantime decreased to such an extent that the average pressure of all the wells is now barely 175 pounds to the square inch. The large compressor plant erected near Sherk's Station in the fall of 1893 was in operation for some nine months, but is now seldom used except to pump out a well of which the pressure has fallen below 70 pounds to the square inch. When a well reaches this stage the pumps are put on, the hole is pumped dry and permanently closed down and plugged. This procedure is rendered necessary by reason of the fact that the pressure in the supply mains is so much higher than that in the failing well, that instead of such a well being a source of supply it really becomes a drain on the main pipe-lines and absorbs a large quantity of gas from other wells which would otherwise be available for immediate consumption. Wells which were at one time large producers are sometimes purposely fed in this way, being used as temporary storing chambers for such gas as is not required for immediate use, the reservoirs of these wells being more readily accessible when the gas is really wanted, than in those formerly having but a small producing capacity. According to the opinion expressed by several of the leading authorities on the subject, it would appear to be merely a question of a few years before the gas supply in the Welland field will be exhausted, at least for commercial purposes, though a small flow may still continue for a much longer period which will be of service for domestic uses to farmers and others with wells on their premises and requiring only a very limited daily supply. In support of this opinion, mention may be made of the Provincial Company's well, No. 63, drilled in 1893, which yielded when the gas was struck, a flow of over 10,000,000 cubic feet per day. The flow from this well has now decreased to such an extent that it does not produce 400,000 feet in the same time, although it has in the interval been several times fed from the other wells."

NATURAL GAS

NATURAL GAS

The following table gives the value of the production of natural gas in Canada since the year 1892 :—

TABLE 1.

NATURAL GAS.

Production. ANNUAL PRODUCTION.

Calendar Year.	Value.
1892	$ 150,000
1893	376,233
1894	313,754
1895	423,032
1896	276,301

NICKEL

NICKEL.

The nickel industry of Canada is still confined to the operations of the mines at Sudbury in Ontario. During the year the chief work done was that of the Canadian Copper Company, though operations were started again during the year at the Inez mine near Worthington by the Trill Mining and Manufacturing Co. Altogether the industry gave employment directly to from 150 to 200 men.

The statistics of production for 1896 and past years are given below in Table 1. A study of the figures given will illustrate the growth of the industry. In the quantity of the metal contained in the matte, etc., shipped, it will be seen that there was an increase from the inception of the industry in 1889 to 1891. The year 1892 showed a falling off as compared with the previous year, which was made up in the two succeeding years. Since 1894, however, there has been a falling away again in the production of about 30 per cent. The total final values calculated on the basis of the market value of the contained nickel are given in the last column of the table. The fluctuations in the figures there given do not of course coincide with those in the quantity column, on account of the continual falling off in the average price shown in the middle column. Thus the decrease in the total value in the last three years has been about 36 per cent as compared with about 30 per cent in the quantity for the same period. For the whole period from 1889 the difference is still greater, the increase in the quantity of the production being about 409 per cent, whilst the value shows only about 239 per cent.

In considering these values it must be borne in mind that they represent the full and final value of the metal contained in the matte, etc., as shipped, calculated at the average value per pound for the year in New York. The spot value to the operators is of course much less. For instance, the average market value given in the table is seen to be 35 cents per pound, whilst the operators reckon the spot value of the nickel in the matte at only about one quarter that standard or about nine cents. Nickel.

There is nothing very new to note in regard to this industry since the date of previous descriptions in former reports of this section.

TABLE 1.

NICKEL.

ANNUAL PRODUCTION. Production.

Calendar Year.	Pounds of nickel in matte.	Price per lb.	Value.
1889	*830,477	60c.	$ 498,286
1890	1,435,742	65c.	933,232
1891	4,626,627	60c.	2,775,976
1892	2,413,717	58c.	1,399,956
1893	3,982,982	52c.	2,071,151
1894	4,907,430	38½c.	1,870,958
1895	3,888,525	35c.	1,360,984
1896	3,397,113	35c.	1,188,990

* Calculated from shipments made by rail.

TABLE 2.

NICKEL.

EXPORTS.* Exports.

Calendar Year.	Value.
1890	$ 89,568
1891	667,280
1892	293,149
1893	629,692
1894	559,356
1895	521,783
1896	658,213

* Practically all the nickel-bearing ore and matte produced in Canada is exported, the apparent discrepancy between Tables Nos. 1 and 2 being due to the different basis of valuation adopted in the two instances. Table 1 represents the total final values of the nickel produced in Canada, for the years represented. In Table 2 the worth of the product shipped is entered at its spot value to the operators, and depends upon the particular stage to which they happen to carry the process of extraction at the time *e.g.*, whether the shipments made are raw ore, low grade matte or high grade matte, etc.

NICKEL.

Imports.

TABLE 3.

NICKEL.

IMPORTS.

Fiscal Year.			Value.
1890			$ 3,154
1891			3,889
1892			3,208
1893			2,905
1894			3,528
1895			4,267
1896	Nickel anodes	Duty 10 p.c.	4,635
	Nickel *	Free.	152
			$ 4,787

* Classified under the general heading of minerals in the Trade and Navigation Report.

PETROLEUM.

PETROLEUM.

Production.

The production of the Canadian oil refineries is given in the following table for the years 1895 and 1896. A comparison of the totals given below shows clearly that the industry is a progressive one. In the total values of the production of the refineries there was an increase of about 15 per cent in 1895, and of about 25 per cent in 1896 as compared with the preceding year in each case.

TABLE 1.

PETROLEUM.

PRODUCTION OF CANADIAN OIL REFINERIES.

Products.	Calendar Years.					
	1894.		1895.		1896.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		$		$		$
Illuminating oils. galls.	11,289,741	1,003,973	10,711,378	1,217,426	11,207,150	1,251,122
Benzine and naphtha "	645,031	54,515	642,484	63,026	719,453	70,733
Paraffine oils "	1,282,749	118,053	1,016,039	140,245	1,014,271	132,308
Gas and fuel oils "	7,323,374	197,193	6,095,355	218,692	6,788,353	261,618
Lubricating oils and tar "	1,801,174	74,309	1,698,559	75,578	1,447,455	77,109
Paraffine wax lbs.	1,950,172	119,091	1,840,021	82,970	1,532,670	466,978
Axle grease "				8,300	318,928	7,774
Totals		1,567,134		1,806,237		2,267,642

TABLE 2.

PETROLEUM.

CONSUMPTION OF CRUDE OIL AND CHEMICALS.

PETROLEUM. Consumption.

Articles.	CALENDAR YEARS.			
	1893.	1894.	1895.	1896.
Crude petroleum .....galls.	27,994,805	27,884,080	24,954,855	25,881,095
Sulphuric acid... ..... lbs.	4,676,353	4,974,610	4,919,271	5,146,429
Soda .... "	420,047	430,810	390,781	438,058
Litharge.... .... "	470,666	472,139	390,573	361,603
Sulphur..... ..... "	74,012	96,144	78,597	80,612

As in former years, the inspection returns of the Inland Revenue Department, for Canadian oils and naphtha have been taken as a basis from which to obtain the production of petroleum in Canada. The ratio of crude to refined petroleum adopted for 1896 was 100 to 42.

As shown in Table 4, following, the amount of the production for 1896 was practically the same as for 1895, but an advance in price raises the total value.

The Canadian oils inspected during the calendar year 1896, as obtained from the books of the Inland Revenue Department, are as follows:—

TABLE 3.

PETROLEUM.

CANADIAN OILS INSPECTED, CALENDAR YEAR 1896.

Inspection of oils.

Number of Packages.	Inspection Fee.	Approximate No. of Gallons per Package.	Total Gallons.
248,867	10c.	42	10,452,414
46,374	2½c.	5	231,870
			10,684,284

PETROLEUM.

Inspection of oils.

TABLE 4.

PETROLEUM.

CANADIAN OILS AND NAPHTHA INSPECTED AND CORRESPONDING QUANTITIES OF CRUDE OIL.

Calendar Year.	Refined Oils Inspected.	Crude Equivalent Calculated.	Ratio of Crude to Refined.	Equivalent in Barrels of 35 Gallons.	Average Price per Barrel of Crude.	Value of Crude Oil.
	Galls.	Galls.				
1881	6,457,270	12,914,540	100 : 50	368,987	.....	.....
1882	6,135,782	13,635,071	100 : 45	389,573	.....	.....
1883	7,447,648	16,550,328	100 : 45	472,866	.....	.....
1884	7,993,995	19,984,987	100 : 40	571,000	.....	.....
1885	8,225,882	20,564,705	100 : 40	587,563	.....	.....
1886	7,768,006	20,442,121	100 : 38	584,061	$0.90	$525,655
1887	9,492,588	24,980,494	100 : 38	713,728	0.78	556,708
1888	9,246,176	24,332,042	100 : 38	695,203	1.02⅜	713,695
1889	9,472,476	24,664,144	100 : 38	704,690	0.92¾	653,600
1890	10,174,894	26,776,037	100 : 38	795,030	1.18	902,734
1891	10,065,463	26,435,430	100 : 38	755,298	1.33¾	1,010,211
1892	10,370,707	27,291,334	100 : 38	779,753	1.26¼	984,438
1893	10,618,804	27,944,221	100 : 38	798,406	1.09½	874,255
1894	11,027,082	29,018,637	100 : 38	829,104	1.00¾	835,322
1895	10,674,232	25,414,838	100 : 42	726,138	1.49⅜	1,036,738
1896	10,684,284	25,438,771	100 : 42	726,822	1.59	1,155,647

Table 6 gives the amount of petroleum inspected, both Canadian and imported, for the fiscal year. The table is compiled from the Reports of the Inland Revenue Department.

For the fiscal year 1896, the totals were obtained as follows :—

TABLE 5.

PETROLEUM.

INSPECTION OF CANADIAN AND IMPORTED OILS, FISCAL YEAR 1896.

Number of Packages.	Inspection Fee.	Approximate Number of Gallons per Package.	Total Gallons, Canadian.	Total Gallons, Imported.
	cts.			
6	25	52	.....	312
246,452	10	42	10,350,984	.....
129,626	10	42	.....	5,444,292
*172	10	42	3,612	3,612
1	5	10	10	.....
348	5	10	.....	3,480
35,869	2½	5	179,345	.....
71,259	2½	5	.....	356,295
Total			10,533,951	5,807,991

*These 172 packages were reported as mixed Canadian and Imported oil. From information at hand it is known that the relative proportions of Canadian and imported oils in this mixture are approximately equal, and this has been assumed in above table.

TABLE 6.

PETROLEUM.

TOTAL AMOUNT OF OIL INSPECTED, CANADIAN AND IMPORTED.

PETROLEUM.

Inspection of oils.

Fiscal Year.	Canadian.	Imported.	Total.
	Galls.	Galls.	Galls.
1881	6,406,783	476,784	6,883,567
1882	5,910,747	1,351,412	7,262,159
1883	6,970,550	1,190,828	8,161,378
1884	7,656,001	1,142,575	8,798,586
1885	7,661,617	1,278,115	8,939,732
1886	8,149,472	1,327,616	9,477,088
1887	8,243,962	1,665,604	9,909,566
1888	9,545,895	1,821,342	11,367,237
1889	9,462,834	1,767,812	11,230,646
1890	10,121,210	2,020,742	12,141,952
1891	10,270,107	2,022,002	12,292,109
1892	10,238,426	2,429,445	12,667,871
1893	10,683,806	2,641,690	13,325,496
1894	10,824,270	5,633,222	16,457,492
1895	10,936,992	5,650,994	16,587,986
1896	10,533,951	5,807,991	16,341,942

In 1893 the inspection fees for imported petroleum were lowered from 25c., 10c. and 5c., to 10c., 5c. and 2½c., and this will account for the amount of oil imported during 1894 being more than double that of 1893.

Table 8 is compiled from the books of the Inland Revenue Department, and is given with the object of more complete comparison. It is similar to Table 6 with the exception that the calendar year is used in Table 8, while in Table 6 the fiscal year is employed. The number of packages of Canadian oil inspected, from which the Canadian production was obtained, was given for Table 4. The corresponding calculation for the imported oil is given herewith.

TABLE 7.

PETROLEUM.

INSPECTION OF IMPORTED OIL, CALENDAR YEAR 1896.

Number of Packages.	Inspection Fee.	Approximate No. of gallons per package.	Total Gallons.
134,351	10c.	42	5,642,742
341	5c.	10	3,410
91,976	2½c.	5	459,880
			6,106,032

PETROLEUM.

Inspection of oils.

TABLE 8.

PETROLEUM.

TOTAL AMOUNT OF OIL INSPECTED, CANADIAN AND IMPORTED.

Calendar Year.	Canadian.	Imported.	Total.
	Galls.	Galls.	Galls.
1892	10,370,707	2,601,946	12,972,653
1893	10,618,804	4,520,392	15,139,196
1894	11,027,082	5,705,787	16,732,869
1895	10,674,232	5,677,381	16,351,613
1896	10,684,284	6,106,032	16,790,316

TABLE 9.

PETROLEUM.

Exports.

EXPORTS OF CRUDE AND REFINED PETROLEUM.

Calendar Year.	Crude Oil.		Refined Oil.		Total.	
	Gallons.	Value.	Gallons.	Value.	Gallons.	Value.
1881					501	$ 99
1882					1,119	286
1883					13,283	710
1884					1,098,090	30,168
1885					337,967	10,562
1886					241,716	9,855
1887					473,559	13,831
1888					196,602	74,542
1889					235,855	10,777
1890					420,492	18,154
1891	446,770	$ 18,471	585	$104	447,355	18,575
1892	310,387	12,945	1,146	100	311,533	13,045
1893	107,719	3,696	2,196	394	109,915	4,090
1894	53,985	2,773	5,297	513	59,282	3,286
1895	22,831	1,044	10,237	2,023	33,068	3,067
1896	601	101	7,489	999	8,090	1,100

TABLE 10.

PETROLEUM.

IMPORTS OF PETROLEUM AND PRODUCTS OF.

PETROLEUM.
Imports.

Fiscal Year.		Gallons.	Value.
1880		687,641	$131,359
1881		1,437,475	262,168
1882		3,007,702	398,031
1883		3,086,316	358,546
1884		3,160,282	380,082
1885		3,767,441	415,195
1886		3,819,146	421,836
1887		4,290,003	467,003
1888		4,523,056	408,025
1889		4,650,274	484,462
1890		5,075,650	515,852
1891		5,071,386	498,330
1892		5,649,145	475,732
1893		6,002,141	446,389
1894		6,597,108	439,988
1895		7,577,674	525,372
1896	Oils:	Duty.	
	Mineral—		
	(a) Coal and kerosene, distilled, purified or refined, naphtha and petroleum, N.E.S.	6c. per gall.	6,882,272	$596,450
	(b) Products of petroleum	6 "	204,135	17,566
	(c) Crude petroleum, fuel and gas oils (other than naphtha benzine or gasoline) when imported by manufacturers (other than oil refiners) for use in their own factories, for fuel purposes or for the manufacture of gas	3 "	25	2
	(d) Illuminating oils composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon	25 p. c	43,654	14,365
	(e) Lubricating oils composed wholly or in part of petroleum costing less than 25 cents per gallon	6c. par gall.	875,805	107,530
			8,005,891	$ 735,913

Petroleum.
Imports.

TABLE 11.*

PETROLEUM.

IMPORTS OF CRUDE AND MANUFACTURED OILS, OTHER THAN ILLUMINATING.

Fiscal Year.	Gallons.
1881	960,691
1882	1,656,290
1883	1,895,488
1884	2,017,707
1885	2,489,326
1886	2,491,530
1887	2,624,399
1888	2,701,714
1889	2,882 462
1890	3,054,908
1891	3,049,384
1892	3,047,199
1893	1,481,749
1894	1,860,829
1895	1,106,907
1896	1,079,940

* This table is composed of items *(b)* and *(e)* of Table 10.

TABLE 12.

PETROLEUM.

IMPORTS OF PARAFFINE WAX.

Fiscal Year.	Pounds.	Value.
1883	43,716	$ 5,166
1884	39,010	6,079
1885	59,967	8,123
1886	62,035	7,953
1887	61,132	6,796
1888	53,862	4,930
1889	63,229	5,250
1890	239,229	15,844
1891	753,854	50,275
1892	733,873	48,776
1893	452,916	38,935
1894	208,099	15,704
1895	163,817	11,579
1896*	150,287	10,042

* Duty—2c. per lb.

TABLE 13.

PETROLEUM.

IMPORTS OF PARAFFINE WAX CANDLES.

PETROLEUM. Imports.

Fiscal Year.	Pounds.	Value.
1880	10,445	$2,269
1881	7,494	1,683
1882	5,818	1,428
1883	7,149	1,734
1884	8,755	2,229
1885	9,247	2,449
1886	12,242	2,587
1887	21,364	3,611
1888	22,054	2,829
1889	8,038	1,337
1890	7,233	1,186
1891	10,598	2,116
1892	9,259	1,952
1893	8,351	1,735
1894	10,818	1,685
1895	19,448	2,541
1896*	25,787	4,072

* Duty—4c. per lb.

TABLE 14.

PETROLEUM.

AVERAGE CLOSING PRICES FOR CRUDE OIL ON PETROLEA OIL EXCHANGE. Prices

Month.	CALENDAR YEARS.					
	1891.	1892.	1893.	1894.	1895.	1896.
	$	$	$	$	$	$
January	1.30	1.29¼	1.18¼	1.01¼	1.16	1.72
February	1.28½	1.29	1.18⅜	1.01	1.19⅞	1.72
March	1.31¾	1.27¾	1 19	1.01	1.27	1.72
April	1.37	1.26	1.19	.99½	1.55¾	1.72
May	1.37½	1.25¾	1.07	.92	1.67½	1.70
June	1.37	1.27½	1.07	.92¾	1.52	1.50
July	1.33½	1.26½	1.06	.94	1.54½	1.50
August	1.34¾	1.26	1.05	.96	1.54	1.50
September	1.35	1.26½	1.04½	.98	1.55½	1.50
October	1.35	1.26¾	1.04	1.06	1.59⅞	1.50
November	1.33½	1.25	1.04	1.12½	1.64½	1.50
December	1.31½	1.18½	1.02	1.13½	1.72⅜	1.50
The Year	1.33¾	1 26¼	1.09½	1.00¾	1.49⅜	1.59

PHOSPHATE.

PHOSPHATE *(Apatite)*.

Production.

The phosphate industry, which at one time was large and flourishing, has of late years gradually decreased, until, at the present time, the production in Canada has almost ceased. This result was due primarily to the competition of the miners of phosphatic gravels of the south eastern United States which, although mostly lower in grade than the Canadian phosphates, can be worked much cheaper than the latter. Of late, also, the market has been strongly affected by the competition of the operators of the Algerian phosphate deposits and of the phosphatic slag produced by the iron smelters.

The production for 1896 was only 570 tons, a small part of which was exported. None of the mines were operated for phosphate, although a little of the mineral is occasionally produced as a by-product at the mica mines in the eastern Ontario and western Quebec districts. The production given above represents the result of clearing up of some mineral left in dumps by operators in previous years, which was bought up and cleaned at the mill at the Bassin du Lièvre, near Buckingham, Ottawa county, Quebec. It was found impossible to get returns of the small lots produced by the mica miners as above mentioned, so that the production given in Table 1 for 1896 may be a little low.

TABLE 1.

PHOSPHATE.

ANNUAL PRODUCTION.

Calendar Year.	Tons.	Value per Ton.	Value.
1886	20,495	$14.85	$304,338
1887	23,690	13.50	319,815
1888	22,485	10.77	242,285
1889	30,988	10.21	316,662
1890	31,753	11.37	361,045
1891	23,588	10.24	241,603
1892	11,932	13.20	157,424
1893	8,198	8.65	70,942
1894	6,861	6.00	41,166
1895	1,822	5.25	9,565
1896	570	6.00	3,420

TABLE 2. PHOSPHATE. Exports.

PHOSPHATE.

EXPORTS.

Calendar Year.	Ontario.		Quebec.		Totals.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
1878.....	824	$12,278	9,919	$195,831	10,743	$208,109
1879.....	1,842	20,565	6,604	101,470	8,446	122,035
1880.....	1,387	14,422	11,673	175,664	13,060	190,086
1881.....	2,471	36,117	9,497	182,339	11,968	218,456
1882...	568	6,338	16,585	302,019	17,153	308,357
1883...	50	500	19,666	427,168	19,716	427,668
1884.....	763	8,890	20,946	415,350	21,709	424,240
1885.....	434	5,962	28,535	490,331	28,969	496,293
1886.....	644	5,816	19,796	337,191	20,460	343,007
1887..... ...	705	8,277	22,447	424,940	23,152	433,217
1888...	2,643	30,247	16,133	268,362	18,776	298,609
1889.....	3,547	38,833	26,440	355,935	29,987	394,768
1890...	1,866	21,329	26,591	478,040	28,457	499,369
1891.....	1,551	16,646	15,720	368,015	17,271	384,661
1892.....	1,501	12,544	9,981	141,221	11,482	153,765
1893.....	1,990	11,550	5,748	56,402	7,738	67,952
1894.....	1,980	10,560	3,470	29,610	5,450	40,170
1895.....	.....	.....	250	2,500	250	2,500
1896.....	1	5	299	2,990	300	2,995

PRECIOUS METALS.

PRECIOUS METALS.

The precious metals, gold and silver, are considered together, as in the past, for the reason that they occur in many districts as constituents of the same ores and are produced by the same mines.

GOLD.

Gold. Taking then the gold production of the whole Dominion, we find in Table 1, below, the figures illustrating this point for a period of eleven years, for which we have complete data.

As with other mineral industries of the country, a most encouraging growth is to be noted in the past three years, of about 146 per cent. By reference to tables following, giving provincial details, it will be seen that the growth above noted is due to a heavy increase in the production of all the gold-producing provinces except Quebec, which shows a large decrease.

PRECIOUS METALS.

Gold.

The gold industry of the Dominion at large has, of late years, been pursued with renewed activity. Not only have Nova Scotia and British Columbia, the main contributors in the past, made large proportional increases, but new discoveries in Ontario, and increased activities in those districts included under the heading, North-west Territories, have caused such a general swelling of the aggregate that gold contributed over 12 per cent of the value of the whole mineral production of Canada for 1896, as compared with less than 6 per cent in 1894.

TABLE 1.

PRECIOUS METALS

Production.

GOLD—ANNUAL PRODUCTION IN CANADA.

Calendar Year.	*Ounces Fine.	Value.
		$
1886	66,061	1,365,496
1887	59,884	1,237,804
1888	53,150	1,098,610
1889	62,658	1,295,159
1890	55,625	1,149,776
1891	45,022	930,614
1892	43,908	907,601
1893	47,247	976,603
1894	54,605	1,128,688
1895	92,485	1,911,676
1896	134,498	2,780,086

* Calculated from the values at the rate of $20.67 per ounce.

Table 2, following, illustrates the contributions of the different provinces to the grand total for the year. British Columbia stands credited with over 64 per cent, and Nova Scotia with over 19 per cent. The North-west Territories, including the Yukon district, come third with about 13 per cent, and Ontario fourth with about 5 per cent, whilst Quebec contributed much under 1 per cent. Comparing these figures with those for 1894, we find the proportions contributed in that year as follows: British Columbia nearly 44 per cent; Nova Scotia nearly 36 per cent; North-west Territories, &c., over 13 per cent; Ontario nearly 4 per cent, and Quebec nearly 3 per cent.

TABLE 2.

PRECIOUS METALS.

GOLD:—PRODUCTION BY PROVINCES, CALENDAR YEAR, 1896.

PRECIOUS METALS. Gold. Production by Provinces.

Provinces.	Ounces.*	Value.
Nova Scotia	*b.* 25,103	$ 518,880
Quebec	*a.* 145	3,000
Ontario	*b.* 5,563	115,000
N. W. Territories (including Yukon district)	*a.* 17,175	355,000
British Columbia	*c.* 86,512	1,788,206
Total	134,498	$2,780,086

* Calculated from the values at the rate of $20.67 per ounce.
a. Placer gold.
b. Gold produced in treating free milling ores.
c. As follows: Gold from placer mining ..... $ 544,026
do vein do 1,244,180
$1,788,206

NOVA SCOTIA.

Nova Scotia.

The gold production of this province is in contrast with that of the other provinces, in that it results entirely from the treatment of the free-milling quartz, found in veins in rocks classed as of Cambrian age. During 1896 operations were carried on at some 56 mines comprised within the boundaries of 25 subdistricts. The number of mills was 50, many of them quite small, and operated for only a short time during the year.

A glance at the following graphic Table A will show the growth and fluctuations of the gold mining industry of this province since 1862. It will be evident that the past three years represent a recovery from a preceding period of depression beginning in 1889 and lasting till 1893, after which the production shows a most encouraging growth. The increase of production of 1896 over 1893 amounts to about 36 per cent, most of which must be credited to 1896, which shows a gain of about 20 per cent over 1895. A glance backward over the record of past years, as exhibited in the table, shows that in the sixties the industry had attained a high degree of prosperity, the output for 1867 being well over half a million, higher even than that for 1896, and the highest for the whole period. Since those early years the mines have of course deepened and therefore have gradually left behind the more easily worked surface ores. As none of the mines are really very deep yet, this disadvantage will be found to be more than offset by the increased facilities becoming available due to the progress in the

PRECIOUS METALS.
Gold.
Nova Scotia.

general development of the country and to improvements in mechanical appliances. Doubtless also now that Canada is attracting attention as a promising field for mineral enterprise, the next few years will see an inflow of capital into the province which will result in a more vigorous development of its already known resources.

GOLD.
NOVA SCOTIA.
ANNUAL PRODUCTION.
Table A.

Calendar Year.	Value.
	$
1862	141,871
1863	272,448
1864	390,349
1865	496,357
1866	491,491
1867	532,563
1868	400,555
1869	348,427
1870	387,392
1871	374,972
1872	255,349
1873	231,122
1874	178,244
1875	218,629
1876	233,585
1877	329,205
1878	245,253
1879	268,328
1880	257,823
1881	209,755
1882	275,090
1883	301,207
1884	313,554
1885	432,971
1886	455,564
1887	413,631
1888	436,939
1889	510,029
1890	474,990
1891	451,503
1892	389,965
1893	381,095
1894	389,338
1895	431,119
1896	518,880

Tables B and C, following, should be studied in connection with Table A. Taking the period dealt with for the production a contrast is noticeable. The increase in the tons of ore crushed is over 112 per cent, as compared with 36 per cent for the production, which indicates a change in practice, the operators finding it worth while to handle

more of their lower grade ores than they did in the initial years of the industry. This point is rendered more clear by a comparison of the amounts of ore crushed in the sixties with the figures of gold produced. The greater activity of the industry in those years, whilst quite apparent in Table B, is not nearly so well emphasized as in the production, in Table A, the selected higher grades of ore being evidently the source of the precious metal in that period.

GOLD.
NOVA SCOTIA.
TONS OF QUARTZ CRUSHED.
Table B.

Calendar Year.	Tons.
1862	6,473
1863	17,000
1864	21,431
1865	24,421
1866	32,157
1867	31,384
1868	32,259
1869	35,144
1870	30,824
1871	30,787
1872	17,089
1873	17,708
1874	13,844
1875	14,810
1876	15,490
1877	17,369
1878	17,989
1879	15,936
1880	13,997
1881	16,556
1882	21,081
1883	25,954
1884	25,186
1885	28,890
1886	29,010
1887	32,280
1888	36,178
1889	39,160
1890	42,749
1891	36,351
1892	32,552
1893	42,354
1894	55,357
1895	60,600
1896	69,169

In Table C, following, the points above set forth are still more apparent. It will be seen that, apart from a certain amount of

PRECIOUS METALS.
Gold.
Nova Scotia.

fluctuation year by year, there has been a steady decrease in the average yield of ore crushed and treated. The first year given, viz., 1862, shows a small number of tons of ore crushed, but a yield of gold of almost $22.00 per ton, in strong contrast with 1896, when there were over ten times the number of tons crushed but the average of the gold extracted per ton had fallen to almost one third. As before mentioned, this is not necessarily to be attributed to an impoverishment of the gold bearing veins with depth, but rather to an improvement in the practice, enabling the lower grade of ores to be treated profitably.

GOLD.
NOVA SCOTIA.
AVERAGE YIELD PER TON OF ORE CRUSHED.
Table C.

Calendar Year.	Value.
	$
1862	21·91
1863	16·02
1864	18·21
1865	20·32
1866	15·28
1867	16·96
1868	12·41
1869	19·91
1870	12·56
1871	12·17
1872	14·94
1873	13·05
1874	12·87
1875	14·76
1876	15·08
1877	18·95
1878	13·63
1879	16 83
1880	18·42
1881	12·66
1882	13·04
1883	11·60
1884	12·44
1885	14·98
1886	15·70
1887	12·81
1888	12·08
1889	13·02
1890	11·11
1891	12·42
1892	11·98
1893	8·99
1894	7·03
1895	7·47
1896	7·50

Table 3, following, gives the details of the yield of the various districts covering a period of 35 years, and well illustrates their relative importance as contributors to the grand total and the average richness of the ore treated.

PRECIOUS METALS. Gold. Nova Scotia.

TABLE 3.

PRECIOUS METALS.

GOLD—NOVA SCOTIA. PRODUCTION OF THE DIFFERENT DISTRICTS, FROM 1862 TO 1896, INCLUSIVE.

Districts.	Tons of Ore Crushed.	Total Yield.				Average yield per ton of 2,000 lbs.
		Oz.	Dwt.	Grs.	Value at $19.50 per oz.	
					$	$
Caribou and Moose R.	92,184	36,509	1	16	711,927	7·72
Montague	20,130	35,835	11	19	698,794	34·71
Oldham	44,488	48,544	9	6	946,617	21·27
Renfrew	48,456	33,909	10	2	661,235	13·64
Sherbroke	178,956	126,160	0	11	2,460,120	13·74
Stormont	95,331	43,731	1	4	852,756	8·94
Tangier & Mooseland	34,354	20,091	3	15	391,778	11·40
Uniacke	50,809	34,090	19	12	664,774	13·08
Waverly	118,595	60,064	5	20	1,171,253	9·87
Salmon River	83,988	31,906	13	19	622,181	7·40
Brookfield	15,930	12,318	14	4	240,215	15·08
Whiteburn	7,368	10,213	18	20	199,172	27·03
Lake Catcha	12,499	11,072	11	20	215,915	17·27
Rawdon	12,808	10,023	16	21	195,465	15·26
Killag	502	538	13	12	10,504	20·92
Wine Harbour	43,368	29,512	8	10	575,492	13·27
Fifteen-Mile Stream	26,976	14,633	15	5	285,358	10·57
Malaga	22,688	14,733	4	21	287,293	12·66
Gold River	570	639	13	3	12,473	21·88
Cow Bay	326	323	19	0	6,317	19·37
Ovens	27	4	19	6	97	3·59
Leipsigate	11	10	10	6	205	18·63
Liscombe Mills	7	0	15	6	15	2·12
Gays River	91	14	1	0	274	3·01
Beaver Dam	80	17	0	0	332	4·14
Lawrencetown	21	4	3	4	81	3·86
Unproclaimed	56,424	42,854	17	21	835,671	14·81
Totals	966,987	617,759	19	19	$12,046,319	$12·45

The district details for 1896 will be found tabulated in Table 4 below. In it will be found all the data necessary to compare the different districts with regard to their relative activity, richness of ore treated, etc. It will be seen that, as a rule, the operations carried on are on a small scale. Of 25 districts named, but seven crushed over 1,000 tons of ore during the year, and five of these range between 1,000 and 10,000 tons, and two go over that amount, viz., Caribou with about 13,000 and Stormont with over 27,000. The average yield

Precious Metals. Gold. Nova Scotia.

of gold per ton for these two districts is low, viz., 3 dwt. 19 grs., and 4 dwt. 5 grs. respectively. For those districts ranging between 1,000 and 10,000 tons of ore crushed, the average yield of gold has been higher than in the last mentioned cases, ranging from 6 dwt. 7 grs. to as high as 15 dwt. 19 grs., average of over 5,000 tons crushed in Brookfield district. For the whole of the districts worked during 1896 there appears a very wide range in the average yield per ton from the lowest at a little over 2 dwts. to the highest at over 6¼ oz. per ton, with an average for all districts, however, of 7 dwt. 9 grs.

Table 4.

Precious Metals.

Gold.—Nova Scotia District Details—Calendar Year 1896.

Districts.	Mines.	Mills.	Tons of Ore Crushed.	Total Yield of Gold.			Average Yield of Gold Per Ton.		
				Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Caribou	8	5	12,862	2,450	8	17	0	3	19
Montague	1	1	93	86	8	9	0	18	14
Oldham	2	2	223	105	17	4	0	9	12
Renfrew	1	1	326	205	10	0	0	12	14
Sherbrooke	5	5	7,177	3,287	1	9	0	9	3
Stormont	9	9	27,488	5,787	10	4	0	4	5
Tangier	2	2	565	78	15	0	0	2	18
Uniacke	5	5	4,501	3,416	13	21	0	15	4
Waverly	1	1	1,686	532	16	6	0	6	7
Brookfield	2	1	5,285	4,177	6	0	0	15	19
Lake Catcha	3	2	607	212	18	17	0	7	0
Rawdon	2	2	633	391	3	0	0	12	8
Wine Harbour	1	1	806	427	6	21	0	10	14
Fifteen-Mile Stream	1	1	5,201	2,634	4	0	0	10	3
Malaga	1	1	411	283	15	0	0	13	19
Gold River	2	2	570	639	13	3	1	2	10
Whiteburn	1	1	152	93	4	0	0	12	6
Killag	2	1	20	125	4	15	6	5	5
Cow Bay	1	1	326	323	19	0	0	19	21
Ovens	1	1	27	4	19	6	0	3	16
Leipsigate	1	1	11	10	10	6	0	19	2
Liscomb Mills	1	1	7	0	15	6	0	2	4
Gays River	1	1	91	14	1	0	0	3	2
Beaver Dam	1	1	80	17	0	0	0	4	6
Lawrencetown	1	1	21	4	3	4	0	3	22
Totals and averages.	56	50	69,169	25,311	4	4	0	7	9

Quebec.

Quebec.

There is little to note regarding this industry at present. A glance at Graphic Table D will illustrate the great variations in the extent of the work of developing the gold deposits of this province. It will be seen that, whilst there was a period of considerable and fruitful

activity in the first five years recorded, these were followed by a considerable falling away during the succeeding three years. From 1885 to 1891 the industry was at a very low ebb, producing but a few thousand dollars worth of gold per year, and although a most hopeful revival occurred during 1892, 1893 and 1894, depression again set in, and for the past few years but little or nothing is to be recorded in the way of production. It must be borne in mind, however, that the figures given in the table are probably below the amounts actually produced, but the progress of the industry has been so irregular and disorganized, that it was found impossible to get exact data. As illustrating the varying fortunes of the industry, however, the figures can be taken as relatively correct.

PRECIOUS METALS. Gold. Quebec.

GOLD.
QUEBEC.
ANNUAL PRODUCTION.
TABLE D.

Calendar Year.	Value.
	$
1877*	12,057
1878	17,937
1879	23,972
1880	33,174
1881	56,661
1882	17,093
1883	17,787
1884	8,720
1885	2,120
1886	3,931
1887	1,604
1888	3,740
1889	1,207
1890	1,350
1891	1,800
1892	12,987
1893	15,696
1894	29,196
1895	1,281
1896	3,000

*Second half of year only.

The following statements by Mr. R. Chalmers, from the Summary Report of the Survey for 1896, refer particularly to the work done in

PRECIOUS METALS.
Gold.
Quebec.

mining in that year, and give also some interesting particulars in regard to the deposits:

"On entering the field, observations were first made in the different districts in which gold mining was in progress, especially where shafts, tunnels, etc., were open. Development work was found to be going on at Dudswell, Ditton, Massawippi Lake, and in Beauce county, though only to a limited extent. On the west side of Massawippi Lake, Mr. James Stark, representing an English company, was at work with twenty-two men, in the bed of a small stream on lot 14, range VI., Hatley, Stanstead county. Some gold was found in the gravels, but not sufficient quantities to pay for working. Mr. Stark's object was, however, to find it in the matrix. Broken quartz seams, with pyritous, slaty and talcose minerals, traverse the rocks mapped as pre-Cambrian there. Specimens of these were brought to the office for assay in the laboratory of the Survey. The work at this place was discontinued after a month or two.

"The stream along which the gold occurs runs entirely across pre-Cambrian rocks and falls into Massawippi Lake, and the gold seems, therefore, to be derived from these rocks. Their character is very much the same as that of the rocks in Dudswell Mountain.

"On lot 5, range XV., Magog, near the foot of Orford Mountain, mining for gold was undertaken by a Mr. Lacroix, and several men were at work in a pit in the bank of a small stream, at the time of my visit. The Cambrian slates there contain some thin quartz seams accompanied by pyritous minerals; but Mr. Lacroix could not show me any gold obtained from this opening, and later on it was closed.

"*Gold Mining at Dudswell.*—From Magog I proceeded to Dudswell, where some time was spent and repeated examinations were made during the summer as work progressed. At Harrison's, lot 1, range VI., Westbury, free gold was found in the autumn of 1895 in a thin seam of quartz in a sort of conglomerate rock.* The exposure in which it occurred was uncovered to a still greater extent, along a low ridge, during the winter, and an opening made in the conglomerate, but without any further result than as stated in the Summary Report referred to. It is evident, however, that this conglomerate exists here in much greater thickness and extent than at first supposed; but whether auriferous throughout has yet to be proved. Mr. John Armstrong, of Marlow, Beauce county, has leased this property and was

*Summary Report, Geol. Surv. Can., 1895, p. 93.

preparing to have the auriferous character of these rocks tested preparatory to working them. PRECIOUS METALS. Gold.

"In Kingsley Brook, a considerable amount of work has been going on this season. A company has been formed to operate the mines on this stream, called The Rodrigue Mining Company, and the mining rights along the whole stream have been secured. Mr. H. C. Donnell, of Boston, U.S., is manager. Early in the season a dam was constructed near the source of Kingsley Brook, and an 80-horse-power boiler and hydraulic pump were put in, principally to work the gravels. Mr. Donnell informed me that he finds gold in paying quantities in these, but his ultimate object is to find the auriferous quartz or matrix, which he hopes to do as he sluices the gravels and uncovers the rock surface in the valley of the stream from the foot of the mountain up towards the dam. The boiler, Mr. Donnell states, is large enough to furnish power to drive a 50 or 60-stamp mill, and can be utilized for that purpose when gold is found in the rock in sufficient quantity to warrant the purchase of a mill. Quebec.

"The rocks of Dudswell Mountain are, like those on the west side of Massawippi Lake, pre-Cambrian slates and schists. Kingsley Brook crosses them nearly at right angles to the strike and has dropped considerable quantities of gold into the joints and crevices. Mr. Donnell informed me he was finding gold in these to a depth of two or three feet below the surface of the rock. Latterly, he was mining the decayed or partially rotten rock to that depth along with the overlying gravels and had sunk his sluice-boxes to that level. The discovery of gold in the rock-fissures means a continuance of operations for many years longer than if the gravels alone were worked.

"In regard to the difficulties encountered in gold mining in Kingsley Brook, and probably also in the valleys of the other small streams flowing off Dudswell Mountain, the first is the scarcity of water during the midsummer months, if operations are conducted on anything like a large scale. This difficulty can only be overcome by the construction of dams and reservoirs. The second is the presence of large boulders in the gravels. These interfere, to some extent, with hydraulic work, and have to be blasted or removed by derricks before the whole of the gravels can be sluiced. No quicksands occur in the valley of these small streams as they do in Beauce county, except in the terraces at the foot of the mountain. Mining has not yet been under taken in any of these terraces.

"On a stream from one to two miles north-east of Kingsley Brook, called Rowe's Brook, lot 8, range IV., Dudswell, alluvial gold mining

PRECIOUS METALS.
Gold.
Quebec.

has been prosecuted this season by Messrs. Hayemal and Soteri, for some months and gold in paying quantities obtained by the ordinary process of sluicing. A clean-up which I witnessed while visiting this locality, seemed to prove this statement. The character of the deposits is very much the same as in the Kingsley Brook valley, as described in the Summary Report for 1895 (p. 91), except that the thickness is perhaps, fully greater.

"*Gold Mining in Ditton.*—In the valley of the Little Ditton River, some work has been performed during the past season by Messrs. McCritchie and McKay of Scotstown, about a quarter of mile above the bridge on the road to Chartierville. The gravels at this point were washed for some weeks by these men previous to the date of my visit and some gold was obtained. One nugget weighing an ounce was found at the bottom of the gravel, close to the bed-rock. The chief auriferous deposits here are those resting upon the rusty rotten rock, and are themselves highly oxidized, though stratified. Overlying them are alternating gravel and sand beds, which must be largely of post-glacial origin. The boulder-clay is, however, rarely seen in contact with these. They contain but little gold.

"To the south of the locality mentioned, along the little Ditton valley, gold has been washed from the gravels at several points, nearly as far up as the International boundary, *e. g.* at a point a mile north of the cross-road going west from Chartierville, also south of that road and near the source of that stream in the vicinity of Prospect Hill, where it is reported to have been found in quartz, but I could obtain no authentic information on this point. It has also been discovered in the alluviums of the main Ditton River to the south of Chartierville village. No work has been done, however, in the two last-mentioned localities.

"*Gold Mining in the Chaudière Valley.*—Along the Chaudière River and its tributaries, very little gold mining has been carried on during the past season. Work in the tunnel at St. George, referred to in the Summary Report for 1895 (p. 87), was continued until September last, when it was found that the old pre-glacial channel of Slate Creek was not likely to be reached by following the course in which the tunnel was started, and it was abandoned for the present. At the time operations were suspended, the tunnel had been run in nearly 900 feet. Great difficulties were experienced in keeping it open, owing to the presence of quicksands and to the quantities of water in the ground overhead seeking outlet and carrying these sands with it. The succession of the deposits disclosed in the tunnel is interesting from a geologi-

cal point of view. In descending order it is as follows:—(1) surface soil; (2) boulder-clay with an intercalated band of stratified clay, or stratified boulder-clay; (3) stratified clay and sand (pipe-clay and quicksands); (4) coarse, stratified gravel with pebbles and a few boulders one or two feet in diameter—colours of gold occur in this gravel; (5) a local bed of coarse slated material with quartz bands running through it. It is apparently a decomposed slate which may have originally been thrown down as a talus at the base of a boss on the slope; (6) fine yellow sand with ochreous streaks through it, passing into rotten rock *in situ* beneath, the strata being in the same position as in the solid rock; (7) unglaciated rock.

"The most remarkable member of the series is number 6. It is unlike any other bed met with in connection with the gold-bearing deposits of Beauce county, and is noteworthy as showing the slight erosive action of the Pleistocene ice, exposed, as this slope of the Chaudière valley must have been to the full force of the glacier which moved over this district from north-west to south-east.

" In the valley of the Rivière du Loup, Mr. L. Gendreau is endeavouring to open up a series of gravel banks on the west side, which extend from three to five miles above its mouth. These gravels are reported to contain gold in workable quantities, but I have seen no competent tests made. The following is a section of one of these banks situated about four miles above the confluence of the du Loup and Chaudière rivers. (1) Surface soil; (2) boulder clay, the upper part stratified in places; (3) a thin seam of stratified sand graduating into the following bed; (4) stratified clay (pipe-clay); (5) stratified sand and gravel, the latter usually in lenticular seams with ochreous bands, especially in the upper part. This is the deposit said to be auriferous; (6) fine, gray, stratified sand, the bottom not reached as it lies below the level of Rivière du Loup.

" Whether gold exists in paying quantities in these gravels does not appear, but Mr. A. A. Humphrey, of the Canada Gold Mining Association, formerly washed a good deal of gold out of the gravels of the du Loup valley in his No. 1 pit, just below the mouth of the Gold Stream, *i.e.*, about two miles lower down than the above section; and also in No. 2 pit near the river's mouth (see Summary Report for 1895, p. 89, where it is called No. 1 pit), though so far as known not in sufficient quantities to pay for hydraulic work.

" In the Gilbert River valley, some gold mining was carried on during the past season by the Leclerc Brothers, who are reported to have met with fair success, and to have taken out in a few weeks

PRECIOUS METALS.
Gold.

about $400 worth. Two nuggets valued at $50 and $60, I am informed. were obtained by these men. One of these nuggets was shown to me.

Quebec.

"On Mill Stream, near St. François, Beauce, some work has been performed by Messrs. Copal and Pomerleau, and gold has been found in parts of the valley of that stream not hitherto prospected. In the valley of Black River, a branch of Des Plantes River, joining it from the south, gold was discovered in the gravels at the confluence of the main tributary.

"The present languishing condition of the gold mining industry in Beauce county, appears to be due to causes other than the scarcity of gold in the alluviums. It would be invidious to make any remarks, however, concerning these causes. That gold still exists in a number of these valleys in paying quantities, *i.e.*, in quantities sufficient at least to warrant a skilful and economic expenditure of capital in their exploitation, is a fact which no one who has examined the district can deny. But on the other hand it must be remembered that this district can show a total of a large number of failures in gold mining, and that there are other causes for this besides want of scientific knowledge or skill and want of capital. In much of the Chaudière districts, the gold exists in a very thin and scattered condition, and the gravels containing it are capped by such thick beds of boulder-clay and quicksands that it is doubtful whether it can be profitably mined. In the deeper parts of the river valleys there are still greater difficulties to contend with. In the old pre-glacial channels the gold has, of course, been more or less concentrated, but when it is considered that these often lie below the present water-courses, and that tunnels or shafts at these levels are likely to receive a portion of the drainage waters, the expense of exploration would be great and only deposits of considerable richness would probably prove remunerative.

"The failure hitherto to find workable gold-bearing quartz, has given wrong impressions concerning the district, leading miners and mining engineers to suppose that it has been but very imperfectly explored. As a matter of fact a considerable number of geologists, mining engineers and experts have visited and examined this district, and the literature pertaining to it is somewhat voluminous. There are, of course, different local conditions existing here as regards the distribution of the gold in the alluviums from what prevail in non-glaciated countries, and these diverse conditions may not have been sufficiently taken into account. But the Chaudière district has not suffered for lack of competent and skilful exploration, or for want of capital.

"Notwithstanding the backward condition of gold mining here, this district, or at least some portions of it, offers inducements to miners and capitalists equal in some respects at least to those of some other gold regions more favourably regarded. PRECIOUS METALS. Gold Quebec.

"The further development of the gold mines of the Chaudière area should, it seems to me, lie in the direction of introducing machinery and plant adapted to alluvial mining under the peculiar local conditions which are found there. But first the gold-bearing gravels, in a great number of places, should be tested anew, and their gold content per cubic yard proved, with the view of ascertaining whether it is sufficient to pay for the expenditure in the direction indicated. To effect this exploration adequately, it would seem that boring machines are absolutely necessary. The great thickness of the boulder clay, which never contains gold in paying quantities, but which must be penetrated by shafts or tunnels before the auriferous deposits can be reached and worked, as well as the difficulty of locating the old river-channels in which the auriferous deposits mainly lie, have hitherto proved serious obstacles to exploration in the deep-lying beds. With boring appliances these difficulties could be overcome, at least to a much greater extent than by the methods hitherto employed, the position of the old channels could be located in less time and at much less expense, and the thickness of the auriferous beds in these ascertained before commencing actual mining operations.

"*Quartz Veins.*—In addition to the facts obtained relating to alluvial gold mines, a considerable body of data concerning quartz veins and other rocks which might be likely to yield gold was collected in the field, with a view of ascertaining, if possible, its primary source. The details regarding these will be given in my forthcoming general report; while such specimens as were brought in from the field will, meantime, be subjected to examination and assay in the laboratory of the Survey."

ONTARIO.

The revival in the gold mining industry of Ontario during the past few years will be evident from a glance at Table 5 below. For the three years following 1887 the industry was practically dead. Since the fresh start made in 1891 there has been a steady and large increase as shown. Apart, however, from several mines in the province, which can be now said to have been placed on a permanent working basis the industry as a whole is yet in the initial stage, but with a very hopeful outlook. Prospecting and development work Ontario

PRECIOUS METALS. Gold. Ontario.

has been actively prosecuted in a number of districts throughout the province and encouraging results are reported. The districts most promising have been the Lake of the Woods and Rainy River districts in the western part of the province and the Hastings and Wahnapitae districts in the east. The latter district lies north of the well known Sudbury nickel and copper mines on the main line of the Canadian Pacific Railway.

TABLE 5.

PRECIOUS METALS.

GOLD—ONTARIO—ANNUAL PRODUCTION.

Calendar Year.	Ounces Fine.	Value.
		$
1886		
1887	327	6,760
1888		
1889		
1890		
1891	97	2,000
1892	344	7,118
1893	708	14,637
1894	1,917	39,624
1895	3,015	62,320
1896	5,563	115,000

The outlook for further discovery of veins similar to those already proved to be gold-bearing in the district already alluded to, is very hopeful. Areas of the series of rocks, classed as Huronian, and where the geological conditions are generally similar to those found in the already proved districts have been shewn by the Geological Survey to exist in many other parts of Ontario, and in many of these exploration will doubtless bring to light payable gold-bearing veins. The location of these Huronian areas is shown on the general map of Canada as well as on a number of more detailed district maps issued by the Survey. The ores of the western districts are almost altogether free-milling, the metal in that condition constituting about 80 per cent of the whole gold contents. The ores of Wahnapitae are similar.

The following description by Prof. A. P. Coleman is given of the work done at the Sultana mine on Lake of the Woods in the report of the provincial government bureau for 1896 :—

"The most justly famous mine in our whole western gold field is undoubtedly the Sultana. on an island seven miles south-east of Rat Portage, owned by Mr. John F. Caldwell, of Winnipeg. After years of hard struggle against adverse circumstances, this plucky and ener-

getic mine owner is reaping a solid reward in the shape of a great body of rich quartz, in places forty feet wide, and already followed more than three hundred feet in depth. Nearly a thousand feet of drifting have been done and there is ore enough in sight to keep the well equipped ten-stamp mill, or one double its size, running for years. The ore bodies appear to be lenticular, the lower one of immense size, and are inclosed in the sheared and schistose edge of an area of coarse porphyritic granitoid gneiss. * * * * The ore is somewhat quartzitic looking, contains one or two per cent of iron pyrites, and is free milling to the extent of 75 or 80 per cent. A recently finished chlorination plant extracts the gold carried by the sulphides very satisfactorily. Gold mining at the Sultana has been reduced to a thoroughly business-like basis, the mill running with scarcely a halt and the weekly brick being turned out with perfect regularity. If this splendid mine had been in the hands of a stock company much would have been heard of its dividend paying powers; but its owner is too modest to boast of its success."

PRECIOUS METALS. Gold. Ontario.

Mr. Wm. McInnes, the geologist in charge of the work of the Geological Survey in this region, has described the geological conditions and other features of a number of these gold-bearing veins in the Summary Report of the Department for 1896 (pp. 34 to 43). His remarks are reproduced below :—

"While on Lake of the Woods, the Regina and Sultana mines were visited. The vein in the case of the former of these, traverses both an intrusive area of altered hornblende-granite and a Keewatin diabase, the line of contact between the two cutting the drifts in the mine and showing an overlap of the diabase by the granite.

"At the Sultana, the vein occurs in a very much crushed and sheared hornblende-granite which occurs here, as it does generally, as an intrusive mass not far from the contact between the biotite-gneiss area and an area of Keewatin rocks. The Scramble mine, which lies to the north of the railway, within six miles of Rat Portage, occurs in a band of Keewatin hornblendic schists or crushed diorites, and close to the edge of the Rossland granitic area. Some surface stripping has been done here, and a shallow shaft has been sunk on a band 25 to 35 feet in width, made up largely of quartz and heavily charged with iron-pyrites, occurring both in thin sheets along the planes of cleavage and irregularly distributed through its mass. Parts of the band were found to pan well, and an average value of over $20 to the ton is claimed for the whole band.

"Considerable activity has been shown in developing and exploiting gold properties about Lake of the Woods generally, and attention

PRECIOUS METALS. Gold. Ontario.

is being again devoted to various properties which have lain undeveloped for years. New discoveries of gold-bearing veins have been made in various places in the district, notably about Shoal Lake, where the Mikado and other properties have been attracting attention.

"Here, as in the Seine River country, the gold has been found, in every case, of which we have any record, at no great distance from the contact between the Keewatin and intrusive granitoid rocks, which occur most frequently as narrow rims along the edge of the more extensive areas of biotite-gneiss, but which also invade the Keewatin rocks as isolated intrusive masses. I know of no case where gold-bearing veins have been found to occur in the main body of the biotite-gneiss areas which we have classed as Laurentian. On a preliminary edition of the Seine River sheet, the rocks in which the Sawbill vein occurs were so classed, but this was owing to a misinterpretation of the notes of the late Mr. W. H. Smith, and it has been corrected on the regular edition of the map.

"As surveys of Manitou Lake were already available from the work of previous seasons, it was not thought necessary to visit this lake during the summer. A number of claims have been located along the shores of the lake as well as about Little Manitou Lake. These claims lie in the Keewatin belt, which extends all along the lake in the form of a narrow band, between the large Laurentian areas to the east and west, and connecting the Keewatin area of Pipestone Lake with that of lakes Wabigoon and Minnietakie. It was known from last season's work that the Laurentian areas approach the shores of the main Manitou closely, and a trip eastward from the foot of Osborne Bay, made by Mr. Lawson last summer, proved that the gneiss area of Eagle Lake extends eastward at least to beyond Niven's 22-mile-post on the Base Line of 1893-94. The marginal area of hornblende-gneiss which so commonly surrounds the biotite-gneiss areas, was found to intervene here also between the main gneiss area and the Keewatin.

"Prospecting was extended northward during the summer into the region lying to the north of the Canadian Pacific Railway along the Minnietakie Lake Keewatin belt, which is a continuation north-easterly of the Wabigoon Lake area. Promising veins are reported in this district, and assays of specimens from there made in the laboratory of the Survey gave small quantities of gold, enough at least to confirm the occurrence of gold in the region.

"Sawbill mine (location 313X.) was visited and the rocks about Sawbill Lake examined. They were found to consist in the main of

hornblende-gneisses and hornblendic granites and syenites often much crushed and sheared, in places becoming schists in structure. PRECIOUS METALS. Gold. Ontario.

"In one of these much crushed and sheared bands the vein occurs on which the Sawbill shaft has been sunk. The shaft, which follows the vein, was down about 40 feet at the time of my visit, and work was continued actively during the summer. The vein at the surface has a width of about 4 feet. It strikes N. 9° E. astronomical (or N. 15° E. mag.)* and can be followed in a southerly direction for 300 feet, where it bends to a direction S. 24° W. for another 300 feet, gradually failing in width until it becomes very small. In a northerly direction it has been traced about 900 feet, beyond which point the surface falls away into a swamp. It was stated by those in charge at the time, that the vein could be picked up again beyond the swamp. The hade of the vein is easterly at an angle of a little over 10 degrees from the vertical. Though running 'with the formation' there seems to be no doubt about the true fissure character of the vein. The walls are well defined, the hanging-wall particularly so, often showing slickensided surfaces and a parting of crushed chloritic material between the wall and the vein-matter. On the foot-wall, there is a certain amount of mingling of the vein-matter with the inclosing rock and a number of stringers and small parallel veins, so that the vein contents do not come away so freely from this wall as from the hanging-wall. The dump showed quartz carrying iron- and copper-pyrites and a considerable amount of free gold, and the vein at the bottom of the shaft was well defined and solid.

"After a few days spent in an examination of some points about Steep Rock and Moose lakes, where the geology is somewhat conplicated, Harold Lake was visited. A number of veins have been exploited here, and half a mile of tramway has been built, connecting the different openings with a five-stamp mill at the lake shore. The outlet of the lake has been deepened to allow sinking on a vein known as the shore vein, which outcrops at the base of a low cliff near the south-west corner of the lake. This vein strikes N. 29° W., with a hade to the north-east of a few degrees from the vertical; it is rich in free gold, but small and somewhat irregular. On No. 1 and No. 2 veins, which vary in width from one to two feet, were drifts about 200 and 140 feet respectively with a shallow winze on each, The mill was not working at the time of my visit. Work was continued during the summer, and Mr. Wiley informs me that a more promising vein, near the tramway, was being opened up. The veins occur near the contact

* Bearings throughout this description are referred to the true meridian unless otherwise stated.

PRECIOUS METALS.
Gold.
Ontario.

of a highly crushed and altered granite with Keewatin schists and diorites.

"A week was next spent in the region about Bad Vermilion Lake, in an examination of some of the gold locations. In this vicinity, on the north shore of Shoal Lake, at Foley's (locations 174E. and 175E.), the veins occur in the so-called protogine granite area. This granite is first seen on the road leading northwards from the shore of the lake, at a point about 200 yards from the shore, and extends continuously northwards nearly to the southern shore of Bad Vermilion Lake. Two shafts have been sunk on a vein on this property to depths of a little over 200 and 100 feet respectively, with drifts aggregating over 300 feet. The vein is a true fissure, and has a width, as exposed on the surface, of from 18 inches to 3 feet. At the bottom of the deeper shaft it is stated that the vein has widened to 5 feet or more. The dump shows very rich looking quartz with iron- and copper-pyrites, galena, and a good proportion of visible free gold.

"Other good looking veins occur on the same property. One of these about 100 feet to the south-west of the first-named vein promises very well. It has a surface width of about 2½ feet, and shows free gold in good quantity. Since my visit the company have continued active work on the property, and a mill is in course of construction.

"Further to the east, on the road running northward from Mine Centre towards Hillier's and Ferguson's, the first rock exposures after leaving the Keewatin rocks, which are seen on the immediate shore, are met with about half a mile south of Hillier's, or about three miles north-west of Mine Centre, on Shoal Lake. They are greenish, highly altered granites with prominent blebs of opalescent quartz. The same granite is continuous to and beyond Ferguson's (A. L. 110). To the north, between the granite and the south shore of Bad Vermilion Lake, occurs a belt of alternating bands of gabbro and Keewatin diorite and schist. A great part of the area crossed by the road is covered with a thick coating of fine white sand, with large boulders of granite, which conceals the underlying rock, except where occasional bosses protrude.

"At Ferguson's (A.L. 110 and adjoining locations) in addition to a considerable amount of surface stripping, cross trenching, etc., two shafts have been sunk to depths of about 50 feet each. On one of these the vein is divided into two small veins of a few inches each, separated by an intervening mass of granite about 18 inches in thickness, which continues to the bottom of the present shaft though narrowing down to a few inches.

"In the other shaft on the same vein, further west, the vein is better defined though still narrow. Among the other veins on the property is one, on which only stripping has been done, which can be traced for over 1000 feet, varying in width from 6 inches to between one and two feet. These veins carry free gold in quantity sufficient, it is claimed, to well repay working. Work was continued during the summer on this property, preparatory to the building of a mill.

"At Hillier's (the 'Lucky Coon,' 655 P.) the mill was idle and nothing was being done. The shafts, which were filled with water at the time of my visit, have been sunk on two parallel veins about 80 yards apart, one vein showing a surface width of from 3 to 6 feet and the other varying from a little over a foot to a broad, irregular vein showing about one foot of crushed country-rock, a foot and a-half to three feet of quartz, and 2 to 3 feet of mixed stringers of quartz and country-rock. These are fissure veins cutting the granite mass. This whole area of granite lying between Bad Vermilion and Shoal lakes has been very much crushed and is fissured in all directions, so that the number of veins is very great, some of them promising well. On locations A.L. 103-4-5-6, are many good veins, the principal among them striking from N. 20° W. to N.W. They vary in size up to a width of from 3 to 7 feet and generally show good walls. Many show visible free gold and others are strong in sulphides. At K. 244, on the north shore of Bad Vermilion Lake, a band of greenish-gray, quartzose, massive rock, fairly mineralized with iron- and copper-pyrites and from 50 to 100 feet in width, is inclosed in green hornblendic schists of Keewatin age with a trend parallel to the strike of the schists. This band appears to be an arm from the granitic area; it is cut in all directions by stringers and small veins of quartz from 9 inches in thickness to mere threads, running generally across the trend of the band but following also every possible direction. These stringers, where weathered on the surface, it is stated, pan well.

"On K. 231, are a number of veins, some of good size but irregular and difficult to trace on account of a swamp on one side and a sand-hill on the other. What their gold content is was not ascertained. Many other properties from which good assays are stated to have been obtained, have been taken up in the neighbourhood, some in the granite, and others both in the interbanded gabbro and diorite and in the Keewatin bands.

"There does not seem to be any good reason why gold-bearing lodes in these last-mentioned rocks should be less permanent or persistent than in the granite."

PRECIOUS METALS.
Gold.
Ontario.

Speaking of some of the routes traversed during the course of his season's work Mr. McInnes draws attention in the subjoined remarks, to places where prospecting might be carried on with likelihood of success.

"The route led through Upper and Lower Scotch lakes, Irish Lake, Welsh Lake, Norway Lake and a number of small lakes and streams to Upper Seine Lake and the Seine River.

"About midway on this route, the belt of Keewatin which forks from the Seine River band at Steep Rock Lake, was crossed. It has here, at its narrowest, a width of about two and a-half miles, and is made up of diorites and kindred eruptives of the Keewatin, with considerable areas of grauwacke and crushed quartz-porphyry, and of felsitic and quartzose schists, all more or less pyritous. Belts of the schist, in a number of places, show pyrites in thin sheets along the planes of cleavage, as well as scattered irregularly through the mass of the work.

"Large angular blocks of quartz with iron- and copper-pyrites, which evidently had not travelled far, were noted about the shores of two of the small lakes near the height-of-land.

"Along the southern edge of this belt, a band of hornblende-gneiss or crushed horblende-granite occurs, and forms a vein along the northern edge of the large biotite-gneiss area of Caribou Lake. This hornblende-gneiss band, where crossed on this route, has a width of a little over a mile, and is without doubt continuous with the area of the same rock about Sawbill and Moose lakes. The area just described with its extension towards the head of Sawbill Lake seems to offer a promising field for the prospector.

* * * * * *

"The regions lying immediately to the south of Eagle and Wabigoon lakes offer a field which promises well for the prospector. In both these districts are bands of Keewatin of very irregular outline, with intrusive areas of hornblende-granites and saussurite-gabbros. These two districts and that to the south of Lower Scotch Lake, have been particularly mentioned only because they are all easily accessible and do not seem to have attracted the notice of prospectors to any great extent, though the character of their rocks is such as to warrant their examination."

An interesting feature in the gold mining of the province is to be found in the work being done at the Empress mine on the north shore of Lake Superior which is situated in an area of Huronian

rocks separate from those already described. Mr. McInnes thus describes this place:— PRECIOUS METALS. Gold. Ontario.

"On the way back to Ottawa, the Empress mine, situated on the north shore of Lake Superior, was visited. This is a low-grade proposition, largely free milling. It lies to the north of the Canadian Pacific Railway, near Jackfish station. At the lake-shore, the rock exposed in the cuttings on the line of railway is a medium-grained, red, hornblende-granite, and along the road leading to the mine the same rocks are seen to within a half mile or less of the mill. The veins on which work is being done occur in green, somewhat hornblendic schists striking N. 67° E. and dipping eastwards at an angle of 64°. Where work was being carried on, there is a series of closely parallel veins, striking and dipping with the cleavage of the schists. The largest of these was about six feet in width where stripped. The belt has been uncovered by cross-trenching for upwards of a mile along the strike, varying, of course, very considerably in quartz contents in that distance. The outcrop occurs on the slope of a southerly-facing hillside at a height of two hundred feet or more above the valley bottom. The ten-stamp mill now on the property, has been placed near the bottom of the hill, so that a tunnel may readily be driven which will catch the veins at a depth of about 140 feet below their outcrop, and will prove the property pretty thoroughly and permit also the economical stoping of a large amount of vein-matter. At the time of my visit no mining work of a permanent character was being done, the ore for the mill was being taken by shallow shaft and drift from wherever it could be got at most conveniently. It was the intention of the management, however, to proceed with the driving of the tunnel during the winter. The owners claim only a low grade ore, but they claim also that the unusual facilities for working economically will ensure them a reasonable margin of profit.

"Other discoveries of gold-bearing veins were reported during the summer from different points along the north shore, but none of these were seen."

NORTH-WEST TERRITORIES.

The gold production given below in Table 6 is, as in former years, that mined in the Saskatchewan River bars added to the quantity obtained from the placer washings of the tributaries of the Yukon River in Canadian territory. North-west Territories.

The nature of this work is such that but an approximate estimate can be arrived at, but the figures given are obtained by a comparison of several close estimates given by persons conversant with these

Precious Metals.

districts, and are probably as near the truth as possible under the circumstances.

Gold.

North-west Territories.

Table 6.

Precious Metals.

Gold :—North-West Territories, Production.

Calendar Year.	*Ounces (fine).	Value.
		$
1885	24	500
1886	29	600
1887	5,907	122,100
1888	1,993	41,200
1889	9,434	195,000
1890	8,660	179,000
1891	2,201	45,500
1892	4,741	98,006
1893	8,981	185,640
1894	6,773	140,000
1895	7,257	150,002
1896	17,175	355,000

* Calculated from the value at $20.67 per oz.

British Columbia.

British Columbia.

The progress of the gold mining industry of British Columbia is illustrated in Table E, following. Beginning with the first year recorded in the Table we have a production of about $700,000 ; six years later in 1863 the value of the gold produced had increase over 555 per cent to nearly four million dollars. Since the palmy days of 1863, with the exception of a few temporary recoveries, the industry has shown a steady falling off, until in 1893 the province could be credited with the production of less than $400,000 worth of gold. This unfortunate feature is due to the gradual exhaustion of the shallower and more accessible placer workings which up to a few years ago were practically the only source of the gold.

Looking at the record of the past four year period, a steady and rapid growth is apparent, the increase of 1896 over 1893 amounting to 471 per cent. This is the more encouraging as it carries great promise for the future, being due to the opening up and operating of a number of veins in the Kootenay and Yale districts of the province. Some of the increase is also to be credited to the inauguration of extensive hydraulic workings operating on the auriferous gravels of the province which, being suitable only to this method of exploitation, had heretofore received but slight attention.

Graphic Tables F and G, supplementing graphic Table E give the details of this industry for the province.

GOLD.
British Columbia.
Annual Production.
Table E.

Calendar Year.	Value.
	$
1858	705,000
1859	1,615,072
1860	2,228,543
1861	2,666,118
1862	2,656,903
1863	3,913,563
1864	3,735,850
1865	3,491,205
1866	2,662,106
1867	2,480,868
1868	2,372,972
1869	1,774,978
1870	1,336,956
1871	1,799,440
1872	1,610,972
1873	1,305,749
1874	1,844,618
1875	2,474,904
1876	1,786,648
1877	1,608,182
1878	1,275,204
1879	1,290,058
1880	1,013,827
1881	1,046,737
1882	954,085
1883	794,252
1884	736,165
1885	713,738
1886	903,651
1887	693,709
1888	616,731
1889	588,923
1890	494,436
1891	429,811
1892	399,525
1893	379,535
1894	530,530
1895	1,266,954
1896	1,788,206

PRECIOUS METALS.
Gold.
British Columbia.

Calendar Year.	Number.
1858	3,000
1859	4,000
1860	4,400
1861	4,200
1862	4,100
1863	4,400
1864	4,400
1865	4,294
1866	2,982
1867	3,044
1868	2,390
1869	2,369
1870	2,348
1871	2,450
1872	2,400
1873	2,300
1874	2,868
1875	2,024
1876	2,282
1877	1,960
1878	1,883
1879	2,124
1880	1,955
1881	1,898
1882	1,738
1883	1,965
1884	1,858
1885	2,902
1886	3,147
1887	2,342
1888	2,007
1889	1,929
1890	1,342
1891	1,199
1892	1,340
1893	1,247
1894	1,610
1895	2,030

GOLD.
BRITISH COLUMBIA.
NUMBER OF MEN EMPLOYED.
Table F.

GOLD.

BRITISH COLUMBIA.

EARNINGS PER MAN.

Table G.

Calendar Year.	Value.
	$
1858	235
1859	403
1860	506
1861	634
1862	648
1863	889
1864	849
1865	813
1866	893
1867	814
1868	992
1869	749
1870	569
1871	734
1872	671
1873	567
1874	643
1875	1,222
1876	783
1877	820
1878	677
1879	607
1880	518
1881	551
1882	548
1883	404
1884	396
1885	246
1886	287
1887	296
1888	307
1889	330
1890	423
1891	358
1892	298
1893	304
1894	283
1895	313

PRECIOUS METALS.
Gold.
British Columbia.

Table 7 has been compiled from data given in the Annual Report of the Minister of Mines for the province, and gives the district details for 1896. It will be seen that already the gold produced from vein mining quite overshadows that obtained from placers, the latter being but about 44 per cent. of the former.

TABLE 7.

PRECIOUS METALS.

GOLD—BRITISH COLUMBIA, PRODUCTION, BY DISTRICTS, CALENDAR YEAR, 1896.

District.	Division.	Placer.		Quartz.	
		Ounces.	Value.	Ounces.	Value.
			$		$
Cariboo	Barkerville	4,145	82,900		
	Lightning Creek	2,650	53,000		
	Quesnel Mouth	2,555	51,100		
	Keithley Creek	9,853	197,050		
Cassiar		1,050	21,000		
Kootenay East		1,054	21,076		
Kootenay West	Nelson	275	5,500	236	4,720
	Slocan			152	3,040
	Trail Creek			55,275	1,104,500
	Other Places	231	4,627	35	700
Lillooet		1,683	33,665		
Yale	Osoyoos			6,561	131,220
	Similkameen	450	9,000		
	Yale	3,255	65,108		
		27,201	544,026	62,259	1,244,180

The relative importance of the various districts of the province as contributors to the total gold production is shown by the figures in Table 7. Taking first the placer gold into consideration, Cariboo heads the list with about 70 per cent, Yale comes next with about 13 per cent.

Lillooet follows with about 6 per cent, Cassiar and Kootenay East contributing under 4 per cent each, and West Kootenay coming last with under 2 per cent. PRECIOUS METALS. Gold. British Columbia.

With regard to the gold obtained in vein mining, with the exception of about 10 per cent to be credited to Yale, it all resulted from the operations of the mines in the West Kootenay division in the districts of Nelson, Trail Creek, Slocan, etc. Of this under 1 per cent came from the Nelson, Slocan and outlying districts and the remaining 99 per cent was contained in the products shipped from the Trail Creek mines, which yielded over a million dollars worth of the precious metal. This output was the result of mining and smelting the gold-bearing copper and iron sulphurets of that district. The remaining small amount represents the results of treating free milling gold ores; as at Camp McKinney, in the Osoyoos district of Yale division; at the Poorman mine, in the Nelson district, and small lots of gold ore sent out to the smelters from other parts.

The outlook for increased production from the south-eastern portion of the province is very encouraging. In the last few years numbers of discoveries have been made of payable ore-bodies and veins, and in 1896 there were about 70 mines producing in the section alluded to. The facilities of transport are now greatly advanced, and this, with the home market furnished by the local smelters, will make it possible to work many claims which a few years ago could not have been operated.

With the construction of the Crow's Nest Pass railway and other increased facilities promised in the immediate future, the outlook is decidedly encouraging for a still greater growth in 1897.

The details of the work of discovery and development in the province are fully dealt with in the report of the provincial mineralogist, Mr. W. A. Carlyle, to the Minister of Mines of the Province.

SILVER. Silver.

The production of silver in Canada has risen in a period of ten years from 349,330 oz., valued at $341,645 in 1887, to 3,205,343 oz., valued at $2,149,503 in 1896. The increase has thus been equivalent to over 900 per cent in the quantity, but owing to the falling price of the metal, but 600 per cent increase is shown in the value. By studying the figures in the accompanying Table No. 8, it will be seen that the relative importance of the different provinces, in respect of their contributions to the total production, has altered entirely. In 1887, Production.

PRECIOUS METALS.
Silver.

Ontario led with Quebec contributing but little less; British Columbia being credited with the remainder, amounting to but little over 3 per cent. In 1896 the relative contributions of the provinces were as follows: Ontario, nothing; Quebec, a little over 2 per cent; British Columbia, the remainder of over 97 per cent.

TABLE 8.

PRECIOUS METALS.

Production.

SILVER.—ANNUAL PRODUCTION.

CALENDAR YEAR.	ONTARIO.		QUEBEC.		BRITISH COLUMBIA.		TOTAL.	
	Ounces.	Value.	Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
1887..	190,495	$186,304	146,898	$143,666	11,937	$11,675	349,330	$341,645
1888..	208,064	195,580	149,388	140,425	37,925	35,649	395,377	371,654
1889..	181,609	169,986	148,517	139,012	53,192	49,787	383,318	358,785
1890..	158,715	166,016	171,545	179,436	70,427	73,666	400,687	419,118
1891..	225,633	222,926	185,584	183,357	3,306	3,266	414,523	409,549
1892..	41,581	36,425	191,910	168,113	77,160	67,592	310,651	272,130
1893..	.....	8,689	.....	126,439	.....	195,000	.....	330,128
1894..	.....	.....	101,318	63,830	746,379	470,219	847,697	543,049
1895 .	.....	.....	81,753	53,369	1,693,930	1,105,797	1,775,683	1,159,166
1896..	....	.....	70,000	46,942	3,135,343	2,102,561	3,205,343	2,149,503

Quebec.

QUEBEC.

The production of Quebec represents the silver contained in the ores mined in the Eastern Townships and utilized as a source of sulphur in acid making. Besides the proportion of copper carried by these ores, they contain a little silver, and the production of the province credited in the above table is altogether from this source. It will be seen that the amount produced in 1896 is but half that for 1887. This is on account of the considerable falling off in the production of ore, and is not due to any lessening of the percentage of contained silver.

Ontario.

ONTARIO.

There has been no production of silver to record for this province for the past three years. The production was over $186,000

in 1887, increasing to nearly $223,000 in 1891, after which it fell away considerably for the following two years and entirely ceased in 1894. PRECIOUS METALS. Silver.

The silver production under consideration resulted from the operation of the silver mines of Thunder Bay district on Lake Superior. In 1885 and the years immediately following, there were many new discoveries in the district of fissure veins cutting the argillites, shales and traps and the lower cherty rocks of the Animikie. This led to a revival of the silver mining of that section which had languished after the closing down of the Silver Islet mines in 1884, and for some years following the prospects were hopeful, but for various reasons all these mines ceased operations. Ontario.

BRITISH COLUMBIA. British Columbia

This province contributed but little to the total output of silver for the Dominion until the last few years. From 1887 to 1890 it increased from nearly $12,000 to over $70,000 worth, but in 1891 it fell to but little over $3,000 worth. From that date till 1896 a continuous and very considerable growth is to be noted, the quantity having increased nearly ten times and the value about seven times, the latter being less in proportion on account of the heavy fall in the market price of silver.

The above noted growth in the industry of this province is to be credited to the opening up of the argentiferous galena mines in the southern part of the Kootenay division, which began in 1892. By far the largest amount is to be credited to the Slocan district, the Ainsworth and Nelson districts contributing also.

Discovery and location of silver-bearing ore deposits had been made from time to time for many years previous to 1892, and a certain amount of work had been done, notably at the Hall mines near Nelson, but the greatest impetus was given when work began in that year in the Slocan district. The average silver contents of these ores for the whole district has been high, and so many extensive ore-bodies have been found that success has attended the opening up of the district from the start and the province has thereby become prominent as a silver producer.

Numerous veins carrying argentiferous galena are also known to exist in other districts in the southern part of the province, but with few exceptions these have been but little worked.

The following table, No. 9, gives the exports of silver ores as entered in the Customs Department. In comparing these figures with those of Table 8, it must be borne in mind that whilst practically all the silver bearing products of the country are exported, the basis of

PRECIOUS METALS.

Silver.

valuation in the two tables is different. With the exception probably of the figures for 1896, the valuation in the entries for export is that of the spot value of the metal in the ore, etc., whilst in Table 8, the valuation, uniformly with that adopted for the other metallic products, is the final market value of the silver contents.

TABLE 9.

PRECIOUS METALS.

SILVER:—EXPORTS OF ORE.

Exports of ore.

Provinces.	Calendar Years.						
	1890.	1891.	1892.	1893.	1894.	1895.	1896.
	$	$	$	$	$	$	$
Ontario	203,142	222,071	35,992	7,878	.....	100	.....
Quebec *	900	.....	.....	.....	.....	.....	.....
Nova Scotia	.....	.....	.....	.....	.....	.....	.....
Manitoba	.....	.....	80	820	.....	.....	.....
British Columbia	100	3,241	20,616	204,997	359,731	994,254	2,271,959
Totals	204,142	225,312	56,688	213,695	359,731	994,354	2,271,959

*The production of silver given under the heading Quebec, in Table 8, represents the amount of that metal in the pyritous copper ores produced and exported from that province. Being but in small proportion it is ignored and does not appear under the heading Silver in the export returns.

PYRITES.

PYRITES.

The ore classed under this heading is a mixture of chalcopyrite or copper-pyrites ($CuFeS_2$), with iron-pyrites (FeS_2). It is mined as an ore of sulphur.

The production of pyrites was less during 1896, than in 1895, by 483 tons and $1,439, as shown in Table 1 below. The total production for the year was 33,715 tons, of which 23,562 tons were shipped to the United States as raw ore, while the remaining 10,153 tons were used in Canada. Almost all of that retained in Canada was treated by the Nichols Chemical Company in their works at Capelton, Que. After the sulphur of the ore has been extracted as sulphuric acid, the ore is run into a matte, and in this form is shipped to the United States to be refined for its copper and silver contents. The output for 1896 contained approximately 70,000 ounces of silver and 2,400,000 pounds of copper.

TABLE 1.

PYRITES.

ANNUAL PRODUCTION.

PYRITES. Production.

Calendar Year.	Tons. 2,000 lbs.	Value.
		$
1886	42,906	193,077
1887	38,043	171,194
1888	63,479	285,656
1889	72,225	307,292
1890	49,227	123,067
1891	67,731	203,193
1892	59,770	179,310
1893	58,542	175,626
1894	40,527	121,581
1895	34,198	102,594
1896	33,715	101,155

TABLE 2.

PYRITES.

IMPORTS.—BRIMSTONE OR CRUDE SULPHUR.

Imports

Fiscal Year.	Pounds.	Value.
1880	1,775,489	$27,401
1881	2,118,720	33,956
1882	2,375,821	40,329
1883	2,336,085	36,737
1884	2,195,735	37,463
1885	2,248,986	35,043
1886	2,922,043	43,651
1887	3,103,644	38,750
1888	2,048,812	25,318
1889	2,427,510	34,006
1890	4,440,799	44,276
1891	3,601,748	46,351
1892	4,769,759	67,095
1893	6,381,203	77,216
1894	5,845,463	61,558
1895	4,900,225	56,965
1896*	6,934,190	63,973

* Brimstone, crude, or in roll or flour, and sulphur in roll or flour. Duty free.

SALT.

SALT.

As this industry has been fully described in former Reports of this Section, no further details are necessary here. The production of 1896, compared with that of 1895, has decreased 8,416 tons, while the value has increased $9,238.

As heretofore the production of salt in Canada was almost entirely from the Ontario salt fields.

A small amount of salt was manufactured in the Dauphin Lake district in Manitoba. The following extract is taken from the Department of the Interior Report for 1896, p. 144.

"Between four and five tons of salt have been manufactured by Mr. Paul Woods at the south end of Lake Winnipegosis, which has been disposed of to the surrounding settlers. With the increased local demand from the fishing industry, and the improved transportation facilities, it is highly probable that Mr. Woods will enlarge his works, as, with an increased capacity, there is no reason why his works should not supply the requirements of the district with that article."

SALT.
Production.

SALT.
ANNUAL PRODUCTION.
Table A.

Calendar Year.	Tons.	Value.
1886	62,359	$227,195
1887	60,173	166,394
1888	59,070	185,460
1889	32,832	129,547
1890	43,754	198,857
1891	45,021	161,179
1892	45,486	162,041
1893	62,324	195,926
1894	57,199	170,687
1895	52,376	160,455
1896	43,960	169,693

Salt. Exports.

TABLE 1.

SALT.

EXPORTS.

Calendar Year.	Bushels.	Value.
1880	467,641	$46,211
1881	343,208	44,627
1882	181,758	18,350
1883	199,733	19,492
1884	167,029	15,291
1885	246,794	18,756
1886	224,943	16,886
1887	154,045	11,526
1888	15,251	3,987
1889	8,557	2,390
1890	6,605	1,667
1891	5,290	1,277
1892	2,000	504
1893	4,940	1,267
1894	4,639	1,120
1895	4,865	959
1896	3,842	899

TABLE 2.

SALT.

Imports.

IMPORTS. SALT PAYING DUTY.

Fiscal Year.		Duty.	Pounds.	Value.
1880			726,640	$ 3,916
1881			2,588,465	6,355
1882			3,679,415	12,318
1883			12,136,968	36,223
1884			12,770,950	38,949
1885			10,397,761	31,726
1886			12,266,021	39,181
1887			10,413,258	35,670
1888			10,509,799	32,136
1889			11,190,088	38,968
1890			15,135,109	57,549
1891			15,140,827	59,311
1892			18,648,191	65,963
1893			21,377,389	79,838
1894			15,867,825	53,336
1895			8,498,404	29,881
1896	Salt, coarse, N.E.S.	5c. per 100 lbs.	3,314,920	5,874
	Salt, fine, in bulk	5c. "	1,466,290	2,238
	Salt, N.E.S., in bags, barrels or other packages	7½c. "	2,884,047	16,438
	Total		7,665,257	$24,550

TABLE 3.

SALT.

IMPORTS. SALT NOT PAYING DUTY.

SALT. Imports.

Fiscal Year.	Pounds.	Value.
1880	212,714,747	$400,167
1881	231,640,610	488,278
1882	166,183,962	311,489
1883	246,747,113	386,144
1884	225,390,121	321,243
1885	171,571,209	255,719
1886	180,205,949	255,359
1887	203,042,332	285,455
1888	184,166,986	220,975
1889	180,847,800	253,009
1890	158,490,075	252,291
1891	195,491,410	321,239
1892	201,831,217	314,995
1893	191,595,530	281,462
1894	196,668,730	328,300
1895	201,691,248	332,711
1896*	205,005,100	338,888

*Salt, imported from the United Kingdom, or any British possession, or imported for the use of the sea or gulf fisheries.

STRUCTURAL MATERIALS.

STRUCTURAL MATERIALS.

Building stone.—The production of building stone in Canada for 1896 was much the same as in 1895. The home consumption, however, shows a slight advance, for not only were the exports less than the year before, but the imports were greater. Building Stone.

TABLE 1.

STRUCTURAL MATERIALS.

PRODUCTION OF BUILDING STONE.

Calendar Year.	Value.
1886	$ 642,509
1887	552,267
1888	641,712
1889	913,691
1890	964,783
1891	708,736
1892	609,827
1893	1,100,000
1894	1,200,000
1895	1,095,000
1896	1,000,000

Structural Materials.

Building Stone.

TABLE 2.

STRUCTURAL MATERIALS.

EXPORTS OF STONE AND MARBLE, WROUGHT AND UNWROUGHT.

Province.	Wrought.		Unwrought.	
	Calendar Years.			
	1895.	1896.	1895.	1896.
Ontario	$5,165	$3,367	$37,166	$16,599
Quebec	3,196	931	1,925	...
Nova Scotia	126	636	9,534	8,623
New Brunswick	100	.....	2,925	7,675
British Columbia	.....	.....	66	.....
Totals	$8,587	$4,934	$51,616	$32,897

TABLE 3.

STRUCTURAL MATERIALS.

IMPORTS OF BUILDING STONE.

Fiscal Year.			Value.
1880			$ 35,970
1881			58,149
1882			33,623
1883			35,061
1884			51,088
1885			30,491
1886			41,675
1887			54,368
1888			86,373
1889			100,314
1890			132,155
1891			170,890
1892			95,550
1893			56,510
1894			52,908
1895			44,282
		Duty.	
1896	Flagstones, granite and rough freestone, sandstone and all building stone, except marble from the quarry, not hammered or chiselled	20 p. c.	$42,737
	Granite and freestones, dressed; all other building stone dressed, except marble	30 "	11,393
			$54,130

TABLE 4.

STRUCTURAL MATERIALS.

IMPORTS OF MANUFACTURES OF STONE OR GRANITE, N.E.S.

STRUCTURAL MATERIALS.

Stone or Granite.

Fiscal Year.	Value.
1880	$29,408
1881	36,877
1882	37,267
1883	45,636
1884	45,290
1885	39,867
1886	41,984
1887	41,829
1888	47,487
1889	61,341
1890	84,396
1891	61,051
1892	39,479
1893	49,323
1894	49,510
1895	51,050
1896 Duty—30 p.c.	51,499

TABLE 5.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF MARBLE.

Marble.

Calendar Year.	Tons.	Value.
1886	501	$9,900
1887	242	6,224
1888	191	3,100
1889	83	980
1890	780	10,776
1891	240	1,752
1892	340	3,600
1893	590	5,100
1894	Nil.	Nil.
1895	200	2,000
1896	224	2,405

STRUCTURAL MATERIALS.

Marble.

TABLE 6.

STRUCTURAL MATERIALS.

IMPORTS OF MARBLE.

Fiscal Year.	Value.
1880	$ 63,015
1881	85,977
1882	109,505
1883	128,520
1884	108,771
1885	102,835
1886	117,752
1887	104,250
1888	94,681
1889	118,421
1890	99,353
1891	107,661
1892	106,268
1893	96,177
1894	94,657
1895	83,422

		Duty.	
1896	Marble and manufactures of:—		
	Blocks or slabs, sawn on not more than two sides.	10 p. c.	$27,782
	do do more than two sides.	20 "	37,356
	Finished	30 "	5,707
	Manufactures of, N.E.S	30 "	16,263
	Rough blocks	Free	2,957
	Total marble and manufactures of		$90,065

Granite.

TABLE 7.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF GRANITE.

Calendar Year.	Tons.	Value.
1886	6,062	$63,309
1887	21,217	142,506
1888	21,352	147,305
1889	10,197	79,624
1890	13,307	65,985
1891	13,637	70,056
1892	24,302	89,326
1893	22,521	94,393
1894	16,392	109,936
1895	19,238	84,838
1896	18,717	106,709

TABLE 8.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF SLATE.

Calendar Year.	Tons.	Value.
1886	5,345	$64,675
1887	7,357	89,000
1888	5,314	90,689
1889	6,935	119,160
1890	6,368	100,250
1891	5,000	65,000
1892	5,180	69,070
1893	7,112	90,825
1894	.....	75,550
1895	.....	58,900
1896	.....	53,370

TABLE 9.

STRUCTURAL MATERIALS.

EXPORTS OF SLATE.

Calendar Year.	Tons.	Value.
1884	539	$6,845
1885	346	5,274
1886	34	495
1887	27	373
1888	22	475
1889	26	3,303
1890	12	153
1891	15	195
1892	87	2,038
1893	178	3,168
1894	187	3,610
1895	36	574
1896	30	8,913

STRUCTURAL MATERIALS.

Slate.

TABLE 10.

STRUCTURAL MATERIALS.

IMPORTS OF SLATE.

Fiscal Year.			Value.
1880			$21,431
1881			22,184
1882			24,543
1883			24,968
1884			28,816
1885			28,169
1886			27,852
1887			27,845
1888			23,151
1889			41,370
1890			22,871
1891			46,104
1892			50,441
1893			51,179
1894			29,267
1895			19,471
		Duty.	
1896	Slate and manufactures of—		
	Mantels	30 p. c	$ 334
	Roofing slate, black or blue	30 p.c., not over 75c. per square.	8,274
	" red, green or other colour	30 p.c., not over 90c. per square.	1,674
	School writing slates	30 p. c	5,042
	Slate pencils	25 "	2,660
	Slate of all kinds and manufactures of, N.E.S.	30 "	6,192
	Total slate		$24,176

TABLE 11.

STRUCTURAL MATERIALS.

Flagstones.

PRODUCTION OF FLAGSTONES.

Calendar Year.	Quantity Sq. ft.	Value.
1886	70,000	$7,875
1887	116,000	11,600
1888	64,800	6,580
1889	14,000	1,400
1890	17,865	1,643
1891	27,300	2,721
1892	13,700	1,869
1893	40,500	3,187
1894	152,700	5,298
1895	80,005	6,687
1896		6,710

TABLE 12.

STRUCTURAL MATERIALS.

IMPORTS OF FLAGSTONES.

STRUCTURAL MATERIALS.

Fiscal Year.	Tons.	Value.
1881	23	$ 241
1882	90	848
1883	10	99
1884	137	1,158
1885	205	1,756
1886	1,602	9,443
1887	1,316	10,966
1888	2,642	21,077
1889	1,669	15,451
1890	5,665	48,995
1891	3,770	36,348
1892	1,571	15,048
1893	884	8,500
1894	218	2,429
1895	15	84
1896*	Nil.	Nil.

*Flagstones, dressed. Duty—30 p.c.

Cement.—Cements embrace those materials obtained by burning or calcining certain rocks or mixtures of clay and limestone, slag, etc., which, when mixed with sand and water to form a mortar, "set" or harden without exposure to air. Cements are thus divided into two classes, natural-rock cements and artificial or Portland cements. Cement.

The principal constituent of all cements is lime. Cement rocks are limestones, either magnesian or not, having intimately mixed with them from 15 to 35 per cent clay. The presence of a small amount of alkalies is essential, and is important in determining the cement forming qualities of these rocks. When the rock has been calcined to a "clinker," it is ground to a very fine powder, and is then ready for use.

Artificial or Portland cement is manufactured by making a mixture in certain definite proportions of some lime-bearing material, such as limestone or marl, with clay, shale or slag, substances which contain silica, alumina and alkalies, and then burning it to a cement clinker. The limestone used must be free from magnesia, as this substance is injurious to Portland cement. When the clinker has been powdered, it must be allowed to air-slack for some time, and the quality gradually improves with age. It thus differs from natural-rock cement which is ready for use as soon as ground, and which has a tendency to deteriorate when exposed to the air. The finer the cement is ground the greater the amount of sand it will carry.

STRUCTURAL MATERIALS. Cement.

Portland cements are manufactured in Quebec, Ontario and British Columbia, while natural-rock cements are produced in Ontario alone. Ontario supplies about 85 per cent of the total cement production of the Dominion.

The following is a list of the cement manufacturers from whom production returns for 1896 were received:

Natural Cement.—

Thorold Hydraulic Cement Works, Thorold, Ont.

Queenston Cement Works, Niagara tp., Lincoln county, Ont.

The Toronto Lime Co., Ltd., Toronto, Ont.

Hamilton Cement Works, Hamilton, Ont.

Portland Cement.—

The Rathbun Co., Deseronto, Ont.

Owen Sound Portland Cement Co., Ltd., Shallow Lake, Ont.

The C. B. Wright Co., Hull, Que.

Crescent Cement Works, Longue Pointe, Que.

The C.P.R. Portland Cement Works, Vancouver, B.C.

Fire Cement.—

Messrs. Hardy & Dubord, Mastaï, Que.

TABLE 13.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF CEMENT.

Calendar Year.		Barrels	Value.
1887		69,843	$ 81,909
1888		50,668	35,593
1889		90,474	69,790
1890		102,216	92,405
1891		93,473	108,561
1892		117,408	147,663
1893		158,597	194,015
1894		108,142	144,637
1895		128,294	173,675
1896	Natural	70,705	60,500
	Portland	78,385	141,151
	Totals	149,090	201,651

TABLE 14.

STRUCTURAL MATERIALS.

EXPORTS OF CEMENT.

Province.	CALENDAR YEARS.				
	1892.	1893.	1894.	1895.	1896.
Ontario	$399	$ 718	$339	$662	$484
Quebec	539	386	42	30	625
Nova Scotia	.....	68	101	245	219
Totals	$938	$1,172	$482	$937	$1,328

TABLE 15.

STRUCTURAL MATERIALS.

IMPORTS OF CEMENT IN BULK OR BAGS.

Fiscal Year.	Bushels.	Value.
1880	65	$ 28
1881	579	298
1882	386	86
1883	1,759	548
1884	4,626	1,236
1885	4,598	1,315
1886	6,808	1,851
1887	5,421	1,419
1888	23,919	5,787
1889	32,818	10,668
1890	21,055	5,443
1891	11,281	2,890
1892	14,351	3,394
1893	12,534	2,909
1894	9,027	2,618
1895	.....	2,112
1896*	.....	3,672

* N.E.S. Duty—20 p.c.

STRUCTURAL MATERIALS.

Cement.

TABLE 16.

STRUCTURAL MATERIALS.

IMPORTS OF HYDRAULIC CEMENT.

Fiscal Year.	Barrels.	Value.
1880	10,034	$ 10,306
1881	7,812	7,821
1882	11,945	13,410
1883	11,659	13,755
1884	8,606	9,514
1885	5,613	5,396
1886	6,164	6,028
1887	6,160	8,784
1888	5,636	7,522
1889	5,835	7,467
1890	5,440	9,048
1891	3,515	6,152
1892	2,214	2,782
1893	4,896	8,060
1894	1,054	985
1895	5,333	7,001
Duty.		
1896 Cement, hydraulic or waterlime.....40 c. per brl.	5,688	$ 8,948

TABLE 17.

STRUCTURAL MATERIALS.

IMPORTS OF PORTLAND CEMENT.

Fiscal Year.	Barrels.	Value.
1880		$ 55,774
1881		45,646
1882		66,579
1883		102,537
1884		102,857
1885		111,521
1886		120,398
1887	102,750	148,054
1888	122,402	177,158
1889	122,273	179,406
1890	192,322	313,572
1891	183,728	304,648
1892	187,233	281,553
1893	229,492	316,179
1894	224,150	280,841
1895	196,281	242,813
Duty.		
1896 Portland or Roman .....40 c. per bbl.	204,407	$ 242,409

STRUCTURAL MATERIALS.

Cement.

TABLE 18.

STRUCTURAL MATERIALS.

PRODUCTION OF ROOFING CEMENT.

Calendar Year.	Tons.	Value.
1890	1,171	$ 6,502
1891	1,020	4,810
1892	800	12,000
1893	951	5,441
1894	815	3,978
1895	.....	3,153
1896	86	430

Lime and Bricks.—The production of lime and bricks is so much in the hands of small producers, and so widely scattered over the country that it has been found impossible to obtain complete figures for either of these industries. The totals given in tables 19 and 22 are therefore partly composed of carefully formed estimates :—

TABLE 19.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF LIME.

Lime.

Calendar Year.	Value.
1886	$283,755
1887	394,859
1888	339,951
1889	362,848
1890	412,308
1891	251,215
1892	411,270
1893	900,000
1894	900,000
1895	700,000
1896	650,000

STRUCTURAL MATERIALS.

Lime.

TABLE 20.

STRUCTURAL MATERIALS.

EXPORTS OF LIME.

Province.	Calendar Year.		
	1894.	1895.	1896.
Ontario	$ 13,208	$ 25,257	$25,500
Quebec	30,294	23,047	18,067
Nova Scotia	3,482	1,468	3,195
New Brunswick	33,830	21,891	24,058
Prince Edward Island	3	.....	.....
Manitoba	.....	30	.....
British Columbia	2,853	4	.....
	$83,670	$ 71,697	$ 70,820

TABLE 21.

STRUCTURAL MATERIALS.

IMPORTS OF LIME.

Fiscal Year.	Barrels.	Value.
1880	6,100	$ 6,013
1881	5,796	4,177
1882	5,064	5,365
1883	7,623	9,224
1884	10,804	11,200
1885	12,072	11,503
1886	11,021	9,347
1887	10,835	8,524
1888	10,142	7,537
1889	13,079	9,363
1890	8,149	5,360
1891	6,259	4,273
1892	6,132	4,241
1893	6,879	4,917
1894	6,766	4,907
1895	12,008	5,743
1896 Duty—20 p. c.	10,239	7,331

TABLE 22.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF BUILDING BRICKS.

Calendar Year.	Value.
1886	$ 873,600
1887	986,689
1888	1,036,746
1889	1,273,884
1890	1,266,982
1891	1,061,536
1892	1,251,934
1893	1,800,000
1894	1,800,000
1895	1,670,000
1896	1,600,000

TABLE 23.

STRUCTURAL MATERIALS.

EXPORTS OF BRICKS.

Province.	CALENDAR YEARS.									
	1892.		1893.		1894.		1895.		1896.	
	M	Value	M	Value	M	Value	M	Value	M	Value
		$		$		$		$		$
Ontario	1,347	8,784	552	2,462	280	1,257	1,053	4,420	266	1,473
Quebec	353	1,566	2,189	17,969	68	917	82	1,092	41	200
Nova Scotia	252	1,662	2,561	16,449	489	3,252	199	834	600	3,276
New Brunswick	10	170	767	7,185	258	1,979	321	2,319	76	729
P. E. Island	1	10	.....	.....	.....	.....	.....	.....	.....	.....
British Columbia	.....	.....	4	45	.....	.....	.....	.....	.....	.....
Totals	1,963	12,192	6,073	44,110	1,095	7,405	1,655	8,665	983	5,678

STRUCTURAL MATERIALS.

Building bricks.

TABLE 24.

STRUCTURAL MATERIALS.

IMPORTS OF BUILDING BRICKS.

Fiscal Year.	Value.
1880	$ 2,067
1881	4,281
1882	24,572
1883	14,234
1884	20,258
1885	14,632
1886	5,929
1887	2,440
1888	20,720
1889	24,585
1890	12,500
1891	9,744
1892	5,075
1893	14,108
1894	18,320
1895	4,705
1896.....Duty—20 p. c.	23,189

TABLE 25.

STRUCTURAL MATERIALS.

Terra cotta.

PRODUCTION OF TERRA COTTA.

Calendar Year.	Value.
1888	$ 49,800
1889	Not available.
1890	90,000
1891	113,103
1892	97,239
1893	55,704
1894	65,600
1895	195,123
1896	83,855

STRUCTURAL MATERIALS.

Sewer pipes.

TABLE 26.

STRUCTURAL MATERIALS.

PRODUCTION OF SEWER PIPES, &c.

Calendar Year.	Value.
1888	$266,320
1889	Not available.
1890	348,000
1891	227,300
1892	367,660
1893	350,000
1894	250,325
1895	257,045
1896	153,875

TABLE 27.

STRUCTURAL MATERIALS.

Drain tiles and sewer pipes.

IMPORTS OF DRAIN TILES AND SEWER PIPES.

Fiscal Year.		Duty.	Value.
1880			$ 33,796
1881			37,368
1882			70,065
1883			70,699
1884			71,755
1885			69,589
1886			57,953
1887			71,203
1888			101,257
1889			83,215
1890			77,434
1891			87,195
1892			59,537
1893			39,001
1894			24,625
1895			21,053
1896	Drain tile, not glazed	20 p. c.	$ 339
	Drain pipes, sewer pipes, chimney linings or vents and inverted blocks, glazed or unglazed.	35 "	18,957
	Total		$19,296

STRUCTURAL MATERIALS.

Pottery.

TABLE 28.

STRUCTURAL MATERIALS.

ANNUAL PRODUCTION OF POTTERY.

Calendar Year.	Value.
1888	$ 27,750
1889	Not available.
1890	195,242
1891	258,844
1892	265,811
1893	213,186
1894	162,144
1895	151,588
1896	163,427

TABLE 29.

Earthenware.

STRUCTURAL MATERIALS.

IMPORTS OF EARTHENWARE.

Fiscal Year.			Value.
1880			$322,333
1881			439,029
1882			646,734
1883			657,886
1884			544,586
1885			511,853
1886			599,269
1887			750,691
1888			697,082
1889			697,949
1890			695,206
1891			634,907
1892			748,810
1893			709,737
1894			695,514
1895			547,935
		Duty.	
1896	Earthenware and china ;—		
	Brown or coloured earthen and stoneware, and Rockingham ware	30 p. c.	$ 12,821
	Decorated, printed or sponged, and all earthenware, N.E.S.	30 "	180,910
	Demijohns or jugs, churns and crocks	3c. per gall. (holding capacity).	4,146
	White granite or ironstone ware, C. C. or cream coloured ware	30 p. c.	187,161
	China and porcelain ware	30 "	161,594
	Earthenware tiles	35 "	16,432
	Manufactures of earthenware, N.E.S.	30 "	12,429
	Total earthenware		$575,493

TABLE 30.

STRUCTURAL MATERIALS.

EXPORTS OF SAND AND GRAVEL.

STRUCTURAL MATERIALS.

Sand and gravel.

CALENDAR YEAR.		Tons.	Value.
			$
1893		329,116	121,795
1894		324,656	86,940
1895		277,162	118,359
1896	Ontario	224,003	77,909
	Quebec	458	1,115
	Nova Scotia	235	940
	New Brunswi k	73	146
	Manitoba	..	..
	British Columbia	...	...
	Total	224,769	80,110

TABLE 31.

STRUCTURAL MATERIALS.

EXPORTS OF SAND AND GRAVEL.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
1877	11,998	$ 2,151	1887	180,860	$ 30,307
1878	50,140	8,381	1888	260,929	38,398
1879	46,999	9,438	1889	283,044	52,647
1880	53,951	11,177	1890	342,158	65,518
1881	58,693	15,129	1891	243,724	59,501
1882	60,158	16,218	1892	297,878	85,329
1883	55,346	14,065	1893	329,116	121,795
1884	73,741	19,978	1894	324,656	86,940
1885	110,661	22,878	1895	277,162	118,359
1886	124,865	24,226	1896	224,769	80,110

INDEX.