CANADA

DEPARTMENT OF MINES

HON. P. E. BLONDIN, MINISTER; R. G. MCCONNELL, DEPUTY MINISTER.

MINES BRANCH

EUGENE HAANEL PH.D., DIRECTOR.

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

During the Calendar Year

1914

JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.

OTTAWA

GOVERNMENT PRINTING BUREAU

1915

No. 384

LETTER OF TRANSMITTAL.

DR. EUGENE HAANEL,
Director of Mines,
Department of Mines, Ottawa.

SIR,—I beg to hand you, herewith, the Annual Report on the Mineral Production of Canada, giving revised statistical information descriptive of the mining and metallurgical production in Canada during the calendar year 1914.

A preliminary report on the mineral production during 1914 was sent to press February 24, 1915, and issued within the following week.

Parts of the present report—including "Report on the Production of Iron and Steel in Canada during 1914," "Report on the Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and Other Metals, in Canada, during 1914," "Report on the Production of Coal and Coke in Canada, during 1914," and "Report on the Production of Cement, Lime, Clay Products, Stone, and Other Structural Materials in Canada, during 1914," have already been separately published.

In the preparation of this Report, Mr. A. Buisson has contributed largely to the compilation of the special chapters on gold, silver, copper, lead, nickel, zinc, and miscellaneous metallic minerals; Mr. L. L. Bolton the chapters on coal and coke, tripolite, asbestos, gypsum, mica, natural gas, petroleum, and other non-metallic products; while Mr. J. Casey has, as usual, given particular care to the compilation of the statistical tables.

Grateful acknowledgment is made of the hearty co-operation of mine and smelter operators who have almost without exception cheerfully complied with our requests, and furnished the department with statistics and information regarding their operations.

The work of this Division fell into arrears and the compilation of the Annual Report was considerably delayed through the unfortunate illness and death of Mr. Cosmo T. Cartwright.

I have the honour to be, Sir,
Your obedient servant,

John McLeish.

DIVISION OF MINERAL RESOURCES AND STATISTICS,
October 19, 1915.

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The term "ton" used throughout this report signifies a ton of 2,000 pounds; while the year referred to means calendar year, unless otherwise stated. The Government fiscal year formerly ended on the 30th of June; but now terminates on the 31st of March. This change took place in 1907, hence the fiscal period ending March 31, 1907, covers only nine months.

Statistics of exports and imports given throughout this report are compiled from the reports of Trade and Navigation, published by the Customs Department.

The term "production" used throughout this report may in general be interpreted as meaning the quantity sold or shipped. Mineral products mined or manufactured, but not sold or shipped, at the end of the year, are not included as "production." An exception to this usage will be found in reference to pig-iron, in which case the statistics of production represent the quantities made.

The value of the metallic minerals produced, whether refined in Canada or not, is calculated on the basis of the average price of the metal in some recognized market. New York prices have usually been taken as the standard. In the case of lead, however, the New York price is so much higher than that of London, that the Montreal price—about midway between these two—is now used. The value of non-metallic products is given as at the mine or point of shipment.

THE

MINERAL PRODUCTION OF CANADA

During the Calendar Year

1914

General Summary.

Broad statements of the mineral production of the country in terms of a total valuation are of chief importance from the point of view of comparison.

The term 'mineral production' is so comprehensive that there is a wide divergence in methods, not only in the compilation of quantities of mineral products, but also in the adoption of a basis of valuation. During the past five years the reports published by this Division have presented results obtained from two methods of compiling statistics of metal production, or the production of metalliferous ores. In the first method, which has been the basis of the statistics here shown since 1886, the metallic production is stated in terms of the refined or recoverable metals produced and valued at the values of the refined metals. In the other method, a total is compiled on the basis of the values of the ores produced or shipped from the mines in so far as these values are reported or are obtainable, a method which naturally gives a total aggregate value somewhat lower than that of the refined product, since the metallurgical operation is not included. There are naturally exceptions to the general principles in each case.

Another method sometimes used to arrive at a total value of production of metallic ores is to calculate the total metal contents of ores shipped, as per sampling analyses and value the metals either at the full market value, or a percentage thereof, or a deduction may be made from the total quantities of metals to allow for smelter losses.

Whether these or other methods be used to arrive at a total, the result is certain to be subject to criticism because of some difficulty or inconsistency, so that, as already stated, the total value is useful chiefly as a means of comparing the results of one year with those of another, or with the production in other countries, the records of which happen to be compiled on a similar basis.

The records of greatest importance in mineral statistics are those showing the quantities of products produced and shipped from mines and works, the home consumption, and the foreign trade, and in this respect, it has been endeavoured to make the report as complete as possible.

The method employed in the reports of this Department of presenting a total valuation on the basis of the quantities of metals recovered in smelt-

ers in Canada, or probably recovered from ores exported and valued at recognized market values is in close agreement with that used in the United States and has been found the most satisfactory in meeting the variety of conditions which arise.

The quantities thus given will differ from those which represent metal contents of ore shipped by amounts due (1) to losses in smelting (2) to the "lag" or lapse of time between the ore shipment and its treatment in the smelter. Thus, the production of refined lead during the past two years has been very much lower than that reported as contained in ores shipped from the mines, the difference being due both to smelter losses and the large accumulation of ore at the smelter.

The total value of the mineral production in Canada in 1914 was thus $128,863,075 or an average value per capita of $15.96, as compared with a total value in 1913 of $145,634,812, or an average per capita of $18.77, thus showing a falling off in 1914 of $16,771,737, or 11·52 per cent.

The records of the annual mineral production in Canada since 1886 shown in the following table indicate the rapid growth which the mineral industry has made in Canada.

Annual Mineral Production in Canada since 1886.

Year.	Value of production.	Value per capita.	Year.	Value of production.	Value per capita.
	$	$ cts.		$	$ cts.
1886	10,221,255	2 23	1901	65,797,911	12 16
1887	10,321,331	2 23	1902	63,231,836	11 36
1888	12,518,894	2 67	1903	61,740,513	10 83
1889	14,013,113	2 96	1904	60,082,771	10 27
1890	16,763,353	3 50	1905	69,078,999	11 49
1891	18,976,616	3 92	1906	79,286,697	12 81
1892	16,623,415	3 39	1907	86,865,202	13 75
1893	20,035,082	4 04	1908	85,557,101	13 16
1894	19,931,158	3 98	1909	91,831,441	13 70
1895	20,505,917	4 05	1910	106,823,623	14 93
1896	22,474,256	4 38	1911	103,220,994	14 42
1897	28,485,023	5 49	1912	135,048,296	18 27
1898	38,412,431	7 32	1913	145,634,812	18 77
1899	49,234,005	9 27	1914	128,863,075	15 96
1900	64,420,877	12 04			

The total value of the production in 1886 was $10,221,255, or about $2.23 per capita. In ten years the value had increased to $22,474,256, or $4.38 per capita, more than twice the total in 1886, and nearly twice the production per capita. The next ten years witnessed an increase to $79,286,697 in 1906, or $12.81 per capita, about 3½ times the production in 1896. From 1906 to 1913 the total production showed an increase of over 80 per cent with an increase of nearly 50 per cent in production per capita. The decrease of 1914 will no doubt be made up very soon after the war and a return to normal conditions of industrial development.

The detailed comparative statement here presented shows the production of each important product during the past two years, the production which each contributes to the total production, and the increase or decrease as the case may be of the production, in 1914 as compared with that of 1913.

Comparative Statement of Mineral Production for Years 1913 and 1914.

Product.	1913.			1914.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
	Quantity.	Value (*a*)	Per cent of total.	Quantity.	Value (*a*)	Per cent of total.	Quantity.	%	Value.	%
Metallic.		$	%		$	%			$	
Cobalt oxide..... Lbs.	660,079			899,027			+ 238,948	36·20		
Nickel oxide..... "	268,304	605,589	0·48	392,512	606,593	0·53	+ 124,208	46·30	+ 1,000	0·16
Cobalt material, mixed cobalt and nickel oxides..... "	.....	90,266		.....	79,995		.....	.....	− 10,271	11·37
Copper (*b*)..... "	76,976,925	11,753,606	8·07	75,735,960	10,301,606	8·07	−1,240,965	1·61	−1,452,000	12·30
Gold..... Ozs.	802,973	16,598,923	11·40	773,178	15,983,007	12·40	− 29,795	3·71	− 615,916	3·71
Iron pig from Canadian ore (*c*)..... *Tons	73,508	996,429	0·68	95,744	1,138,912	0·88	+ 22,236	30·25	+ 142,483	14·30
Iron ore sold for export (*k*)..... "	216,614	430,561	0·30	60,410	135,300	0·11	− 56,204	25·95	− 295,261	68·66
Lead (*d*)..... Lbs.	37,662,703	1,754,705	1·21	36,337,765	1,627,568	1·27	−1,324,938	3·52	− 127,137	7·23
Molybdenum ore..... "	.....	.....	.....	3,814	2,063	.....	+ 3,814	100·00	+ 2,063	100·00
Nickel (*e*)..... "	49,676,772	14,903,032	10·23	45,517,937	13,655,381	10·59	−4,158,835	8·37	−1,247,651	8·36
Platinum..... Crude ozs.	18	489	.....	.....	.....	.....	− 18	100·00	− 489	100·00
Silver (*f*)..... Ozs.	31,845,803	19,040,924	13·07	28,449,821	15,593,631	12·10	−3,395,982	10·66	−3,447,293	18·10
Zinc ore..... Tons	7,889	186,827	0·13	10,893	262,563	0·20	+ 3,004	38·02	+ 75,736	40·54
Total.....	.....	66,361,351	45·57	.....	59,386,619	46·15	.....	.....	−6,974,732	10·51

Comparative Statement of Mineral Production for Years 1913 and 1914.—*Continued.*

Product.	1913.			1914.			Increase (+) or Decrease (−).		Increase (+) or Decrease (−).	
	Quantity.	Value. (a)	Per cent of total	Quantity.	Value. (a)	Per cent of total	Quantity.	%	Value.	%
Non-metallic.		$	%		$	%			$	
Actinolite....Tons	66	720	.....	119	1,304	.....	+ 53	80·25	+ 584	81·11
Arsenious oxide.... "	1,692	101,463	0·07	1,737	104,015	·08	+ 45	2·66	+ 2,552	2·51
Asbestos.... "	136,951	3,830,909	2,63	96,542	2,892,266	2·22	− 40,409	29·51	− 938,643	24·50
Asbestic.... "	24,135	19,016	.....	21,031	17,540	.....	− 3,104	12·86	− 1,476	7·76
Chromite.... "	.....	.....	.....	136	1,210	.....	+ 136	.....	+ 1,210	.....
Coal.... "	15,012,178	37,334,940	25·64	13,637,529	33,471,801	25·97	−1,374,649	9·16	−3,863,139	10·35
Corundum.... "	1,177	137,036	0·09	548	72,176	·05	− 629	53·44	− 64,860	47·33
Feldspar.... "	16,790	60,795	.....	18,060	70,824	·05	+ 1,270	7·56	+ 10,029	16·50
Graphite.... "	2,162	90,282	0·06	1,647	107,203	·08	− 515	23·82	+ 16,921	18·74
Graphite, artificial.... "	1,092	.....	.....	617	.....	.....	− 475	43·49	.....	.....
Grindstones.... "	4,837	51,325	.....	3,976	54,504	·04	− 861	17·83	+ 3,179	6·19
Gypsum.... "	636,370	1,447,739	0·99	516,880	1,156,207	·89	− 119,490	18·78	− 291,532	20·14
Magnesite.... "	515	3,335	.....	358	2,240	.....	− 157	30·49	− 1,095	32·83
Manganese.... "	.....	.....	.....	28	1,120	.....	+ 28	.....	+ 1,120	.....
Mica.... "	.....	194,304	0·13	.....	109,061	·08	.....	.....	− 85,243	43·87
Mineral pigments—										
Barytes....Tons	641	6,410	.....	612	6,169	.....	− 29	4·52	− 241	3·76
Ochres.... "	5,987	41,774	.....	5,890	51,725	·04	− 97	1·62	+ 9,951	23·82
Mineral water....	.....	173,677	0·12	.....	134,111	·10	.....	.....	− 39,566	22·78
Natural gas (g)....M. Ft	20,477,838	3,309,381	2·27	21,692,504	3,484,727	2·70	+1,214,666	5·93	+ 175,346	5·30
Peat....Tons	2,600	10,100	.....	685	2,470	.....	− 1,915	73·65	− 7,630	75·54
Petroleum....Bls.	228,080	406,439	0·28	214,805	343,124	·28	− 13,275	5·82	− 63,315	15·58
Phosphate....Tons	385	3,643	.....	954	7,275	.....	+ 569	147·00	+ 3,632	99·70
Pyrites.... "	158,566	521,181	0·36	228,314	744,508	·57	+ 69,748	43·99	+ 223,327	42·85
Quartz.... "	78,261	169,842	0·12	54,148	84,583	·06	− 24,127	30·83	− 85,259	50·20
Salt.... "	100,791	491,280	0·38	107,038	493,648	·38	+ 6,247	6·20	+ 2,368	0·48
Talc.... "	12,250	45,980	.....	10,808	40,418	·03	− 1,442	11·77	− 5,562	12·10
Tripolite.... "	620	12,138	.....	650	13,000	.....	+ 30	4·84	+ 862	7·10
Total....	.....	48,463,709	33·28	.....	43,467,229	33·72	.....	.....	−4,996,480	10·31

Structural Materials and Clay Products.			$	%		$	%				$	
Cement, Portland	Bls.	8,658,805	11,019,418	7·57	7,172,480	9,187,924	7·13	−	1,486,325	17·16	−1,831,494	16·62
Clay products—												
Brick, common	No.	668,426,675	5,917,373	4·07	457,513,762	3,653,861	2·83	−	210,912,913	31·55	−2,263,512	38·25
Brick, pressed	"	116,802,053	1,458,733	1·00	93,634,858	1,115,556	·80	−	23,167,195	19·83	− 343,177	23·53
Brick, paving	"	4,208,295	75,669	.....	2,707,000	49,627	·03	−	1,501,295	35·67	− 26,042	34·42
Brick, moulded and ornamental		875,355	15,423	.....	1,554,496	23,592	.....	+	679,141	77·58	+ 8,169	52·97
Fireclay, and fireclay products		.....	142,738	0·10	.....	107,568	·08	.....		.....	− 35,170	24·54
Fireproofing architectural terra-cotta		.....	461,387	0·32	.....	405,543	·31	.....		.....	− 55,844	12·10
Kaolin	Tons	500	5,000	.....	1,000	10,000	.....	+	500	100·00	+ 5,000	100·00
Pottery		.....	53,533	.....	.....	35,371	·02	.....		.....	− 18,162	33·93
Sewer-pipe		.....	1,035,906	0·66	.....	1,104,499	·84	.....		.....	+ 68,593	6·62
Tile, drain	No.	.....	338,552	0·24	.....	366,340	·28	.....		.....	+ 27,788	8·21
Lime	Bus.	7,558,484	1,609,398	1·11	7,028,582	1,360,628	1·05	−	529,902	7·01	− 248,770	15·46
Sand-lime brick	No.	92,586,676	906,665	0·63	70,650,030	609,515	·47	−	21,936,646	23·69	− 297,150	32·77
Sand and gravel (*n*)		.....	2,258,874	1·56	.....	2,505,310	1·94	.....		.....	+ 246,436	10·91
Slate	Squares	1,432	6,444	....	1,075	4,837	.....	−	357	24·93	− 1,607	24·93
Stone—												
Granite		.....	1,653,791	1·14	.....	2,176,602	1·69	.....		.....	+ 522,811	31·61
Limestone		.....	3,204,091	2·20	.....	2,672,781	2·08	.....		.....	− 531,310	16·58
Marble		.....	249,975	0·71	.....	132,533	·10	.....		.....	− 117,442	46·98
Sandstone		.....	396,782	0·28	.....	487,140	·38	.....		.....	+ 90,358	22·77
Total		.....	30,809,752	21·15	.....	26,009,227	20·03	.....		.....	−4,800,525	15·58
Grand total		.....	145,634,812	100·00	.....	128,863,075	100·00	.....		.....	−17,078,544	11·73

*Short tons throughout. (*a*) The metals copper, lead, nickel, and silver are for statistical and comparative purposes valued at the final average value of the refined metal. Pig-iron, zinc ore, and cobalt oxides are valued at the furnace or spot, and non-metallic products at the mine or point of shipment. (*b*) Copper content of smelter products and estimated recoveries from ores exported, at 15·269 cents per pound, in 1913; and 13·602 cents per pound in 1914. (*c*) The total production of pig-iron in Canada in 1913 was 1,128,967 tons valued at $16,540,012, of which it is estimated 1,055,459 tons valued at $15,543,583 should be credited to imported ores; in 1914 the total production was 783,164 tons valued at $10,002,856, of which 687,420 tons valued at $8,863,944 are credited to imported ores. (*d*) Refined lead and lead contained in base bullion exported at 4·659 cents per pound in 1913, and 4·479 cents in 1914, the average prices in Montreal. (*e*) Nickel content of matte produced valued at 30 cents in 1913 and 1914. (Increasing quantities of nickel-copper matte are now being used in making monel metal which is sold at a price much below that of refined nickel). The value of the nickel contained in matte, as returned by the operators, was about 10 cents per pound for both years. (*f*) Estimated recoverable silver at 59·791 cents per ounce in 1913, and at 54·811 cents in 1914. (*g*) Gross returns for sale of gas. (*h*) In 1913 and 1914 figures as reported by the producers, which differ slightly from those of the Trade and Navigation reports. (*n*) Partial record only of production.

It will be observed that there has been a general falling off in the production of nearly all mine products, the notable exceptions being, pyrites, salt, and natural gas. In the case of pyrites, there is an increase of about 43 per cent, and about 6 per cent in quantity of salt produced. The quantity and value of natural gas produced shows an increase of about 6 per cent.

The falling off in the production of the metals is no doubt to be ascribed in large measure to the conditions resulting from the war. Especially is this true in the case of the metals: copper, nickel, and silver. The cutting off of markets and the closing of metal exchanges with the consequent cessation of market quotations resulted in the almost immediate closing down or restriction of operation at many properties. However, before the close of the year, many of these adverse conditions had been adjusted although prices had fallen considerably.

The actual quantities of copper and lead produced were but little less than in the previous year; nickel showed a decrease of 8 per cent, and silver of 10·6 per cent in quantity.

The total values, because of lower prices, showed much larger percentage decreases.

The iron industry was undoubtedly affected by industrial conditions of depression and shows a falling off of 30 per cent in tonnage of pig-iron made.

The total value of the metallic production in 1914 was $59,386,619 as against $66,361,351, a decrease of $6,974,732 or 10 per cent.

With the exception of lead and nickel all the chief metals showed a falling off in price in 1913 as compared with 1912. The same metals showed a further falling off in 1914. Copper dropped from 15·269 cents per pound to 13·602 cents, a decrease of 1·667. Silver dropped from 59·791 cents per ounce on the New York market to 54·811 cents, a loss of 4·980 cents per ounce. The average price of spelter in New York decreased from 5·648 cents per pound in 1913 to 5·213 cents in 1914, and tin from 44·252 cents per pound in 1913 to 34·301 cents in 1914. The average price of lead in London increased from 4·072 cents per pound in 1913 to 4·146 cents in 1914, but the Montreal and New York prices showed a falling off.

Metal Prices.

	1909.	1910.	1911.	1912.	1913.	1914.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Copper, New York	12·982	12·738	12·376	16·341	15·269	13·602
Lead " "	4·273	4·446	4·420	4·471	4·370	3·862
" London	2·839	2·807	3·035	3·895	4·072	4·146
" Montreal*	3·268	3·246	3·480	4·467	4·659	4·479
Nickel, New York	40·000	40·000	40·000	40·000	40·000	40·000
Silver, "	51·503	53·486	53·304	60·835	59·791	54·811
Spelter, "	5·503	5·520	5·758	6·943	5·648	5·213
Tin, "	29·725	34·123	42·281	46·096	44·252	34·301

*Quotations furnished by Messrs. Thomas Robertson & Company, Montreal, Que.

The total value of the non-metallic production in 1914 was $69,476,456, as against $79,273,461 in 1913, a decrease of $9,797,005 or 12·36 per cent.

The decrease was most pronounced in the case of coal, asbestos, gypsum, petroleum, and corundum, and in those products such as cement, clay products (building brick, sewer pipe, etc.), and lime, generally classed as structural materials, although there was a small increase in the production of stone quarries.

Industrial depression, the culmination of over-development and extravagant land speculation is largely responsible for this sudden reverse, although the asbestos output would be restricted by the disturbance in foreign markets, and the coal production would also be affected by the restricted metallurgical operations.

Reference has already been made to the increased production of pyrites, salt, and natural gas. There were also slight increases in the production of white arsenic, feldspar, grindstones, ochres, phosphate, and tripolite. Asbestos shows a decrease of 29 per cent in tonnage and 24 per cent in value, coal a decrease of 9 per cent in tonnage and 10 per cent in value, petroleum a decrease of 5·8 per cent in quantity and 15·6 per cent in value, clay products nearly 28 per cent in total value, and lime 7 per cent in quantity and 15 per cent in value.

Coal is still the most important mineral product in Canada in point of value of production, having contributed 26 per cent of the total in 1914. The metals came next in importance with gold contributing 12·4 per cent, silver 12·1 per cent, nickel 10·6 per cent and copper 8 per cent. The production of cement made up 7·13 per cent of the total, clay products 5·3 per cent, stone quarries 4·24 per cent, natural gas 2·7 per cent, and asbestos 2·24 per cent.

The production of pig-iron given in the general table includes only that proportion of the output of Canadian blast furnaces credited to Canadian ores. There is an important production of pig-iron from imported ores (shown in the footnotes of the general table, and in the chapter on iron and steel) and the total value thereof in 1914 was exceeded only by the production of coal, gold, silver, copper, and nickel. There is also a large production of aluminium from imported ores, for which no value is included in the general table of production.

EXPORTS AND IMPORTS.

A very large portion of the mineral production of Canada is exported for consumption or refining outside of Canada. On the other hand considerable quantities of mine products, chiefly those which have been refined or subjected to partial treatment, or in the form of manufactured goods ready for consumption, are imported.

The total value of the exports of products of the mine, including direct mine products and manufactures thereof, in 1914 was $75,533,305 compared

with $79,803,874 in 1913. This value includes for 1914, mine products to the value of $53,781,102, and manufactures valued at $21,752,203, as against mine products valued at $50,073,167, and manufactures valued at $20,730,707 in 1913.

Practically the whole of the Canadian production of copper, nickel, and silver is exported, also a very large proportion of the production of gold, asbestos, and mica. There are, as well, considerable exports of coal. These products alone contribute about 93 per cent of the value of the mine products exported. Manufactured products exported consist chiefly of iron and steel goods, agricultural implements, aluminium, calcium carbide, acetate of lime, fertilizers, and coke.

The United States is the chief destination of Canada's mine exports, about 67 per cent having been exported to that country during the fiscal year 1913-1914, and about 27 per cent to the United Kingdom.

A great variety of mineral products, chiefly in a manufactured or semi-manufactured condition, are annually imported into Canada, and these imports have been increasing with much greater rapidity than has Canada's domestic mineral production. The total value of such imports during the calendar year 1914, was $181,374,250 as compared with imports valued at $259,299,745 in 1913; $238,212,835 in 1912; $181,773,708 in 1911, and $147,305,012 in 1910. Of the total imports in 1913, over $46,000,000 was made up of the cruder forms of mineral products such as coal, diamonds unset and bort, iron ore, asphaltum, ores of metals, alumina, sand and gravel, etc., as against $58,000,000 for similar products in 1913.

The imports of iron and steel in 1914 included in this table, were valued at $79,762,262, as against $145,226,792 in 1914. Imports of the metals, aluminium, antimony, copper, gold, silver, lead, platinum, tin, and zinc, and manufactures thereof, and metallic alloys, reached a total value of over $30,000,000, as compared with a value of over $22,000,000 in 1913; petroleum and products of, $11,072,362, as against $13,238,429 in 1913; clays and clay products, $4,407,140, as against $6,760,752 in 1913.

EXPORTS.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1913 and 1914.

	1913.		1914.	
	Quantity.	Value.	Quantity.	Value.
MINE PRODUCTS.		$		$
Arsenic....Lbs.	2,606,767	107,094	3,751,900	132,567
Asbestos....Tons	103,812	2,848,047	81,081	2,298,646
Asbestos sand.... "	24,766	138,737	18,991	108,548
Coal.... "	1,562,020	3,961,351	1,423,126	3,880,175
Copper, fine in ore, etc....Lbs.	81,879,080	9,479,480	68,830,059	7,130,778
" black or coarse and in pigs.... "	771,280	123,431	6,581,564	908,201
Feldspar....Tons	15,966	62,767	18,072	74,100
Gold....$	.....	12,770,838	.....	15,242,200
Gypsum....Tons	417,302	504,383	345,830	404,234
Lead, in ore, etc....Lbs.	329,960	9,136	246,100	2,681
Lead, pig, etc.... "	.....	.....	510,573	19,507
Mica.... "	817,152	240,775	669,163	178,940
Mineral pigments.... "	3,912,400	18,931	3,554,900	22,311
Mineral water....Gals.	3,640	526	2,287	599
Nickel, in ore, etc....Lbs.	49,459,017	5,195,560	46,528,327	5,149,427
Oil, mineral, crude, etc....Gals.	3,650	379	3,996	362
Oil, refined.... "	24,273	3,188	3,922	826
Ores—				
Corundum....Tons	1,077	121,741	947	87,740
Iron.... "	126,124	426,681	135,451	360,974
Manganese.... "	8	303	30	750
Other ores.... "	10,835	658,808	12,770	782,437
Phosphates.... "	.....	.....	247	677
Platinum....Ozs.	158	7,929	43	2,161
Plumbago....Cwt.	32,842	85,368	18,375	50,528
Pyrites....Tons	46,066	211,640	89,999	377,985
Salt....Cwt.	4,609	3,047	9,527	5,229
Sand and gravel....Tons	644,633	440,956	952,370	802,358
Silver....Ozs.	37,371,569	21,441,220	28,020,089	15,584,813
Stone, building....Tons	191,981	82,646	63,009	46,198
" ornamental.... "	1,942	687	231	5,607
" crushed.... "	4,814	3,126	25,130	18,153
" for manufacture of grindstones.... "	.....	.....	54	294
Other products of the mine....	.....	124,392	.....	101,096
Total mine products....	.....	59,073,167	.....	53,781,102

EXPORTS.

Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1913 and 1914.—*Continued.*

		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
MANUFACTURES.					
Acetate of lime	Lbs.	14,902,990	322,069	16,052,255	282,146
Acid, sulphuric	"	2,494,740	15,295	7,485,509	45,612
Agricultural implements—					
Cultivators	No.	7,795	201,758	6,030	146,668
Drills	"	10,364	634,121	3,961	259,701
Harrows	"	7,300	127,482	6,252	92,556
Harvesters	"	23,194	2,439,319	19,474	2,015,996
Hay rakes	"	9,846	247,445	6,524	196,519
Mowing machines	"	24,044	847,253	21,457	725,831
Parts of	$	.....	915,142	.....	712,414
Ploughs	No.	15,450	465,505	12,896	324,349
Reapers	"	5,604	317,716	3,919	223,228
Seeders	"	.....	.....	32	1,810
Threshing machines	"	1,928	712,270	1,965	799,307
All other	"	.....	503,235	.....	290,520
Aluminium, in bars	Cwt.	130,150	1,762,214	145,108	2,364,907
" manufactures of	$	.....	8,203	.....	5,571
Asbestos, manufactures of	"	.....	73,446	.....	94,538
Bricks	M	977	8,579	1,486	11,871
Calcium carbide	Lbs.	5,163,577	153,702	15,447,014	470,387
Cement	$	.....	1,739	.....	2,223
Clay, manufactures of	"	.....	27,201	.....	26,866
Coke	Tons	68,235	308,410	67,838	306,117
Earthenware, and all manufactures of	$	.....	16,553	.....	9,336
Fertilizers	$	.....	2,439,923	.....	2,390,494
Grindstones, manufactured	$	.....	54,867	.....	24,113
Gypsum and plaster ground	$	.....	5,795	.....	35,490
Iron and steel:—					
Castings, n.e.s	$	.....	61,362	.....	24,218
Gas buoys and parts of	$	.....	35,462	.....	21,009
Wire and wire nails	Cwt.	.....	.....	193,255	355,781
Hardware, tools, etc	$	.....	101,990	.....	95,497
" n.e.s	$	.....	70,767	.....	190,763
Machinery (Linotype machines)	$	.....	9,631	.....	5,562
" n.e.s	$	.....	435,333	.....	344,689
Pig-iron	Tons	6,326	351,646	14,198	201,145
Scrap iron and steel	Cwt.	911,111	483,813	708,107	446,337
Sewing machines	No.	8,122	114,438	2,109	31,392
Steel and manufactures of	$	.....	1,051,004	.....	2,931,908
Stoves	No.	1,371	23,858	4,198	25,149
Typewriters	"	3,048	201,763	3,055	200,441
Vehicles—					
Automobiles	"	5,997	3,395,382	5,621	3,011,327
" parts of	$	.....	210,623	.....	384,428
Bicycles	No.	90	8,058	111	10,021
" parts of	$	.....	16,901	.....	3,973
Washing machines	"	.....	15,872	.....	33,986
Ferro-Silicon and Ferro Compounds	Tons	.....	.....	4,865	285,221
Lime	$	.....	29,234	.....	16,927
Metals:—					
Brass, old and scrap	Cwt.	32,144	293,572	21,209	196,710
Copper "	"	24,972	324,903	19,871	231,710
Metallic shingles, etc	$	.....	119,673	.....	105,663
Metals, n.o.p	$	.....	399,792	.....	393,829
Mineral and aerated waters (in bottles)	$	.....	970	.....	1,768
Naphtha and gasoline	Gals.	17,875	4,284	43,023	11,607
Oil, n.o.p	"	634,861	171,663	455,867	104,179
Phosphorus	Lbs.	534,340	73,395	610,350	92,303
Plumbago, manufactures of	$	.....	24,284	.....	72,718
Stone, building	$	.....	.....	.....	370
" ornamental	$	.....	7,381	.....	1,752
Tar	$	.....	30,628	.....	36,719
Tin, manufactures of	$	.....	53,783	.....	24,531
Total manufactures	$	.....	20,730,707	.....	21,752,203
Grand total	$	.....	79,803,874	.....	75,533,305

EXPORTS.

Showing Destination of Mine Products during the Fiscal Years, 1911-12, 1912-13, and 1913-1914.

Destination.	1911–12. Value.	1912–13. Value.	1913–14. Value.
British Empire.	$	$	$
United Kingdom	5,555,599	12,066,622	16,027,128
Australia and Tasmania	178,260	73,283	92,457
Bermuda	62,494	5,315	1,192
British South Africa	10,460	33,415	13,863
" Guiana	1,492	37,983	23,351
" W. Indies	13,635	15,383	3,343
Hong Kong	434,202	491,121	1,058,229
Newfoundland and Labrador	618,766	498,989	649,682
New Zealand	1,050	948	.....
Total British Empire	6,875,958	13,223,059	17,869,245
Other Countries.			
Alaska	305,086	327,325	102,383
Argentina	24,313	66,315	19,206
Austria-Hungary	1,410	32,474	74,200
Belgium	101,661	141,924	258,180
Brazil	.....	54,760	.....
Chili	19,669	.....	.....
China	103,904	511,155	162,034
Cuba	21,590	8,852	19,253
Denmark	448	877	365
France	74,487	114,370	167,974
French Africa	.....	2,127	.....
Germany	248,925	172,966	618,201
Greece	.....	.....	200
Hayti	.....	843	.....
Holland	5,260	27,529	185,158
Italy	4,358	7,430	16,704
Japan	58,773	54,976	32,626
Mexico	159,345	69,946	.....
Miquelon and St. Pierre	30,205	47,093	20,476
Norway	.....	.....	100
Peru	3,682	.....	.....
Philippines	2,824	.....	.....
Portugal	.....	.....	1,322
Portuguese Africa	20,340	.....	.....
Roumania	.....	4,791	.....
Russia in Europe	.....	.....	140
San Domingo	1,000	.....	.....
Spain	1,471	.....	10
Sweden	.....	.....	150
Switzerland	159	.....	.....
United States	33,259,580	42,541,751	39,491,127
Uruguay	68	31,983	.....
Total other countries	34,448,558	44,219,487	41,169,809
Grand total	41,324,516	57,442,546	59,039,054

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products —Calendar Years 1913 and 1914.

Products.	1913. Value.	1914. Value.
	$	$
Alumina	614,713	571,419
Alum, alum cake, and chloralum	198,613	188,918
Aluminium and manufactures	745,694	860,351
Antimony regulus	49,408	47,498
Antimony salts	2,421	10,217
Arsenic, oxide and sulphide of	18,820	1,005
Asbestos	520,082	282,053
Asphaltum	905,829	712,980
Bells and gongs	130,351	99,898
Bismuth	4,940	3,927
Blanc fixe and satin white	38,043	39,849
Blast furnace slag	71,114	20,736
Borax	104,787	103,975
Brick and tile	1,928,735	1,296,657
Brick, fire, of a kind not made in Canada, and n.o.p.	1,192,857	690,133
Bromine and bromides	385	997
Burrstones	1,784	16
Cement, Portland, and manufactures	427,032	159,691
Chalk, Cornwall stone, feldspar, fluorspar, etc.	164,879	113,211
Clays	324,290	288,128
Coal, anthracite, bituminous, slack, and run of mine	47,949,119	39,801,498
Coal tar and coal pitch	225,765	198,283
Coke	2,180,830	1,585,259
Coke, ground for electric batteries	9,942	13,115
Copper and manufactures of	7,414,610	4,256,901
Cryolite	33,487	60,517
Crucibles, clay or plumbago	73,971	49,913
Chloride of lime	115,614	138,619
Cyanides of potassium, sodium, cyanogen, or cpd of bromine	217,472	309,913
Diamonds, unset, and bort	3,223,711	2,190,786
Earthenware	3,314,870	2,192,222
Earths, crude	9,527	3,992
Electric carbons	98,944	55,880
Emery	184,649	118,008
Fertilizers, compound or manufactured	505,904	677,174
Flint, quartz, silex, etc.	74,529	63,433
Foundry facings	24,226	11,372
Fullers earth	13,190	12,338
Fossils	3,237	4,477
Gannister	1,776	595
Gold and silver and manufactures of	2,736,517	15,777,804
Graphite and manufactures of	82,262	50,279
Grindstones	145,247	98,872
Gypsum and plaster of Paris	188,252	75,031
Hydrofluosilicic acid	46,517	41,576
Iron and steel—Total, 1913, $145,226,792 1914, 79,762,262		
Pig-iron	3,247,405	982,189
Ferro products and chrome steel	970,100	560,686
Ingots, blooms, billets, puddled bars, etc.	1,212,314	259,703
Scrap iron and scrap steel	1,488,255	337,406
Plates and sheets	13,965,865	7,576,312
Tin plates and sheets	3,954,615	3,151,385
Bars, rods, hoops, bands, etc.	10,195,280	5,138,193
Structural iron and steel	12,739,954	4,214,520
Rails and connexions	5,120,830	1,116,773
Pipes and fittings	847,922	395,466
Nails and spikes	360,489	210,098
Wire	3,688,660	3,205,635
Forging castings and manufactures	2,090,533	1,375,590
Other iron and steel products	85,344,750	51,238,306
Iron ore	3,877,824	2,387,358
Iron sand	10,168	13,743
Kainite	1,970	13,337
Lead and manufactures; litharge	1,215,433	1,042,538
Lime	238,271	211,123
Lithographic stone	7,152	4,107
Manganese, oxide of	46,990	42,287

IMPORTS.

Imports of Products of the Mine and Manufactures of Mine Products Calendar Years 1913 and 1914—*Continued.*

Products.	1913. Value.	1914. Value.
	$	$
Magnesia	12,226	16,429
Meerschaum	111	372
Mercury or quicksilver, cinnabar	109,493	97,449
Metallic alloys:—		
Babbitt metal	41,112	26,489
Brass and manufactures of	4,667,768	2,868,464
Britannia metal	43,417	33,080
German silver, nickel, and nickel silver	249,192	238,612
Type metal	1,981	1,500
Mineral and bituminous substances	198,519	146,763
Mineral water, including aerated water	257,153	199,327
Nickel anodes	8,512	12,640
Ochres, etc	283,554	278,064
Ores of metals, n.o.p., cobalt ore	894,989	574,690
Paraffin wax	72,351	57,527
Paraffin candles	37,546	44,874
Petroleum and products of	13,238,429	11,072,362
Phosphate (fertilizer)	16,070	20,220
Platinum and manufactures of	145,674	79,614
Potash and manufactures of	414,165	343,004
Precious stones	360,473	177,168
Pumice	17,861	16,976
Salt	565,283	540,881
Saltpetre	81,797	108,784
Sand and gravel	440,343	224,759
Slate and manufactures of	235,474	213,256
Sand paper	171,516	138,415
Soda products: barilla, bichromate, caustic, salt, and salt cake	998,993	960,670
Stone and manufactures of (including marble)	1,640,849	1,252,869
Soda, nitrate of	1,645,320	604,952
Sulphate of iron (copperas)	5,036	5,517
Sulphur and phosphorus	638,970	877,628
Sulphuric acid	4,054	7,149
Talc	10,706	8,983
Tin and manufactures of (including tinware)	3,118,760	2,023,329
Whiting and prepared chalk	151,380	134,511
Zinc and manufactures of	1,576,943	1,210,652
	259,299,745	181,374,250

(*b*) Nine months only.

METALLIC ORES AND PRODUCTS.

Antimony.—There has been no production of antimony during the past three years. The imports of antimony or regulus thereof, in 1914, were 648,516 pounds, valued at $47,498, and of antimony salts, 45,634 pounds, valued at $10,217, or a total value of imports of $57,715. In 1913, the imports were antimony and regulus, 667,050 pounds, valued at $49,408; and antimony salts, 23,649 pounds, valued at $2,421, or a total value of imports of $51,829.

Cobalt.—Cobalt oxide, cobalt material, and cobalt residues are being produced in Canadian smelters and reduction mills.

The production of cobalt oxide in 1914 was 899,027 pounds, valued at $571,710, and of mixed oxides of cobalt and nickel together with cobalt residues 2,079,001 pounds, containing 242,572 pounds of metallic cobalt and valued at $79,995. During 1913 the production of cobalt oxide was 660,079 pounds valued at $525,028, and of mixed oxides and cobalt residues 3,216,000 pounds, containing 403,882 pounds of cobalt and valued at $90,266.

Copper.—The production of copper contained in blister, matte, or ore, which was practically all exported, was 75,735,960 pounds in 1914, valued at $10,301,606, as compared with 76,976,925 pounds in 1913, valued at $11,753,606.

The exports of copper in 1914 were reported as 77,398,723 pounds, valued at $8,270,689 as against exports in 1913 of 85,147,560 pounds, valued at $9,927,814. The total imports of copper in 1914 were valued at $4,256,901 and included crude and manufactured copper, 26,280,815 pounds valued at $3,983,322, and other manufactures of copper, valued at $273,579. In 1913 the total value of the imports was $7,414,610 including 41,011,961 pounds of crude and manufactured copper, valued at $6,935,822, and copper sulphate and other manufactures, valued at $478,788.

Gold.—The total value of the production of gold in 1914 was $15,983,007 representing 773,178 fine ounces, as compared with $16,598,923 representing 802,973 fine ounces of metal in 1913.

The Yukon placer production in 1914 was 247,940 fine ounces, valued at $5,125,374.

Of the total production in 1914 about $5,687,501 were derived from alluvial workings; $6,051,968 in bullion from milling ores, and $4,243,538 from ores and concentrates sent to smelters. In 1913 about $6,346,072 were derived from alluvial workings: $5,185,544 as bullion from milling ore and $5,067,307 from ores and concentrates sent to smelters.

The exports of gold-bearing dust, quartz, nuggets, and gold in ore, etc., in 1914 were valued at $15,242,200, as against $12,770,838 in 1913.

The imports of gold bullion during the calendar year 1914 were $14,534,482, of gold coin $117,700,824, and of manufactures of gold and silver $614,043.

Pig-Iron.—The total production of pig-iron in Canadian blast furnaces in 1914 was 783,164 tons valued at $10,002,856 of which it is estimated 687,420 tons valued at $8,863,944 should be credited to imported ores, and 95,744 tons valued at $1,138,912 to domestic ores. In 1913 the total production was 1,128,967 tons, valued at $16,540,012, of which it is estimated 1,055,459 tons, valued at $15,543,583, should be credited to imported ores, and 73,508 tons, valued at $996,429, to domestic ores.

The exports of pig-iron, including ferro-products, in 1914, were 19,063 tons, valued at $486,366, as against 6,326 tons valued at $351,646, in 1913.

The imports of pig-iron in 1914 were 78,594 tons, valued at $981,107; ferro-manganese, etc., 22,147 tons, valued at $549,485, and charcoal pig-iron 86 tons, valued at $1,082, as compared with imports in 1913 of pig-iron 235,843 tons, valued at $3,234,877; ferro-manganese, etc., 30,355 tons, valued at $940,443, and charcoal pig 926 tons, valued at $12,528.

The total exports of iron and steel and manufactures thereof, in 1914 were valued at $14,391,746, as against $13,999,149 in 1913. The imports of iron and steel and manufactures thereof during the calendar year 1914 were valued at $79,762,262, as compared with $145,226,972 during the calendar year 1913.

Iron Ore.—The total shipments of iron ore from Canadian mines in 1914 were 244,854 tons, valued at $542,041, as compared with 307,634 tons, valued at $629,843 in 1913. The quantity of imported iron ore used in Canada in 1914 was about 1,324,326 tons, as compared with 2,110,828 tons of imported ore used in 1913.

Lead.—The production of lead in 1914 was 36,337,765 pounds, valued at $1,627,568, as against 37,662,703 pounds, valued at $1,754,705 in 1913. The exports of lead in 1914 were pig lead 510,573 pounds valued at $19,507, lead in ore, etc., 246,100 pounds, valued at $2,681; the exports in 1913 were, lead in ore, etc., 329,960 pounds, valued at $9,136. The total value of the imports of lead and manufactures of, in 1914 was $1,042,538, as compared with imports in 1913, valued at $1,215,433.

Molybdenum.—There was a small production of molybdenum in 1914 equivalent to 3,814 pounds of concentrate, valued at $2,063.

Nickel.—The production of nickel contained in nickel-copper matte produced in Canada and exported for refinement was, in 1914, 45,517,937 pounds, valued at $13,655,381, as compared with a production of 49,676,772 pounds, valued at $14,903,032 in 1913. During 1914 there were smelted 947,053 tons of ore, producing 46,396 tons of matte, as against 823,403 tons of ore, producing 47,150 tons of matte, in 1913. Small quantities of nickel-oxide are also produced in connexion with the treatment of the Cobalt District silver ores, the production in 1914 being 392,512 pounds, valued at $34,883. The exports of nickel contained in ore, matte, etc., during 1914 were 46,528,327 pounds, valued at $5,149,427; being 10,291,979 pounds

to Great Britain; 36,015,642 pounds to the United States, and 220,706 pounds to other countries.

In 1913 the exports were 49,459,017 pounds, valued at $5,195,560; being 5,164,512 pounds to Great Britain, 44,224,119 pounds to the United States, and 70,386 pounds to other countries. The imports of nickel, nickel-silver in ingots, bars, sheets, etc., in 1914, were 619,852 pounds, valued at $155,427, as against 592,491 pounds, valued at $162,520 imported in 1913.

Silver.—The production of silver contained in bullion, or estimated as recovered from mattes and ores, etc., exported, was in 1914, 28,449,821 fine ounces, valued at $15,593,631, as compared with 31,845,803 fine ounces, valued at $19,040,924, in 1913. The exports of silver contained in ores, mattes, etc., in 1914 were 28,020,089 ounces, valued at $15,584,813; as against exports of 37,371,569 ounces, valued at $21,441,220, in 1913. The imports of silver bullion during the calendar year 1914 were valued at $629,279, as compared with bullion imports of $840,245 in 1913.

Zinc.—The shipments of zinc ore in 1914 were 10,893 tons, valued at $262,563, as compared with shipments of 7,889 tons, valued at $186,827. The total value of the imports of zinc and manufactures of zinc, in 1914, was $1,210,652, as compared with imports, valued at $1,576,943 in 1913.

NON-METALLIC PRODUCTS.

Actinolite.—A production of 119 tons, valued at $1,304, was reported in 1914, as compared with 66 tons valued at $720 in 1913.

Arsenic.—Smelter returns show a production in 1914 of 1,737 tons of arsenious oxide, valued at $104,015, as compared with a production in 1913 of 1,692 tons, valued at $101,463.

The exports of arsenic in 1914 were 1,876 tons, valued at $132,567, as against 1,303 tons, valued at $107,094 in 1913. The imports of sulphide of arsenic in 1914 were 11,494 pounds, valued at $756 as against 455,394 pounds, valued at $17,759 in 1913.

Asbestos.—The shipments of asbestos in 1914 were 96,542 tons, valued at $2,892,266, and of asbestic 21,031 tons, valued at $17,540.

The shipments in 1913 were, of asbestos, 136,951 tons, valued at $3,830,909, and of asbestic, 24,135 tons, valued at $19,016. The shipments in 1914 consisted of 4147·9 tons of crude asbestos, valued at $773,193, and 92,394 tons of mill stock, valued at $2,119,073. Considerable quantities both of crude and of mill stock were held in manufacturers' hands at the close of the year.

Exports in 1914 were 81,081 tons, valued at $2,298,646, as against 103,812 tons, valued at $2,848,047 in 1913. There was also exported in 1914, 18,991 tons of asbestic sand, valued at $108,548.

Imports of asbestos and manufactures of asbestos in 1914 were valued at $282,053, and in 1913, $520,082.

Chromite.—There was a small shipment of chromite in 1914 amounting to 136 tons, valued at $1,210.

Coal.—The production of coal in 1914 was 13,637,529 tons, valued at $33,471,801, as against 15,012,178 tons, valued at $37,334,940 in 1913.

The exports of coal in 1914 were 1,423,126 tons, valued at $3,880,175, as compared with 1,562,020 tons, valued at $3,961,351, in 1913. The total imports of coal in 1914 were 14,721,057 tons, valued at $39,801,498, as against imports in 1913 of 18,201,953 tons, valued at $47,949,119.

The 1912 imports included 7,776,415 tons of bituminous round and run of mine coal, valued at $14,954,321; 4,435,010 tons of anthracite and anthracite dust, valued at $21,241,924; and 2,509,632 tons of bituminous slack, such as will pass through a ¾″ screen, valued at $3,605,253. The consumption of coal in 1914 was approximately 26,852,323 tons, as against 31,582,545 tons in 1913.

The 1913 imports included 10,743,473 tons of bituminous round and run of mine coal, valued at $21,756,658; 4,642,057 tons of anthracite and anthracite dust, valued at $22,034,839; and of bituminous slack, such as will pass through a ¾″ screen, 2,816,423 tons, valued at $4,157,622.

Coke.—The total quantity of oven coke made in 1914 was 1,015,253 tons, the quantity sold or used was 1,023,860 tons, valued at $3,658,514, as compared with 1,517,133 tons made, in 1913, and 1,530,499 tons sold or used, valued at $5,919,596. The quantity of coal charged to coke ovens in 1914 was 1,541,913 tons, as compared with 1,541,547 tons in 1913. The exports of coke in 1914 were 67,838 tons, valued at $306,117, and in 1913 68,235 tons, valued at $308,410.

The imports of coke in 1914 were 553,046 tons, valued at $1,585,259, as compared with imports of 723,906 tons, valued at $2,180,830 in 1913.

Corundum.—The total sales of grain corundum in 1914 were 548 tons, valued at $72,176, as compared with sales of 1,177 tons, valued at $137,036 in 1913. Exports for 1914 were 947 tons, valued at $87,740.

Feldspar.—Shipments of feldspar in 1914 were 18,060 tons, valued at $70,824, as compared with 16,790 tons, valued at $60,795 in 1913. The exports are recorded as 18,072 tons, valued at $74,100, in 1914, and 15,996 tons, valued at $62,767 in 1913.

Fluorspar.—No production has been reported during the past two years. Canadian furnaces in 1914 used 8,845 tons of fluorspar. Imports of hydrofluosilicic acid were 1,384,087 pounds, valued at $41,576.

Graphite.—Shipments of crude and milled graphite during 1914 totalled 1,647 tons, valued at $107,203, as against 2,162 tons, valued at $90,282 in 1913. The production of artificial graphite in 1914 was reported as 617 tons, as compared with 1,092 tons in 1913.

Exports of plumbago in 1914 are reported as 919 tons, valued at $50,528, and manufactures of plumbago, valued at $72,718. Exports in 1913 were:

plumbago 1,642 tons, valued at $85,368, and manufactures of plumbago valued at $24,284.

Imports of graphite in 1914 were valued at $100,192, and included: plumbago not ground $801; blacklead $6,798; plumbago ground and manufactures of, $42,680; and crucibles of clay or plumbago $49,913. In 1913 the imports were valued at $156,233, and included: plumbago not ground $9,375; blacklead $8,633; plumbago ground and manufactures of, $64,254; and crucibles of clay or plumbago, $73,971.

Grindstones.—The production of grindstones, scythestones, and wood pulpstones, in 1914 was 3,976 tons, valued at $54,504, as compared with 4,837 tons, valued at $51,325 in 1913. The exports in 1914 were: manufactured grindstones valued at $24,113, and stone for the manufacture of grindstones 54 tons, valued at $294. The exports in 1913 were: manufactured grindstones, valued at $54,867. The imports of abrasives in 1914 included: grindstones valued at $98,872; burrstones $16; emery in bulk, crushed or ground $29,127; manufactures of emery, carborundum, etc., $88,881; pumice stone $16,976; also iron sand, $13,743; sandpaper $138,415. The 1913 imports comprised: grindstones, valued at $145,247; burrstones $1,784; emery in bulk, crushed or ground $48,995; manufactures of emery, carborundum, etc., $135,654; pumice stone, $17,861; also iron sand $10,168; sandpaper, $171,516.

Gypsum.—The total shipments of gypsum, crude and calcined, in 1914, were 516,880 tons, valued at $1,156,507, as compared with shipments of 636,370 tons, valued at $1,447,739 in 1913. The tonnage of gypsum mined or quarried in 1914 was 579,841, and the quantity calcined 138,212 tons.

In 1913, 684,726 tons of gypsum were mined or quarried, and 147,532 tons calcined. The shipments in 1914 included: crude lump 351,729 tons, valued at $400,521; crude crushed 49,441 tons, valued at $61,686; fine ground 6,097 tons, valued at $14,496; and calcined gypsum 109,613 tons, valued at $679,504. The shipments in 1913 included: crude gypsum 499,460 tons, valued at $615,493; ground gypsum 10,281 tons, valued at $20,576; and calcined gypsum 126,629 tons, valued at $811,670.

The exports of gypsum in 1914 were: 345,830 tons of crude gypsum, valued at $404,234, and gypsum ground or calcined, valued at $35,490. The 1913 exports were 417,302 tons of crude gypsum, valued at $504,383, and gypsum ground, or calcined, valued at $5,795.

The imports of gypsum in 1914 were valued at $75,031,and included: crude gypsum, 3,572 tons, valued at $16,448; ground gypsum, 536 tons, valued at $4,301; and plaster of Paris, 7,739 tons, valued at $54,282.

The imports of gypsum in 1913 were valued at $188,252, including: crude gypsum, 4,522 tons, valued at $21,763; ground gypsum 2,496 tons, valued at $11,770; and plaster of Paris 20,113 tons, valued at $154,719.

Magnesite.—Shipments of magnesite in 1914 were 358 tons, valued at $2,240, and in 1913, 515 tons, valued at $3,335. Imports of magnesia in 1914 were 254,283 pounds, valued at $16,429.

Manganese.—Shipments of manganese in 1914 were reported as 28 tons, valued at $1,120. The exports in 1914 were 30 tons, valued at $750, as against exports in 1913 of 8 tons, valued at $303. The 1914 imports included 1,702 tons of manganese oxide, valued at $42,287, as compared with 2,588 tons, valued at $46,990 in 1913.

Mica.—The value of the mica production in 1914, as reported by mine operators, was $109,061, as compared with $194,304 in 1913. The exports of mica in 1914 were 669,163 pounds, valued at $178,940, as against 817,152 pounds, valued at $240,775 in 1913.

Mineral Pigments.—Shipments of barytes in 1914 were 612 tons, valued at $6,169, as against 641 tons, valued at $6,410 in 1913. The production of ochres, iron oxides, in 1914 was 5,890 tons, valued at $51,725, as compared with 5,987 tons, valued at $41,774 in 1913.

The exports of iron oxides in 1914 were 1,777 tons, valued at $22,311, as against 1,956 tons, valued at $18,931 in 1913. The imports in 1914 were: ochres and ochrey earth and raw siennas, 1,532 tons, valued at $33,197; and oxides, dry fillers, fireproof umbers, and burnt siennas 4,023 tons, valued at $244,867, as compared with imports in 1913, comprising: ochres and ochrey earth and raw siennas 1,663 tons, valued at $43,119; and oxides, dry fillers, fireproof umbers, and burnt siennas 4,387 tons, valued at $240,435.

Mineral Water.—The value of the production of mineral water in 1914 for which returns were received was $134,111, as compared with a value of $173,677 in 1913. The imports of mineral and aerated waters in 1914 were valued at $199,153, as against a value of $257,153, in 1913. The exports in 1914 were valued at $1,367, as against $1,496 in 1913.

Natural Gas.—The production of natural gas in 1914 was 21,693 million cubic feet, valued at $3,484,727, as compared with 20,478 million cubic feet, valued at $3,309,381 in 1913.

Peat.—Shipments of peat for fuel purposes in 1914 were 685 tons, valued at $2,470, as compared with 2,600 tons, valued at $10,100 in 1913.

Petroleum.—The production of crude petroleum shows a further falling off in 1914, the production being 214,805 barrels, or 7,518,168 gallons, valued at $343,124; as compared with 228,080 barrels, or 7,982,798 gallons, valued at $406,439 in 1913.

Exports of refined oil in 1914 were 2,922 gallons, valued at $826, and 24,273 gallons, valued at $3,188 in 1913. There was an export in 1914 of naphtha and gasoline of 43,023 gallons, valued at $11,607, crude mineral oil 3,996 gallons, valued at $362, and also an export of other oils n.e.s., of 455,867 gallons, valued at $104,179, which may have included products of petroleum.

While the production has been decreasing the imports have been increasing; the total imports of petroleum oils, crude and refined in 1914 were 224,487,973 gallons, valued at $11,072,362, and 1,594,236 pounds of paraffin wax and candles, valued at $102,401. The oil imports included; crude oil 195,207,210 gallons, valued at $5,750,971; refined and illuminating oils 12,833,065 gallons, valued at $970,481; gasoline 24,396,401 gallons, valued at $2,744,368; lubricating oils 5,767,676 gallons, valued at $940,143, and other petroleum products 6,283,621 gallons, valued at $663,407.

The total imports in 1913 were 222,779,028 gallons, valued at $13,238,429, in addition to 1,628,837 pounds of paraffin wax and candles, valued at $109,897. The oil imports included: crude oil 162,061,926 gallons, valued at $5,250,835; refined and illuminating oils 19,393,627 gallons, valued at $1,394,440; gasoline 29,525,180 gallons, valued at $4,822,941; lubricating oils 6,789,451 gallons, valued at $1,172,986, and other petroleum products 5,008,844 gallons, valued at $597,227.

Phosphate.—Shipments of phosphate or apatite in 1914 were 954 tons, valued at $7,275, as compared with 385 tons, valued at $3,643 in 1913. Exports in 1914 were reported as 247 tons valued at $677. There was an export of phosphorus in 1914 of 610,350 pounds, valued at $92,303, while in 1913, 5,343,340 pounds, valued at $73,395 were exported. The imports of phosphate rock (fertilizer) in 1914 were valued at $20,220; phosphorus 20,994 pounds valued at $6,760, and manufactured fertilizers valued at $677,174. The imports in 1913 included rock (fertilizer) valued at $16,070; phosphorus 17,600 pounds, valued at $5,856; and manufactured fertilizers valued at $505,904.

Pyrites.—The production of pyrites in 1914 was 228,314 tons, valued at $744,508, as compared with 158,566 tons, valued at $521,181 in 1913. The exports in 1914 were 89,999 tons, valued at $377,985, as against exports of 46,066 tons, valued at $211,640 in 1913. The imports of brimstone or sulphur in 1914 were 41,954 tons, valued at $870,868, as against 30,433 tons, valued at $633,114 in 1913.

Quartz.—The production of quartz in 1914 was reported as 54,148 tons, valued at $84,583, as compared with a production in 1913 of 78,261 tons, valued at $169,842. There were imported during 1914, 870 tons of silex of crystallized quartz, valued at $15,502, and 3,835 tons of flint, valued at $47,931; and in 1913, 690 tons of silex, valued at $13,811, and 6,708 tons of flint, valued at $60,718.

Salt.—The total sales of salt in 1914 were 107,038 tons, valued at $493,648, (exclusive of packages). The value of the packages used was $278,897. In 1913 the sales were 100,791 tons, valued at $491,280, and value of packages used $262,479.

Exports of salt in 1914 were 952,700 pounds, valued at $5,229, and in 1913, 460,900 pounds, valued at $3,047. The total imports of salt in 1914 were valued at $540,881, and included: 33,893 tons, valued at $151,108,

subject to duty; and 108,753 tons, valued at $389,773, duty free. The 1913 imports were valued at $565,283, and included: 31,508 tons, valued at $147,775, subject to duty; and 112,939 tons, valued at $417,508, duty free.

Among the imports of soda products in 1914 are included: soda ash or barilla 59,508,897 pounds, valued at $392,559, soda bichromate 583,467 pounds, valued at $27,998; caustic soda in packages of 25 pounds or more, 18,436,827 pounds, valued at $314,278; sal soda 9,519,177 pounds, valued at $55,502; nitrate of soda or cubic nitre 27,565,027 pounds, valued at $604,952, and sulphate of soda 38,175,604 pounds, valued at $170,333.

Talc.—The production of talc in 1914 was 10,808 tons, valued at $40,418 as against 12,250 tons, valued at $45,980 in 1913. Imports of talc for the calendar year 1914 were 584 tons, valued at $8,983.

Tripolite.—There were 650 tons of tripolite, valued at $13,000, shipped in 1914.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Cement.—The total sales of cement in 1914 were 7,172,480 barrels, valued at $9,187,924, as against 8,658,805 barrels, valued at $11,019,418 in 1913. The exports of cement in 1914 were valued at $2,223, as compared with exports valued at $1,730, in 1913.

The imports of cement in 1914 included: manufactures of cement valued at $12,533; and Portland cement 343,076 hundredweight, (98,022 barrels) valued at $147,158. The imports in 1913 included: manufactures of cement, valued at $17,729; and Portland cement 889,324 hundredweight (254,093 barrels), valued at $409,303. The consumption of Portland cement in Canada in 1914 was approximately 7,270,502 barrels, as compared with 8,912,898 barrels in 1913.

Clay Products.—The total value of the production of clay products in Canada in 1914 was $6,871,957, as compared with a total value of $9,504,314 in 1913. Brick and tile products alone were valued at $5,208,976, as against $7,805,750 in 1913. The value of sewerpipe production in 1914 was $1,104,499, as compared with $1,035,906 in 1913.

The only clay products exported in 1914 were 1,486,000 building brick, valued at $11,871; manufactures of clay valued at $26,866, and earthenware valued at $9,336, against 977,000 building brick, valued at $8,579; manufactures of clay, valued at $8,493, and earthenware valued at $16,553 in 1913. The total imports of clay products in 1914 were valued at $4,467,140, and included: brick and tile valued at $1,986,790; earthenware and chinaware $2,192,222; and clays valued at $288,128. The total imports in 1913 were valued at $6,760,752, and included: brick and tile valued at $3,121,592; earthenware and chinaware $3,314,870, and clays valued at $324,290.

Kaolin.—In 1914 a shipment of 1,000 tons valued at $10,000 was reported, as compared with shipments in 1913 of 500 tons valued at $5,000.

Lime.—The total production of lime in 1914 was 7,028,582 bushels, valued at $1,360,628, as compared with 7,558,484 bushels, valued at $1,609,398 in 1913. The exports of lime in 1914 were valued at $16,927, as against exports valued at $29,234 in 1913. The imports of lime in 1914 were 340,829 barrels, valued at $211,123, and in 1913, 386,693 barrels, valued at $238,271.

Sand-Lime Brick.—The total sales of sand-lime brick in 1914 were 70,650,030, valued at $609,515, an average value of $8.63 per thousand. The sales in 1913 were 92,586,676, valued at $906,665, an average value of $9.79 per thousand.

Slate.—The production of slate in 1914 was 1,075 squares, valued at $4,837, and 1,432 squares, valued at $6,444 in 1913. The imports of slate in 1914 were valued at $213,256, and included: roofing slate valued at $91,977; school writing slate $54,723; slate pencils $6,514; and manufactures of slate $59,444. The imports in 1913 were valued at $235,474, and included roofing slate valued at $97,730; school writing slate, $51,953; slate pencils $9,166, and manufactures of slate, $76,625.

Stone.—The total value of the production of stone of all kinds in 1914 was $5,469,056, as compared with a value of $5,504,639 in 1913. The value of stone exports in 1914 was $72,080, as against $93,840 in 1913; and the total value of stone imported in 1914 was $1,252,869, as against imports valued at $1,640,849 in 1913.

The production in 1914 included: granite valued at $2,176,602; limestone $2,672,781; marble $132,533, and sandstone $487,140.

The production in 1913 included: granite, valued at $1,653,791; limestone $3,204,091; marble $249,975, and sandstone $396,782.

Sand and Gravel.—According to returns received, the production of sand and gravel in 1914 was valued at $2,505,310, as compared with $2,258,874 in 1913.

The exports of sand and gravel in 1914 were 952,370 tons, valued at $802,358, and the imports 273,812 tons, valued at $224,759.

PRODUCTION BY PROVINCES.

A summary of the mineral production by provinces in 1913 and 1914 is shown in the accompanying tables, in the first of which the total production in the several provinces and the percentages of each, are given for the past three years. Ontario continues as the largest contributor to the total, having a production of $53,034,677, or 41·1 per cent, as against $59,167,749, or 40·6 per cent of the total in 1913. British Columbia was second, with a production of $24,164,039 or 18·7 per cent of the total, as against $28,086,312 or 19·3 per cent of the total in the previous year. Nova Scotia, third in importance, had a production of $17,584,639 or 13·6 per cent of the total in 1914, as against $19,376,183, or 13·3 per cent of the total in 1913. Alberta, in fourth place, had a production of $12,684,234,

or 9·8 per cent; Quebec occupied fifth place, with a production of $11,836,929 or 9·2 per cent. The Yukon District, Manitoba, New Brunswick, and Saskatchewan, follow in the order named.

In making these comparisons it should be remembered that Nova Scotia is not credited with the large production of pig-iron and steel at Sydney and Sydney Mines, which is made almost entirely from imported iron ores and is not naturally credited as Canadian mine product. Similarly a large proportion of the pig-iron production in Ontario is excluded from the total value, because it is derived from imported ores. The Province of Quebec also, is not credited with the production of aluminium at Shawenegan Falls, which is made from imported bauxite.

Mineral Production by Provinces, 1912, 1913, and 1914.

Province.	1912.		1913.		1914.	
	Value of production. $	Per cent of total. %	Value of production. $	Per cent of total. %	Value of production. $	Per cent of total. %
*Nova Scotia	18,922,236	14·01	19,376,183	13·30	17,584,639	13·65
New Brunswick	771,004	0·57	1,102,613	0·76	1,014,570	·79
Quebec	11,656,998	8·63	13,475,534	9·25	11,836,929	9·19
Ontario	51,985,876	38·50	59,167,749	40·63	53,034,677	41·16
Manitoba	2,463,074	1·83	2,214,496	1·52	2,413,489	1·87
Saskatchewan	1,165,642	0·86	881,142	0·60	712,313	·55
Alberta	12,073,589	8·94	15,054,046	10·34	12,684,234	9·84
British Columbia	30,076,635	22·27	28,086,312	19·29	24,164,039	18·75
Yukon	5,933,242	4·39	6,276,737	4·31	5,418,185	4·20
Dominion	135,048,296	100·00	145,634,812	100·00	128,863,075	100·00

*Includes a small production of lime from Prince Edward Island.

Mineral Production of Nova Scotia, 1913 and 1914.

Product.		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Gold	Ozs.	2,174	44,935	2,904	60,031
Iron ore sold for export	Tons.	20,436	21,049	.....	.....
Pig-iron from Canadian ore*	"	2,617	39,255	.....	.....
Barytes	"	641	6,410	612	6,169
Coal	"	7,980,073	17,812,663	7,370,924	16,452,955
Grindstones	"	350	4,900	350	5,270
Gypsum	"	404,801	479,515	303,155	368,931
Manganese	"	.....	.....	28	1,120
Tripolite	"	620	12,138	650	13,000
Clay products		.....	332,272	.....	266,204
Lime	Bus.	854,812	171,339	517,722	103,748
Stone		.....	350,511	.....	221,090
Other products		.....	101,196	.....	86,121
Total		.....	19,376,183	.....	17,584,639

*The total production of pig-iron in Nova Scotia in 1913 was 480,068 tons valued at $7,201,020 and in 1914, 227,052 tons valued at 2,951,676.

Mineral Production of New Brunswick, 1913 and 1914.

Product.		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Iron ore sold for export	Tons	80,941	144,537	4,775	10,841
Coal	"	70,311	166,637	98,049	241,075
Grindstones	"	4,487	46,425	3,626	49,234
Gypsum	"	103,954	279,395	79,083	200,680
Natural gas	M cu. ft	828,603	*174,147	425,826	54,249
Petroleum	Bls.	2,111	3,762	1,725	2,742
Clay products		.....	62,269	.....	66,502
Lime	Bus.	392,985	98,841	391,739	102,980
Stone		.....	103,732	.....	261,172
Other products		.....	22,868	.....	25,095
Total		.....	1,102,613	.....	1,014,570

* The value of natural gas sold in 1913 should have been recorded as $67,197 instead of $174,147.

Mineral Production of Quebec, 1913 and 1914.

Product.		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Copper	Lbs.	3,455,887	527,679	4,201,497	571,488
Gold	Ozs.	701	14,491	1,292	26,708
Iron ore sold for export	Tons	5,102	26,999	.....	.....
Silver	Ozs.	34,573	20,672	57,737	31,646
Zinc ore	Tons	335	6,700	969	10,017
Asbestos and asbestic	"	161,086	3,849,925	117,573	2,909,806
Chromite	"	.....	.....	136	1,210
Feldspar	"	74	1,554	98	2,156
Graphite	"	103	9,620	261	18,886
Magnesite	"	515	3,335	358	2,240
Mica	"	626	125,488	246	62,794
Mineral water	Gals.	.....	30,805	.....	16,566
Ochres, iron oxides	Tons	5,987	41,774	5,890	51,725
Peat	"	2,000	8,000	.....	.....
Phosphate	"	385	3,643	554	4,875
Pyrites	"	87,314	349,256	117,698	470,792
Quartz	"	1,008	2,000	847	847
Cement	Bls.	2,940,211	3,430,023	2,846,061	3,331,601
Clay products		.....	1,601,816	.....	1,257,700
Kaolin	Tons	500	5,000	1,000	10,000
Lime	Bus.	1,616,446	418,008	1,767,935	389,064
Slate	Squares	1,432	6,444	1,075	4,837
Stone		.....	2,329,461	.....	2,286,078
Other products		.....	662,841	.....	375,893
Total		.....	13,475,534	.....	11,836,929

There was also in this Province an important production of aluminium from imported ores.

Mineral Production of Ontario, 1913 and 1914.

Product.		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Cobalt oxide	Lbs.	660,079	525,028	889,027	571,710
Cobalt-nickel residues, mixed cobalt and nickel oxides	"	.....	90,266	.....	79,995
Copper	"	25,885,929	3,952,522	28,948,211	3,937,536
Gold	Ozs.	219,801	4,543,690	268,264	5,545,509
Iron ore, sold for export	Tons	110,135	237,976	55,635	124,459
Iron, pig, from Canadian ore (*a*)	"	70,889	957,174	95,744	1,138,912
Lead	Lbs.	33,000	1,537	.....	.....
Molybdenum ore		.....	.....	.....	1,500
Nickel	Lbs.	49,676,772	14,903,032	45,517,937	13,655,381
Nickel oxide	"	268,304	80,561	392,512	34,883
Silver	Ozs.	28,411,261	16,987,377	25,139,214	13,779,055
Actinolite	Tons	66	720	119	1,304
Arsenious oxide	"	1,692	101,463	1,737	104,015
Corundum	"	1,177	137,036	548	72,176
Feldspar	"	16,716	59,241	17,962	68,668
Fluorspar	"	.....	.....	400	2,400
Graphite	"	2,059	80,662	1,386	88,317
Gypsum	"	62,315	208,029	81,219	204,033
Mica		478	68,816	349	46,267
Mineral water		.....	138,072	.....	115,215
Natural gas	M. cu. ft.	12,474,745	2,055,768	14,094,521	2,215,808
Peat	Tons	600	2,100	685	2,470
Petroleum	Bls.	225,969	402,677	212,693	338,182
Pyrites	Tons	71,252	171,925	110,616	273,716
Quartz	"	77,253	167,842	52,947	83,628
Salt	"	100,791	491,280	107,038	493,648
Talc	"	12,250	45,980	10,808	40,418
Cement	Bls.	3,992,988	4,311,183	2,775,142	3,062,129
Clay products		.....	5,220,467	.....	3,979,606
Lime	Bus.	3,254,482	573,209	3,393,078	556,850
Sand-lime brick	No.	48,211,502	420,177	43,804,995	329,403
Stone		.....	1,593,168	.....	1,253,849
Other products		.....	638,771	.....	833,635
Total		.....	59,167,749	.....	53,034,677

(*a*) The total production of pig-iron in Ontario in 1913 was 648,899 tons, valued at $9,338,992; in 1914, 556,112 tons, valued at $7,051,180.

Mineral Production of Manitoba, 1913 and 1914.

Product.		1913.		1914.	
		Quantity.	Value.	Quantity.	Value.
			$		$
Calcined gypsum	Tons	65,100	479,500	53,423	382,563
Clay products		.....	514,358	.....	317,488
Lime	Bus.	576,938	107,281	526,167	92,898
Cement	Bls.	179,342	326,856	402,131	737,046
Sand-lime brick	No.	19,619,555	198,878	19,200,809	207,501
Stone		.....	389,904	.....	361,912
Other products		.....	197,719	.....	314,081
Total		.....	2,214,496	.....	2,413,489

Mineral Production of Saskatchewan, 1913 and 1914.

Product.	1913.		1914.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Coal.....Tons	212,897	358,192	232,299	374,245
Clay products.....	.....	189,820	.....	98,349
Lime.....Bus.	35,000	10,000	.....	.....
Sand-lime brick.....No.	7,290,714	86,753	1,550,000	17,700
Other products.....	.....	236,377	.....	222,019
Total.....	.....	881,142	.....	712,313

Mineral Production of Alberta, 1913 and 1914.

Products.	1913.		1914.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Gold.....Ozs.	.....	.....	48	992
Coal.....Tons	4,014,755	10,418,941	3,683,015	9,350,392
Natural gas.....M.cu.ft.	7,174,490	1,079,466	7,172,157	1,214,670
Cement.....Bls.	956,169	1,947,933	641,395	1,212,342
Clay products.....	.....	893,408	.....	462,199
Lime.....Bus.	465,250	115,355	280,252	58,321
Sand-lime brick.....No.	15,464,905	176,794	5,453,000	49,731
Stone.....	.....	156,984	.....	60,272
Other products.....	.....	265,165	.....	275,315
Total.....	.....	15,054,046	.....	12,684,234

Mineral Production of British Columbia, 1913 and 1914.

Product.	1913.		1914.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Copper (a).....Lbs.	45,791,579	6,991,916	41,219,202	5,606,636
Gold.....Ozs.	297,459	6,149,027	252,730	5,224,393
Lead.....Lbs.	37,626,899	1,753,037	36,289,845	1,625,422
Platinum.....Crude ozs.	18	489	.....	.....
Silver.....Ozs.	3,312,343	1,980,483	3,159,897	1,731,971
Zinc ore.....	7,554	180,127	9,924	252,546
Coal.....Tons	2,714,420	8,482,562	2,239,799	6,999,374
Gypsum..... "	200	1,300	.....	.....
Mineral water.....	.....	4,800	.....	2,330
Cement.....Bls.	574,258	980,560	491,151	833,606
Clay products.....	.....	684,904	.....	413,909
Lime.....Bus.	362,571	115,365	151,689	56,767
Stone.....	.....	580,879	.....	1,024,683
Other products.....	.....	180,863	.....	392,402
Total.....	.....	28,086,312	.....	24,164,039

(a) Smelter recoveries of copper.

Mineral Production of Yukon, 1913 and 1914.

Product.	1913.		1914.	
	Quantity.	Value.	Quantity.	Value.
		$		$
Copper.....Lbs.	1,843,530	281,489	1,367,050	185,946
Gold.....Ozs.	282,838	5,846,780	247,940	5,125,374
Lead.....Lbs.	2,804	131	47,920	2,146
Silver.....Ozs.	87,626	52,392	92,973	50,959
Coal.....Tons	19,722	95,945	13,443	53,760
Total.....	.....	6,276,737	.....	5,418,185

Mineral Production by Provinces, 1899-1914.

Calendar Year	Nova Scotia.*	New Brunswick.	Quebec.	Ontario.	Manitoba.	Alberta.	Saskatchewan.	Yukon.	British Columbia.	Total.
	$	$	$	$	$	$	$	$	$	$
1899	6,817,274	420,227	2,585,635	9,819,557	17,108,707				12,482,605	49,234,005
1900	9,298,479	439,060	3,292,383	11,258,099	23,452,330				16,680,526	64,420,877
1901	7,770,159	467,985	3,759,984	13,970,010	19,297,940				20,531,833	65,797,911
1902	10,686,549	607,129	3,743,636	14,619,091	16,127,400				17,448,031	63,231,836
1903	11,431,914	580,495	3,585,938	14,160,033	14,082,986				17,899,147	61,740,513
1904	11,212,746	559,913	3,688,482	12,582,843	12,713,613				19,325,174	60,082,771
1905	11,507,047	559,035	4,405,975	18,833,292	11,387,642				22,386,008	69,078,999
1906	12,894,303	646,328	5,242,058	25,111,682	10,092,726				25,299,600	79,286,697
1907	14,532,040	664,467	6,205,553	30,381,638	898,775	4,657,524	533,251	3,335,898	25,656,056	86,865,202
1908	14,487,108	579,816	6,372,949	30,623,812	584,374	5,122,505	413,212	3,669,290	23,704,035	85,557,101
1909	12,504,810	657,035	7,086,265	37,374,577	1,193,377	6,047,447	456,246	4,032,678	22,479,006	91,831,441
1910	14,195,730	581,942	8,270,136	43,538,078	1,500,359	8,996,210	498,122	4,764,474	24,478,572	106,823,623
1911	15,409,397	612,830	9,304,717	42,796,162	1,791,772	6,662,673	636,706	4,707,432	21,299,305	103,220,994
1912	18,922,236	771,004	11,656,998	51,985,876	2,463,074	12,073,589	1,165,642	5,933,242	30,076,635	135,048,296
1013	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	15,054,046	831,142	6,276,737	28,086,312	145,634,812
1914	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	12,684,234	712,313	5,418,185	24,164,039	128,863,075

*Includes a small production of lime from Prince Edward Island.

MINE PRODUCTION.

Reference has already been made to the distinction between statistics of mine production and statistics based on smelter recoveries with particular reference to metalliferous ores.

For a number of years past this Division has endeavoured to obtain from every mine operator in Canada, an annual return with respect to labour employed, wages paid, tonnage and value of ores or minerals mined, treated and shipped, and in the case of metallic ores, the quantities of metals contained in the ores shipped or treated. In the case, however, of gold placer mining, and the production of crude petroleum, it has not as yet been found feasible to obtain complete returns from the operators themselves, so that in these cases, while a record of production is available, there is no record of the labour employed, nor the wages paid.

Statistics covering each of the past five years are shown in the accompanying tables. According to the records shown the total value of the mineral production compiled on this basis was $114,239,635 in 1914, as against $126,444,201 in 1913; $120,332,966 in 1912; $91,876,084 in 1911, and $92,501,244 in 1910. Excluding placer and hydraulic workings and petroleum wells, the total number of shipping mines, clay works, quarries, etc., in 1914 was 1,661, as against 1,529 in 1913, and 1,437 in 1912. The total number of men employed was 56,855 in 1914, as against 71,011 in 1913 and 66,734 in 1912. The total wages paid were $43,609,696 in 1914, as against $50,368,602 in 1913 and $45,502,479 in 1912.

The total number of metalliferous mines shipping in 1914, exclusive of placer and hydraulic workings, was 187 in 1914, as against 183 in 1913, and 163 in 1912; number of men employed in 1914, 11,994, as against 12,437 in 1913, and 10,612 in 1912; wages paid $11,669,854 in 1914, compared with $11,746,400 in 1913, and $10,113,578 in 1912; tons of ore mined 4,997,406 in 1914, as against 4,736,288 in 1913, and 4,194,517 in 1912; tons of ore concentrates or metal shipped from mines 3,115,855 in 1914, as against 3,423,414 in 1913 and 3,360,451 in 1912; total net value of shipments including placer gold, $44,763,179 in 1914, compared with $47,170,740 in 1913 and $46,457,423 in 1912.

In non-metalliferous mining, exclusive of stone quarries, clay works, etc., and not including petroleum wells, there were employed in 1914 an average of 33,732 men, earning in wages, $22,058,526, as against 34,207 men employed and $25,752,148 wages paid in 1913.

The manufacture of cement, clay products, and lime, and the quarrying of stone, etc., employed in 1914 an average of 21,129 men to whom were paid in wages, $9,881,316. These operations in 1913 engaged an average of 24,367 men earning $12,870,054.

It should be remembered that these records cover only active shipping mines and do not include the labour employed in prospecting or in develop-

ing new properties, nor is there included any record of the labour employed in the smelting and refining of ores, nor in blast furnace operations. The values of the ores given herein are in general those furnished by the operators. In certain cases, however, where such values have not been furnished, estimates have been made.

There has been added to the statement of ore shipments in 1914 and 1913, tables showing the quantities of metals contained in the ores shipped, the record showing the total quantities of metals contained without any deductions or allowances being made for smelter or treatment losses. Comparison of this record of metal contents of ore shipments with statistics of the production of the metals is not in all cases feasible because of the long lapse of time between the shipment from the mine and the treatment at the smelter.

Mine Production, 1910.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	971		443,998	335,768	259,418	574,362
Milling gold ores—							
Bullion shipped	.....	.....		.....	.....	.....	659,987
Concentrates	47	969		725,989	138,021	8,997	565,340
Silver-cobalt ores—							
Mine bullion shipped	.....	.....	.....	.....	.....	35	542,034
Ore and concentrate	38	1,623	1,322	2,642,133	274,780	35,627	15,344,470
Nickel-copper ores	7	660	286	719,237	652,392	652,392	2,609,568
Copper ores	3	118	97	105,366	54,220	36,714	172,162
Silver-lead and zinc ores	48	592	282	850,416	180,070	58,418	1,668,415
Copper-gold-silver ores	19	1,432	487	1,872,242	1,958,591	1,924,405	7,888,306
Shipping mines not reporting—							
Silver-lead	12	..	.....	.....	1,994	1,994	.....
Copper-gold	9						
Placer mining—							
Yukon	.....	.....	.....	.....	.....	.....	4,550,000
British Columbia	.....	.....	.....	.....	.....	.....	540,000
Other provinces	.....	.....	.....	.....	.....	.....	1,850
Total metallic	191	8,839		7,359,381	3,595,836	2,978,000	35,116,494
Total non-metallic	.....	36,210		22,698,000	16,148,993	13,800,989	37,757,158
Total structural material	.....	17,259		7,547,000	.....	.....	19,627,592
Total	.....	62,308		37,604,381	.....	.....	92,501,244

Mine Production, 1911.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	943		449,468	421,113	210,344	522,319
Milling gold ores—							
Bullion shipped							513,991
Concentrates	45	1,085		954,659	118,758	8,026	663,213
Silver-cobalt ores—							
Mine bullion shipped						130	2,007,440
Ore and concentrate	36	1,794	1,448	2,722,228	254,290	25,539	14,400,245
Nickel-copper ores	7	858	425	889,894	612,511	612,511	2,450,044
Copper ores	2	119	67	98,084	66,088	39,047	247,555
Silver-lead and zinc ores	40	528	297	809,862	120,323	48,660	1,186,996
Gold-copper-silver ores	22	1,495	563	1,933,385	1,602,247	1,486,931	7,727,696
Placer mining—							
Yukon							4,606,812
British Columbia							426,000
Other provinces							8,202
Total metallic	160	9,622		7,857,580	3,195,330	2,431,188	34,760,513
Total non-metallic		32,126		18,469,420	13,890,468	12,247,348	34,405,960
Total structural materials		19,004		8,827,508			22,709,611
		60,752		35,154,508			91,876,084

Mine Production, 1912.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	8	524		371,938	171,792	215,883	523,315
Milling gold ore—							
Bullion shipped	43					5	2,278,066
Concentrates		1,671		1,551,006	290,297	6,114	669,727
Silver-cobalt ores—							
Mine bullion shipped	31					164	2,899,360
Ore and concentrate		1,685	1,448	3,107,286	319,348	29,106	14,592,559
Nickel-copper ores	8	970	830	1,404,652	737,726	737,726	2,953,306
Copper ores	3	154	95	160,765	64,952	60,869	508,993
Silver-lead and zinc ores	50	597	331	1,002,203	202,343	66,377	2,767,741
Gold-copper-silver ores	20	1,434	873	2,515,728	2,408,059	2,244,193	13,113,144
Tungsten concentrates						14	7,840
Placer mining—							
Yukon							5,576,493
British Columbia							555,500
Other provinces							11,379
Total metalliferous	163	10,612		10,113,578	4,194,517	3,360,451	46,457,423
Total non-metalliferous	443	33,954		23,877,781	17,165,628	15,548,981	45,080,674
Total structural materials	831	22,168		11,511,120			28,794,869
	1,437	66,734		45,502,479			120,332,966

Mine Production, 1913.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	12	877		529,934	324,935	307,634	629,843
Milling gold ore—							
Bullion shipped	.....	.....		.....	.....	11	5,060,018
Concentrates	50	2,210		2,079,005	515,855	10,269	873,901
Silver-cobalt ores—							
Mine bullion shipped	.....	.....	.....	.....	.....	260	4,539,906
Ore and concentrate	30	2,089	1,525	3,387,069	456,241	40,579	12,565,718
Nickel-copper ores	9	1,258	617	1,665,659	784,697	784,697	3,138,788
Copper ores	3	191	92	155,318	97,899	87,376	458,136
Silver-lead and zinc ores	57	830	468	1,287,761	256,302	85,978	3,276,812
Zinc products						Zinc 7,889	186,827
Gold-copper-silver ores	22	1,413	867	2,641,654	2,300,359	2,098,775	10,056,739
Placer mining—							
Yukon	.....	.....	.....	.....	.....	.....	5,874,052
British Columbia	.....	.....	.....	.....	.....	.....	510,000
Other provinces	.....	.....	.....	.....	.....	.....	.....
Total metalliferous	183	12,437		11,746,400	4,736,288	3,423,468	47,170,740
Total non-metalliferous	435	34,207		25,752,148	18,636,039	16,198,066	48,463,709
Total structural materials	911	24,367		12,870,054	.....	.....	30,809,752
	1,529	71,011		50,368,602	.....	.....	126,444,201

Mine Production 1913, Content of Shipments.

	Gold.	Silver.	Nickel.	Copper.	Lead.	Zinc.
	Ozs.	Ozs.	Lbs.	Lbs.	Lbs.	Lbs.
Milling gold ore—						
Bullion	250,851	59,015	.....	.....	.....	.....
Concentrates	46,959	33,898	.....	2,354	142,497	.....
Silver-cobalt ores—						
Mine bullion shipped	.....	7,599,929	.....	.....	.....	.....
Ore and concentrate	.....	21,862,174	.....	.....	.....	.....
Nickel-copper ores	.....	.....	51,203,607	27,010,719	.....	.....
Copper ores	738	36,393	.....	4,996,393	.....	.....
Silver-lead zinc ores	999	2,564,155	.....	.....	53,807,570	.....
Zinc products	.....	143,459	.....	.....	.....	7,069,800
Gold-copper-silver ores	207,486	733,758	.....	60,090,180	.....	.....
Placer mining—						
Yukon	282,320	63,522	.....	.....	.....	.....
British Columbia	24,671	.....	.....	.....	.....	.....
Total	814,024	33,096,303	51,203,607	92,099,646	53,950,067	7,069,800

Mine Production, 1914.

	No. of mines or works.	Men employed.		Wages paid.	Ores or minerals mined.	Metals, ores, concentrates or minerals shipped.	Net value of shipments.
		Underground.	Surface.				
METALLIFEROUS ORES.	No.	No.		$	Tons.	Tons.	$
Iron ores	5	598		364,489	345,410	244,854	542,041
Milling gold ore—							
Bullion shipped						13	6,101,463
Concentrates	44	1,070	1,206	2,603,414	754,732	6,974	860,379
Silver-cobalt ores—							
Mine bullion shipped						354	5,665,006
Ore and concentrate	29	1,412	1,883	3,207,116	733,174	16,917	7,827,140
Nickel-copper ores	9	736	1,286	1,693,997	1,000,364	999,908	5,020,003
Copper ores	4	113	180	177,721	119,292	117,762	502,637
Silver-lead and zinc ores	76	394	817	1,110,876	186,646	70,207	2,652,802
Zinc products						10,893	262,563
Gold-copper-silver ores	20	823	1,746	2,512,241	1,857,788	1,647,973	9,580,537
Placer mining—							
Yukon						10	5,182,616
British Columbia						1	565,000
Other provinces							(a) 992
Total metalliferous	187	11,994		11,669,854	4,997,406	3,115,855	44,763,179
Total non-metalliferous	451	33,732		22,058,526	17,078,300	14,708,307	43,467,229
Total structural materials	1,023	21,129		9,881,316			26,009,227
	1,661	66,855		43,609,696	22,075,706	17,824,162	114,239,635

(a) Alberta's production.

Mine Production 1914, Content of Shipments.

	Gold.	Silver.	Nickel.	Copper.	Lead.	Zinc.
	Ozs.	Ozs.	Lbs.	Lbs.	Lbs.	Lbs.
Milling gold ore—						
Bullion	289,860	85,110				
Concentrates	38,717	64,218		90	15,141	
Silver-cobalt ores—						
Mine bullion shipped		10,335,527				
Ore and concentrate		15,523,608				
Nickel-copper ores			60,800,799	36,300,532		
Copper ores	1,059	51,440		6,450,899		
Silver-lead zinc ores	334	2,501,820			50,527,130	
Zinc products		376,420				9,101,460
Gold-copper-silver ores	182,784	761,890		53,771,126		
Placer mining—						
Yukon	247,753	55,744				
British Columbia	27,332					
Alberta	48					
Total	787,887	29,755,777	60,800,799	96,522,647	50,542,271	9,101,460

Labour and Wages Statistics Covering Non-Metalliferous Mines During 1912, 1913 and 1914.

	1912.			1913.			1914.		
	No. active mines or works.	No. employed.	Wages paid.	No. active mines or works.	No. employed.	Wages paid.	No. active mines or works.	No. employed.	Wages paid.
NON-METALLIC.			$			$			$
Asbestos and asbestic	10	2,955	1,401,653	10	2,951	1,687,957	10	2,992	1,283,977
Coal	244	27,581	20,784,843	236	27,917	22,065,141	231	27,571	19,060,011
Feldspar	4	80	31,487	5	78	33,900	5	104	29,197
Graphite	7	221	86,831	6	135	63,714	4	135	47,776
Grindstones, pulpstones, scythestones	6	149	35,057	5	125	27,500	5	155	34,950
Gypsum	19	1,381	579,952	18	1,400	641,735	16	1,149	552,192
Mica and phosphate	26	241	95,415	27	209	85,334	30	232	78,646
Mineral pigments: barytes, and ochres	4	65	21,270	4	64	25,818	4	73	21,146
Mineral water	14	90	34,550	14	79	36,639	18	64	32,058
Natural gas	76	433	302,012	78	547	614,425	92	561	474,293
Peat	3	27	4,450	2	37	5,000	.....	.....	.....
Pyrites	4	115	110,888	6	151	131,161	8	214	165,001
Quartz	7	128	80,340	6	130	69,441	8	81	33,872
Salt	12	231	155,648	12	251	178,386	11	253	178,277
Others†	7	257	153,385	6	133	85,997	9	148	67,130
Total non-metallic	443	33,954	23,877,781	435	34,207	25,752 148	451	33,732	22,058,526
STRUCTURAL.									
Cement	26	3,461	2,623,902	27	4,276	3,466,451	24	2,977	2,271,006
Clay products	460	10,450	4,504,213	456	11,218	4,696,801	419	8,339	3,201,380
Lime	78	1,103	576,217	77	1,076	577,841	85	1,015	518,331
Sand-lime brick	20	544	349,192	22	589	289,398	21	467	190,031
Sand and gravel	54	875	527,425	110	1,042	607,554	254	2,382	821,601
Slate	1	25	12,055	1	35	12,544	1	20	7,150
Stone	192	5,710	2,918,116	218	6,131	3,219,465	219	5,929	2,871,817
Total structural	831	22,168	11,511,120	911	24,367	12,870,054	1,023	21,129	9,881,316
Total non-metalliferous	1,274	56,122	35,388·901	1,346	58,574	38,622,202	1,474	54,861	31,939,842

† Includes: in 1912—actinolite, chromite, corundum, fluorspar, magnesite, manganese, talc, and tripolite. Includes: in 1913—actinolite, corundum, tripolite, and talc. Includes: in 1914—actinolite, chromite, corundum, magnesite, manganese, peat, talc and tripolite. Partial record only in 1912 and 1913.

SMELTER PRODUCTION.

Statistics of the production of copper, lead, and silver smelters and refineries, showing the tonnage of ore treated, the matte, blister, base bullion, or refined metal produced, etc., have been collected by this Branch since 1908.

The active smelting companies in 1914 were as follows:—

The Mond Nickel Company, Coniston, Ont.
The Canadian Copper Company, Copper Cliff, Ont.
The Coniagas Reduction Company, Thorold, Ont.
The Deloro Mining and Reduction Co., Deloro, Ont.
The Buffalo and Ontario Smelting Co., Kingston, Ont.
The Dominion Refineries, Ltd., North Bay, Ont.
The Metals Chemical Co., Ltd., Welland, Ont.
The North American Smelting Co., Kingston, Ont.
The Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B.C.
The Granby Consolidated Mining, Smelting and Power Co., Ltd., Grand Forks, and Anyox, B.C.
The British Columbia Copper Co., Ltd., Greenwood, B.C.

The total quantity of ores and concentrates treated in these smelters during 1914 was 2,649,935 tons (including 58,894 tons of imported ore), as compared with 3,037,391 tons in 1913. The largest proportion of the total tonnage, about 61 per cent in 1914, consists of the copper-gold-silver ores of British Columbia, chiefly from the Boundary (Phoenix and Greenwood) Rossland and Coast (Britannia, Texada Island and Granby Bay) districts. The nickel-copper ore of the Sudbury district, Ontario, contributed about 35·7 per cent of the tonnage, the balance being lead ores and other ores treated in lead furnaces and the silver cobalt ores of Ontario treated in silver smelters. Gold and silver ores treated by cyanide processes are not included in this record.

The quantities of the several classes of ores smelted during the past seven years, have been as follows:—

Year.	Nickel-copper ores.	Silver-cobalt ores.	Lead ores.	Copper-gold-silver ores.	Totals.
1908	360,180	7,182	53,545	1,797,488	2,218,395
1909	462,336	8,384	54,539	1,850,889	2,376,148
1910	628,947	9,466	57,549	1,987,752	2,683,714
1911	610,834	9,330	55,408	1,517,981	2,193,553
1912	725,065	8,097	59,932	2,212,316	3,005,410
1913	823,403	6,124	78,010	2,119,754	3,027,291
1914	947,053	5,681	71,224	1,626,197	2,650,155

The products obtained in Canada from the treatment of these ores nclude: pig lead produced at Kingston, Ont., (furnace idle in 1914); refined pig lead and lead pipe produced at Trail, B.C., and fine gold, fine silver,

copper sulphate and antimony, produced from the residue of the Trail lead refinery; silver bullion, white arsenic, nickel oxide and cobalt oxide produced in Ontario from the Cobalt district ores. In addition to these refined products, blister copper, copper matte, nickel-copper matte, cobalt material or mixed nickel and cobalt oxides are produced and exported for refining.

The aggregate results of smelting and refining operations may be summarized as shown in the next table. Unfortunately, the figures cannot be taken to represent the total production from smelting ores mined in Canada, since considerable quantities of copper and silver ores are still shipped to other smelters outside of Canada for smelting.

It should also be explained that the figures include the results of the treatment in British Columbia of a small quantity of imported ores.

Smelter and Refinery Production in Canada.

Refined products produced.	Calendar Years.					
	1909.	1910.	1911.	1912.	1913.	1914.
Antimony.....Lbs.	61,207	.....	.....	.....	.....	.....
Gold.....Ozs.	18,241	13,298	15,270	12,118	11,977	11,088
Silver..... "	14,242,545	16,373,799	19,078,768	17,572,217	13,789,709	11,096,861
Lead.....Lbs.	41,883,614	32,987,508	23,525,050	35,893,190	37,923,043	36,443,706
Copper sulphate.. "	51,405	163,228	197,187	87,110	130,533	152,060
Cobalt oxide..... "	.....	.....	154,174	349,054	660,079	899,027
Nickel oxide..... "	.....	.....			268,304	392,512
White arsenic..... "	2,258,087	3,003,467	4,194,209	4,090,768	3,384,249	3,474,322
Matte, blister copper, and other smelter products obtained and exported for refining.						
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
(1) Blister copper.....	14,239	13,918	10,710	17,063	15,270	13,238
(2) Copper matte.....	11,597	11,519	11,320	6,727	5,159	6,291
(3) Nickel-copper matte.	25,845	33,033	32,607	41,925	47,150	46,396
(4) Lead bullion.....	2,010	.....	.....	.....	.....	.....
(5) Cobalt material.....	.....	54	630	642	122	101
Metals contained in above unrefined smelter products.						
Gold.....Ozs.	200,129	197,181	175,189	184,815	213,279	170,818
Silver..... "	4,845,920	2,136,414	585,896	686,171	934,601	873,400
Lead.....Lbs.	3,973,810	.....	.....	.....	.....	.....
Copper..... "	53,328,583	56,149,299	29,855,868	58,405,910	59,245,722	59,237,016
Nickel..... "	27,041,957	37,587,676	34,098,744	44,841,542	49,676,772	45,517,937

(1) Blister copper carrying gold and silver values.
(2) Copper matte " " "
(3) Bessemer nickel-copper carrying small gold and silver values as well as metals of the platinum group.
(4) Unrefined lead bullion carrying silver values.
(5) Cobalt material carrying nickel and silver values.

Nickel-Copper Ores.—These ores of the Sudbury district, together with a small tonnage from the Alexo mine in the district of Nipissing, Ontario, are treated in the smelters of the Canadian Copper Company at Copper Cliff, and the Mond Nickel Company at Coniston, formerly at Victoria Mines. In addition to the nickel and copper which will probably average slightly over 3 per cent nickel, and 2 per cent copper, these ores of the Sudbury district contain small amounts of gold, silver, platinum, and palladium. The present metallurgical practice involves the following processes:—

I. Roasting the ores in open heaps, to remove part of the sulphur.
II. Smelting in water-jacketed blast furnaces, to produce a low grade matte, containing 33 per cent copper-nickel and nearly all the precious metals.
III. Converting the furnace matte in Bessemer basic converters, to make a matte containing about 80 per cent copper-nickel.
IV. Refining the converter matte, separating the nickel-copper, and precious metals.

At the present time the first three processes only are carried on in Canada. The converter matte is shipped to the United States and to England for final treatment.

The total quantity of nickel-copper ore mined during 1914 was 1,000,364 tons and the quantity smelted 947,053 tons. There were produced 46,396 tons of Bessemer matte, containing 14,448 tons of copper and 22,759 tons of nickel. With the exception of 1913, this is the largest production since the beginning of operations in 1886. In 1913 there were smelted 823,403 tons of ore, from which was produced 47,150 tons of Bessemer matte, containing 12,938 tons of copper and 24,838 tons of nickel.

Statistics of smelter production from these ores since the commencement of this industry are shown in the following table:—

Smelter Production of the Nickel-Copper Ores of the Sudbury District.

Calendar Year.	Ore mined.	Ore smelted.	Matte shipped.	Value matte.	Nickel content of matte.	Copper content of matte.
	Tons.	Tons.	Tons.	$	Tons.	Tons.
1886	3,307					
1887	567	30,000	.....	.....	900	1,500
1888	.....					
1889	44,990	40,146	3,274	.....	432	733
1890	.....	.....	.....	.....	718	651
1891	83,300	72,558	10,336	.....	2,018	2,064
1892	74,381	57,022	.....	.....	1,207	1,102
1893	.....	.....	9,425	.....	1,991	1,821
1894	103,223	96,038	11,681	766,422	2,454	2,604
1895	74,135	68,618	10,188	890,834	1,944	2,288
1896	94,966	71,027	10,759	416,594	1,699	1,584
1897	93,154	96,370	13,968	.....	1,999	2,750
1898	123,820	121,924	.....	.....	2,759	4,187
1899	159,957	172,761	.....	702,341	2,872	2,834
1900	196,420	.....	23,336	1,076,306	3,540	3,364
1901	315,692	255,958	.....	1,661,839	4,594	4,318
1902	269,538	211,847	25,311	1,327,448	5,347	3,553
1903	136,033	207,030	13,832	2,686,469	6,253	3,576
1904	203,388	118,470	10,154	2,193,198	5,274	2,455
1905	277,766	251,421	17,405	4,019,814	9,438	4,386
1906	343,814	340,059	20,310	4,628,011	10,745	5,264
1907	351,916	359,076	22,025	3,289,382	10,595	6,996
1908	409,551	360,180	21,210	2,930,989	9,572	7,503
1909	451,892	462,336	25,845	1,913,012	13,141	7,873
1910	652,392	628,947	35,033	5,380,064	18,636	9,630
1911	612,511	610,834	32,607	4,945,593	17,049	8,966
1912	737,726	725,065	41,925	6,303,102	22,421	11,116
1913	784,697	823,403	47,150	7,076,945	24,838	12,938
1914	1,000,364	947,053	46,396	7,189,031	22,759	14,448

A large proportion of the ore tonnage shipped from the Cobalt district is still sent to smelters in the United States, although during the past three years there has been a considerable increase in the treatment of these ores by cyanidation and the recovery of silver at the mine in the form of bullion. Thus we find a further falling off, during 1914, in the recovery of silver at Ontario smelters and an increased amount of bullion produced at the mines.

The treatment of these ores in Ontario smelters during the past four years has given the following results:—

———	1911.	1912.	1913.	1914.
Ore treated.....Tons.	9,330	8,097	6,124	5,681
Products recovered—				
Silver produced†.....Ozs.	17,753,167	15,675,218	11,356,707	9,042,993
White arsenic.....Lbs.	4,194,209	4,090,768	3,384,249	3,474,322
Speiss or residues.....Tons	.....	.....	.....	.....
Cobalt oxide.....Lbs.	154,174	349,054	660,079	899,027
Nickel oxide..... "			268,304	392,512
Mixed cobalt and nickel oxides and cobalt material..... "	1,260,832	1,285,280	243,737	.....

† Fine ounces contained in silver bullion, fineness ranging from 850 to 998.

Silver-Copper-Nickel-Arsenic Ores.—The first shipments of silver ores from the Cobalt district were made in 1904, and in 1906 the first works for the treatment of these ores in Canada were established by the Canadian Copper Company, at Copper Cliff, Ont. This plant was closed down, however, in 1913 because of the extended treatment of these ores in cyanide plants at the mines. Operations have been continuous at the plants of the Coniagas Reduction Company, at Thorold, and the Deloro Mining and Reduction Company, at Deloro, Ont. At each of these plants, nickel and cobalt oxide are recovered in addition to silver bullion and white arsenic. Several other plants have been operating more or less irregularly, those reporting production in 1914 being the Canada Refining and Smelting Company, Ltd., Orillia, The Buffalo and Ontario Smelting Company, Kingston, and The Standard Smelting and Refining Company, North Bay.

Lead Smelters.—The lead smelter and refinery at Trail, B.C., owned by the Consolidated Mining and Smelting Company, was the only lead smelter operated during 1914. The small plant at Kingston, Ontario, built by the North American Smelting Company, and completed in 1912 was operated in 1913 but remained idle throughout 1914.

In the lead refinery at Trail, the bullion from the smelter is cast into anodes and re-deposited electrolytically upon cathode sheets of refined lead. The refined lead is cast into pigs or manufactured into lead pipe. The slimes from the tank room carry gold, silver, antimony, arsenic, and copper.

The first two are recovered as fine metals, and the copper as copper sulphate. Antimony is also recovered, though not regularly and bearing metal is manufactured.

The annual production of refined lead, fine gold and silver, and copper sulphate has been as follows:—

Calendar Year.	Refined lead.	Fine gold.	Fine silver.	Copper sulphate.
	Lbs.	Ozs.	Ozs.	Lbs.
1904	7,519,440	4,336	551,450	56,000
1905	15,804,509	8,602	1,088,328	77,175
1906	20,471,314	9,993	1,263,809	143,135
1907	26,607,461	10,395	1,631,422	97,751
1908	36,549,274	15,346	1,956,039	203,379
1909	41,883,614	18,241	2,003,003	51,405
1910	32,987,508	13,298	1,798,960	163,228
1911	23,525,050	15,270	1,325,601	197,187
1912	37,008,490	12,118	1,896,999	87,110
1913	39,663,766	11,977	2,433,002	130,533
1914	36,443,706	11,088	2,043,868	152,060

Extensive improvements undertaken at the Trail smelter, during the year included the following additions and changes to the lead plant, as described by the General Manager in his Annual Report to the Directors:—

"Two Wedge roasters, having a capacity each of from 85 to 95 tons per day.

Conveyors and automatic scales for handling the ore from storage to the roasters, and for handling the pre-roasted product from roasters to sintering pots.

Three new lead blast furnaces and extensions to building, with crane for handling receivers and by-products, such as matte.

A Cottrell plant for clearing the blast furnace gases of lead fume.

Flues connecting the blast furnaces with the Cottrell plant.

New charge cars and some small equipment for the lead sampling mill.

"Your lead plant formerly handled a considerable tonnage of high-grade clean concentrates, comparatively low in sulphur and free from zinc, which was supplied mainly from the St. Eugene mine. With the working out of the St. Eugene mine, it has been necessary to replace the tonnage, to a large extent, with ore of lower grade and of a much more refractory nature, largely from the Sullivan mine; and carrying more sulphur and requiring more capacity for roasting and furnacing in order to produce an equal tonnage of lead.

"In the roasting plant, particularly, the seven Godfrey roasters with which the smelter was previously equipped had a capacity of only 25 tons per day each of Sullivan ore; the two Wedge roasters, just installed, have a capacity each of from 85 to 95 tons per day.

"The installation of conveyors handling the ore to and from the roasters will still further reduce the costs of operation of the roasters, by substituting mechanical equipment for manual labour.

"The costs of operating the Heberlein pot plant have already been materially reduced by the substitution of mechanical appliances for hand labor, which alterations were made last year.

"The building of new lead furnaces was made necessary by the condition of the old ones, which had been in operation for a long time, and it was considered advisable in rebuilding them to place them further from the copper plant, in order to allow for any necessary extensions to the copper plant; also to allow for better arrangements for charging and handling the products.

"The installation of the Cottrell plant was very necessary on account of large losses in fume from the blast furnaces, The flues and Cottrell plant are now saving in the neighborhood of eight tons per day of material high in lead, a considerable portion of which was previously lost."

Gold-Silver-Copper Ores of British Columbia.—Four copper smelters were active in British Columbia during 1914. These were the Trail copper furnace of the Consolidated Mining and Smelting Company treating the ores of the Rossland camp and other ores of the district; the Grand Forks plant of the Granby Consolidated Mining, Smelting and Power Co., and the Greenwood plant of the British Columbia Copper Company, treating chiefly the low grade ores of the Boundary district, and the Anyox plant of

the Granby Consolidated Company, treating the ores of the Hidden Creek mines at Anyox and other coast properties.

On the coast, the Tyee Copper Company's furnace at Ladysmith was idle throughout the year.

The aggregate production of British Columbia copper smelters during the past five years including the foreign ores treated, was as follows:—

Production British Columbia Copper Smelters.

——	1911.	1912.	1913.	1914.
Ore smelted.....Tons	1,517,981	2,212,316	2,119,754	1,612,197
Smelter products—				
Matte..... "	11,320	6,727	5,159	6,291
Blister..... "	10,710	17,069	15,270	13,238
Metallic content of matte and blister—				
Gold..... Ozs.	175,189	184,815	213,279	170,818
Silver..... "	585,896	686,171	934,601	873,400
Copper.....Lbs.	29,855,868	36,174,185	33,370,176	30,341,191

Trail Smelter.—Statistics of the production of the Trail smelter including both the copper and lead furnaces, have been published in the annual reports of the Company, the figures since 1896 having been as follows:—

Production of Trail Smelter.

Fiscal Year.	Ore smelted.	Metals contained in matte and bullion produced.			
		Gold.	Silver.	Lead.	Copper.
	Tons.	Ozs.	Ozs.	Lbs.	Lbs.
1906 (6 months), ending June 30th...	157,640	64,590	1,074,255	15,133,683	2,399,161
1907, ending June 30th.....	222,573	69,168	1,100,271	20,283,083	3,443,310
1908 " "	305,956	121,380	2,224,888	32,157,139	4,004,468
1909 " "	347,417	114,920	2,443,475	43,675,077	4,637,631
1910 " "	487,125	137,614	2,162,406	42,368,816	5,974,959
1911 " "	388,785	119,067	1,458,758	24,026,015	4,421,988
1912 " "	296,458	129,789	1,765,992	26,072,074	2,914,141
1913 (15 mos. to Sept. 30, 1913).....	407,124	186,017	3,224,408	48,325,252	3,454,814
1914 (12 mos. to Sept. 30, 1914).....	374,771	129,083	2,568,301	34,617,318	3,645,997
Production from 1894 to Sept. 30, 1914	3,925,822	1,462,012	26,017,332	333,913,214	57,890,794

The General Manager's Report contains the following list of improvements and alterations to the copper plant of the smelter:—

"Rebuilding of three of the five blast furnaces and increasing the dimensions of two of them.

Building of a new smoke stack.

Repairs to the flues.

Installation of a crane in the copper furnace building, and re-building of the launders leading to the slag dump.

"Improvements to the copper plant were made necessary by the wearing out of jackets on the old furnaces. In rebuilding, two of them have been increased in size from 300 ins. to 420 ins. in length, and from 42 ins. to 50 ins. in width at the tuyeres. The enlarged furnaces so far show an increase in smelting capacity of from 60 per cent to 80 per cent over the older ones. This increase in capacity will result in a proportionate decrease in cost of labor and, probably, in a decrease in cost of coke per ton of ore smelted."

Granby and Anyox Smelters.—The Granby smelter is situated at Grand Forks in the Boundary district, and the Anyox smelter at Observatory Inlet, Portland canal; both are owned by the Granby Consolidated Mining, Smelting and Power Company. The ores treated at Grand Forks are those from the Company's mines at Phoenix together with a small tonnage of custom ore; while at the Anyox smelter the ores from the Hidden Creek mine and other coast properties are reduced.

The Phoenix ores have been of particular interest because of the low tenor of their metal values, their self-fluxing character, and the large tonnage treated. The percentage of metals contained has been decreasing and the recovery of metals during the year ending June 30, 1914, as shown in the Company's annual report was: copper 17·28 pounds; silver 0·332 ounces; and gold 0·0352 ounces per ton of ore smelted including recoveries from foreign ores.

The first furnace of 300 tons capacity was completed in 1900, and since that date the capacity of the plant has been increased from time to time until at present there are eight furnaces with a total capacity of about 4,500 tons per day. The converter plant was first installed in 1902, and enlarged in 1909.

At the Hidden Creek mines, Anyox, the ore in sight is estimated at 18,153,000 tons which it is believed will average 1·4 per cent copper. Of this amount it is estimated that 9,563,000 tons will average 2·2 per cent copper. The gold and silver values will average about 30 cents per ton or less than half the gold and silver values in the Phoenix ores.

At Anyox[1] "the furnaces, of which there are three, (with a total daily capacity of 2,000 tons) are 50 inches wide by 30 feet long, and are the regular type of rectangular water-jacketed matting furnace made by the Traylor Engineering & Mfg. Co. The furnaces are provided with 4½-inch tuyeres at 10-inch centers. The slag tap is at the side. The converter room is in one end of the main smelter building, in which are three converter stands. The converters of the Great Falls type are 12 feet in diameter.

"The downtakes from the furnaces, and the flue from the converter hoods, lead into a large dust chamber by the side of the main smelter building. From the center of the chamber the main flue leads up the hill to the reinforced-concrete stack 22 feet in diameter by 153 feet high, the top of which is about 300 feet above the furnaces."

[1] Engineering and Mining Journal, Jan. 3, 1914.

The quantities of ores smelted and the total production of metals shown in the accompanying table, are compiled from the Company's annual published reports.

The blast furnace department at Grand Forks was operated throughout the year ending June 30, 1914, and that at Anyox from March.

The furnaces treated:—

Phoenix ores.....1,201,955 dry tons
Anyox ores..... 63,105 " "
Foreign ores..... 23,940 " "

and produced 23,320,097 pounds of fine copper; 435,275 ounces of silver, and 43,882 ounces of gold.

Ores Smelted and Metals Recovered at Granby Smelters.

Year ending June 30.	All materials smelted.				Metals produced.		
	Granby ore.	Foreign.		Total.	Gold.	Silver.	Copper.
		Ore.	Matte.				
	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Lbs.
1901	169,087	7,832	.....	176,919	8,871	34,990	5,435,955
1902	293,645	4,454	3,001	301,100	30,786	274,511	10,836,851
1903	289,583	7,691	6,223	303,497	35,121	277,574	12,551,758
1904	516,059	36,182	4,290	556,531	54,493	275,935	16,020,986
1905	550,738	39,382	.....	590,120	42,980	215,449	14,224,692
1906	796,188	36,158	.....	832,346	50,020	316,947	19,939,004
1907	649,022	16,893	.....	665,915	32,738	201,337	16,410,576
1908	858,432	24,179	.....	882,611	40,068	300,204	21,092,288
1909	964,789	19,944	.....	984,733	45,760	335,520	21,901,528
1910	1,175,548	21,829	.....	1,197,377	48,752	356,746	22,754,899
1911	959,563	24,783	.....	984,346	41,707	343,178	17,858,860
1912	721,719	17,800	.....	739,519	33,932	225,305	13,231,121
1913	1,264,690	15,179	.....	1,279,869	47,266	324,336	22,688,614
1914	1,265,060	23,940	.....	1,289,000	43,882	435,275	23,320,097
Total	10,474,123	296,246	13,514	10,783,883	556,376	3,917,307	238,267,229

Greenwood Smelter.—The plant of the British Columbia Copper Company, at Greenwood, B.C., includes three large furnaces, having a total daily capacity of from 2,400 to 2,500 tons, and a converter plant.

The last annual published report of the Company covering the year ending December 31, 1914, contains the following references to smelting operations:—

"The smelter was not operated to full capacity, due to shortage of custom ore. This in connection with the low price of copper, made it apparent, early in the year, that it was a question of very little time before operations must cease entirely. The furnaces were blown out on the 23rd of August and the plant cleaned up as far as practicable.

"The total amount of ore smelted from January 1st to August 23rd was 299,928 tons, and consisted of:—

B. C. Copper Co's ores.....193,512 tons.
Custom ores.....106,416 "

"The amount of converter slag made and smelted was 5,129 tons, and contained 1,627 tons of custom ore and 466 tons of clay.

"The amount of coke used was 41,026 tons and represented 13·52% of the entire charge fed to the furnaces.

"The time of actual operation was 450 furnace days; the total amount of charge smelted, ex-coke was 303,430 tons, or amount of charge smelted per furnace day, 674 tons.

"The average grade of the matte was 39·7% copper.

"The blast furnace slag contained 0·251% copper; 0·0039 ozs. gold; and 0·07 ozs. silver per ton. The average analysis was; Silica, 41·9%; iron, 18·00%; lime, 22·0%. The recoveries, based on blister copper returns, slag losses and metals tied up in process, showed as follows: Gold, 101·39%; silver, 75·48%; copper, 77·27%. The production was:—

Copper (fine)	.....	4,116,190 lbs.
Gold "	.....	14,442·28 oz.
Silver "	.....	63,501·27 oz."

METALLIC ORES.

ALUMINIUM.

No commercial ores of aluminium have as yet been found in Canada. Aluminium is, however, made in extensive works at Shawenegan Falls, Quebec, from bauxite ores imported from France, Germany, and the United States, by the Northern Aluminium Company. A wire mill for the manufacture of aluminium wire and cables is also operated by the same firm.

There being but one firm engaged in the manufacture of aluminium, we are precluded from publishing statistics of production.

Imports of alumina, probably including bauxite, and exports of aluminium are, however, published in the reports of the Department of Customs.

During the twelve months ending December 31, 1914, the imports of alumina were 28,557,000 pounds, or 14,279 tons valued at $571,419. The imports of aluminium in ingots, bars, etc., were 3,812,128 pounds, or 1,906 tons, valued at $752,753, besides manufactures of aluminium valued at $107,598. During the same period exports of aluminium in ingots, bars, etc., amounted to 14,510,800 pounds valued at $2,364,907 together with manufactures of aluminium valued at $5,571.

The imports of alumina and exports of aluminium during the past ten years, and the imports of aluminium during the past five years, are shown in tabular form as follows:—

Annual Imports of 'Alumina' and Exports of Aluminium.

Calendar Year.	Imports of alumina.		Exports of aluminium.		
			Ingots, bars, etc.		Manufactures
	Lbs.	Value. $	Lbs.	Value. $	Value. $
1905	5,360,800	138,765	2,535,386	508,219	1,588
1906	8,975,400	239,136	4,521,486	899,113	2,244
1907	12,705,300	268,502	5,478,203	1,109,353	1,499
1908	1,485,500	29,752	1,713,800	399,785	1,727
1909	11,794,100	234,544	6,134,500	918,195	3,453
1910	19,464,400	403,283	7,722,400	1,160,242	3,741
1911	18,607,200	372,009	4,990,100	747,587	1,555
1912	22,400,500	448,061	18,285,700	2,002,363	10,898
1913	30,704,200	614,713	13,015,000	1,762,214	8,203
1914	28,557,000	571,419	14,510,800	2,364,907	5,571

The price of aluminium No. 1 ingots in New York did not fluctuate much during the whole year, the lowest average weekly quotation was 16½ cents in May, and the highest was 20½ cents in September; the average for the year being 18¾ cents.

In Europe, prices for aluminium for several years have been considerably lower than in the United States. In 1914 the prices, as reported by the London Mining Journal, ranged from £81 to £94 per long ton, or otherwise from 17½ to 20½ cents per pound.

The average yearly prices as reported by the "Metallgesellschaft" are shown in tabular form.

Annual Imports of Aluminium.

Calendar Year.	Ingots, blooms, bars.		Tubing.		Manufactures.	Total.
	Lbs.	Value.	Lbs.	Value.		
		$		$	$	$
1910	3,180,250	674,683	10,019	4,203	77,664	756,550
1911	2,527,120	531,273	3,594	1,495	115,278	648,046
1912	2,396,375	410,022	11,624	3,654	120,029	533,705
1913	3,455,686	604,582	19,856	9,174	131,938	745,694
1914	3,796,353	745,855	15,775	6,898	107,598	860,351

Average Monthly Price of Ingot Aluminium.[1]

(At New York in cents per pound).

	1911.	1912.	1913.	1914.
January	20·13	19·13	26·31	18·81
February	21·25	19·44	26·04	18·81
March	21·15	19·58	27·05	18·50
April	20·75	20·38	27·03	18·16
May	20·55	21·69	26·44	17·95
June	20·03	22·83	24·68	17·75
July	20·20	23·50	23·38	17·66
August	20·02	24·38	22·70	19·88
September	19·34	25·13	21·69	19·94
October	18·75	26·25	20·13	18·50
November	18·79	26·56	19·35	18·00
December	18·85	25·75	18·88	18·96
	20·07	22·01	23·64	18·63

[1] As quoted by the Engineering and Mining Journal.

Yearly Average Prices of Aluminium at European Works.[1]

Year.	In marks per Kg.	In cents per pound.	Year.	In marks per Kg.	In cents per pound.
1902	2·25–2·50	24½–27	1908	1·30–2·00	14 –21½
1903	2·25–2·50	24½–27	1909	1·25–1·50	13½–16
1904	2·25–2·50	24½–27	1910	1·30–1·60	14 –17½
1905	3·25–3·75	35 –40½	1911	1·05–1·25	11 –13½
1906	3·25–3·75	35 –40½	1912	1·25–1·75	13½–18½
1907	3·25–4·00	35 –43½	1913	1·60–1·80	17½–19½

[1] From Statistical report of the Metallgesellschaft.

The "Mineral Industry" reports the estimated production of aluminium in principal countries during 1914, as follows, in metric tons: United States 42,270; Canada 6,820 (exports); Germany, Austria-Hungary 4,000; Switzerland 10,000; France 12,000; England 8,000; Italy 800; and Norway 2,500; or a total of 86,390 metric tons.

ANTIMONY.

The production of antimony in Canada has been not only small, but spasmodic.

The last production reported was in 1909 and consisted of 364 tons of antimony concentrates, valued at $13,906, shipped from West Gore, Nova Scotia.

The auriferous antimony property at West Gore, formerly operated by the Dominion Antimony Company, Limited, was taken over in July, 1909, by the West Gore Antimony Company.

The mines and works of the Canadian Antimony Company, Limited, at Lake George, New Brunswick, have not been in operation since 1909.

In British Columbia, some of the lead ores contain a small percentage of antimony—about one-third of one per cent. Some refined antimony was recovered at Trail in 1907 and 1909.

Annual Shipments of Antimony Ore.*

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	665	31,490	1905 (a)	527	.....
1887	584	10,860	1906 (a)	782	.....
1888	345	3,696	1907	2,016	65,000
1889	55	1,100	*Refined antimony	.....	5,108
1890	26½	625	1908 (b)	148	5,443
1891	10	60	1909	35	1,575
1892 to 1897	Nil.	Nil.	*Refined antimony	.....	4,285
1898	1,344	20,000	1910	364	13,906
1899 to 1904	Nil.	Nil.	1911	.....	.....

(a) As recorded by the Nova Scotia Department of Mines; no value given.
(b) Exports.
* Refined antimony: 63,850 pounds in 1907 and 61,207 pounds in 1909.

Exports of Antimony Ore.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1880	40	1,948	1899	6¾	190
1881	34	3,308	1900	210	3,441
1882	323	11,673	1901	10	1,643
1883	165	4,200	1902	90	13,658
1884	483	17,875	1903	33	4,332
1885	758	36,250	1904	160	7,237
1886	665	31,490	1905	525	27,118
1887	229	9,720	1906	420	17,064
1888	352½	6,894	1907	1,327	37,807
1889	30	695	1908	148	5,443
1890	38	1,000	1909	4	120
1891	3½	60	1910	239	14,095
1892–1897	Nil.	Nil.	1911	57	4,946
1898	1,232	15,295	1912–1914	Nil.	Nil.

Imports of Antimony.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	42,247	5,903	1898	156,451	12,350
1881	.....	7,060	1899	289,066	16,851
1882	183,597	15,044	1900	186,997	20,001
1883	105,346	10,355	1901	350,737	24,714
1884	445,600	15,564	1902	504,822	39,276
1885	82,012	8,182	1903	868,146	65,434
1886	89,787	6,951	1904	418,943	27,112
1887	87,827	7,122	1905	186,454	12,828
1888	120,125	12,242	1906	403,918	56,297
1889	119,034	11,206	1907 (9 mos.)	321,385	71,493
1890	117,066	17,439	1908	484,899	66,484
1891	114,084	17,483	1909	444,254	32,133
1892	180,308	17,680	Calendar year.		
1893	181,823	14,771	1910	483,282	34,488
1894	139,571	12,249	1911	579,466	38,823
1895	79,707	6,131	1912	1,053,728	67,653
1896	163,209	9,557	1913	690,699	51,829
1897	134,661	8,031	1914	694,150	57,715

			Lbs.	$
1914	Antimony, or regulus of, not ground, pulverized or otherwise manufactured	Duty free.	648,516	47,498
	Antimony salts	„	45,634	10,217
	Total		694,150	57,715

The average prices of antimony, as quoted by the Engineering and Mining Journal, are shown in the following table:—

Average Prices of Antimony.

	1912.			1913.			1914.		
	Cookson's.	U.S.	Ordinaires.	Cookson's.	U.S.[1]	Ordinaires.[2]	Cookson's.	U.S.	Ordinaires.
January	7·53	7·47	6·88	9·94	9·53	8·97	7·388	7·110	6·125
February	7·27	7·44	6·83	9·47	9·09	8·25	7·250	7·057	6·100
March	7·65	7·56	6·86	9·28	8·85	8·18	7·315	7·073	6·053
April	8·05	7·75	6·94	9·13	8·50	7·98	7·363	7·048	6·006
May	8·02	7·75	7·10	8·88	8·37	7·79	7·365	7·020	5·845
June	8·09	7·78	7·21	8·79	8·27	7·64	7·250	7·000	5·825
July	8·42	7·96	7·50	8·54	8·08	7·55	7·210	6·940	5·638
August	8·59	7·98	7·70	8·38	7·91	7·39	17·250	15·800	13·800
September	9·12	8·50	8·26	8·37	7·93	7·37	11·830	.....	9·940
October	10·30	9·62	9·30	7·60	7·27	6·49	14·680	.....	12·060
November	10·39	9·86	9·30	7·62	7·30	6·45	17·750	.....	14·450
December	10·21	9·62	9·18	7·50	7·25	6·13	16·130	.....	13·310
	8·90	8·26	7·76	8·73	8·22	7·52	10·732	.....	8·763

[1] United States brands.
[2] Hungarian, Chinese, or other "Foreign" brands.

The weekly quotations showed that the price of antimony, ordinary brands, was 5½ cents at the beginning of August, rose to 18 cents in the middle of the same month, gradually declining again to 9 cents in October. During the last months of the year, however, the price again rose to 12 and 14 cents.

COBALT.

The silver-cobalt-nickel-arsenides of Coleman and adjacent townships, more familiarly known as the Cobalt district, in the Province of Ontario, are now the principal sources of the world's production of cobalt.

The recovery of this metal in Canada has been in the form of cobalt-oxide and mixed oxides of cobalt and nickel, produced by the smelters treating the above ores, together with cobalt residues produced at the high grade mill of the Nipissing Mining Company. While these residues have been chiefly exported, a portion has been shipped to the Canadian smelters producing cobalt-oxide.

According to direct returns there were produced during 1914, 899,027 pounds of cobalt-oxide, valued at $571,710, and 392,512 pounds of nickel-oxide valued at $34,883. The production of mixed oxides of cobalt and nickel, together with the shipments abroad of cobalt residues, amounted to 2,079,001 lbs., valued at $79,995, and containing 242,572 pounds of metallic cobalt. Assuming the cobalt-oxide to average 70 per cent cobalt the total production of the metal would approximate 871,891 pounds in 1914.

No record is available as to the recovery of cobalt from silver ores exported but it is stated that cobalt speiss has been accumulated at United States smelters treating these ores.[1]

The production of cobalt-oxide, nickel-oxide and cobalt material during the past three years has been as follows:—

Production of Cobalt and Nickel-Oxides.

Year.	Cobalt oxide.		Nickel oxide.		Mixed oxides of cobalt and nickel and other cobalt material.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1912.....	257,677	$128,843	91,377	$ 9,137	1,285,280	$163,988
1913.....	660,079	525,028	268,304	30,122	3,216,000	90,266
1914.....	899,027	571,710	392,512	34,883	2,079,001	79,995

The following table shows the ore shipments and estimated cobalt content, as published by the Ontario Bureau of Mines:—

Shipments of Silver and Cobalt Ores and Estimated Cobalt Content

Year.	Ores shipped.	Estimated total cobalt content.	Per cent.	Year.	Ores shipped.	Estimated total cobalt content.	Per cent.
	Tons.	Tons.			Tons.	Tons.	
1904....	158	16	10·1	1910.....	34,282	1,098	3·2
1905....	2,144	118	5·5	1911.....	26,653	852	3·2
1906....	5,335	321	6·0	1912.....	21,933	934	3·2
1907....	14,788	739	5·0	1913.....	20,877	821	3·2
1908....	25,624	1,224	4·7	1914.....	.....	.....	.....
1909....	30,677	1,533	5·0				

[1] Mineral Resources of the United States, 1913, p. 340.

The result of researches on cobalt and cobalt alloys, undertaken for the Mines Branch, by Dr. H. T. Kalmus, at Queens University, have been published in two reports.[1]

Under the provisions of the "Metal Refining Bounty Act," passed by the Ontario Legislature in 1907, bounties amounting to $26,038.02 were paid to the refineries on cobalt-oxide, and $8,978.70 on nickel-oxide in 1913; and $26,744.75 on cobalt-oxide and $10,280.28 on nickel-oxide, in 1914.

The bounty is at the rate of six cents per pound on the metallic contents of the oxides. The "Act" which expires in April, 1917, is quoted with the amendment, as follows:—

An Act to Encourage the Refining of Metals in Ontario.

Whereas, it is desirable to encourage the refining of nickel, cobalt, copper and arsenic ores within the Province;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as 'The Metal Refining Bounty Act.'

2. The treasurer of the Province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified, when refined in the Province from ores raised and mined in the Province, a bounty upon each pound of such metal or compound so refined as follows:—

Class 1.—On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel-oxide; but nickel upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $60,000 in any one year.

Class 2.—On refined metallic cobalt or on refined oxide of cobalt 6 cents per pound on the free metallic cobalt or on the cobalt contained in the oxide of cobalt; but cobalt upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the cobalt products herein mentioned is not to exceed in all $30,000 in any one year.

Class 3.—On refined metallic copper or on refined sulphate of copper, 1½ cents per pound on the free metallic copper or on the copper contained in the sulphate of copper; or on any copper product carrying at least 95 per cent of metallic copper, one-half cent per pound; but copper upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as

[1] Mines Branch No. 259 "Preparation of Metallic Cobalt by Reduction of the Oxide." Report on, by H. T Kalmus, B.Sc., Ph.D.
Mines Branch No. 309 "The Physical Properties of the Metal Cobalt." Report on, by H. T. Kalmus, B.Sc., Ph.D.

bounty on the copper products herein mentioned is not to exceed in all $60,000 in any one year.

Class 4.—On white arsenic, otherwise known as arsenious acid, produced from mispickel ores and not from ores carrying smaltite or niccolite or cobaltite, one-half cent per pound; but the amount to be paid as bounty on the arsenic compound herein mentioned is not to exceed in all $15,000 in any one year.

(1) Provided, however, that if so much of any of the above-mentioned classes of refined products is refined in the Province in any one year that the amount hereby set apart in respect of the said class would be insufficient to pay the bounties herein provided therefor, then the bounty payable to the refiners of such class of refined products shall abate and be payable upon a *pro rata* basis so that not more than the maximum amount herein specified for any of the said classes shall be paid in respect of said class in any one year.

(2) Provided, also, that the bounties herein provided for shall cease and determine with the payment of any sum or sums which shall have been earned during the period of five years from the passing of this Act.

(3) No person, firm or company shall be entitled to claim or receive any of the bounties in this Act provided for unless such person, firm or company shall have been at all times prepared and ready and willing during the period for which the bounty is claimed, to smelt, treat and refine ores from which the same product as that on which the bounty is claimed can be produced, belonging to any other person, firm or company, at rate and on terms and conditions approved by the Lieutenant-Governor in Council, or shall have been ready to purchase such ores at rates approved by the Lieutenant-Governor in Council at current market rates.

An Act to Amend the Act to Encourage the Refining of Metals in Ontario.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. Subsection 2 of section 2 of The Metal Refining Bounty Act is amended by striking out the word 'five' where the same appears in the last line of the said subsection, and substituting therefor the word 'ten.'

COPPER.

The total production of copper in Canada in 1914 estimated on the basis of smelter recovery from ores treated, was 75,735,960 pounds, which, at the average price of copper for the year in New York 13·602 cents per pound, would be worth $10,301,606.

Since 1912 there has been a gradual falling off in quantity, and owing to the decrease in the price of the metal, a still greater falling off in value.

Statistics showing the annual copper production of Canada since 1886 are given in the following table, which shows the yearly increase or decrease as the case may be and also the yearly price per pound in New York:—

Annual Production of Copper.

Calendar 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	(d) 244,576	6·99	366,798	(d) 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	(d) 796,081	11·69	947,153	10,812	1·15	15·75
1891	9,529,401	3,515,730	58·46	1,226,703	279,550	29·51	12·87
1892	7,087,275	2,442,126	25·63	818,580	(d) 408,123	33·27	11·55
1893	8,109,856	1,022,381	14·40	871,809	53,229	6·50	10·75
1894	7,708,789	(d) 401,067	4·94	736,960	(d) 134,849	15·46	9·56
1895	7,771,639	62,850	0·81	836,228	99,268	13·47	10·76
1896	9,393,012	1,621,373	20·86	1,021,960	185,732	22·21	10·88
1897	13,300,802	3,907,790	41·60	1,501,660	479,700	46·94	11·29
1898	17,747,136	4,446,334	33·43	2,134,980	633,320	42·17	12·03
1899	15,078,475	(d) 2,668,661	15·04	2,655,319	520,339	24·37	17·61
1900	18,937,138	3,858,663	25·59	3,065,922	410,603	15·46	16·19
1901	37,827,019	18,889,881	99·75	6,096,581	3,030,659	98·84	16·117
1902	38,804,259	977,240	2·58	4,511,383	(d) 1,585,198	26·00	11·626
1903	42,684,454	3,880,195	10·00	5,649,487	1,138,104	25·23	13·235
1904	41,383,722	(d) 1,300,732	3·05	5,306,635	(d) 342,852	6·07	12·823
1905	48,092,753	6,709,031	16·21	7,497,660	2,191,025	41·29	15·590
1906	55,609,888	7,517,135	15·63	10,720,474	3,222,814	42·98	19·278
1907	56,979,205	1,369,317	2·46	11,398,120	677,654	6·32	20·004
1908	63,702,873	6,723,668	11·80	8,413,876	2,984,244	26·18	13·208
1909*	52,493,863	.....	.....	6,814,754	.....	.....	12·982
1910	55,692,369	3,198,506	6·09	7,094,094	279,340	4·10	12·738
1911	55,648,011	(d) 44,358	0·79	6,886,998	(d) 207,096	2·92	12·376
1912	77,832,127	22,184,116	28·50	12,718,548	5,831,550	45·85	16·341
1913	76,976,925	(d) 855,202	1·10	11,753,606	(d) 964,942	7·59	15·269
1914	75,735,960	(d) 1,240,965	1·64	10,301,606	(d) 1,452,000	14·10	13·602

*The decrease is not as large as the figures would indicate because of the calculation of part of the 1909 production on a different basis from previous years. (See explanation in text).

In the case of British Columbia the metal is mainly derived from ores low in copper content, and since in smelting the copper, losses are necessarily high, running as high in some cases as 25 per cent and over, the difference between the copper content of the ore as shipped by the mine, and the metal recovered from the ore at the smelter, is considerable.

Statistics of the copper production for the years previous to 1909 include for British Columbia a record of the copper production in that Province as collected by the Provincial Bureau of Mines. These are compiled on the basis of the total metal content of the ores received at the smelters, for which smelter returns were received during the year, and show a relatively higher copper production than the figures published for the Province of Ontario, which are based on copper content of matte produced.

Since 1909 the method of compilation of statistics of copper production by the Provincial Bureau of Mines in British Columbia, provides for a deduction of five pounds of copper per ton of ore shipped on account of smelter losses, a method which gives a result closely approximating that obtained by this Branch.

Production of Copper by Provinces 1912, 1913, and 1914.

Provinces.	1912.		1913.		1914.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$
Quebec	3,282,210	536,346	3,455,887	527,679	4,201,497	571,488
Ontario	22,250,601	3,635,971	25,885,929	3,952,522	28,948,211	3,937,536
British Columbia	50,526,656	8,256,561	45,791,579	6,991,916	41,219,202	5,606,636
Other districts	*1,772,660	289,670	*1,843,530	281,489	†1,367,050	185,946
Total	77,832,127	12,718,548	76,976,925	11,753,606	75,735,960	10,301,606

*Includes Nova Scotia and Yukon. †Yukon only.

Prices:—The price of copper in New York varied between a maximum of 14·70 cents in February and a minimum of 11·05 cents in November. For three months following the declaration of war there were no market quotations. By the end of December prices had increased again to 13 cents.

Monthly Average Prices of Electrolytic Copper in New York.

(In cents per pound.)

Months.	1910.	1911.	1912.	1913.	1914.
	cts.	cts.	cts.	cts.	cts.
January	13·620	12·295	14·094	16·488	14·223
February	13·332	12·256	14·084	14·971	14·491
March	13·255	12·139	14·698	14·713	14·131
April	12·733	12·019	15·741	15·291	14·211
May	12·550	11·989	16·031	15·436	13·996
June	12·404	12·385	17·234	14·672	13·603
July	12·215	12·463	17·190	14·190	13·223
August	12·490	12·405	17·498	15·400	*
September	12·379	12·201	17·508	16·328	*
October	12·553	12·189	17·314	16·337	*
November	12·742	12·616	17·326	15·182	11·739
December	12·581	13·552	17·376	14·224	12·801
Yearly average	12·738	12·376	16·341	15·269	13·602

*No quotations.

Monthly Average Prices of Standard Copper in London.

(In £ Sterling per ton of 2,240 pounds.)

Months.	1910.	1911.	1912.	1913.	1914.
	£	£	£	£	£
January	60·923	55·604	62·760	71·741	64·304
February	59·388	54·970	62·893	65·519	65·259
March	59·214	54·704	65·884	65·329	64·276
April	57·238	54·035	70·294	68·111	64·747
May	56·313	54·313	72·352	68·807	63·182
June	55·310	56·368	78·259	67·140	61·336
July	54·194	56·670	76·636	64·166	60·540
August	55·733	56·264	78·670	69·200	*
September	55·207	55·253	78·762	73·125	*
October	56·722	55·176	76·389	73·383	*
November	57·634	57·253	76·890	68·275	53·227
December	56·069	62·063	75·516	65·223	56·841
Yearly average	57·054	55·973	72·942	68·335	61·524

*No quotations.

With the exception of a small output of copper sulphate at Trail, B.C., the copper production of Canada is exported for refining. The exports of copper in ore, matte, regulus, etc., during the calendar year 1914 were 68,830,059 pounds valued at $7,130,778, of which 57,923,363 pounds valued at $6,287,439 were exported to the United States, and 10,906,696 pounds valued at $843,339 to Great Britain. The exports of copper black or coarse and in pigs, to the United States amounted to 6,581,564 pounds valued at $908,201. There was also an export of "old and scrap" copper amounting to 19,871 cwt. and valued at $231,710, distributed as follows: to the United States 16,604 cwt. valued at $189,793; to Great Britain, 2,751 cwt. valued at $35,918; and to other countires 516 cwt. valued at $5,999.

The following tables give, in detail, the exports for 1913 and 1914:—

Exports of Copper 1913 and 1914.

1914.	Fine in ore, matte, regulus, etc.		Black or coarse and in pigs.		"Old and Scrap."	
	Pounds.	Value. $	Pounds.	Value. $	Cwt.	Value. $
United States	57,923,363	6,287,439	6,581,564	908,201	16,604	189,793
Great Britain	10,906,696	843,339	.....	.....	2,751	35,918
Other countries	.....	.....	.....	.....	516	5,999
Total	68,830,059	7,13 0,778	6,581,564	908,201	19,871	231,710
1913.						
United States	76,552,312	9,079,167	771,280	123,431	18,432	237,678
Great Britain	5,325,468	400,163	.....	.....	6,071	80,647
Other countries	1,300	150	.....	.....	469	6,578
Total	81,879,080	9,479,480	771,280	123,431	24,972	324,903

Exports of Copper in Ore, Matte, etc., from 1885—1914.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1885		262,600	1900	23,631,523	1,741,885
1886		249,259	1901	32,488,872	3,404,908
1887		137,966	1902	26,094,498	2,476,516
1888		257,260	1903	38,364,676	3,873,827
1889		168,457	1904	38,553,282	4,216,214
1890		398,497	1905	40,740,861	5,443,873
1891		348,104	1906	42,398,538	7,303,366
1892		277,632	1907	54,688,450	8,749,609
1893	4,792,201	269,160	1908	51,136,371	5,934,559
1894	1,625,389	91,917	1909	54,447,750	5,832,246
1895	3,742,352	236,965	1910	56,964,127	5,840,553
1896	5,462,052	281,070	1911	55,287,710	5,467,725
1897	14,022,610	850,336	1912	78,488,564	9,036,479
1898	11,572,381	840,243	1913*	85,147,560	9,927,814
1899	11,371,766	1,199,908	1914*	77,398,723	8,270,689

*Includes "Old and Scrap."

The total imports of copper during the calendar year were valued at $4,256,901 and included crude and manufactured copper to the extent of 26,280,815 pounds valued at $3,983,322, copper sulphate 1,143,039 pounds valued at $53,802, and other manufactures of copper valued at $219,777.

In 1913 the total value of the imports was $7,414,610 and included 41,011,961 pounds of crude and manufactured copper valued at $6,935,822; copper sulphate 2,037,714 pounds valued at $107,960; and other copper manufactures valued at $370,828.

Imports of Copper 1913 and 1914.

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
		$		$
Copper, old and scrap	596,700	87,790	127,800	15,717
Copper in pigs, ingots or in blocks	5,314,200	845,095	3,733,300	507,499
Copper in bars, and rods, in coils, or otherwise, in lengths, not less than 6 feet, unmanufactured	29,387,900	4,886,846	18,212,300	2,689,940
Copper, in strips, sheets or plates, not planished or coated, etc.	4,255,900	782,974	3,373,100	574,783
Copper tubing in lengths not less than 6 feet and not polished, bent or otherwise manufactured	884,920	205,797	696,444	159,602
Copper rollers, for use in calico printing		11,704		22,301
Copper and Manufactures of:—				
Nails, tacks, rivets and burrs or washers		3,479		4,445
Wire, plain, tinned or plated	572,341	127,320	137,871	35,781
Wire cloth, etc.		5,844		4,433
All other manufactures of, n.o.p.		349,286		188,270
Copper precipitate of crude	4,743	515	2,017	328
Copper sulphate	2,037,714	107,960	1,143,039	53,802
Total value		7,414,610		4,256,901

Imports of Copper 1910 to 1914 inclusive.

Year.	Pigs, ingots or in blocks.		Old and scrap.		Manufactures of copper.			Crude precipitate.		Copper sulphate.		Total value.
					Bars, rods, sheets, tube and wire.		Other manufactures.					
	Lbs.	$	Lbs.	$	Lbs.	$	$	Lbs.	$	Lbs.	$	$
1910	4,640,500	609,111	273,700	31,070	25,322,906	3,579,270	150,322	4,847	595	1,925,557	77,782	4,448,150
1911	5,650,400	705,598	265,300	28,748	29,244,210	3,898,416	215,289	2,608	299	2,191,899	88,419	4,936,769
1912	5,121,800	806,705	400,500	56,748	35,198,208	5,776,003	305,680	5,703	570	2,105,419	101,650	7,047,356
1913	5,314,200	845,095	596,700	87,790	35,101,061	6,002,937	370,313	4,743	515	2,037,714	107,960	7,414,610
1914	3,733,300	507,499	127,800	15,717	22,419,715	3,460,106	219,449	2,017	328	1,143,039	53,802	4,256,901

Copper:—Imports of Pigs, Old Scrap, etc.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	31,900	2,130	1898	1,050,000	80,000
1881	9,800	1,157	1899	1,655,000	246,740
1882	20,200	1,984	1900	1,144,000	180,990
1883	124,500	20,273	1901	951,500	152,274
1884	40,200	3,180	1902	1,767,200	325,832
1885	28,600	2,016	1903	2,038,400	252,594
1886	82,000	6,969	1904	2,115,300	270,315
1887	40,100	2,507	1905	1,944,400	266,548
1888	32,300	2,322	1906	2,627,700	441,854
1889	32,300	3,288	1907 (9 mos.)	2,616,600	520,971
1890	112,200	11,521	1908	3,612,400	650,597
1891	107,800	10,452	1909	2,732,300	383,441
1892	343,600	14,894	Calendar year.		
1893	168,300	16,331	1910	4,914,200	640,181
1894	101,200	7,397	1911	5,915,700	734,346
1895	72,062	6,770	1912	5,522,300	863,453
1896	86,905	9,226	1913	5,910,900	932,885
1897	49,000	5,449	1914	3,861,100	523,216

Imports of Manufactures of Copper.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	123,061	1892	422,870	1904	1,191,610
1881	159,163	1893	458,715	1905	1,775,881
1882	220,235	1894	175,404	1906	2,660,303
1883	247,141	1895	251,615	1907 (9 mos.)	2,545,600
1884	134,534	1896	285,220	1908	2,713,060
1885	181,469	1897	264,587	1909	2,086,205
1886	219,420	1898	786,529	Calendar year.	
1887	325,365	1899	551,586	1910	3,729,592
1888	303,459	1900	1,090,280	1911	4,113,395
1889	402,216	1901	951,045	1912	6,081,464
1890	472,668	1902	1,281,522	1913	6,373,250
1891	563,522	1903	1,291,635	1914	3,679,555

Quebec.

The mines of the Eastern Townships were still more active during 1914 with an increased copper production therefrom. This amounted to 4,206,497 pounds, valued at $571,488, representing the estimated recovery from 117,699 tons of ore and concentrates. Statistics of the copper production of Quebec province since 1886 are shown in the table following:—

Quebec:—Production of Copper.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	3,340,000	367,400	1901	1,527,442	246,178
1887	2,937,900	330,514	1902	1,640,000	190,666
1888	5,562,864	927,107	1903	1,152,000	152,467
1889	5,315,000	730,813	1904	760,000	97,455
1890	4,710,606	741,920	1905	1,621,243	252,752
1891	5,401,704	695,469	1906	1,981,169	381,930
1892	4,883,480	564,042	1907	1,517,990	303,659
1893	4,468,352	480,348	1908	1,282,024	169,330
1894	2,176,430	208,067	1909	1,088,212	141,272
1895	2,242,462	241,288	1910	877,347	111,757
1896	2,407,200	261,903	1911	2,436,190	301,503
1897	2,474,970	279,424	1912	3,282,210	536,346
1898	2,100,235	252,658	1913	3,455,887	527,679
1899	1,632,560	287,494	1914	4,201,497	571,488
1900	2,220,000	359,418			

Ontario.

The copper production from Ontario comes mainly from the nickel-copper ores of Sudbury district.

The chief companies are: The Canadian Copper Co., Limited, shipping from the Creighton, Crean Hill, the No. 2 and the No. 3, or Frood mines; and the Mond Nickel Co., Limited, operating the Garson, Victoria No. 1, North Star and Worthington. The Alexo mine, near Porquis Junction, on the Timiskaming and Northern Ontario Railway, shipped a considerable tonnage of nickel-copper ore to the Mond Nickel Company's smelter.

The British America Nickel Corporation did some development work at the Murray and Whistle mines, but made no production.

A small shipment was made of copper ore from Dane to United States smelters, and payments were made for a small amount of copper in shipments from the Cobalt district to American smelters.

The total tonnage of nickel-copper ores smelted in 1914 was 947,053 tons. There were produced during the year 46,396 tons of bessemer matte, containing 14,448 tons of copper and 22,759 tons of nickel, the shipping value of the matte being approximately $7,189,031. Details of the production of these ores are given more completely and in tabular form in the article on "Nickel."

The Ontario Government offers a bounty on copper over 95 per cent pure metal, and on copper-sulphate produced from ore mined and refined in the Province. The text of the Act will be found in the chapter on cobalt under the heading "Metal Refining Bounty Act."

Statistics of the copper production of Ontario since 1886 are given in the table following:—

Ontario:—Production of Copper.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1886	165,000	18,150	1901	8,695,831	1,401,507
1887	322,524	36,284	1902	7,408,202	861,278
1888	Nil.	Nil.	1903	7,172,533	949,285
1889	1,466,752	201,678	1904	4,913,594	630,070
1890	1,303,065	205,233	1905	8,779,259	1,368,686
1891	4,127,697	531,234	1906	10,638 231	2,050,838
1892	2,203,795	254,538	1907	14,104,337	2,821,432
1893	3,641,504	391,461	1908	15,005,171	1,981,883
1894	5,207,679	497,854	1909	15,746,699	2,044,237
1895	4,576,337	492,414	1910	19,259,016	2,453,213
1896	3,167,256	344,598	1911	17,932,263	2,219,297
1897	5,500,652	621,023	1912	22,250,601	3,635,971
1898	8,375,223	1,007,539	1913	25,885,929	3,952,522
1899	5,723,324	1,007,877	1914	28,948,211	3,937,536
1900	6,740,058	1,091,215			

British Columbia.

According to returns received from the smelters, the total quantity of copper contained in matte, blister, and copper-sulphate produced in British Columbia during 1914, and including an estimate of smelter recovery for copper ores exported, was 41,219,202 pounds, after deducting the amount of copper produced from foreign ores. The production of 1913 on a similar basis was 43,791,579 pounds, and in 1912—50,526 656 pounds.

Returns of smelter production in this Province were not collected by this Department previous to 1908, and a complete record of statistics of production on this basis is not available.

The production of copper in this Province, according to statistics collected and published by the Provincial Department of Mines, reached a total of 45,009,699 pounds in 1914, as compared with 46,460,305 pounds in 1913. Statistics of the annual production since 1894, as ascertained by the Provincial Department of Mines, and the production by districts since 1908 are shown in the tables following:—

British Columbia:—Copper Content of Ores Shipped.†

Calendar Year.	Copper contained in ores shipped.	Increase.		Value.
	Lbs.	Lbs.	%	
				$
1894	324,680			31,039
1895	952,840	628,160	193·60	102,526
1896	3,818,556	2,865,716	301·00	415,459
1897	5,325,180	1,506,624	39·00	601,213
1898	7,271,678	1,946,498	36·00	874,783
1899	7,722,591	450,913	6·00	1,359,948
1900	9,977,080	2,254,489	29·00	1,615,289
1901	27,603,746	17,626,666	177·00	4,448,896
1902	29,636,057	2,032,311	7·00	3,445,488
1903	34,359,921	4,723,864	16·00	4,547,735
1904	35,710,128	1,350,207	3·7	4,579,110
1905	37,692,251	1,982,123	5·6	5,876,222
1906	42,990,488	5,298,237	14·1	8,287,706
1907	40,832,720	*2,157,768	*5·02	8,168,177
1908	47,274,614	6,441,894	15·8	6,244,031
1909	45,597,245	*1,677,369	*3·6	5,918,522
1910‡	38,243,934			4,871,512
1911‡	36,927,656	*1,316,278	*3·4	4,571,644
1912‡	51,546,537	14,618,881	39·6	8,408,513
1913‡	46,460,305	*4,996,232	9·7	7,094,489
1914‡	45,009,699	*1,450,606	3·1	6,121,319

* Decrease. †As published by British Columbia Bureau of Mines. ‡Allowing 5 pounds copper per ton of ore for smelter losses.

British Columbia:—Production of Copper by Districts.

——	1909.*	1910.†	1911.†	1912.†	1913.†	1914.†
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cariboo					1,838	6,000
Cassiar	137,651		19,151	88,403	1,336	11,123,376
West Kootenay—						
Nelson	186,572	231,936		26,257	815,126	586,764
Trail creek	3,509,909	3,577,745	3,429,702	2,539,900	2,538,661	3,779,830
Yale—						
Boundary	40,603,042	31,354,985	22,327,359	33,372,199	28,621,973	16,428,959
Ashcroft / Kamloops		1,178	152,723		37,578	14,525
Coast districts	1,160,071	3,078,090	10,998,721	15,429,778	14,443,793	13,070,245
Totals	45,597,245	38,243,934	36,927,656	51,456,537	46,460,305	45,009,699

*Copper content of ores shipped. †After deducting five pounds of copper per ton of ore for slag losses.

According to the direct returns in 1914, the ores of the Boundary district produced 42·9 per cent of the total against 63·5 per cent of the total for 1913; the Trail Creek and Nelson divisions came in for about 11·3 per cent; and the Coast and Cassiar districts for 45·8 per cent—compared with 29·8 per cent of the total for 1913.

In the Boundary the production was mainly from the mines of three of the large smelting companies; the Granby Consolidated Mining, Smelting and Power Co., Limited; the British Columbia Copper Co., Limited, and the New Dominion Copper Co., Limited. The two first named operate their own smelters and convert their matte to blister copper. The low grade

ores of this district are self-fluxing and very uniform in character, averaging a little over 1 per cent in copper, and from $1 to $2 in gold and silver.

The chief producing mines of the district were the Granby mines at Phoenix, the Mother Lode of the British Columbia Copper Company at Deadwood, and Rawhide of the New Dominion Copper Company, near Phoenix.

The British Columbia Copper Company have been steadily developing their properties at Princess Camp in the Similkameen, employing a large number of men. The properties were producing during 1914 and we may look forward to the eventual establishment in that part of the country of another important copper producing centre.

In the interior the main shippers were, at Rossland, the Centre Star, Le Roi groups, owned by the Consolidated Mining and Smelting Co., and the Le Roi II (Josie) mine. Besides these, shipments were made from the Nelson district by the Queen Victoria mine of the British Columbia Copper Co., and the Silver King of the Consolidated Mining and Smelting Company.

Much development was done in the neighbourhood of New Hazelton in the Omineca mining division.

The Montana Continental Development Co., did extensive improvements and much work on the Rocher de Boule property, and will likely be an important producer in 1915.

The decrease in production in the Boundary district was more than offset by the large increase in production of the Coast district, which now ranks as the principal producer of copper ores in British Columbia with heavy shipments from the Hidden Creek mine on Observatory inlet; the Britannia mines on Howe Sound and the Marble Bay mines on Texada island.

Yukon.

The main shipments from this Territory were from the Pueblo mine at Whitehorse. Some smaller properties also shipped, and the owners of the Pueblo have re-opened the War Eagle in the same neighbourhood.

GOLD.

The production of gold in Canada in 1914 reached a total of 773,178 fine ounces valued at $15,983,007 as compared with 802,973 fine ounces valued at $16,598,923 in 1913. The production was made up as follows: (a) gold derived from alluvial workings $5,687,501 or 35·6 per cent of the total; (b) gold obtained from the crushing of free milling quartz ores, i. e. stamp mill bullion $6,051,968, or 37·9 per cent; and (c) gold obtained from ores and concentrates sent to the copper and lead smelters $4,243,538 or 26·5 per cent of the total production.

Statistics of the annual gold production of Canada are shown in the following table:—

Annual Production of Gold in Canada, 1858-1914.

Calendar Year.	Ozs. (fine†)	Value.	Calendar Year.	Ozs. (fine†)	Value.
		$			$
1858	34,104	705,000	1886	70,782	1,463,196
1859	78,129	1,615,072	1887	57,460	1,187,804
1860	107,806	2,228,543	1888	53,145	1,098,610
1861	128,973	2,666,118	1889	62,653	1,295,159
1862	135,391	2,798,774	1890	55,620	1,149,776
1863	202,498	4,186,011	1891	45,018	930,614
1864	199,605	4,126,199	1892	43,905	907,601
1865	192,898	3,987,562	1893	47,243	976,603
1866	152,555	3,153,597	1894	54,600	1,128,688
1867	145,775	3,013,431	1895	100,798	2,083,674
1868	134,169	2,773,527	1896	133,262	2,754,774
1869	102,720	2,123,405	1897	291,557	6,027,016
1870	83,415	1,724,348	1898	666,386	13,775,420
1871	105,187	2,174,412	1899	1,028,529	21,261,584
1872	90,283	1,866,321	1900	1,350,057	27,908,153
1873	74,346	1,536,871	1901	1,167,216	24,128,503
1874	97,856	2,022,862	1902	1,032,161	21,336,667
1875	130,300	2,693,533	1903	911,559	18,843,590
1876	97,729	2,020,233	1904	796,374	16,462,517
1877	94,304	1,949,444	1905	684,951	14,159,195
1878	74,420	1,538,394	1906	556,415	11,502,120
1879	76,547	1,582,358	1907	405,517	8,382,780
1880	63,121	1,304,824	1908	476,112	9,842,105
1881	63,524	1,313,153	1909	453,865	9,382,230
1882	60,288	1,246,268	1910	493,707	10,205,835
1883	53,853	1,113,246	1911	473,159	9,781,077
1884	51,202	1,058,439	1912	611,885	12,648,794
1885	55,575	1,148,829	1913	802,973	16,598,923
			1914	773,178	15,983,007

†Calculated from the value: one dollar = 0·048375 oz.

Gold was first discovered in various provinces about 1858 and the production gradually increased, reaching over four million dollars in 1863, to decrease again, so that in 1892 the production amounted only to $907,601. The discovery of gold in the Yukon and other discoveries in 1896 gave the mining industry a new impetus, resulting in a rapid increase in the gold production, which, in 1900, reached the high mark of nearly twenty million

dollars, from which it decreased again until 1907, and after a stationary period around the ten million mark, with the discovery of the Porcupine mines in Ontario, it has rapidly increased again, suffering a slight decrease in 1914, due to the unsettled conditions caused by the European war.

The imports during the calendar year 1914 were: gold bullion valued at $14,534,482; gold coins $117,700,824; and manufactures of gold and silver valued at $614,043.

The exports of gold in dust, nuggets, etc., during the same period were valued at $15,242,200.

Refined Metal:—The Dominion Assay Office in Vancouver, operated in connexion with this Department, receives, assays, and purchases crude bullion, amalgam, nuggets, and dust, the resultant bullion being re-sold. The total quantity of bullion thus received during the twelve months ending December 31, 1914 was 163,523·61 ounces, being the weight after melting, valued at $2,029,251.31, after deducting office charges.

A refinery is in operation at the Royal Mint at Ottawa and shipments of gold have been received from various provinces.

There is but one other refinery in Canada producing fine gold; that of the Consolidated Mining and Smelting Co. of Canada, Limited, at Trail, B.C., where the gold is mainly recovered from the high grade silver-lead ores and the "dry" ores shipped to the smelter. Its annual output is given below.

Production of Refined Gold at Trail, B.C.

Year	Ozs.	Year.	Ozs.	Year.	Ozs.
1904	4,336	1908	15,346	1912	12,118
1905	8,602	1909	18,241	1913	11,977
1906	9,993	1910	13,298	1914	11,088
1907	10,395	1911	15,270		

The production of gold by provinces is shown in the following table:—

Production of Gold by Provinces, 1912, 1913, and 1914.

	1912.		1913.		1914.	
	Ozs. (fine‡)	Value.	Ozs. (fine‡)	Value.	Ozs. (fine‡)	Value.
		$		$		$
Nova Scotia	4,385	90,638	2,174	44,935	2,904	60,031
Quebec	642	13,270	701	14,491	1,292	26,708
Ontario	86,523	1,788,596	219,801	4,543,690	268,264	5,545,509
Alberta	73	1,509	.....	.....	48	992
British Columbia	(a) 251,815	5,205,485	(a) 297,459	6,149,027	(a) 252,730	5,224,393
Yukon	268,447	5,549,296	282,838	5,846,780	247,940	5,125,374
Totals	611,885	12,648,794	802,973	16,598,923	773,178	15,983,007

‡Calculated from the value: one dollar=0·048375 oz.

	1912.	1913.	1914.
	$	$	$
(a) As follows: Gold from placer mining	555,500	510,000	565,000
Gold from vein mining	4,649,985	5,639,027	4,659,393
	5,205,485	6,149,027	5,224,393

The exact value of fine gold is $\frac{20.67}{1}$ dollars per ounce equivalent to $20·671834. (United States Standard.) In most cases, statistics of gold production are stated as crude bullion with value thereof. The fine ounces given in the tables in this report are calculated from the values by mutliplying these by $\frac{1}{20.67}$ or 0·048375.

Nova Scotia.

The gold production of this Province, which is derived almost entirely from quartz ores, is reported by the Provincial Department of Mines as 2,904 fine ounces valued at $60,031, compared with 2,174 fine ounces valued at $44,935 for the year 1913; i.e., an increase of 33 per cent.

The production of Nova Scotia, which was 6,863 fine ounces in 1862, reached a maximum of 30,348 fine ounces in 1902; then decreased gradually, reaching in 1913 a minimum of 2,174 fine ounces.

Statistics of the annual production since 1862 are given in the following table:—

Nova Scotia:—Annual Production of Gold.

Cal. Year.	Tons. treated.	Ozs. (fine).	Value.	Yield of gold per ton.	Cal. Year.	Tons treated.	Ozs. (fine).	Value.	Yield of gold per ton.
			$	$				$	$
1862.....	6,473	6,863	141,871	21·91	1888..	36,178	21,137	436,939	12.08
1863.....	17,000	13,180	272,448	16.02	1889..	39,160	24,673	510,029	13.02
1864.....	21,431	18,883	390,349	18.21	1890..	42,749	22,978	474,990	11.11
1865.....	24,421	24,011	496,357	20.32	1891..	36,351	21,841	451,503	12.42
1866.....	32,157	23,776	491,491	15.28	1892..	32,552	18,865	389,965	11.98
1867.....	31,384	25,763	532,563	16.96	1893..	42,354	18,436	381,095	8.99
1868.....	32,259	19,377	400,555	12.41	1894..	55,357	18,834	389,338	7.04
1869.....	35,144	16,855	348,427	19.91	1895..	60,600	21,919	453,119	7.47
1870.....	30,824	18,740	387,392	12.56	1896..	69,169	23,876	493,568	7.13
1871.....	30,787	18,139	374,972	12.17	1897..	73,192	27,195	562,165	7.68
1872.....	17,089	12,352	255,349	14.94	1898..	82,747	26,054	538,590	6.50
1873.....	17,708	11,180	231,122	13.05	1899..	112,226	29,876	617,604	5.50
1874.....	13,844	8,623	178,244	12.87	1900..	87,390	28,955	598,553	6.85
1875.....	14,810	10,576	218,629	14.76	1901..	91,948	26,459	546,963	5.32
1876.....	15,490	11,300	233,585	15.08	1902..	93,042	30,348	627,357	6.68
1877.....	17,369	15,925	329,205	18.95	1903..	103,856	25,533	527,806	5.08
1878.....	17,989	11,864	245,253	13.63	1904..	45,436	10,362	214,209	4.71
1879.....	15,936	12,980	268,328	16.83	1905..	57,774	13,707	283,353	4.90
1880.....	13,997	12,472	257,823	18.42	1906..	66,059	12,223	252,676	3.82
1881.....	16,556	10,147	209,755	12.66	1907..	58,550	13,675	282,686	4.82
1882.....	21,081	13,307	275,090	13.04	1908..	61,536	11,842	244,799	3.97
1883.....	25,954	14,571	301,207	11.60	1909..	56,790	10,193	210,711	3.71
1884.....	25,186	15,168	313,554	12.44	1910..	43,006	7,928	163,891	3.81
1885.....	28,890	20,945	432,971	14.98	1911..	18,328	7,781	160,854	8.78
1886.....	29,010	22,038	455,564	15.70	1912..	14,360	4,385	90,638	6.51
1887.....	32,280	20,009	413,631	12.81	1913..	7,324	2,174	44,935	6.13
					1914..	13,156	2,904	60,031	4.56

Total fine ounces gold..... 893,197
Total value.....$18,464,102

The production of gold by districts during the twelve months ending September 30, 1914, as collected and published by the Provincial Mines Department, and the production from 1862 to 1914, by districts, according to the same authority, are shown in tabular form, as follows:—

Nova Scotia:—District Details of Gold Production, Year Ending September 30, 1914.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.		
		oz.	dwt.	grs.	oz.	dwt.	grs.
Caribou.....	789	483	10	2	.....	12	6
Caribou (Moose River).....	405	94	13	0	.....	4	16
Fifteen Mile Brook.....	120	44	15	18	.....	7	11
Lake Catcha.....	1,106	387	13	23	.....	7	0
Millers Lake.....	6	1	6	0	.....	4	8
Montagu.....	118	40	12	23	.....	6	21
Oldham.....	358	182	10	0	.....	10	5
Sherbrooke.....	6,806	895	14	0	.....	2	15
Stormont.....	2,257	707	14	0	.....	6	7
Tangier.....	416	56	17	3	.....	2	18
Wagamatkook.....	775	262	17	13	.....	6	19
Totals.....	13,156	3,158	4	10	.....	4	19

Nova Scotia:—Production of Gold from 1862 to 1914.

District.	Tons crushed.	Total yield of gold.			Average yield of gold per ton.			Valued at $19 per oz.
		oz.	dwt.	grs.	oz.	dwt.	grs.	
								$
*Caribou and Moose River	222,233	61,319	11	14	.....	5	12	1,165,072
Montagu	29,740	42,232	12	8	1	8	10	802,420
Oldham	59,348	67,687	18	22	1	2	19	1,286,071
Renfrew	61,795	48,699	7	19	.....	15	18	925,288
Sherbrooke	307,019	153,985	15	4	.....	10	1	2,925,729
Stormont	527,514	121,265	18	13	.....	4	14	2,304,053
Tangier	67,428	28,965	8	12	.....	8	14	550,343
†Uniacke	63,351	43,983	1	17	.....	13	21	835,679
Waverley	155,520	69,980	10	16	.....	9	0	1,329,630
‡Brookfield	93,527	38,709	2	2	.....	8	7	735,473
‡‡Salmon River	118,819	41,852	5	20	.....	7	1	795,193
††Whiteburn	6,907	9,800	0	2	1	8	9	186,200
Lake Catcha	31,928	28,209	14	17	.....	17	16	535,985
¶Rawdon	12,189	9,606	5	10	.....	15	18	182,519
Wine Harbour	77,396	34,992	15	11	.....	9	1	664,863
**Fifteenmile Stream	36,878	17,363	0	5	.....	9	10	329,897
Malaga Barrens	22,926	20,305	12	6	.....	17	17	385,807
§West Gore (from Stibnite ore)	3,240	4,512	15	10	1	7	20	85,743
Other districts	145,836	75,670	2	5	.....	10	9	1,437,846
	2,043,594	919,147	18	21	.....	9	0	17,463,811

*From 1869, †from 1868, ‡from 1887, ‡‡from 1883, ††from 1882, ¶from 1887, **from 1883, §from 1905.

Quebec.

The gold production in Quebec during 1914 was 1,292 fine ounces valued at $26,708, against 701 fine ounces valued at $14,491, in 1913, an increase of 84 per cent. This production is derived from the pyritic mines of the Eastern Townships, which are worked chiefly for the sulphur and copper contents of the ore.

No alluvial production has been reported for the last two years. The following table gives the production for Quebec from 1877 to 1914:—

Quebec:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1877	583	12,057	1896	145	3,000
1878	868	17,937	1897	44	900
1879	1,160	23,972	1898	295	6,089
1880	1,605	33,174	1899	238	4,916
1881	2,741	56,661	1900	Nil.	Nil.
1882	827	17,093	1901	145	3,000
1883	860	17,787	1902	391	8,073
1884	422	8,720	1903	180	3,712
1885	103	2,120	1904	140	2,900
1886	193	3,981	1905	191	3,940
1887	78	1,604	1906	165	3,412
1888	181	3,740	1907	Nil.	Nil.
1889	58	1,207	1908	Nil.	Nil.
1890	65	1,350	1909	193	3,990
1891	87	1,800	1910	124	2,565
1892	628	12,987	1911	613	12,672
1893	759	15,696	1912	642	13,270
1894	1,412	29,196	1913	701	14,491
1895	62	1,281	1914	1,292	26,708
			Total	18,191	376,001

*Calculated from the value: one dollar = 0·048375 oz.

Ontario.

The gold production in Ontario which in 1913 had exceeded the total of all the other years since 1886, showed a further increase in 1914 of about one million dollars, amounting to 268,264 fine ounces valued at $5,545,509.

The Porcupine district was the main producer. Other producing districts being Kirkland Lake, Larder Lake, and Long Lake.

Statistics of the production of gold in Ontario since 1887 are shown in the following table:—

Ontario:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1887	327	6,760	1901	11,844	244,837
1888	Nil.	Nil.	1902	11,118	229,828
1889	Nil.	Nil.	1903	9,096	188,036
1890	Nil.	Nil.	1904	1,935	40,000
1891	97	2,000	1905	4,402	91,000
1892	344	7,118	1906	3,202	66,193
1893	708	14,637	1907	3,212	66,399
1894	1,917	39,624	1908	3,212	66,389
1895	3,015	62,320	1909	1,569	32,425
1896	5,563	115,000	1910	3,089	63,849
1897	9,157	189,294	1911	2,062	42,625
1898	12,863	265,889	1912	86,523	1,788,596
1899	20,394	421,591	1913	219,801	4,543,690
1900	14,391	297,495	1914	268,264	5,545,509
			Total	698,105	14,431,104

*Calculated from the value: one dollar = 0·048375 oz.

It may be noted from the table "Production of Gold by Provinces" that Ontario from third rank, has become the largest producer of gold in Canada.

The remarkable increase of these last three years was brought about by the successful development of the Porcupine district and recently by the extension of milling facilities in that camp.

The following extracts from the "Report of the Timiskaming and Northern Ontario Railway Commission," gives an idea of the development going on in Northern Ontario:—

Porcupine Gold Production 1914.

Mines and Mills.	Tonnage milled.	Bullion.	Value.
		Ozs.	$
Acme	2,910	1,500·00	31,000.00
Dome	221,390	51,016·12	1,054,503.24
Dome Lake	1,638	556·00	8,832·32
Hollinger	208,936	134,000·00	2,688,354.80
Porcupine Crown	40,857	57,213·00	671,177.06
Porcupine Pet	1,433	580·40	8,264.00
Rea	11,607	6,444·00	125,000.00
McIntyre	62,209	27,500·00	549,583.00
Vipond	9,559	3,217·95	66,514.58
Total	560,539	282,327·47	5,203,229.00

Porcupine Gold Production 1910—1914.

Year.	Ore treated.	Gold bullion.	Value.
	Tons.	Ounces.	$
1910	1,060	1,947	35,539
1911	707	851	17,187
1912	.....	83,726	1,730,628
1913	.....	207,583	4,284,928
1914	560,539	282,327	5,203,229
Total	562,296	576,434	11,271,511

Cyanide:—"It was feared that those mines using cyanide might have to curtail their output, because much of the world's production of cyanide was of German manufacture, the buying of which is now contrary to the laws of Canada. As a matter of fact it was found on inquiry that all the mines of this district with two exceptions, were using cyanide manufactured in Great Britain by the Cassel Cyanide Co., Ltd., of Glasgow, Scotland.

"Owing to increased cost of raw materials, due directly or indirectly to the war, the price of cyanide has risen to 18 cents per pound, which is a rise of three cents above the price immediately before the war. The offer that the Cassel Cyanide Company is now making to the mines is to keep them supplied with cyanide on the following terms: 18 cents per pound to June 1915; 16 cents per pound to the end of 1916; and 15 cents, or the normal price during 1917 providing that the mines on their part will give the Company an exclusive cyanide contract for two years, giving an estimate now of what their requirements are likely to be during that time.

"The mining companies now using cyanide in the district are:—Cobalt—Buffalo, Dominion Reduction, Nipissing, and O'Brien. Porcupine—Dome, Hollinger, McIntyre, Porcupine Crown, Vipond.

"The normal monthly consumption of cyanide in the district is about 50 tons in Cobalt and 20 tons in Porcupine. This may be expected to gradually increase till the consumption a year from now should run over 100 per month, i.e., nearly half the 1913 consumption of the United States."

Zinc Dust:—"Since the outbreak of war the zinc dust situation has also been creating some uneasiness. Before August last, the main supplies came from Belgium and Silesia, but these being cut off, the mines now have to look to the United States.

"The Belgian price was 6¾ cents, but now the price is 11 cents f.o.b. Cobalt. The method of preparation adopted in the United States is different from that of the Belgian furnaces, the American product carrying a slightly higher percentage of oxide and more lead, and therefore having a proportionately smaller precipitating power."

Pebbles:—"The supply of pebbles for pebble mills, formerly came from Denmark and France. Shipments from these points are now practically cut off, but an adequate supply can be obtained from Newfoundland and Sweden. The European pebbles are flint, but those from Newfoundland are a greywacke.

"At the close of 1914 the price per ton of pebbles was $21.17 at Cobalt and $21.69 at Porcupine—practically the same price as before the war.

"The annual consumption of pebbles is about 600 tons for Cobalt and 1400 tons for Porcupine."

The mills now using pebbles in this district are:—

Cobalt: Beaver, Buffalo, Cobalt Lake, Dominion Reduction, McKinley-Darragh, Nipissing, O'Brien, and Penn-Canadian. Kirkland Lake: Tough Oakes. Larder Lake: Huronia. Porcupine: Dome, Dome Lake, Hollinger, McIntyre, Porcupine Crown, and Vipond.

The principal producers during 1914 were:—

Operator.	Mine.	District.
Canadian Exploration Co	Long Lake	Algoma.
The Dome Mines Co., Ltd	Dome	Timiskaming.
The Dome Lake Mines, Ltd	Dome Lake	"
Hollinger Gold Mines, Ltd	Hollinger	"
Acme Gold Mines	Acme	"
Porcupine Vipond Mines Co., Ltd	Porcupine Vipond	"
The McIntyre Porcupine Mines, Ltd	McIntyre	"
The Porcupine Crown Mines, Ltd	Porcupine Crown	"
Wm. C. Offer, et al	Porphyry Hill	"
Mines Leasing and Dev. Co	Rea	"
Tough Oakes Gold Mines	Tough Oakes	"
La Mine d'Or Huronia, Ltd	Huronia	"

The following notes are taken from the respective company's reports:—

The Dome Mines Co., Ltd.

Year ending March 31, 1914.

"Record of production for twelve months ending March 31, 1915.

Tons of ore milled	248,550
Total value of ore treated	$1,163,954.80
Average value per ton	$ 4.68
Bullion recovered by amalgamation	$ 671,054.44
Bullion recovered by cyanidation	$ 384,442.34
Per cent of value recovered by amalgamation	57·60
Per cent of value recovered by cyanidation	33·00
Total value recovered	$1,055,496.78
Per cent of value recovered	90·60
Per cent of possible running time	93·70

The Company is expecting that the mill's highest crushing capacity—about 28,000 tons per month—will be reached by July, 1915.

The Dome is essentially a low-grade proposition.

Hollinger Gold Mines, Limited.

Year ending December 31, 1914.

	Hollinger.	Acme.	Total.
Tons of ore milled	208,936	2,910	211,846
Average value per ton	$ 13,676	$11,176	.....
Total values sent to mill	$2,857,397.54	$32,521.93	$2,889,919.47
Average tons per day			583.59
Per cent of possible running time			92·2
Average tons per 24 hours of running time			632·97
Stamp duty tons per 24 hours of running time			13·30

"Unrecovered values:—

Concentrates stored for re-treatment	$53,686.00
Lost in filter tails	116,879.00
Total	$170,565.00
Values recovered	$2,719,354.47
Value per ton in tailings	$ 0·56
Cyanide consumed per ton of ore	0·525 lbs.
Lime " " " "	1·557 "
Zinc " " " "	0·532 "
Acid " " " "	0·216 "
Lead acetate " " " "	0·0031 "
Tons of solution precipitated per ton of ore	2·315
Zinc added per ton of solution	0·230
Average value of pregnant solution	$5·698
Per cent of gold extracted	94·089

"The average working cost per ton during 1914 amounted to $4.42 (exclusive of amounts written off for depreciation), as against $5.21 in 1913. Further reductions will follow, and it is hoped that by the end of 1915 the working cost will be found not to exceed $4.00 per ton.

"The estimated ore reserves are 1,162,960 tons, with a gross value of $13,358,420, or a value per ton of $11.49."

Porcupine Crown Mines, Limited.

Year ending December 31, 1914.

"Tons of ore milled	40,857
Average value of heads	$17.18
" " " tails	0.47
" extraction	97·26%
Cost per ton of ore milled	$7.09
Gross value of production	$691,394.29
Mint charges	2,242.83
Mine operation expense	339,196.99
" " net profit	349,954·47
Dividends paid in 1914	240,000.00

"The development of the property during the past year has been most satisfactory. The operating costs during the year were appreciably reduced, and by the increase in tonnage can be still further reduced. The ore reserves are valued at 1½ million dollars and amount to 85,000 tons."

McIntyre Porcupine Mines.

Year ending December 31, 1914.

"Tons of ore milled	62,209
Average value	$9·262
Extraction per ton	8·828
Tailing loss " "	0.434
Gross value	$576,217.60
Bullion produced and by-products obtained	$549,255.42
Total loss in tails	$ 26,962.18
Extraction	95·3%
Cost per ton of ore milled	$6·406

"The estimated ore reserves, as of March 31, 1915, were 109,693 tons valued at $854,436."

Manitoba.

There was no production in Manitoba during 1914, but development work was reported from Star Lake, near the eastern boundary of the Province, and from Rice Lake, east of Lake Winnipeg.

Saskatchewan.

In the autumn of 1913 considerable interest was created in the reported gold discoveries at Beaver Lake. A number of prospectors went in with the opening of navigation. A good deal of prospecting was done during 1914, but no shipments have been reported.

The Consolidated Gold Mines (Beaver Lake) Limited, with the Beaver Lake Mining Co., are the two principal operators in the Beaver Lake district. There is talk of the latter Company erecting a 10-stamp mill which would serve as an aid to the general development of the district.

Alberta.

In past years there has been a small production of gold from the gravels of the Saskatchewan river. A very small recovery was reported for 1914 amounting to 48 ounces valued at $992.

Statistics of the production from the abovementioned source since 1887, are shown in the table following:—

Alberta:—Annual Production of Gold.

Calendar Year.	Ozs. (fine*).	Value.	Calendar Year.	Ozs. (fine*).	Value.
		$			$
1887	102	2,100	1901	726	15,000
1888	58	1,200	1902	484	10,000
1889	967	20,000	1903	48	1,000
1890	193	4,000	1904	24	500
1891	266	5,500	1905	121	2,500
1892	508	10,506	1906	39	800
1893	466	9,640	1907	33	675
1894	726	15,000	1908	50	1,037
1895	2,419	50,000	1909	25	525
1896	2,661	55,000	1910	89	1,850
1897	2,419	50,000	1911	10	207
1898	1,209	25,000	1912	73	1,509
1899	726	15,000	1913	.....	.....
1900	242	5,000	1914	48	992
			Total	14,732	304,541

*Calculated from the value: one dollar=0·048375 oz.

British Columbia.

The gold production of British Columbia in 1914, amounted to $5,224,393, comprising: placer gold $565,000; bullion from milling ores $549,437, and smelter recoveries $4,109,956.

The statistics for lode gold represent, as closely as can be ascertained, the actual gold recovery based on smelter recoveries and bullion shipments.

There was an increase of 10 per cent in the placer production over that of 1913; a decrease of about 16 per cent in the bullion from milling ores, and a decrease of over 17 per cent in smelter recoveries.

This reduction in production is due to a large extent to the heavy decrease in the output of the Boundary and Nelson districts brought on by the European war, but was made up to some extent by a considerable increase in the Cassiar district, due to the commencement of smelter operations by the Granby Company at Anyox, and by an increase in output from the Trail Creek division.

Of the 1914 production, 10·7 per cent was from alluvial workings; 10·5 per cent from mill bullion, and the balance or 78·8 per cent from smelter recoveries.

Statistics of the production by districts in 1914, as published by the British Columbia Bureau of Mines, and the total annual production since 1858 are given in the following tables:—

British Columbia:—Annual Production of Gold.

Calendar Year.	Ozs. (fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1858	34,104	705,000	1887	33,558	693,709
1859	78,129	1,615,072	1888	29,834	616,731
1860	107,806	2,228,543	1889	28,489	588,923
1861	128,973	2,666,118	1890	23,918	494,436
1862	128,528	2,656,903	1891	20,792	429,811
1863	189,318	3,913,563	1892	19,327	399,525
1864	180,722	3,735,850	1893	18,360	379,535
1865	168,887	3,491,205	1894	25,664	530,530
1866	128,779	2,662,106	1895	61,289	1,266,954
1867	120,012	2,480,868	1896	86,504	1,788,206
1868	114,792	2,372,972	1897	131,805	2,724,657
1869	85,865	1,774,978	1898	142,215	2,939,852
1870	64,675	1,336,956	1899	203,295	4,202,473
1871	87,048	1,799,440	1900	228,916	4,732,105
1872	77,931	1,610,972	1901	257,292	5,318,703
1873	63,166	1,305,749	1902	288,383	5,961 409
1874	89,233	1,844,618	1903	284,108	5,873,036
1875	119,724	2,474,904	1904	275,975	5,704,908
1876	86,429	1,786,648	1905	285,529	5,902,402
1877	77,796	1,608,182	1906	269,886	5,579,039
1878	61,688	1,275,204	1907	236,216	4,883,020
1879	62,407	1,290,058	1908	286,858	5,929,880
1880	49,044	1,013,827	1909	250,320	5,174,579
1881	50,636	1,046,737	1910	261,386	5,403,318
1882	46,154	954,085	1911	238,496	4,930,145
1883	38,422	794,252	1912	251,815	5,205,485
1884	35,612	736,165	1913	297,459	6,149,027
1885	34,527	713,738	1914	252,730	5,224,393
1886	43,714	903,651			
			Total	7,344,540	151,825,155

‡Calculated from the value: one dollar = 0·048375 oz.

British Columbia:—Production of Gold by Districts, 1914.*

Districts.	Gold placer.		Gold lode.	
	Ozs.	Value.	Ozs.	Value.
		$		$
Cariboo:—				
Cariboo	8,250	165,000	.....	.....
Quesnel	1,750	35,000	.....	.....
Omineca	300	6,000	203	4,196
Cassiar:—				
Atlin	16,100	322,000	1,000	20,670
All others	1,150	23,000	2,884	59,612
East Kootenay:—				
Fort Steele	50	1,000	.....	.....
West Kootenay:—				
Ainsworth	.....	.....	100	2,067
Nelson	.....	.....	15,298	316,210
Slocan	.....	.....	13	269
Trail creek	.....	.....	138,568	2,864,201
Others	100	2,000	8	165
Lillooet	150	3,000	231	4,775
Yale:—				
Grand Forks, Greenwood and Osoyoos	50	1,000	84,908	1,775,048
Similkameen, Nicola, and Vernon	150	3,000	35	724
Yale, Ashcroft and Kamloops	150	3,000	14	289
Coast	50	1,000	3,908	80,778
	28,250	565,000	247,170	5,109,004

*From Annual Report of the Minister of Mines for British Columbia.

Yukon.

The production of the Yukon in 1914 was $5,125,374, as compared with $5,846,780 in 1913, a decrease of $721,406, or 12·3 per cent. In this is included the production from the lode mines.

The statistics of production of gold in the Yukon district during the years between 1898 and 1906, as given in the table showing the annual production, are based primarily on the receipts of gold at the United States mints and receiving offices credited to the Canadian Yukon. Although a royalty was exacted on the gold output, it seems certain that considerable amounts of gold were produced which escaped royalty payment especially during the years of high production.

Since 1906 the statistics of gold production of the Yukon have been based on the royalty of 2½ per cent which is collected by the Interior Department. For the purpose of collecting the royalty, a fixed value of $15 per ounce is placed on the crude gold. The actual value of the deposits for a number of years, has been about $16.50 per ounce. At the Dominion Government assay office at Vancouver, B.C., there were deposited during the twelve months ending December 31, 1914, 56,564·83 ounces from the Yukon, valued, after all charges had been deducted, at $916,914.44, showing an average of $16.21 per ounce.

The production of crude placer gold in the Yukon during the past six years, as ascertained by the Interior Department, and upon which a royalty of 2½ per cent has been collected, is shown in the accompanying table:—

Production of Crude Gold in the Yukon District.

Month.	1909.	1910.	1911.	1912.	1913.	1914.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
January	69·50	16·68	.....	5·25	19·30	136·50
February	115·33	749·28	435·66	525·29	56·90	325·50
March	848·39	193·81	13·30	0·50	.....	6·75
April	3·75	0·50	.....	.....	1,293·69	1,572·65
May	117·33	43·83	16,719·16	26,158.66	5,557·35	11,668·10
June	62,254·92	54,301·17	38,499·39	54,243·03	67,594·39	67,604·85
July	52,126·43	37,942·31	42,783·38	58,283·29	57,873·50	45,067·31
August	47,440·83	47,673·06	47,677·49	56,975·55	63,315·92	49,458·17
September	44,466·20	57,695·65	48,383·63	53,225·29	58,641·62	62,744·69
October	26,572·23	51,888·18	58,690·82	66,518·01	66,798·37	63,365·22
November	4,858·69	21,404·29	11,097·51	11,648·08	26,565·50	4,308·00
December	892·75	3,563·75	13,130·63	7,432·72	5,183·50	3,433·43
	239,766·35	275,472·51	277,430·97	335,015·67	352,900·04	309,691·17

The placer production of the Yukon in 1914 is estimated at 247,753 fine ounces of gold valued at $5,121,509, and 55,744 fine ounces of silver, valued at $30,554, making the total valuation of the Yukon placer output $5,153,063. The placer production in 1913 was estimated at 282,320 fine ounces of gold valued at $5,836,072 and 63,522 fine ounces of silver valued at $37,980 or a total valuation of $5,874,052.

A small amount of gold was derived from lode mining.

The Mines Branch has published in 1914 a report on lode mining in the Yukon,[1] being an investigation of the quartz deposits in the Klondike division.

Statistics of the annual production of gold in Yukon since 1885, are shown in the following table:—

Annual Production of Gold in Yukon.

Calendar Year.	Ozs. (fine‡).	Value.	Calendar Year.	Ozs. (fine‡).	Value.
		$			$
1885	4,837	100,000	1900	1,077,553	22,275,000
1886			1901	870,750	18,000,000
1887	3,386	70,000	1902	701,437	14,500,000
1888	1,935	40,000	1903	592,594	12,250,000
1889	8,466	175,000	1904	507,938	10,500,000
1890	8,466	175,000	1905	381,001	7,876,000
1891	1,935	40,000	1906	270,900	5,600,000
1892	4,233	87,500	1907	152,381	3,150,000
1893	8,514	176,000	1908	174,150	3,600,000
1894	6,047	125,000	1909	191,565	3,960,000
1895	12,094	250,000	1910*	221,091	4,570,362
1896	14,513	300,000	1911*	224,197	4,634,574
1897	120,937	2,500,000	1912*	268,447	5,549,296
1898	483,750	10,000,000	1913*	282,838	5,846,780
1899	774,000	16,000,000	1914*	247,940	5,125,374
				7,617,895	157,475,886

‡Calculated from the value: one dollar=0·048375 oz.
*Including a small production from lode mines.

Since 1898 a royalty to the extent of $4,248,459.47 has been collected on the gold production of this district. The yearly amounts collected, as well as the annual production of gold as ascertained by the Interior Department, are shown in the accompanying table. The difference between these figures and those shown in the table of annual production of the district which are based on mint receipts of Yukon gold, has already been mentioned, and is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at $15 per ounce, a figure probably slightly less than the actual value of the gold, (2) the probability that in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small but growing production from the lode mines.

[1]Mines Branch No. 222. "Lode Mining in Yukon." Report by T. C. MacLean, M.E.

Gold Production in the Yukon, and Royalty Collected.‡

Fiscal Year.	Total gold production.	Total exemption.	Royalty collected on.	Royalty paid.
	$	$	$	$ cts.
1898	3,072,773	339,845	2,732,928	273,292.82
1899	7,582,283	1,699,657	5,882,626	588,262.37
1900	9,809,464	2,501,744	7,307,720	730,771.99
1901	9,162,082	1,927,666	7,236,522	592,660.98
1902	9,566,340	1,199,114	8,367,225	331,436.79
1903	12,113,015	.....	12,113,015	302,893.48
1904	10,790,663	.....	10,790,663	272,217.96
1905	8,222,054	.....	8,222,054	206,760.87
1906	6,540,007	.....	6,540,007	163,963.25
1907 (9 months)	3,304,791	.....	3,304,791	82,622.42
1908	2,820,162	.....	2,820,162	70,505.65
1909	3,260,282	.....	3,260,282	81,507.07
1910	3,594,251	.....	3,594,251	89,844.10
1911	4,126,728	.....	4,126,728	103,168.19
1912	4,024,237	.....	4,024,237	100,606.29
1913	5,018,412	.....	5,018,412	125,460.52
1914	5,299,389	.....	5,299,389	132,484.72

‡From the Report of the Yukon and Mining Lands Branch of the Department of the Interior.

IRON AND STEEL.

INTRODUCTORY.

The iron and steel industry in Canada in 1914 was marked by a general decrease in production, which, with a large falling off in imports, showed a greatly diminished consumption.

The quantities of iron and steel annually used is a fair measure of the nation's constructional activity, and Canada had already been experiencing a period of reaction when the war in August caused an almost immediate collapse in an already declining industry. Before the close of the year, however, the demand for steel for munitions and war supplies enabled many of the steel companies to resume operations on a large scale.

Summary of Iron and Steel Statistics, 1911-14.

	1911.	1912.	1913.	1914.
	Tons.	Tons.	Tons.	Tons.
Iron ore shipped	210,344	215,883	307,634	244,854
Canadian iron ore charged to blast furnaces	67,434	71,588	139,436	182,964
Imported iron ore charged to blast furnaces	1,628,368	2,019,165	2,110,828	1,324,326
Iron ore charged to steel furnaces	42,892	43,006	55,018	37,686
Pig-iron made	917,535	1,014,587	1,128,967	783,164
Pig-iron and ferro-alloys, exported	5,870	6,976	6,326	19,063
Pig-iron imported	208,487	272,565	236,769	78,680
Ferro-alloys made	7,507	7,834	8,075	7,524
Ferro-alloys imported	17,226	19,810	30,355	22,147
Pig-iron consumption	1,144,885	1,307,820	1,397,840	872,452
Pig-iron used in steel furnaces	700,679	706,895	913,722	619,030
Steel ingots and castings made	882,396	957,681	1,168,993	828,641
Steel rails made	399,760	471,422	554,481	428,225
Canadian coke used in iron blast furnaces	543,933	609,183	710,260	330,269
Imported coke used in iron blast furnaces	577,388	656,815	706,888	590,902
Iron and steel imported	(b)1,215,936	(b)1,369,150	(c)1,890,506	(c) 882,636
Number of completed blast furnaces.....No.	18	19	22	22
Number of men employed in blast furnaces.... "	1,778	1,358	1,589	1,018
Wages paid in blast furnaces.....$	1,097,354	993,941	1,149,345	693,632
Value of pig-iron produced.....$	12,307,125	14,550,999	16,540,012	10,002,856
Value of iron and steel goods exported. (c).....$	9,907,281	10,682,484	13,999,149	14,391,746
Value of iron and steel goods imported. (d).....$	88,179,152	105,614,450	145,226,972	79,762,262

(b) Figures cover the fiscal year ending March 31 and include all iron and steel goods for which weights are given.
(c) Figures cover the calendar year.
(d) Figures cover the fiscal year ending March 31, except for 1913 and 1914 when the calendar year is represented.

The conditions under which the iron industry has been carried on in so far as the general relationship of domestic ore supplies to furnace requirements is concerned, have remained practically the same for a number of years. Canadian furnaces are operated largely on imported ores and fuels, only about 12 per cent of the ore consumption and 36 per cent of the fuel used in 1914 being of domestic origin. The imports of iron and steel goods of all kinds has, during the past ten years, been considerably in excess of the domestic production.

Hitherto the exports of iron and steel which have been small compared with the imports, have consisted chiefly of machinery and manufactured goods. In 1914, however, there was some export of pig-iron and of steel rails. With the falling off in Canadian demand, the steel companies have sought new markets abroad, particularly for rails, while the Nova Scotia plants as a result of the war, have also developed an export trade in billets, wire rods, nails, and wire.

IRON ORE.

The total shipments of iron ore from Canadian mines in 1914 were 244,854 tons valued at $542,041, as compared with 307,634 tons valued at $629,843, shipped in 1913. Of the total shipments in 1914, 184,444 tons were sent to blast furnaces in Canada and 60,410 tons to the United States.

The shipments comprised 89,454 tons of hematite; 109,838 tons of roasted siderite, and 45,562 tons of magnetite (including some ores with an admixture of hematite). Shipments in 1913 included 92,386 tons of hematite and roasted siderite; 209,886 tons of magnetite, and 5,362 tons of titaniferous iron ore.

There was no active mining of iron ore in Nova Scotia, New Brunswick, or Quebec, during 1914. One shipment of 4,775 tons was made from the Bathurst mine stock.

In Ontario mining operations were confined to the Moose Mountain mines and the Magpie and Helen mines in the Michipicoten districts.

The Canada Iron Mines, Ltd., shipped from Trenton a small tonnage of concentrates averaging about 56 per cent iron. Neither the mines at Bessemer nor the concentrator at Trenton were operated during the year.

The Moose Mountain mines were operated for the first six months of the year and shipments made both of cobbed ore and briquetted ore. The cobbed ore averaged 54·45 per cent iron and the briquetted ore 63·12 per cent iron.

The Algoma Steel Corporation operated both the Helen and Magpie mines. The hematite shipped from the Helen averaged about 55 per cent, and the siderite from the Magpie, after roasting, about 50 per cent, of iron.

Production of Iron Ore by Provinces, 1912-13-14.

Provinces.	1912.		1913.		1914.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
New Brunswick.....	71,520	127,716	86,416	153,820	4,775	10,841
Nova Scotia.....	30,857	168,877	20,436	21,049	.....	.....
Quebec.....	1,185	4,232	5,102	26,999	.....	.....
Ontario.....	112,321	222,490	195,680	427,975	240,079	531,200
	215,883	523,315	307,634	629,843	244,854	542,041

Classified Production of Iron Ore, 1913-14.

Character of ore.	1913.			1914.		
	Short tons.	Value.	Per ton.	Short tons.	Value.	Per ton.
		$	$ cts.		$	$ cts.
Magnetite.....	215,248	442,702	2 06	45,562	95,060	2 09
Hematite.....	92,386	187,141	2 03	89,454	171,480	1 92
Siderite.....				109,838	275,501	2 51
	307,634	629,843	2 04	244,854	542,041	2 21

A record of the production by provinces in past years is shown in the accompanying tables. There was a considerable production in Ontario previous to 1886 which is not recorded.

Production of Iron Ore, by Provinces, 1886-1914.

Calendar Year.	New Brunswick.	Nova Scotia.	Quebec.	Ontario.	British Columbia.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1886	.....	44,388	.....	16,032	3,941	64,361
1887	.....	43,532	13,404	16,598	2,796	76,330
1888	.....	42,611	10,710	16,894	8,372	78,587
1889	.....	54,161	14,533	.....	15,487	84,181
1890	.....	49,206	22,305	.....	.....	76,511
1891	.....	53,649	14,380	.....	950	68,979
1892	.....	78,258	22,690	.....	2,300	103,248
1893	.....	102,201	22,076	.....	1,325	125,602
1894	.....	89,379	19,492	.....	1,120	109,991
1895	.....	83,792	17,783	.....	1,222	102,797
1896	.....	58,810	17,630	15,270	196	91,906
1897	.....	23,400	22,436	2,770	2,099	50,705
1898	.....	19,079	17,873	21,111	280	58,343
1899	.....	28,000	19,420	25,126	2,071	74,617
1900	.....	18,940	19,000	82,950	1,110	122,000
1901	.....	18,619	15,489	272,538	7,000	313,646
1902	.....	16,172	18,524	359,288	10,019	404,003
1903	.....	40,335	12,035	209,634	2,290	264,294
1904	.....	61,293	16,152	141,601	.....	219,046
1905	.....	84,952	12,681	193,464	.....	291,097
1906	.....	97,820	9,933	141,078	.....	248,831
1907	.....	89,839	12,748	207,769	2,500	312,856
1908	.....	11,802	10,103	216,177	.....	238,082
1909	.....	.....	4,150	263,893	.....	268,043
1910	5,336	18,134	4,503	231,445	.....	259,418
1911	31,120	22	3,616	175,586	.....	210,344
1912	71,520	30,857	1,185	112,321	.....	215,883
1913	86,416	20,436	5,102	195,680	.....	307,634
1914	4,775	.....	.....	240,079	.....	244,854

Production of Iron Ore in Nova Scotia, 1876-1885.

Calendar Year.	Tons.	Calendar Year.	Tons.
1876	15,274	1881	39,843
1877	16,879	1882	42,135
1878	36,600	1883	52,410
1879	29,889	1884	54,885
1880	51,193	1885	48,129

EXPORTS AND IMPORTS OF IRON ORE.

According to returns received direct from the mine operators, 60,410 tons of ore were shipped to the United States during 1914, as against shipments to destinations outside of Canada during 1913 totalling 216,614 tons, and including 196,151 tons shipped to the United States, 12,927 tons to Scotland, and 7,536 tons to Holland.

The imports of iron ore into Canada were not separately shown by the Customs Department until April, 1912. The imports during the twelve months ending December, 1914, were reported as 1,147,108 tons, valued at $2,387,358, as compared with 1,942,325 tons valued at $3,877,824 imported in 1913. The imports in 1914 included 749,979 tons valued at $1,972,550 from the United States; 389,850 tons valued at $389,850 from Newfoundland, and 7,279 tons valued at $24,958 from other countries.

There were used in Canadian furnaces in 1914, 1,324,326 tons of imported ores as compared with 2,110,828 tons in 1913. The annual consumption of imported ores in blast furnaces which was formerly the only record of imports, is shown in tabular form and the total quantity of imported ores thus consumed since 1896 has been about 16,000,000 tons.

The imported ores have been obtained chiefly from Newfoundland and the iron ranges south of Lake Superior.

The Newfoundland deposits are operated by the two Canadian companies operating coal mines and steel plants at Sydney and Sydney Mines in Cape Breton.

The total quantity of Newfoundland ores shipped during 1914 from the Wabana Mines, was 639,430 short tons of which 422,920 tons were shipped to Sydney and 216,510 tons to the United States and Europe.

In 1913 the shipments from Wabana, Newfoundland, were 1,605,920 short tons of which 1,048,432 tons were shipped to Sydney and 557,488 tons to the United States and Europe.

According to the "United States Report of Commerce and Navigation" there were exported to Canada during the twelve months ending June 1914, 1,125,090 short tons of iron ore valued at $3,401,146 and during the previous year 1,367,928 tons valued at $3,684,233.

Exports of Iron Ore, Calendar Years 1893-1914.

Calendar Year.	Tons.	Value.	Average. value.	Calendar Year.	Tons.	Value.	Average. value.
		$	$			$	$
1893.....	2,419	7,590	3 14	1904*.....	168,828	401,738	2 38
1894.....	.....	21,294	.....	1905*.....	168,289	407,881	2 42
1895.....	1,571	3,909	2 49	1906.....	74,778	149,177	2 01
1896.....	1,033	1,911	1 85	1907.....	25,901	45,907	1 77
1897.....	403	811	2 01	1908.....	(a)	.....	.....
1898.....	182	278	1 54	1909.....	21,956	61,954	2 82
1899.....	4,145	9,538	2 30	1910.....	114,499	324,186	2 83
1900.....	5,527	13,511	2 44	1911.....	37,686	133,411	3 54
1901*.....	306,199	762,283	2 49	1912.....	118,129	382,005	3 23
1902*.....	428,901	1,065,019	2 48	1913.....	126,124	426,681	3 38
1903*.....	368,233	922,571	2 51	1914.....	135,451	360,974	2 67

*The export figures for the five years indicated are incorrect owing to a duplication of entries.
(a)The figures of the Trade Report for this year include ferro-products, and are, therefore, omitted.

Imports* of Iron Ore into the United States from Canada, 1893-1914.

Year ending June 30.	Short tons.	Value.	Average value.	Year ending June 30.	Short tons.	Value.	Average value.
		$	$ cts.			$	$ cts.
1893	7,706	17,186	2 23	1904	126,995	283,765	2 23
1894	301	756	2 51	1905	120,241	245,623	2 04
1895	2,681	10,114	3 77	1906	113,809	220,112	1 93
1896	39	142	3 64	1907	34,731	52,765	1 52
1897	2,535	5,243	2 07	1908	32,124	55,617	1 73
1898	1,313	2,904	2 21	1909	3,490	12,660	3 63
1899	2,585	5,120	1 98	1910	36,070	97,984	2 72
1900	4,477	5,550	1 24	1911	117,393	264,452	2 25
1901	34,453	76,159	2 21	1912	45,089	89,336	1 98
1902	309,527	685,540	2 21	1913	159,146	282,434	1 77
1903	144,725	320,263	2 21	1914	168,203	360,484	2 14

*Compiled from the "Foreign Commerce and Navigation of the United States."

Exports of Iron Ore from the United States to Canada.

Year ending June 30.	Tons of 2000 lbs.	Value.	Average value.	Year ending June 30.	Tons of 2000 lbs.	Value.	Average value.
		$	$ cts.			$	$ cts.
1896	1,270	4,042	3 18	1906	254,399	608,029	2 39
1897	10,942	34,168	3 12	1907	266,103	670,995	2 52
1898	12,921	34,224	2 65	1908	327,918	880,197	2 68
1899	33,598	60,497	1 80	1909	449,755	1,264,048	2 81
1900	45,237	78,542	1 74	1910	609,617	1,636,917	2 69
1901	67,994	175,689	2 58	1911	826,071	2,496,246	3 02
1902	76,457	178,107	2 45	1912	931,647	2,806,238	3 01
1903	86,258	264,755	3 07	1913	1,367,928	3,684,233	2 69
1904	92,577	252,254	2 72	1914	1,125,090	3,401,146	3 02
1905	264,214	529,454	2 00				

Annual Shipments of Iron Ore from Wabana Mines, Newfoundland.

Calendar year.	To Canada.	To Europe and United States.	Total shipments.
	Short tons.	Short tons.	Short tons.
1909	697,068	412,981	1,110,049
1910	808,762	450,864	1,259,626
1911	765,184	416,279	1,181,463
1912	956,459	375,453	1,331,912
1913	1,048,432	557,488	1,605,920
1914	422,920	216,510	639,430

PIG-IRON AND STEEL.

The making of iron and steel in Canada, is an industry which has been built up largely on the basis of imported ores. The output has increased very rapidly from 1900 to 1913 but through lack of demand fell off very considerably in 1914.

The total production of pig-iron in 1914, not including the output of ferro-products which is separately tabulated, was 783,164 short tons (699,256 long tons) valued at approximately $10,002,856, as compared with 1,128,967 short tons (1,008,006 long tons), valued at $16,540,012 in 1913, and 1,014,587 short tons (905,881 long tons) valued at $14,550,999 in 1912. A decrease of over 30 per cent is shown in the production of pig-iron in 1914, as compared with an increase of 11·3 per cent in the production of 1913 over that of 1912.

At the close of the year Canada had twenty-two completed furnaces grouped in twelve separate completed plants owned by nine companies or corporations. Of the twenty-two completed furnaces, eleven having an aggregate daily capacity of about 1,540 tons, were idle throughout the past year. The eleven furnaces operated had an aggregate daily capacity of about 2,950 tons. The capacities of the various furnaces are shown on page 97.

Of the total output of pig-iron in 1914, 9,380 tons were made with charcoal as fuel, and 773,784 tons with coke. The amount of charcoal pig-iron made in 1913 was 23,696 tons, and in 1912, 21,701 tons, while the quantity made with coke in 1913 was 1,105,271 tons, and in 1912, 992,886 tons.

The classification of the coke iron production in 1914 according to the purpose for which it was intended was as follows: Bessemer 230,817 tons; basic 346,553 tons; foundry, including miscellaneous 196,414 tons.

The classification of the coke iron production in 1913, was as follows: Bessemer 265,685 tons; basic 614,845 tons; foundry, including miscellaneous, 224,741 tons.

The total production of pig-iron in 1913 and 1914 is shown by provinces in the following table, the average value per ton also being indicated. It should be explained that the value placed upon the pig-iron production in Nova Scotia is an assumed or estimated value. A large proportion of the pig-iron made in this Province is directly converted into steel, and as a very small portion only of the metal is sold as pig-iron it is difficult to obtain a satisfactory valuation for the output. It must not be inferred, therefore, that these values represent sales values.

There has been no production of pig-iron in the Province of Quebec during the past three years. In former years this Province has had a continuous though small production of charcoal iron which commanded a high price.

Production of Pig-Iron by Provinces, 1913-14.

Provinces.	1913.			1914.			Percentage increase or decrease in quantity.
	Tons.	Value.	Value per ton.	Tons.	Value.	Value per ton.	
		$	$ cts.		$	$ cts.	%
Nova Scotia	480,068	7,201,020	15 00	227,052	2,951,676	13 00	−52·70
Ontario	648,899	9,338,992	14 39	556,112	7,051,180	12 68	−14·30
Total	1,128,967	16,540,012	14 65	783,164	10,002,856	12 77	−30·63

A record of the production by provinces since 1887 is shown in the following table. Formerly Nova Scotia was the largest producer but since 1909, Ontario has had the largest output. The proportions of the total contributed by the two provinces in 1914 were: Nova Scotia 30 per cent and Ontario 70 per cent.

Annual Production of Pig-Iron by Provinces, 1887-1914.

Year.	Nova Scotia.		Ontario.		Quebec.		Total.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$		$
1887	19,320	250,000	.....	.....	5,507	116,192	24,827	366,192
1888	17,556	211,403	.....	.....	4,243	101,832	21,799	313,235
1889	21,289	383,202	.....	.....	4,632	116,670	25,921	499,872
1890	18,382	262,608	.....	.....	3,390	69,080	21,772	331,688
1891	20,840	297,728	.....	.....	3,051	71,173	23,891	368,901
1892	34,393	458,556	.....	.....	8,050	178,865	42,443	637,421
1893	46,472	553,408	.....	.....	9,475	236,875	55,947	790,283
1894	41,344	449,533	.....	.....	8,623	196,914	49,967	646,447
1895	35,192	417,083	.....	.....	7,262	169,653	42,454	586,736
1896	32,351	400,829	28,302	368,942	6,615	154,358	67,268	924,129
1897	22,500	230,000	26,115	291,466	9,392	217,235	58,007	738,701
1898	21,627	221,677	48,253	530,789	7,135	159,929	77,015	912,395
1899	31,100	404,300	64,749	808,157	7,094	164,849	102,943	1,377,306
1900	28,133	421,995	62,387	938,725	6,055	140,978	96,575	1,501,698
1901	151,130	1,764,017	116,371	1,599,413	6,875	149,493	274,376	3,512,923
1902	237,244	2,477,767	112,688	1,584,273	7,970	181,501	357,902	4,243,541
1903	201,246	2,186,273	87,004	1,345,464	9,635	210,973	297,885	3,742,710
1904	164,488	1,700,130	127,845	1,746,126	11,121	241,729	303,454	3,687,985
1905	261,014	2,440,722	256,704	3,868,197	7,588	166,267	525,306	6,475,186
1906	315,008	3,439,217	275,558	4,338,275	7,845	177,644	598,411	7,955,136
1907	366,456	4,211,913	275,459	4,581,309	10,047	232,004	651,962	9,125,226
1908	352,642	3,554,540	271,484	4,385,271	6,709	171,383	630,835	8,111,194
1909	345,380	3,453,800	407,012	6,002,441	4,770	125,623	757,162	9,581,864
1910	350,287	4,203,444	447,273	6,956,923	3,237	85,255	800,797	11,245,622
1911	390,242	4,682,904	526,635	7,606,939	658	17,282	917,535	12,307,125
1912	424,994	6,374,910	589,593	8,176,089	.....	.....	1,014,587	14,550,999
1913	480,068	7,201,020	648,899	9,338,992	.....	.....	1,128,967	16,540,012
1914	227,052	2,951,676	556,112	7,051,180	.....	.....	783,164	10,002,856

A record of the average monthly prices per gross ton of pig-iron at Montreal during 1913 and 1914, as published by the Department of Labour, and of Bessemer pig-iron and grey forge iron at Pittsburgh for a period of ten years, as compiled by trade journals, is shown in the accompanying tables:—

Average Monthly Prices of Pig-Iron in Canada During 1913-14.

(From Report on Wholesale Prices by Department of Labour.)

	(1) Foundry No. 1, N.S. at Montreal.		(2) Summerlee No. 2 at Montreal.	
	1913.	1914.	1913.	1914.
January	22·00	19·50–21·00	24·00	23·00
February	22·00	19·50–21·00	24·00	23·00
March	22·00	19·50–21·00	24·00	23·00
April	22·00	19·00–20·50	24·00	22·50
May	22·00	19·00–20·50	22·50	22·50
June	21·00–22·00	19·00–20·00	22·50	22·50
July	20·00–21·00	19·00–20·00	22·50	22·50
August	20·00–21·00	19·00–20·00	22·50	22·50
September	20·00–21·00	19·00–20·00	22·50	22·50
October	20·00–21·00	19·00–20·00	22·50	22·75
November	19·50–21·00	19·00–19·75	22·50	22·75
December	19·50–21·00	19·00–19·75	22·50	23·00
Average	19·437	19·708	23·00	22·708

(1) Price per ton of 2,240 pounds, f.o.b. at Montreal, on the opening market day of each month; quotations supplied by the Dominion Iron and Steel Co., Ltd.

(2) Price per ton at Montreal, in the first week of each month, quotations furnished by Drummond, McCall & Co., Ltd.

Bessemer Pig-Iron at Pittsburgh, per Gross Ton (2,240 pounds)*.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
	$ cts	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
January	16 85	18 35	23 15	19 00	17 34	19 90	15 90	15 05	18 15	14 96
February	16 41	18 35	22 85	17 90	16 78	19 34	15 90	14 90	18 15	15 09
March	16 35	18 28	22 85	17 86	16 25	18 60	15 90	15 09	18 15	15 09
April	16 35	18 19	23 35	17 49	15 78	18 27	15 90	15 15	17 90	14 90
May	16 16	18 10	24 01	16 93	15 84	17 52	15 90	15 13	17 70	14 90
June	16 65	18 23	24 27	16 90	16 05	16 60	15 90	15 15	17 14	14 90
July	14 85	18 41	23 55	16 83	16 46	16 40	15 90	15 20	16 70	14 90
August	15 20	19 00	22 90	16 23	17 03	16 09	15 90	15 46	16 52	14 90
September	15 91	19 54	22 90	15 90	18 05	15 90	15 90	16 15	16 65	14 90
October	16 54	20 35	22 00	15 71	19 53	15 90	15 44	17 80	16 60	14 84
November	17 85	22 85	20 65	16 59	19 90	15 82	15 00	18 02	16 02	14 59
December	18 35	23 75	19 34	17 40	19 90	15 90	15 03	18 15	15 77	14 70

* From the *Iron Age*.

Grey Forge Pig-Iron at Pittsburgh, per Gross Ton (2,240 pounds).

	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts
January	16 11	17 30	22 58	17 00	15 40	17 40	14 09	13 40	17 15	13 65
February	15 99	17 29	22 20	15 99	15 09	17 02	14 27	13 40	17 15	13 65
March	16 00	16 91	21 76	15 90	14 65	16 15	14 40	13 40	16 92	13 65
April	15 77	16 66	21 72	15 45	14 40	16 09	14 40	13 65	16 17	13 65
May	15 57	16 49	22 88	14 90	14 40	15 90	14 27	13 78	15 17	13 65
June	15 18	16 35	23 15	14 90	14 77	15 20	14 00	13 90	14 71	13 65
July	14 55	16 41	22 96	14 90	14 85	14 52	13 90	13 90	14 55	13 65
August	14 36	17 75	21 90	14 71	15 21	14 30	13 90	14 15	14 25	13 65
September	14 72	18 35	21 15	14 46	16 15	14 15	13 84	14 65	14 25	13 65
October	15 66	19 47	20 40	14 40	17 02	14 15	13 65	16 18	14 26	13 58
November	16 58	22 45	19 17	14 90	17 27	14 09	13 47	16 50	14 25	13 45
December	16 97	22 85	18 40	15 25	17 40	13 90	13 40	17 15	13 95	13 40

Previous to 1896, pig-iron was made entirely from Canadian ores. Since that date, however, increasing quantities of imported ore have been used, as well as imported fuels and fluxes, and in 1914 about 88 per cent of the ore charged, 64 per cent of the coke, and a large proportion of the limestone, were imported. This condition is attributed largely to questions of cost and transportation affecting the ore supplies available for each furnace. The Newfoundland ores can be cheaply and conveniently laid down at Sydney, N.S.—in fact the iron and steel industry here has been built up on the basis of these ores and by the local coal supply. During the past two years considerable quantities of limestone have also been obtained from Newfoundland. In Ontario also, large quantities of imported ores are used. In 1914 the imported ores used in Ontario amounted to 865,004 tons, and the Canadian ores 182,964 tons, the imported ores being derived from the deposits south of Lake Superior. With the exception of a small quantity of charcoal, the fuel used in Ontario was altogether imported, either as coal or as coke. A portion of the limestone flux was also imported.

Iron Ore, Fuel, and Flux Charged to Blast Furnaces.

Calendar Year.	Iron ore charged.		Fuel charged.			Limestone.
	Canadian.	Imported.	Charcoal.	*Coke from Canadian coal.	Coke imported or made from imported coal.	
	Tons.	Tons.	Bushels.	Tons.	Tons.	Tons.
1887	60,434	.....	940,400	33,581	.....	17,171
1888	54,956	.....	804,286	30,228	.....	16,857
1889	65,670	.....	755,800	36,333	.....	22,122
1890	57,304	.....	589,860	34,073	.....	18,478
1891	60,933	.....	441,812	32,796	.....	11,377
1892	96,948	.....	1,121,365	52,622	.....	22,967
1893	124,053	.....	1,302,720	65,332	.....	27,797
1894	108,871	.....	1,173,970	60,026	.....	35,101
1895	93,208	.....	789,561	51,629	.....	31,585
1896	96,560	46,300	756,600	50,067	33,990	37,462
1897	53,658	55,722	1,031 800	35,800	27,810	31,273
1898	57,881	77,107	836,400	31,952	50,407	33,913
1899	66,384	120,650	1,928,025	44,844	64,648	51,826
1900	71,341	112,042	1,799,737	45,021	59,345	52,966
1901	156,613	361,010	1,835,736	207,835	115,367	169,399
1902	125,664	559,381	2,146,623	362,208	112,314	293,594
1903	82,035	485,911	2,322,030	350,190	96,540	277,452
1904	180,932	454,671	3,477,470	257,182	130,210	211,278
1905	116,974	861,847	4,404,394	365,897	243,882	369,715
1906	221,733	982,740	2,168,476	462,672	304,676	456,036
1907	244,104	1,117,260	1,682,085	521,068	327,082	488,462
1908	209,266	1,051,445	1,121,990	492,076	325,670	483,065
1909	231,994	1,235,000	1,779,258	412,016	507,255	526,076
1910	149,505	1,377,035	1,615,919	491,281	476,838	569,355
1911	67,434	1,628,368	1,960,459	543,933	577,388	625,216
1912	71,588	2,019,165	1,886,748	609,183	656,815	705,613
1913	139,436	2,110,828	2,206,191	710,260	706,888	630,119
1914	182,964	1,324,326	920,045	330,259	590,902	447,641

*Includes for the first ten years small quantity of coal.

IRON BLAST FURNACES IN CANADA IN 1914.

Of twenty-two completed furnaces, eleven were in blast in 1914 for varying periods of time. The total, daily capacity of the 22 furnaces is about 4,490 tons. The operating companies, with numbers and capacities of furnaces, were as follows:—

Dominion Iron & Steel Co., Sydney, C.B.: six completed furnaces of 280 tons capacity each, per day; one operated throughout 1914; one for 225 days, and one for 241 days; three furnaces idle throughout the year.

Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N.S.: one furnace at Sydney Mines, C.B., of 250 tons capacity; operated 128 days.

Londonderry Iron & Mining Co., Ltd. (in liquidation), Londonderry, N.S.: one furnace of 100 tons capacity; idle throughout the year.

Canada Iron Corporation, Ltd. (in liquidation), Montreal, Que.: two small furnaces of seven and eight tons capacity, at Drummondville, Que.; one furnace of 24 tons daily capacity, at Radnor Forges, Que.; two furnaces of 125 tons and 250 tons at Midland, Ont., all idle throughout the year.

Standard Iron Co. of Canada, Ltd., Deseronto, Ont.: one furnace at Deseronto with a daily capacity of 112 tons, operated for 144 days during the year 1914; one furnace of 84 tons capacity at Parry Sound idle throughout the year.

The Steel Co. of Canada, Ltd., Hamilton, Ont.: two furnaces, one of 200 tons capacity, operated for 184 days in 1914, a second furnace of 300 tons capacity, operated 211 days in 1914.

Algoma Steel Co., Ltd., Sault Ste. Marie, Ont.: three furnaces at Steelton, near Sault Ste. Marie, two of 250 tons capacity each, operated for 358 and 365 days respectively; and one of 450 tons capacity, operated 243 days.

The Atikokan Iron Co., Ltd., Port Arthur, Ont.: one furnace of 175 tons capacity, idle throughout the year.

The Canadian Furnace Co. Ltd., Port Colborne, Ont.: one furnace of 300 tons capacity, operated 262 days in 1914.

EXPORTS AND IMPORTS OF PIG-IRON.

The total exports of pig-iron, including ferro-alloys, during 1914 were 19,063 tons valued at $486,366, or an average value per ton of $25.51 compared with exports of 6,326 tons valued at $351,646, or an average of $55.59 in 1913.

The exports between 1905 and 1913 did not exceed 10,000 tons in any one year, and consisted largely, if not entirely, of ferro-alloys. During 1914, however, there was a small export of pig-iron chiefly from Sydney to Philadelphia. The exports during the first three months of the year were 4,431 tons which probably included about 4,000 tons of pig-iron. From the

first of April the exports were separately classified and during the last nine months of the year included 9,767 tons of pig-iron valued at $118,111 or an average of $12.09 per ton and 4,865 tons of ferro-alloys valued at $285,221 or an average of $58.63 per ton.

Considerable quantities of pig-iron are annually imported into Canada. During the calendar year 1914 the total imports of pig-iron, excluding ferro-products which are separately stated, were 78,680 tons valued at $982,189, and included 69,254 tons valued at $862,598, or an average of $12.46 per ton, from the United States; and 9,426 tons valued at $119,591 or an average of $12.68 per ton, from Great Britain. The total imports in 1913 were 236,769 tons valued at $3,247,405 or an average of $13.71 per ton, and in 1912, 272,680 tons valued at $3,512,969 or an average of $12.88 per ton. These imports in 1914 included 86 tons of charcoal pig-iron valued at $1,082, or $12.58 per ton, as compared with 926 tons of charcoal pig-iron in 1913, valued at $12,528 or an average of $13.52 per ton.

The annual imports of these two classes of pig-iron since 1880 are shown herewith.

Annual Exports of Pig-Iron and Ferro-Alloys, 1896-1914.

Calendar Year.	Tons.	Value.	Average value.	Calendar Year.	Tons.	Value.	Average value.
		$	$ cts.			$	$ cts.
1896	2,187	55,448	25 35	1905	866	22,284	25 73
1897	3,099	81,381	26 26	1906	305	7,429	24 36
1898	1,278	32,645	25 54	1907	439	13,504	30 76
1899	6,981	149,190	21 37	1908	290	10,614	36 60
1900	3,513	88,052	25 06	1909	5,063	186,778	36 89
1901	57,650	593,739	10 30	1910	9,763	296,310	30 35
1902	75,195	778,619	10 35	1911	5,870	271,968	46 33
1903	4,400	78,382	17 81	1912	6,976	310,702	44 54
1904	21,016	200,363	9 53	1913	6,326	351,646	55 59
				1914	19,063	486,366	25 51

Annual Imports of Pig-Iron Since 1880.

Year.	Pig-iron.			Charcoal pig-iron.			Total.	
	Tons.	Value.	Average value.	Tons.	Value.	Average value.	Tons.	Value.
		$	$ cts.		$	$ cts.		$
1880(c)	(a) 23,159	371,956	16 06	.....	.....	.....	23,159	371,956
1881	(a) 43,630	715,997	16 41	.....	.....	.....	43,630	715,997
1882	56,594	811,221	14 33	6,837	211,791	30 98	63,431	1,023,012
1883	75,295	1,085,755	14 42	2,198	58,994	26 84	77,493	1,144,749
1884	49,291	653,708	13 26	2,893	66,602	23 02	52,184	723,010
1885	42,279	545,426	12 90	1,119	27,333	24 43	43,398	572,759
1886	42,463	528,483	12 45	3,185	60,086	18 87	45,648	588,569
1887	46,295	554,388	11 98	3,919	77,420	19 76	50,214	631,808
1888	(b) 48,973	648,012	13 23	.....	.....	.....	48,973	648,012
1889	(b) 72,115	864,752	11 99	.....	.....	.....	72,115	864,752
1890	(b) 87,613	1,148,078	13 10	.....	.....	.....	87,613	1,148,078
1891	(b) 81,317	1,085,929	13 35	.....	.....	.....	81,317	1,085,929
1892	(b) 68,918	886,485	12 86	.....	.....	.....	68,918	886,485
1893	56,849	682,209	12 00	5,944	84,358	14 19	62,793	766,567
1894	42,376	483,787	11 42	2,906	34,968	12 03	45,282	518,755
1895	31,637	341,259	10 80	2,780	31,171	11 21	34,417	372,430
1896	36,131	394,591	10 92	917	11,726	12 79	37,048	406,317
1897	25,766	291,788	11 32	2,936	35,373	12 05	28,702	327,161
1898	37,186	382,103	10 28	2,250	23,533	10 46	39,436	405,636
1899	44,261	452,911	10 23	1,955	19,123	9 78	46,216	472,034
1900	49,767	811,490	16 31	1,816	38,736	21 33	51,583	850,226
1901	35,293	548,033	15 53	490	7,121	14 53	35,783	555,154
1902	39,978	585,077	14 64	38	726	19 11	40,016	585,803
1903	91,730	1,338,574	14 59	882	16,352	18 54	92,612	1,354,926
1904	62,515	894,728	14 31	.....	.....	.....	62,515	894,728
1905	71,005	857,879	12 08	.....	.....	.....	71,005	857,879
1906(c)	96,797	1,401,047	14 47	.....	.....	.....	96,797	1,401,047
1907(d)	150,127	2,280,860	15 19	30	675	22 33	150,157	2,281,535
1908(e)	57,343	771,615	13 46	1,022	18,818	18 41	58,365	790,433
1909	147,925	1,798,172	12 16	413	5,727	13 87	148,338	1,803,899
1910	227,753	3,122,695	13 71	16,106	242,152	15 03	243,859	3,364,847
1911	208,487	2,610,989	12 52	.....	.....	.....	208,487	2,610,989
1912	272,565	3,511,599	12 88	115	1,370	11 91	272,680	3,512,969
1913	235,843	3,234,877	13 72	926	12,528	13 53	236,769	3,247,405
1914(e)	78,594	981,107	12 48	86	1,082	12 58	78,680	982,189

(a) Comprises pig-iron of all kinds.
(b) These figures appear in Customs reports under heading "iron in pigs, iron kentledge, and cast iron."
(c) Year ending June 30.
(d) Nine months ending March 31.
(e) Calendar year from 1908 to date.

FERRO-PRODUCTS.

Ferro-silicon and ferro-phosphorus were produced in Canada in electric smelting plants during 1914, the latter in small quantities only. Ferro-silicon, both 50 per cent and 75 per cent, was made at Welland, Ont., by the Electro-Metals, Ltd., and ferro-phosphorus, or phosphate of iron at Buckingham, Que., by the Electric Reduction Co., Ltd.

The total production of ferro-products during 1914 was 7,524 tons valued at $478,355 as against a production of 8,075 tons valued at $493,018 in 1913. In 1912 the production was 7,834 short tons valued at $465,225, and in 1911, 7,507 short tons valued at $376,404.

The exports of ferro-products were formerly included with pig-iron but have been separately tabulated since April 1, 1914. During the nine

months ending December 1914, the exports of ferro-silicon and other ferro-products, as already stated, were 4,865 tons valued at $285,221.

The imports of ferro-silicon, ferro-manganese, etc., during the calendar year 1914, were 22,147 tons valued at $549,485, or an average of $24.81 per ton, as compared with imports during the calendar year 1913, of 30,355 tons valued at $940,443, or an average of $30.98 per ton.

The annual imports since 1887 are shown in the following table:—

Imports of Ferro-Manganese, Ferro-Silicon, Etc.

	Tons.	Value.	Average. value.		Tons.	Value.	Average. value.
Fiscal Year.		$	$ cts.	Fiscal Year.		$	$ cts.
*1887	123	1,435	11 67	†1903	6,350	162,710	25 62
*1888	1,883	29,812	15 83	†1904	2,975	75,554	25 40
*1889	5,868	72,108	12 29	†1905	12,935	246,815	19 08
*1890	696	18,895	27 15	†1906	15,023	462,739	30 80
*1891	2,707	40,711	15 04	†1907 (9 mos)	16,414	610,875	37 22
*1892	1,311	23,930	18 25	†1908	17,417	612,062	35 14
*1893	529	15,858	29 98				
*1894	284	9,885	34 81	Calendar Year.			
†1895	164	5,408	32 98				
†1896	652	12,811	19 65	†1909	17,699	411,536	23 25
†1897	426	9,233	21 67	†1910	18,900	464,741	24 59
†1898	1,418	22,516	15 88	†1911	17,226	429,465	24 93
†1899	1,160	22,539	19 43	†1912	19,810	469,884	23 72
†1900	1,149	39,064	34 00	†1913	30,355	990,443	30 98
†1901	1,512	38,954	25 76	1914	22,147	549,485	24 81
†1902	6,513	150,977	23 18				

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

CONSUMPTION OF PIG-IRON.

The total quantity of pig-iron ferro-alloys used in Canada in 1914, arrived at by adding to the production, the excess of imports over exports amounted in 1914 to 872,452 tons. Of this amount 639,282 tons were used in steel furnaces, leaving 233,170 tons for foundry and other uses.

Consumption of Pig-Iron and Ferro-Alloys.

Year.	Total Consumption.*	Used in Steel furnaces.		Available for foundry and other uses.
		Pig-iron.	Ferro-alloys.	
	Tons.	Tons.	Tons.	Tons.
1910	1,060,970	690,913	8,143	361,914
1911	1,144,885	700,697	21,359	422,829
1912	1,307,820	735,559	24,237	548,024
1913	1,397,840	913,722	29,408	454,710
1914	872,452	619,030	20,252	233,170

* Production of pig-iron and ferro-alloys plus excess of imports over exports.

STEEL.[1]

The production of steel ingots and castings in 1914 was 828,641 tons, as compared with 1,168,993 tons in 1913, and 957,681 tons in 1912. In 1914 the production of open-hearth ingots was reported as 608,383 tons; Bessemer ingots 203,184 tons; direct open-hearth castings 15,315 tons; and other steel castings 1,759 tons. The falling off in production compared with 1913 was 354,578 tons, or 30 per cent.

The production during the past five years is shown in the following table:—

Production of Steel, 1910-14.

——	1910.	1911.	1912.	1913.	1914.
	Tons.	Tons.	Tons.	Tons.	Tons.
Ingots—Open-hearth (basic)	580,932	651,676	692,236	824,818	608,383
Bessemer (acid)	222,668	209,817	231,044	301,932	203,184
Castings—Open-hearth	18,085	20,163	31,845	39,217	15,315
Other steels	599	740	2,556	3,026	1,759
Total	822,284	882,396	957,681	1,168,993	828,641

A statistical record of the materials used in steel furnaces has been obtained during the past five years. The total quantity of pig-iron used in steel furnaces during the year 1914 was 619,030 tons, of which 610,645 tons were produced by firms reporting, and 8,385 tons purchased. The quantity of ferro-alloys used was 20,252 tons purchased. Scrap, etc., was used to the extent of 286,863 tons, being 276,596 tons produced by the firms reporting, and 10,267 tons purchased. Ores used included 723 tons of manganese ore and 37,686 tons of iron ore, while 114,859 tons of limestone, or dolomite flux, were used, and 7,845 tons of fluorspar. In Ontario, about 327 million cu. ft. of natural gas were used, while in Nova Scotia coke-oven gas was used at Sydney, of which a record of quantity was not obtained.

The total quantity of pig-iron used in steel furnaces during the year 1913 was 913,722 tons, of which 860,360 tons were produced by firms reporting, and 53,362 tons purchased. The quantity of ferro-alloys used was 29,408 tons purchased. Scrap, etc., was used to the extent of 406,403 tons, being 277,509 tons produced by the firms reporting, and 128,894 tons purchased. Ores used included 1,342 tons of manganese ore and 55,018 tons of iron ore, while 197,028 tons of limestone or dolomite flux were used, and 10,687 tons of fluorspar. In Ontario, a little over 413 million cu. ft. of natural gas were used, while in Nova Scotia coke-oven gas was used at Sydney, of which a record of quantity was not obtained.

In 1912 the total quantity of pig-iron used in steel furnaces was 735,559 tons, of which 706,895 tons were produced by firms reporting, and

[1] The statictics of steel production for 1914 published in the separate report on iron and steel (No. 349) have been revised and corrected in this report.

28,664 tons purchased. The quantity of ferro-alloys used was 24,237 tons purchased. Scrap, etc., was used to the extent of 336,265 tons, being 223,404 tons produced by the firms reporting, and 112,861 tons purchased. Ores used included 985 tons of manganese ore, and 43,006 tons of iron ore, while 148,045 tons of limestone or dolomite flux were used, and 9,709 tons of fluorspar. In Ontario, a little over 423 million cu. ft. of natural gas were used.

Statistics of the production of steel ingots and castings since 1894 are given in the following table, the figures for 1894 to 1906 inclusive having been collected and published by the American Iron and Steel Association; those for the years 1907 to 1914 have been collected by this Department and are shown in detail in the previous table.

Annual Production of Steel Ingots and Castings, 1894-1914.

Calendar Year.	Short tons.	Calendar Year.	Short tons.	Calendar Year.	Short tons.
1894	28,767	1901	29,214	1908	588,763
1895	19,040	1902	203,881	1909	754,719
1896	17,920	1903	203,296	1910	822,284
1897	20,608	1904	166,381	1911	882,396
1898	24,125	1905	451,863	1912	957,681
1899	24,640	1906	639,396	1913	1,168,993
1900	26,406	1907	706,982	1914	828,641

Rolled Products:—Statistics of the production of rolled products and of manufactured steel received from the largest producers, show a production of blooms, billets, slabs, etc., of 802,658 tons, of which 773,249 tons were used by the producer for further manufacture, and 29,409 tons sold to other rolling mills.

The production of rails was 428,226 tons; of wire rods, 63,856 tons; of bars and rods (not including wire rods) 107,054 tons; and of other rolled steel products 37,450 tons. There was also a production of iron bars, etc., amounting to 31,007 tons. The production of steel rails in 1913 was returned as 554,481 tons; in 1912, 471,422 tons; and in 1911, 399,760 tons.

The production of finished rolled iron and steel in Canada from 1910 to 1914 as ascertained and published by the American Iron and Steel Association was as follows, in long tons:—

Annual Production of Rolled Iron and Steel, 1910-1914.

Products—Gross tons.	1910.	1911.	1912.	1913.	1914.
Rails	366,465	360,547	423,885	506,709	382,344
Structural shapes and wire rods	80,993	76,617	64,082	68,048	59,050
Plates and sheets	26,642	14,833	373,257	392,340	218,125
Nail plate, merchant bars, and all other finished rolled forms	265,711	323,427			
Total	739,811	775,424	861,224	967,097	659,519

BOUNTIES.

Bounties on iron and steel made in Canada were provided for by the Dominion Government in 1897 under the authority of Chapter 6, Statutes of Canada, 1897. These bounties were continued under subsequent statutes until 1911. Bounty on pig-iron and steel made in electric furnaces was available until December 31, 1912, but no claims therefor were made during the year.

Since 1896 a total of $16,785,827 has been paid by the Government of Canada in bounties for the production of iron and steel, the annual payments on pig-iron, puddled iron bars, steel, and manufactures of steel, being shown in the following table:—

Total Bounties on Iron and Steel Paid by the Government of Canada Since 1896.

Year ended.	Pig-iron.	Puddled iron bars.	Steel.	Manufactures of steel.
	$	$	$	$
June 30, 1896	104,105	5,611	59,499	.....
" 1897	66,509	3,019	17,366	.....
" 1898	165,654	7,706	67,454	.....
" 1899	187,954	17,511	74,644	.....
" 1900	238,296	10,121	64,360	.....
" 1901	351,259	16,703	100,058	.....
" 1902	693,108	20,550	77,431	.....
" 1903	666,001	6,702	729,102	.....
" 1904	533,982	11,669	347,990	15,321
" 1905	624,667	7,895	676,318	231,324
" 1906	687,632	5,875	941,000	369,832
March 31, 1907 (9 months)	385,231	312	575,259	338,999
" 1908	863,817	.....	1,092,201	347,135
" 1909	693,423	.....	838,100	333,091
" 1910	573,969	.....	695,752	538,812
" 1911	261,434	.....	350,456	526,858
" 1912	.....	.....	.....	166,750
" 1913	.....	.....	.....	.....
Total	7,097,041	113,674	6,706,990	2,868,122

EXPORTS AND IMPORTS OF IRON AND STEEL GOODS.

The exports of iron and steel from Canada consist chiefly of manufactured goods such as agricultural implements, automobiles, bicycles, machinery, etc. Compared with the value of imports, the total value of the exports is small, amounting to not more than 10 per cent of the former. The total value of iron and steel exported during the calendar year 1914 was $14,391,746, as compared with a value of exports in 1913 of $13,999,149, and in 1912 of $10,682,484. The exports during 1914 included: pig-iron and ferro-products, etc., to the value of $486,366; scrap iron and steel valued at $446,337; manufactures of iron and steel $4,260,395; agricultural implements $5,788,899; automobiles and bicycles $3,409,749.

The exports during 1913 in similar groupings were pig-iron and ferro-products $351,646; scrap-iron and steel $483,813; manufactures of iron and steel $2,121,480; agricultural implements $7,411,246; automobiles and bicycles $3,630,964.

The exports during 1912 in similar groupings were: pig-iron and ferro-products, etc., $310,702; scrap iron and steel $145,250; manufactures of iron and steel $2,076,493; agricultural implements, $5,967,545; automobiles and bicycles $2,182,494.

A detailed record of these exports during the past two years is shown in the accompanying table.

Exports of Iron and Steel Goods, the Product of Canada, during the Calendar Years 1913 and 1914.

	1913.			1914.		
	Quantity.	Value.	Average value.	Quantity.	Value.	Average. value.
		$	$ cts.		$	$ cts.
Stoves.....No.	1,371	23,858	17 40	4,198	25,149	5 99
Gas buoys and parts of..... "	.....	35,462	.....	.....	21,009	.....
Castings, n.e.s..... "	.....	61,362	.....	.....	24,218	.....
Pig-iron.....Tons	6,326	351,646	55 59	14,198	201,145	14 17
Ferro-silicon and ferro-compounds "	.....	.....	.....	4,865	285,221	57 45
Wire and wire-nails..... "	.....	.....	.....	9,663	355,781	36 82
Machinery (linotype machines).. $	.....	9,631	.....	.....	5,562	.....
Machinery, n.e.s..... "	.....	435,333	.....	.....	344,689	.....
Sewing machines.....No.	8,122	114,438	14 09	2,109	31,392	14 88
Washing machines, etc..... $	.....	15,872	.....	.....	33,986	.....
Typewriters ..... No.	3,048	201,763	66 20	3,055	200,441	65 61
Scrap iron and steel.....Tons	45,556	483,813	10 62	35,405	446,337	12 60
Hardware, tools, etc..... $	.....	101,990	.....	.....	95,497	.....
Hardware, n.e.s..... "	.....	70,767	.....	.....	190,763	.....
Steel and manufactures of..... "	.....	1,051,004	.....	.....	2,931,908	.....
Agricultural implements—						
Mowing machines.....No.	24,044	847,253	35 24	21,457	725,831	33 83
Reapers..... "	5,604	317,716	56 69	3,919	223,228	56 96
Drills.....	10,364	634,121	61 18	3,961	259,701	65 56
Harvesters..... "	23,194	2,439,319	105 17	19,474	2,015,996	103 52
Ploughs..... "	15,450	465,505	30 13	12,896	324,349	25 15
Harrows..... "	7,300	127,482	17 46	6,252	92,556	14 80
Hay rakes..... "	9,846	247,445	25 13	6,524	196,519	30 12
Seeders..... "	.....	.....	.....	32	1,810	56 56
Threshing machines..... "	1,928	712,270	369 43	1,965	799,307	406 77
Cultivators..... "	7,795	201,758	25 88	6,030	146,668	24 32
All other..... "	.....	503,235	.....	.....	290,520	.....
Parts of..... "	.....	915,142	.....	.....	712,414	.....
Automobiles "	5,997	3,395,382	566 18	5,621	3,011,327	535 73
" parts of..... "	.....	210,623	.....	.....	384,428	.....
Bicyles "	90	8,058	89 53	111	10,021	90 28
" parts of..... "	.....	16,901	.....	.....	3,973	.....
Total.....	.....	13,999,149	.....	.....	14,391,746	.....

Annual Exports of Iron and Steel Products since 1884.

Year.	Value.	Year.	Value.	Year.	Value.
	$		$		$
1884	186,854	1895	174,778	1906	1,552,963
1885	115,158	1896	284,296	1907	1,607,368
1886	228,027	1897	592,849	1908	2,098,138
1887	251,221	1898	593,060	1909*	7,172,413
1888	184,214	1899	975,377	1910	7,895,489
1889	144,909	1900	1,570,013	1911	9,907,281
1890	133,724	1901	1,837,179	1912	10,682,484
1891	152,919	1902	2,751,324	1913	13,999,149
1892	155,597	1903	3,058,320	1914	14,391,746
1893	214,636	1904	1,318,482		
1894	167,183	1905	1,287,558		

* Agricultural implements, automobiles, and bicycles included in 1909 and subsequent years.

The total value of the imports of iron and steel goods during the calendar year 1914 was $79,762,262, as compared with a value of $145,226,972 imported during the calendar year 1913, showing a decrease of over 45 per cent. Previous to 1913 the record is shown covering the fiscal periods. During the twelve months ending March 1913, the imports were valued at $148,579,272 as against imports valued at $105,614,450 during the twelve months ending March 1911.

Between 1895 and 1904 the imports of iron and steel increased from about $8,600,000 to over $40,000,000. During the next five years there was comparatively little change, but from 1909 to 1913 the increase was again very rapid. During the latter part of 1913 there was, however, a distinct check to imports with the heavy falling off shown in 1914. A detailed statement of the imports of iron and steel during the calendar years 1914 and 1913, is shown in the general tables of imports of iron and steel goods following.

The imports during 1914 subject to duty were valued at $64,901,486, the imports duty free during the same period being valued at $14,860,776. The imports during 1913, subject to duty were valued at $125,082,378, and the imports duty free during the same period were valued at $20,144,594. These imports include all classes of iron and steel goods manufactured as well as those of the cruder form. In many cases the values only of the imported goods are given, so that a total tonnage of imports cannot be stated. In the case of most of the cruder materials, however, the quantities are given, and a compilation of these showing the importation of the cruder forms of iron and steel since 1909 is shown in the accompanying table. Thus during the twelve months ending December, 1914, there were imported 882,636 tons of iron and steel valued at $28,523,956, or an average value per ton of $32.32 together with other iron and steel goods of which the quantities are not stated, valued at $51,238,306.

During the twelve months ending December, 1913, there were imported 1,890,506 tons of iron and steel goods valued at $59,882,222, or an

average value per ton of $31.67, together with other iron and steel goods of which the quantities are not stated, valued at $85,344,750.

A decrease in the imports of each class of product is shown in 1914, with the exception of wire, the imports of which increased about 10 per cent.

The imports of pig-iron in 1914 were 78,680 tons as against 236,769 tons in 1913, a decrease of 158,089 tons, or 66·77 per cent; ferro-products and chrome steel 22,271 tons in 1914 as against 30,678 tons in 1913, a falling off of 8,407 tons or 27·40 per cent; ingots, blooms, billets, etc., 13,049 tons as against 52,872 tons, a decrease of 39,823 tons, or 75·32 per cent; scrap iron and steel 27,688 tons compared with 104,747 tons, a decrease of 77,059 tons, or 73·57 per cent; plates and sheets 221,203 tons as against 365,675 tons, a decrease of 144,472 tons or 39·51 per cent; tin plates and sheets 50,791 tons as against 58,031 tons, a decrease of 7,240 tons, or 12·48 per cent, bars, rods, hoops, etc., 148,368 tons compared with 227,879 tons, a decrease of 79,511 tons, or 34·89 per cent; structural iron and steel 160,538 tons in 1914 as against 439,871 tons in 1913, a decrease of 279,333 tons or 63·50 per cent; rails and connexions 42,064 tons compared with 182,421 tons, a decrease of 140,357 tons, or 76·94 per cent; pipe and fittings 4,864 tons compared with 30,663 tons, a decrease of 25,799 tons, or 84·14 per cent; wire 77,167 tons in 1914 compared with 70,712 tons in 1913, an increase of 6,455 tons or 9·13 per cent; forgings, castings, etc., 20,339 tons as against 32,604 tons, a decrease of 12,265 tons, or 37·62 per cent.

A very large proportion of these imports is derived from the United States, and a record has been compiled from the "Commerce and Navigation of the United States" showing the exports of iron and steel goods from that country to Canada.

According to this authority there were exported to Canada from United States during the twelve months ending June 30, 1914, 1,169,349 tons of iron and steel goods, valued at $35,921,812, together with other iron and steel goods of which the weight is not given valued at $40,731,318 or a total value of $76,653,130.

During the twelve months ending June 30, 1913, the corresponding exports to Canada were 1,695,916 tons of iron and steel goods valued at $51,936,616, together with other iron and steel goods of which the weight is not given, valued at $54,673,774 or a total value of $106,610,390.

During the twelve months ending June 30, 1912, exports to Canada were 1,175,464 tons valued at $36,637,305, together with other iron and steel goods valued at $46,020,989, or a total value of $82,658,294.

Summary of Imports of Iron and Steel, 1914.

Material.	Tons.	Value.	Average.
		$	$ cts.
Pig-iron	78,680	982,189	12 48
Ferro-products and chrome steel	22,271	560,686	25 18
Ingots, blooms, billets, puddled bars, etc	13,049	259,703	19 90
Scrap iron and scrap steel	27,688	337,406	12 19
Plates and sheets	221,203	7,576,312	34 25
Tin plates and sheets	50,791	3,151,385	62 05
Bars, rods, hoops, bands, etc	148,368	5,138,193	34 63
Structural iron and steel	160,538	4,214,520	26 25
Rails and connexions	42,064	1,116,773	26 55
Pipe and fittings (a)	15,614	395,466	25 33
Nails and spikes	4,864	210,098	43 20
Wire (a)	77,167	3,205,635	41 54
Forgings, castings, and manufactures	20,339	1,375,590	67 63
Total	882,636	28,523,956	32 32
Other iron and steel products valued at	.....	51,238,306	.....
Total value of imports of iron and steel	.....	79,762,262	.....

Summary of Imports of Iron and Steel,* 1913.

Material.	Tons.	Value.	Average.
		$	$ cts.
Pig-iron	236,769	3,247,405	13 72
Ferro-products and chrome steel	30,678	970,100	31 62
Ingots, blooms, billets, puddled bars, etc	52,872	1,212,314	22 93
Scrap iron and scrap steel	104,747	1,488 255	14 21
Plates and sheets	365,675	13,965,865	38 19
Tin plates and sheets	58,031	3,954,615	68 14
Bars, rods, hoops, bands, etc	277,879	10,195,280	36 69
Structural iron and steel	439,871	12,739,954	28 96
Rails and connexions	182,421	5,120,830	28 07
Pipe and fittings (a)	30,663	847,922	27 65
Nails and spikes	7,584	360,489	47 53
Wire (a)	70,712	3,688,660	52 16
Forgings, castings, and manufactures	32,604	2,090,533	64 12
Total	1,890,506	59,882,222	31 67
Other iron and steel products valued at		85,344,750	
Total value of imports of iron and steel	.....	145,226,972	

* For details of these items see general tables following.
(a) There are additional imports of pipe and wire included under "other iron and steel products."

Summary of Tonnage of Iron and Steel Imported 1909-1913.

Material.	Twelve months ending March.				
	1909.	1910.	1911.	1912.	1913.
	Tons.	Tons.	Tons.	Tons.	Tons.
Pig-iron	58,591	159,506	270,102	201,112	291,904
Ferro-products and chrome steel	13,206	15,153	19,182	18,548	23,378
Ingots, blooms, billets, puddled bars, etc.	8,887	36,819	48,395	89,190	86,745
Scrap iron and scrap steel	26,212	28,797	53,824	78,378	103,317
Plates and sheets	116,610	200,575	205,690	243,461	376,633
Tin plates and sheets	26,859	39,866	44,025	45,802	64,571
Bars, rods, hoops, bands, etc.	73,261	117,159	183,865	195,139	278,878
Structural iron and steel	162,735	195,748	232,585	268,572	377,551
Rails and connexions	32,543	55,183	36,690	97,062	156,318
Pipe and fittings	18,309	16,705	28,831	26,627	40,987
Nails and spikes	1,611	3,476	3,374	7,201	11,420
Wire	39,375	68,211	64,850	69,597	80,846
Forgings, castings, and manufactures	14,394	18,093	24,523	27,668	47,195
Total	592,593	955,291	1,215,936	1,368,357	1,939,743

Annual Imports of Iron and Steel Products since 1895.

Year.	Value.	Year.	Value.
Twelve months ending June	$	Twelve months ending March	$
1895	8,684,024	1907*	44,739,403
1896	10,206,759	1908	64,257,238
1897	11,063,156	1909	42,075,797
1898	16,340,992	1910	62,356,974
1899	19,463,329	1911	88,179,152
1900	27,926,766	1912	105,614,450
1901	25,023,453	1913	148,579,272
1902	31,591,488	Twelve months ending December	
1903	39,536,867	1913	145,226,972
1904	40,449,175	1914	79,762,262
1905	40,820,233		
1906	42,210,305		

*Nine months.

Annual Imports of Tin Plate.

Year.	Tons.	Value.	Year.	Tons.	Value.
Fiscal Year.		$	Fiscal Year		$
1891	10,734	854,770	1904	24,820	1,461,811
1892	19,296	1,235,961	1905	30,000	1,751,507
1893	15,131	892,106	1906	30,259	1,869,000
1894	15,369	956,813	1907	22,628	1,516,777
1895	13,022	681,739	1908	34,876	2,437,540
1896	16,910	923,279	1909	26,859	1,682,366
1897	18,768	919,596	Calendar Year:		
1898	22,864	1,150,741	1909	36,904	2,216,089
1899	16,575	927,036	1910	39,101	2,475,010
1900	25,108	1,683,788	1911	47,006	3,172,943
1901	27,165	1,466,965	1912	60,502	3,826,735
1902	27,207	1,528,655	1913	58,031	3,954,615
1903	30,251	1,806,643	1914	50,791	3,151,385

Imports of Iron and Steel Goods Subject to Duty.

Material.		Calendar year 1913.			Calendar year 1914.		
		Quantity.	Value.	Value per unit.	Quantity.	Value.	Value per unit.
			$	$ cts.		$	$ cts.
Agricultural implements, n.o.p. viz.—							
Binding attachments	$	.....	33,319	.....	.....	3,548	.....
Cultivators and weeders	No.	.....	60,426	.....	.....	48,246	.....
Drills, seed	"	7,295	241,749	33 14	3,928	58,886	14 98
Farm, road, or field rollers	"	617	129,269	209 51	443	122,429	276 36
Forks, pronged	"	16,143	7,929	0 49	9,168	5,218	0 57
Harrows	"	3,642	198,020	54 37	.....	79,107	.....
Harvesters, self-binding	"	3,796	337,849	89 00	1,676	181,210	108 12
Hay loaders	"	478	24,206	50 64	219	10,966	50 07
Hay tedders	"	6	126	21 00	15	607	40 47
Hoes	"	9,052	2,344	0 26	9,950	2,775	0 28
Horse rakes	"	1,466	41,868	28 56	770	14,754	19 16
Knives, hay or straw	"	14,719	4,325	0 29	4,835	2,061	0 43
Knives edging	"	2,838	1,646	0 58	138	88	0 64
Lawn mowers	"	15,701	64,828	4 13	14,258	59,424	4 17
Manure spreaders	"	499	33,502	67 14	1,037	66,309	63 94
Mowing machines	"	1,439	47,765	33 19	1,260	46,042	37 33
Ploughs	"	.....	1,366,959	.....	.....	501,704	.....
Post hole diggers	"	3,517	5,005	1 42	4,691	4,495	0 96
Potato diggers	"	1,618	54,222	33 51	1,435	44,036	30 69
Rakes, n.o.p.	"	20,868	5,744	0 28	26,552	5,346	0 20
Reapers	"	679	40,402	59 50	395	30,434	77 05
Scythes	Doz.	2,661	13,037	4 90	3,029	14,805	4 89
Sickles or reaping hooks	"	516	1,212	2 35	289	631	2 18
Snaths	"	3	17	5 67	10	17	1 70
Spades and shovels of iron or steel, n.o.p.	"	9,566	42,910	4 49	4,694	19,438	4 14
Spade and shovel blanks, and iron or steel cut to shape for the same	"	1,021	2,259	2 21	1,549	2,883	1 86
Parts of agricultural implements paying 12½ per cent and 17½ per cent	$	.....	590,256	.....	.....	191,070	.....
Parts of agricultural implements paying 12½, 17½, and 20 per cent	"	.....	680,973	.....	.....	204,874	.....
All other agricultural implements, n.o.p.	"	.....	106,736	.....	.....	81,867	.....
Anvils and vises	"	.....	99,339	.....	.....	54,163	.....
Cart or wagon skeins or boxes	Tons	217·9	15,862	72 79	190·5	20,714	108 73
Springs, n.o.p., and parts thereof, of iron or steel, for railway, tramway, or other vehicles	"	.....	162,557	.....	.....	65,206	.....
Axle and axle parts, n.o.p., and axle blanks and parts thereof, of iron or steel for railway, tramway, or other vehicles	"	.....	621,777	.....	.....	221,513	.....
Bar iron or steel, rolled, whether in coils, bundles, rod or bars, comprising rounds, ovals, squares, and flats, n.o.p.	"	139,932·6	4,381,341	31 31	49,693·8	1,442,734	29 03
Butts and hinges, n.o.p.	"	.....	156,840	.....	.....	92,375	.....

Imports of Iron and Steel Goods Subject to Duty—*Continued.*

Material.	Calendar Year, 1913.			Calendar Year, 1914.		
	Quantity.	Value.	Value per unit.	Quantity.	Value.	Value per unit.
		$	$ cts.		$	$ cts.
Canada plates, Russia iron, terne plate, and rolled sheets of iron and steel coated with zinc spelter or other metal, of all widths or thicknesses, n.o.p. ... Tons	8,639·2	490,791	56 81	8,369·9	435,622	52 05
Castings, iron or steel, n.o.p. ... $	.....	1,644,991	.....	.....	681,523	.....
Castings, malleable iron, when imported by manufacturers of mowers, binders, harvesters and reapers for use exclusively in their own factories ... "	.....	.....	.....	.....	71,812	.....
Cast-iron pipe of every description ... Tons	30,662·5	847,922	27 65	15,614·1	395,466	25 33
Cast scrap iron ... "	49,874·0	659,319	13 22	10,162	118,299	11 64
Chains, coil chain, chain links, and chain shackles of iron or steel of $\frac{5}{16}$" diameter, and over ... "	3,112·8	217,175	69 77	1,012·6	82,957	81 92
Chains, coil chains and links, including repair links and chain shackles of iron and steel n.o.p. ... "	.....	.....	.....	698·5	55,321	79 20
Chains, n.o.p. ... $	.....	158,914	.....	.....	95,421	.....
Tacks, shoe ... Tons	24·2	3,143	129 88	14·9	2,105	141 28
Nails, brads, spikes, and tacks of all kinds, n.o.p. ... "	317	44,486	140 33	324·4	38,001	117 14
Engines, etc.:—						
Locomotives for railways ... No.	171	692,370	4,048,95	89	260,345	2,925 22
Locomotive parts ... $	.....	144,309	.....	.....	76,444	.....
Motor cars for railway and tramways ... No.	109	199,945	1,834 36	23	47,967	2,085 52
Engines, fire ... "	15	61,984	4,132 27	28	105,572	3,770 40
Engines, gasoline ... "	25,126	3,150,314	125 38	15,392	1,959,637	127 31
Engines, steam ... "	476	547,866	1,150 98	356	248,820	698 93
Boilers, steam ... "	.....	454,726	.....	.....	236,691	.....
Boilers, n.o.p. ... "	.....	337,390	.....	.....	278,262	.....
Fire extinguishing machines, including sprinklers for fire protection ... $	.....	125,861	.....	.....	103,316	.....
Fittings, iron or steel, for iron or steel pipe of every description ... Tons	.....	1,165,364	.....	.....	780,884	.....
Flat eye-bar blanks, not punched or drilled, for use exclusively in the manufacture of bridges or of steel structural work, or in car construction ... "	567	16,853	29 72	3,035	206,456	68 02
Ferro-silicon, spiegeleisen, and ferro-manganese ... "	30,355	940,443	30 98	5,741	152,245	26 52
Ferro-silicon, containing more than 15 % silicon ... "	.....	.....	.....	1	88	88 00
Spiegeleisen and ferro-manganese containing not more than 15% manganese ... "	.....	.....	.....	2,375	68,445	28 82
Forging of iron and steel of whatever size, shape, or in whatever stage of manufacture, n.o.p., and steel shafting turned, compressed or polished and hammered, drawn or cold rolled iron or steel bars or shapes, n.o.p. ... "	2,442·1	263,975	108 09	1,568·6	174,742	11 14
Hardware, viz., builders, cabinet-makers, upholsterers, harness-makers, saddlers, and carriage hardware, including curry-combs, n.o.p. ... $	.....	956,703	.....	.....	627,968	.....
Horse, mule, and ox shoes ... "	.....	39,362	.....	.....	24,563	.....
Iron or steel billets, weighing not less than 60 pounds per lineal yard ... Tons	51,765·4	1,178,151	22 76	12,247	241,234	19 70

Iron or steel ingots, cogged ingots, blooms, slabs, puddled bars and loops, or other forms, n.o.p., less finished than iron or steel bars, but more advanced than pig-iron except castings	"	654·5	19,379	29 61	154·6	3,348	21 65
Iron or steel bridges or parts thereof, iron or steel structural work, columns, shapes or sections, drilled, punched, or in any further stage of manufacture, than as rolled or cast, n.o.p.	$	.....	971,735	.....	.....	515,223	.....
Iron in pig	Tons	235,843	3,234,877	13 72	78,594	981,107	12 48
Iron in pig charcoal	"	926	12,528	13 53	86	1,082	12 58
Locks of all kinds	$	.....	568,263	.....	.....	254,699	.....
Machines, machinery, etc.—							
Automobiles and motor vehicles of all kinds	No.	6,956	8,233,529	1,183 66	5,599	5,296,831	946 03
Automobiles and motor vehicles, parts of	$	.....	3,004,156	.....	.....	2,785,634	.....
Cranes and derricks	No.	360	850,686	2,363 02	145	448,176	3,090 87
Dental engines	"	.....	.....	.....	47	4,000	85 10
Fanning mills	"	1,199	22,915	19 11	783	18,094	23 11
Grain crushers	"	421	6,469	15 37	366	6,593	18 01
Hay presses	"	219	43,779	199 90	188	31,349	166 75
Windmills and complete parts thereof	"	.....	43,562	.....	.....	50,596	.....
Ore crushers and rock crushers, stamp mills, cornish and belted rolls, rock drills, air compressors, cranes, derricks, and percussion coal cutters	$	.....	601,531	.....	.....	459,531	.....
Portable machines:—							
Fodder or feed cutters	No.	2,053	19,016	9 26	665	10,506	15 80
Horse powers for farm purposes	"	12	265	22 09	3	93	31 00
Portable engines with boilers in combination and traction engines for farm purposes	"	1,864	3,539,078	1,898 65	532	854,364	1,605 95
Portable sawmills and planing mills	"	31	10,284	331 74	12	3,261	271 75
Steam shovels	"	97	603,827	6,225 02	29	215,356	7,426 07
Threshing machine separators	"	1,820	1,025,296	563 35	607	308,283	507 88
Threshing machine separators, parts of, including wind-stackers, baggers, weighers and self-feeders for same, and finished parts thereof for repairs, when imported separately	$	.....	499,832	.....	.....	223,009	.....
All other portable machines, n.o.p., and parts	"	.....	60,552	.....	.....	119,758	.....
Concrete mixing machines	No.	208	110,059	529 13	156	66,121	423 85
Sewing machines	"	18,446	364,265	19 75	15,667	281,164	17 95
Sewing machines, parts of	$	.....	119,061	.....	.....	73,424	.....
Adding machines	No.	1,678	269,358	160 52	1,470	269,766	183 51
Machines, typewriting	"	13,997	848,834	60 64	9,051	514,831	56 88
Machines, type-casting and type-setting, and parts thereof, adapted for use in printing offices	"	.....	150,975	.....	.....	.....	.....
Machines specially designed for ruling, folding, binding, embossing, creasing, or cutting paper or cardboard, when for use exclusively by printers, bookbinders, and by manufacturers of articles made from paper or cardboard, including parts thereof, composed wholly or in part of iron, steel, brass, or wood	"	.....	363,600	.....	.....	231,832	.....
Lithographic presses and type-making accessories for same	$	.....	610,189	.....	.....	308,907	.....
Printing presses	"	.....		.....	.....		.....
Type-making accessories for printing	"	.....		.....	.....	16,574	.....
Cement making machines	"	.....	187,991	.....	.....	49,097	.....
Coal handling machines	"	.....	120,359	.....	.....	190,500	.....
Paper and pulp mill machines	"	.....	417,898	.....	.....	414,396	.....
Rolling mill machines	"	.....	123,758	.....	.....	147,219	.....
Sawmill machines	"	.....	189,976	.....	.....	140,699	.....
Machinery of a class or kind not made in Canada and parts thereof adapted for carding, spinning, weaving, braiding, or knitting fibrous material, when imported by manufacturers for such purposes	"	.....	2,180,923	.....	.....	581,918	.....

Imports of Iron and Steel Goods Subject to Duty.—*Continued.*

Material.		Calendar Year, 1913.			Calendar Year, 1914.		
		Quantity.	Value.	Value per unit.	Quantity.	Value.	Value per unit.
			$	$ cts.		$	$ cts.
All machinery composed wholly or in part of iron or steel, n.o.p., and iron or steel castings, and iron or steel integral parts of all machinery specified in tariff item 453	$	.....	17,118,296	.....	.....	10,327,957	.....
Machines, washing	No.	9,578	88,420	9 23	8,440	70,030	8 30
Nails and spikes, composition and sheathing nails	Tons	293·9	17,725	60 31	87·7	4,513	51 46
Nails and spikes, cut (ordinary builders)	"	202·8	9,127	45 00	261·3	9,629	36 85
Railway spikes	"	5,272·6	194,194	36 83	2,997·6	92,966	31 01
Nails, wire of all kinds, n.o.p.	"	1,473·1	91,814	62 33	1,177·9	62,884	53 39
Pumps, hand, n.o.p.	No.	32,662	131,463	4 02	21,887	111,113	5 08
Pumps, power and parts of	"	1,707	277,709	162 69	2,985	427,085	143 08
Iron and steel railway bars or rails of any form, punched or not, n.o.p., for railways which term for the purposes of this item shall include all kinds of railways, street railways and tramways, even although they are used for private purposes only, and even although they are not used or intended to be used in connexion with the business of common carrying of goods or passengers	Tons	177,041	4,886,117	27 59	38,496	979,723	25 45
Railway fish plates	"	3,366	146,493	43 52	2,900	113,913	39 28
Railway tie-plates	"	2,014	88,220	43 80	668	23,137	34 64
Rolled iron or steel angles, tees, beams, channels, girders and other rolled shapes or sections, not punched or drilled or further manufactured than rolled, n.o.p.	"	107,494·8	3,201,384	29 78	33,927·6	920,350	27 13
Rolled iron or steel beams, channels, angles, and other rolled shapes of iron and steel, not punched, drilled or further manufactured than rolled, weighing not less than 35 pounds per lineal yard, not being square, flat, oval, or round shapes, and not being railway bars or rails	"	249,435·1	7,074,279	28 36	82,448·7	2,103,032	25 51
Rolled iron or steel hoop, band, scroll, or strip, 12 inches or less in width, No. 13 gauge and thicker, n.o.p.	"	7,342·6	246,635	33 59	3,439·7	114,498	33 29
Rolled hoop iron or hoop steel galvanized, No. 12 and 13 gauge	"	.....	.....	.....	40·9	1,800	44 00
Rolled iron or steel, hoop, band, scroll, or strip, No. 14 gauge and thinner, galvanized or coated with other metal or not, n.o.p.	"	13,985·8	651,338	46 57	10,391·9	451,814	43 48
Rolled iron or steel sheets or plates, sheared or unsheared, and skelp iron or steel, sheared or rolled grooves, n.o.p.	"	47,444·4	1,517,344	31 98	17,264·3	501,177	29 03
Rolled iron or steel plates not less than 30" in width and not less than ¼" in thickness, n.o.p.	"	65,190·6	1,939,739	29 75	27,856·3	791,976	28 43
Rolled iron or steel sheets, polished or not, No. 14 gauge and thinner, n.o.p.	"	51,776·5	2,545,347	49 16	28,600·4	1,260,522	44 07
Rolls of chilled iron or steel	"	194·5	11,457	58 90	54·1	2,802	51 79
Rolled iron wire rods in the coil of iron or steel not over ½ inch in diameter when imported by wire manufacturers for use in making wire in the coil in their own factories	"	.....	.....	.....	13,851·8	302,228	21 82

Rolled round rods in the coil of iron or steel for the manufacture of chains	"	.....	.....	.....	196·8	4,968	25 24
Sad or smoothing hatters' and tailors' irons	$	.....	10,945	.....	.....	3,583	.....
Safes, doors for safes and vaults	"	.....	192,803	.....	.....	187,364	.....
Screws, iron and steel, commonly called wood screws n.o.p., including lag or coach screws, plated or not, and machine or other screws n.o.p.	Gross	.....	110,442	.....	.....	45,970	.....
Scales, balances, weighing beams, and strength-testing machines of all kinds	$	.....	178,365	.....	.....	101,505	.....
Shafting, round, steel, in bars not exceeding 2½" diameter	Tons	4,416·6	161,238	36 51	1,937·3	69,275	35 76
Shafting, steel, turned compressed or polished	$	.....	15,074	.....	.....	13,121	.....
Sheets or plates of steel, cold rolled with sheared edges over 14 gauge, and not less than 1½" wide for the manufacture of mower bars, hinges, typewriters, and sewing machines	Tons	742·1	30,294	40 82	321	13,862	43 18
Sheets, flat, of galvanized iron or steel	"	19,416·7	1,193,044	61 44	14,406·9	774,558	53 76
Sheets, iron or steel, corrugated, galvanized	"	203·2	14,975	73 70	72·5	3,939	54 33
Sheets, iron or steel corrugated not galvanized	"	293·3	13,895	47 37	10·5	646	61 52
Skates, of all kinds, roller or other, and parts thereof	Pairs	.....	79,972	.....	.....	45,328	.....
Skelp iron or steel, sheared or rolled in grooves, imported by manufacturers of wrought iron or steel pipe, for use exclusively in the manufacture of wrought iron or steel pipe in their own factories	Tons	105,963·5	2,957,887	27 65	91,073·1	2,077,213	22 81
Steel billets, n.o.p.	"	452·5	14,784	32 67	647·2	15,121	23 37
Stoves, of all kinds, for coal, wood, oil, spirits or gas	$	.....	902,256	.....	.....	563,371	.....
Stove urns of metal, and dovetails, chaplets, and hinge tubes of tin for use in the manufacture of stoves	"	.....	25,748	.....	.....	11,948	.....
Switches, frogs, crossings, and intersections for railways	Tons	.....	324,694	.....	.....	148,848	.....
Tubing:—							
Wrought or seamless tubing, plain or galvanized, threaded and coupled or not, over 10" in diameter, n.o.p.	$	.....	.....	.....	.....	185,311	.....
Wrought or seamless tubing, iron or steel, plain or galvanized, threaded and coupled, or not, over 4", but not exceeding 10" in diameter, n.o.p.	"	.....	774,683	.....	.....	201,408	.....
Wrought or seamless tubing, iron or steel, plain or galvanized, threaded and coupled, or not, 4" and less in diameter, n.o.p.	"	.....	419,294	.....	.....	164,147	.....
Seamless steel tubing, valued at not less than 3½ cents per lb	Tons	724·6	82,538	113 91	211·8	30,314	143 13
Rolled or drawn square tubing of iron or steel, adapted for use in the manufacture of agricultural implements	$	.....	14,895	.....	.....	6,036	.....
Iron or steel pipe or tubing, plain or galvanized, riveted, corrugated or otherwise specially manufactured, including lockjoint pipe, n.o.p.	"	.....	1,572,658	.....	.....	469,598	.....
Iron or steel pipe, not butt or lap welded, and wire bound wooden pipe, not less than 30" internal diameter when for use exclusively in alluvial gold mining	"	.....	84	.....	.....	1,211	.....
Ware—Agate, granite, or enamelled iron or steel ware	"	.....	349,564	.....	.....	241,813	.....
Ware—Iron or steel hollow ware, plain black or coated, n.o.p., and nickel and aluminium kitchen or household hollow ware	"	.....	224,552	.....	.....	161,443	.....
Wire bale ties	Bundles of 250 ties	.....	5,943	.....	.....	8,436	.....
Wire bound wooden pipe, n.o.p.	$	.....	723	.....	.....	1,624	.....
Wire cloth or woven wire and netting of iron and steel	Tons	2,370·8	260,186	109 75	2,236·9	243,885	109 02
Wire, crucible cast steel, valued at not less than 6 cents per lb	"	122·9	38,687	314 79	10,996·9	34,390	31 27
Wire screens, doors, and windows	$	.....	49,703	.....	.....	39,587	.....
Wire buckthorn strip fencing, woven wire fencing, and wire fencing, of iron and steel, n.o.p., not to include woven wire or netting made from wire, smaller than No. 14 gauge, not to include fencing or wire larger than No. 9 gauge	Tons	938·9	74,774	79 64	945·4	74,182	78 47
Wire, single or several, covered with cotton, linen, silk, rubber, or other material, including cable so covered	"	.....	1,099,921	.....	.....	401,590	.....
Wire of iron and steel all kinds, n.o.p.	"	6,105·3	332,419	54 44	3,810·5	198,464	52 08
Wire rope, stranded or twisted wire clothes lines, picture or other twisted wire, and wire cables, n.o.p.	"	4,339·3	642,905	148 16	2,670·3	432,099	161 81
Iron or steel nuts, rivets, or bolts with or without threads, nut bolt, and hinge blank, and T and strap hinges of all kinds, n.o.p.	"	3,792·2	324,320	85 52	2,147·8	169,929	79 12

Imports of Iron and Steel Goods Subject to Duty—*Continued.*

Material.		Calendar Year, 1913.			Calendar Year, 1914.		
		Quantity.	Value.	Value. per unit.	Quantity.	Value.	Value per unit.
			$	$ cts.		$	$ cts.
Iron or steel scrap, wrought, being waste or refuse, including punchings, cuttings, and clippings of iron or steel plates or sheets having been in actual use: crop ends of tin plate bars, blooms, and rails, the same not having been in actual use	Tons	54,869·3	828,860	15 10	17,446·3	218,553	12 53
Penknives, jack-knives, and pocket knives of all kinds	$	.....	103,792	.....	.....	81,715	.....
Knives and forks of steel, plated or not, n.o.p.	"	.....	342,946	.....	.....	210,260	.....
All other cutlery, n.o.p.	"	.....	875,316	.....	.....	539,548	.....
Guns, rifles, including air guns and air rifles (not being toys), muskets, cannons, pistols, revolvers, or other firearms	"	.....	887,236	.....	.....	718,211	.....
Bayonets, swords, fencing foils, and masks	"	.....	7,453	.....	.....	8,612	.....
Needles of any material or kind, n.o.p.	"	.....	140,685	.....	.....	117,408	.....
Steel, chrome steel	Tons	323	29,657	91 82	123·9	11,201	90 40
Steel plate, universal mill or rolled edge plates of steel over 12" wide, imported by manufacturers of bridges or of structural work, or for use in car construction	"	62,543·6	1,812,399	28 98	29,277·8	785,230	26 82
Steel in bars or sheets to be used exclusively in the manufacture of shovels when imported by the manufacturers of shovels	"	2,985·8	88,421	29 61	653·7	17,082	26 13
Rolled iron or steel, or cast steel in bars, bands, hoops, scroll, or strip, sheet, or plate of any size, thickness, or width, galvanized or coated with any material or not, and steel blanks for the manufacture of milling cutters, when of greater value than 3½ cents per pound	"	9,907·9	1,197,321	120 84	6,172·4	779,716	126 32
Steel balls adapted for use in bearings of machinery and vehicles	$	.....	27,134	.....	.....	19,747	.....
Flat steel, cold rolled, not over ¼" thick, for the manufacture of cups and cones for ball bearings	Tons	26·8	2,222	82 91	.....	172	61 43
Steel wool	"	.....	4,995	.....	.....	4,729	.....
Tools and implements—							
Adzes, cleavers, hatchets, wedges, sledges, hammers, crowbars, cant-dogs and track tools, picks, mattocks and eyes and poles for the same	$	.....	91,339	.....	.....	47,608	.....
Axes	Doz.	11,492	66,088	5 75	4,048	26,195	6 47
Saws	$	.....	155,005	.....	.....	83,110	.....
Files and rasps, n.o.p.	"	.....	149,962	.....	.....	101,699	.....
Tools, hand or machine, of all kinds, n.o.p.	"	.....	985,772	.....	.....	621,039	.....
Knife blades or blanks, and table forks of iron and steel, in the rough, not handled, filed, ground, or otherwise manufactured	"	.....	278	.....	.....	87	.....
Manufactures, articles or wares of iron and steel, or of which iron and steel (or either) are the component materials of chief value, n.o.p.	"	.....	11,206,350	.....	.....	7,542,806	.....
			125,082,378	.....	.....	64,901,486	.....

Imports of Iron and Steel Goods Free of Duty.

Material.		Calendar Year, 1913.			Calendar Year, 1914.		
		Quantity.	Value.	Value per unit.	Quantity.	Value.	Value. per unit.
			$	$ cts.		$	$ cts.
Anchors for vessels	Tons	330·4	27,282	82 57	425·5	30,943	72 72
Chain coil, coil chain links including repair links and chain shackles of iron and steel 1½" in diameter and over	"	.....	.....	.....	263·1	19,722	75 48
Chain, malleable sprocket or link belting	$	.....	303,463	.....	.....	139,663	.....
Cream separators, and steel bowls for	"	.....	429,741	.....	.....	455,337	.....
Cream separators—materials which enter into the construction and form part of when imported by manufacturers of cream separators to be used in the manufacture thereof	"	.....	277,660	.....	.....	236,958	.....
Ferro-manganese and spiegeleisen containing over 15 per cent manganese	"	.....	.....	.....	14,030	328,707	23 43
Gas buoys—The following articles and materials, when imported by manufacturers of automatic gas buoys and automatic gas beacons, for use in the manufacture of such buoys and beacons for the Government of Canada or for export, viz., iron or steel tubes over 16" in diameter; flanged and dished steel heads made from boiler plate, over 5 feet in diameter; hardened steel balls, not less than 3" in diameter; acetylene gas lanterns and parts thereof, and tobin bronze in bars or rods	"	.....	7,035	.....	.....	21,288	.....
Gun barrels, in single tubes, forged, rough bored	"	.....	.....	.....	.....	.....	.....
Iron or steel rods over ⅛" in diameter for manufacturing of chain	Tons	1,093·2	30,777	28 15	46·7	1,041	22 29
Iron or steel, rolled round wire rods, in the coil, not over ½" in diameter, when imported by wire manufacturers for use in making wire in the coil in their own factories	"	79,608·4	1,962,235	24 65	51,201·2	1,165,401	22 76
Boiler plate of iron or steel not less than 30" in width, and not less than ¼" in thickness, for use exclusively in the manufacture of boilers	"	24,348·2	804,582	33 04	7,528·8	212,669	28 25
Flat galvanized iron or steel sheets	"	34,768·4	2,135,558	61 42	23,203·8	1,372,577	59 15
Rolled iron and steel, and cast steel in bars, band, hoop, scroll or strip, sheet or plate of any size, thickness, or width: galvanized or coated with any material or not, and steel blanks for the manufacture of milling cutters, when of greater value than 3½ cts. per lb	"	4,813·8	798,549	165 89	2,452·3	408,754	166 68
Rolled iron or steel sheets in strips, polished or not, 14 gauge and thinner, n.o.p.	"	15,909·3	771,694	48 50	8,756·4	369,144	42 16
Rolled iron or steel, hoop, band, scroll, or strip, No. 14 gauge or thinner, galvanized or coated with other metal or not, n.o.p.	"	865·5	36,165	41 79	549·0	23,254	42 35
Iron tubing, lacquered or brass covered, not over 2" in diameter, and brass trimmings, when imported by manufacturers of iron or brass bedsteads, for use exclusively for the manufacture of such articles in their own factories	$	.....	285,798	.....	.....	147,961	.....
Iron tubing, brass covered, not over 2" in diameter, in the rough where imported by manufacturers for use only in their own factories, in the manufacture of towel bars, bath tub rails and clothes carriers	"	.....	408	.....	.....	512	.....
Iron tubing, lacquered or brass covered, not over 2" in diameter, brass covered rods and brass trimmings, when imported by manufacturers of carriage ralls, for use exclusively in the manufacture of such articles in their own factories	"	.....	7,015	.....	.....	1,813	.....

Imports of Iron and Steel Goods Free of Duty.—*Continued.*

Material.		Calendar Year, 1913.			Calendar Year, 1914.		
		Quantity.	Value.	Value per unit.	Quantity.	Value.	Value per unit.
			$	$ cts.		$	$ cts.
Iron tubing for manufacture of extension rods for windows	$	.....	5,285	.....	.....	3,761	.....
Iron or steel, beams, sheets or plates, ankles, knees, masts or parts thereof and cable chains for wooden, iron, steel or composite ships or vessels	Tons	20,397·6	651,892	31 96	14,884·3	405,908	27 27
Iron and steel bands, strips or sheets, No. 14 gauge or thinner, coated, polished or not, and rolled iron or steel sections, not being ordinary square, flat or round bars, when imported by manufacturers of saddlery, hardware and hames, for use exclusively in the manufacture of such articles in their own factories	"	.....	.....	.....	.....	11,835	.....
Locomotive and car wheel tires of steel in the rough	"	11,801·5	625,636	53 01	6,713·0	316,904	47 21
Manufactured articles of iron or steel or brass, which, at the time of their importation, are of a class or kind not manufactured in Canada, imported for use in the construction or equipment of ships or vessels	$	.....	245,208	.....	.....	101,590	.....
Scrap iron and scrap steel, old, and fit only to be remanufactured, being part of or recovered from any vessel wrecked in waters subject to the jurisdiction of Canada	Tons	3·7	76	20 54	80·2	554	6 91
Skelp iron or steel, sheared or rolled in grooves, not over 4½" wide, for the manufacture of rolled iron tubes not over 1½" in diameter	"	849·1	22,959	27 04	414·9	10,910	26 30
Machinery:—							
Articles of metals as follows when for use exclusively in mining or metallurgical operations, viz: coal cutting machines, except percussion coal cutters, coal heading machines; coal augers; rotary coal drills; core drills; miners safety lamps and parts thereof, also accessories for cleaning, filling, and testing such lamps; electric or magnetic machines for separating or concentrating iron ores; furnaces for the smelting of copper, zinc, and nickel ores; converting apparatus for metallurgical processes in metals; copper plates, plated or not, machinery for extraction of precious metals by the chlorination or cyanide process; amalgam safes; automatic ore samplers; automatic feeders; retorts, mercury pumps, pyrometers; bullion furnaces; amalgam cleaners; blast furnace blowing engines; wrought iron tubing, butt or lap welded; threaded, or coupled or not, over 4" in diameter; and integral parts of all machinery mentioned in this item; blowers of iron or steel for use in the smelting of ores, or in the reduction, separation, or refining of metals, rotary kilns, revolving roasters, and furnaces of metal designed for roasting ore, mineral rock or clay; furnace slag trucks, and slag pots of a class or kind not made in Canada, buddles, vanners, and slime tables adapted for use in gold mining	$	.....	1,033,571	.....	.....	629,593	.....
Diamond drills, not to include motive power	"	.....	70,549	.....	.....	48,617	.....
Appliances of iron and steel, of a class or kind not made in Canada, and elevators and machinery of floating dredges, when for use exclusively in alluvial gold mining	"	.....	259,722	.....	.....	186,695	.....
Well-drilling, and apparatus of a class or kind not made in Canada for drilling for water, natural gas or oil, and for prospecting for minerals, not to include motive power	"	.....	22,934	.....	.....	222,958	.....

Briquette making machines	$	.....	3,708	.....	.....	3,946	.....
Newspaper printing presses, of not less value by retail than $1,500 each, of a class or kind not made in Canada	No.	122	513,348	4,207 77	71	402,310	5,666 34
Machinery or tools not manufactured in Canada up to the required standard necessary for any factory to be established in Canada for the manufacture of rifles for the Government of Canada	$	.....	25,329	.....	.....	131,900	.....
All materials, or parts in the rough, unfinished, and screws, nuts, bands, and springs to be used in rifles to be manufactured at any such factory for the Government of Canada	"	.....	60,656	.....	.....	211,273	.....
Machines, typecasting and typesetting and parts thereof, adapted for use in printing offices	"	.....	504,837	.....	.....	582,272	.....
Machinery of every kind, and structural iron and steel for use in the construction and equipment of factories for the manufacture of sugar from beet root	"	.....	19,449	.....	.....	8,641	.....
Machinery of a class or kind not made in Canada and parts thereof, for the manufacture of twine cordage, or linen, or for the preparation of flax fibre	"	.....	56,265	.....	.....	43,020	.....
Machines, traction ditching (not being ploughs) adapted for tile drainage on farms, valued at retail at not more than $3,000 each	No.	138	54,681	396 24	32	77,993	2,437 28
Mould boards or shares, or plough plates, land sides, or other plates for agricultural implements, when cut to shape from rolled plates of steel, but not moulded, punched, polished, or otherwise manufactured	Tons	4,963·6	290,245	58 47	2,033·2	116,335	57 22
Sewing machine attachments	$	.....	39,789	.....	.....	31,413	.....
Steel for manufacturing ball bearings	Tons	.....	.....	.....	.....	.....	.....
Steel balls adapted for use on bearings on machinery and vehicles	$	.....	1,996	.....	.....	3,269	.....
Steel, rolled, for saws and straw cutters, not tempered, or ground, nor further manufactured than cut to shape without indented edges	Tons	1,309·9	187,929	143 46	887·3	132,899	149 78
Steel strips, and flat steel wire when imported into Canada by manufacturers of buckthorn and plain strip fencing for use exclusively in their own factories in the manufacture thereof	"	0·9	92	102 22	.....	.....	.....
Steel wire, Bessemer soft drawn spring of Nos. 10, 12, and 13 gauge, respectively, and homo steel spring wire of Nos. 11 and 12 guage, respectively, when imported by manufacturers of wire mattresses, to be used exclusively in their own factories in the manufacture of such articles	"	1,032	48,042	46 55	569·5	27,672	48 59
Steel, crucible sheet, 11 to 16 gauge, 2⅛" to 18" wide for the manufacture of mower and reaper knives when imported by manufacturers thereof for use exclusively in the manufacture of such articles in their own factories	"	593·8	46,491	78 29	501·0	37,895	75 64
Steel No. 20 gauge and thinner, but not thinner than 30 gauge, for the manufacture of corset steels, clock springs, and shoe shanks, imported by manufacturers of such articles for exclusive use in the manufacture of such articles in their own factories	"	48·9	6,891	140 92	44·2	4,134	93 53
Steel wire, flat, ot 16 gauge or thinner, imported by the manufacturers of crinoline, and corset wires and dress stays, for use exclusively in the manufacture of such articles in their own factories	"	377·4	50,227	133 09	347·5	55,215	158 89
Steel, No. 12 gauge and thinner, but not thinner than No. 30 gauge, for the manufacture of buckle clasps, bed fasts, furniture casters, and ice-creepers, imported by the manufacturers of such articles, for use exclusively in the manufacture of such articles in their own factories	"	179·6	10,084	56 15	104·2	5,159	49 51
Steel No. 24 and 17 gauge, in the sheets 63" long and from 18" to 32" wide, when imported by the manufacturers of tubular bow sockets for use exclusively in the manufacture of such articles in their own factories	"	88·5	3,566	40 29	58·7	3,098	52 78
Steel springs for the manufacture of surgical trusses, when imported by manufacturers of surgical trusses for use exclusively in the manufacture thereof in their own factories	"	0·6	264	440 00	0·3	197	656 67
Swedish rolled iron, and Swedish rolled steel nail rods, under half an inch in diameter, for the manufacture of horseshoe nails	"	4,419·7	119,225	26 98	1,575·3	72,841	46 24
Tin plates and sheets	"	58,031	3,954,615	.....	50,791	3,151,385	.....
Steel seamless tubing valued at not less than 3½ cents per pound	"	114·5	21,092	184 21	39	7,438	190 72

Imports of Iron and Steel Goods Free of Duty.—*Concluded.*

Material.		Calendar Year, 1913.			Calendar Year, 1914.		
		Quantity.	Value.	Value per unit.	Quantity.	Value.	Value per unit.
			$	$ cts.			$ cts.
Steel rolled or drawn square tubing adapted for use in the manufacture of agricultural implements	$	.....	.....	.....	.....	.....	.....
Steel or iron tubes, rolled, not joined or welded, not more than 1¼" in diameter, n.o.p.	"	.....	33,921	.....	.....	37,256	.....
Seamless steel, or wrought iron boiler tubes, including flues and corrugated tubes for marine boilers	"	.....	1,048,288	.....	.....	706,675	.....
Barbed fencing wire of iron or steel	Tons	13,451·7	566,670	42 13	17,001·3	662,814	38 99
Wire crucible cast steel, valued at not less than 6 cents per pound	"	6·5	1,947	299 54	12	3,142	261 83
Wire, curved or not, galvanized iron or steel, Nos. 9, 12, and 13 gauge	"	38,282·8	1,387,528	36 24	35,347·9	1,223,600	34 62
Wire rope for use exclusively for rigging of ships and vessels	"	119·2	13,226	110 95	39·5	4,616	116 86
Wire, steel, valued at not less than 2¾ cents per pound when imported by manufacturers of rope for use exclusively in the manufacture of rope	"	3,296·6	258,399	78 38	3,026·1	237,299	78 42
Total		.....	20,144,594	.....	.....	14,860,776	.....

Imports of Iron and Steel into Canada from the United States.*

Material.	Twelve months ending June, 1912.			Twelve months ending June, 1913.			Twelve months ending June, 1914.		
	Quantity.	Value.	Average.	Quantity.	Value.	Average.	Quantity.	Value.	Average.
		$	$ cts.		$	$ cts.		$	$ cts.
Bar iron.....Short Tons	9,591·9	308,745	32 19	11,773·8	429,181	36 45	6,544·2	308,248	47 10
Bars or rods of steel—									
Wire rods..... "	53,582·9	1,412,910	26 37	82,474·3	2,134,198	25 88	63,108·3	1,617,939	25 64
All other..... "	95,215·9	2,859,441	30 03	124,761·6	3,921,471	31 43	92,791·8	3,019,274	32 54
Billets, ingots, and blooms of steel..... "	60,008·5	1,200,710	20 01	87,968·2	1,865,120	21 20	24,243·5	487,089	20 09
Bolts, nuts, rivets and washers..... "	(a).....	.....	.....	3,220·2	218,805	67 95	2,603·4	181,072	69 55
Hoop, band and scroll..... "	7,206·2	281,946	39 13	9,436·3	376,561	39 91	9,157·1	376,999	41 17
Horseshoes..... "	(a).....	.....	.....	271·1	24,894	91 83	248·8	22,941	92 21
Nails and spikes—									
Cut..... "	5,419·6	159,215	29 38	8·3	488	58 80	21·3	932	43 76
Railroad spikes..... "	(a).....	.....	.....	6,218·4	224,193	36 05	3,543·2	121,999	34 43
Wire..... "	1,245·9	52,498	42 14	2,262·4	106,693	47 16	1,342·3	62,046	46 22
All other, including tacks..... "	3,113·1	176,371	56 65	628·0	48,063	76 53	398·2	34,164	85 80
Pig-iron..... "	157,480·9	1,979,355	12 57	248,846·1	3,124,550	12 56	140,510·7	1,782,862	12 69
Pipes and fittings..... "	76,248·5	3,578,892	46 94	78,618·7	4,175,057	53 11	52,674·8	2,732,573	51 88
Radiators and cast-iron heating boilers "	3,819·9	250,552	65 59	8,989·5	653,182	72 66	5,722·7	401,980	70 24
Rails for railways..... "	132,973·1	3,369,894	25 34	155,051·7	3,980,657	25 67	129,545·9	3,415,167	26 36
Scrap and old, fit only for remanufacture "	64,365·3	737,167	11 45	84,523·0	1,032,971	12 22	49,570·0	577,917	11 66
Sheets and plates—									
Iron, galvanized..... "	43,790·6	2,030,648	46 37	41,505·6	2,428,687	58 51	26,827·5	1,595,003	59 45
Iron, all other..... "				15,568·1	692,434	44 48	9,763·2	434,525	44 51
Steel, plates..... "	209,207·2	7,457,232	35·65	220,528·7	6,706,433	30 41	141,842·1	4,245,763	29 93
Steel, sheets..... "				120,309·0	3,916,764	32 56	97,516·2	3,014,796	30 92
Structural iron and steel..... "	144,721·9	5,150,353	35 59	269,250·2	9,242,288	34 33	224,666·4	6,990,022	31 01
Tin plates, terne plates, and taggers tin "	42,336·8	2,985,065	70 51	58,289·2	4,065,672	69 75	36,582·3	2,513,867	68 72
Wire and manufactures of—									
Wire, barbed..... "	21,497·9	895,725	41 67	16,094·8	656,185	40 77	12,688·9	508,337	40 06
" all other..... "	43,638·2	1,750,586	40 12	49,318·8	1,912,069	38 77	37,436·5	1,476,297	39 43
	1,175,464·3	36,637,305	31 17	1,695,916·0	51,936,616	30 62	1,169,349·3	35,921,812	30 72
Builders' hardware and tools—									
Locks..... $	.....	1,762,066	.....	.....	479,985	.....	.....	303,601	.....
Hinges, and other builders' hardware..... "	.....	.....	.....	.....	1,712,768	.....	.....	1,365,987	.....
Car wheels..... No.	3,749	36,021	9 61	14,640	107,300	7 33	11,696	108,174	9 25
Castings, not elsewhere specified..... $	.....	1,312,729	.....	.....	1,656,680	.....	.....	1,626,211	.....

Imports of Iron and Steel into Canada from the United States.—*Continued.*

Material.		Twelve months ending June, 1912.			Twelve months ending June, 1913.			Twelve months ending June, 1914.		
		Quantity.	Value.	Average.	Quantity.	Value.	Average.	Quantity.	Value.	Average.
			$	$ cts.		$	$ cts.		$	$ cts.
Cutlery—										
Razors	$		(a)			46,962			39,099	
Table	"		27,841			24,409			31,870	
All other	"		175,666			132,951			102,870	
Enamelware—										
Baths, tubs	No.		(a)		2,058	38,415	18 67	1,718	25,090	14 60
Lavatories and sinks	$		(a)			156,987			158,889	
All other	"		(a)			163,394			140,664	
Firearms	"		503,710			679,784			529,528	
Machinery, machines and parts of—										
Adding machines	No.		288,617		1,551	331,477	213 72	2,472	405,125	163 89
Air-compressing machinery	"		(a)			333,448			224,275	
Brewers machinery	"		112,627			311,638			189,008	
Cash registers	"	1,026	81,234	79 18	1,894	124,133	65 54	848	90,145	106 30
Cream separators	"		(a)		8,980	344,424	38 35	7,518	287,242	38 21
Electrical machinery	$		1,869,761							
Elevators and elevator machinery	"		(a)			423,725			468,800	
Laundry machinery	"		167,735			232,726			119,491	
Lawn mowers	"		(a)			51,379			49,902	
Metal working machinery (including metal working machine tools)	"		1,362,326			2,326,270			1,199,356	
Milling machinery (flour and grist)	"		(a)			423,227			197,029	
Mining machinery	"		1,224,011			2,223,659			1,210,884	
Paper-mill machinery	"		(a)			930,196			317,317	
Printing presses and parts of	"		1,265,657			920,522			770,417	
Pumps and pumping machinery	"		701,144			878,431			723,447	
Refrigerating machinery, ice-making machinery, etc.	"		170,564			289,777			199,540	
Sewing machines and parts of	"		484,687			527,726			412,422	
Shoe machinery	"		274,388			300,356			192,035	
Steam and other power engines and parts of—										
Electric locomotives	No.	8	46,745	5,843 13	21	146,458	6,974 19	12	27,623	2,301 92
Gas, stationary	"	766	130,713	174 64	991	149,648	151 01	1,097	143,546	130 85
Gasoline, automobile	"	6,844	769,195	112 39	8,906	753,702	84 63	353	71,070	201 33
" marine	"	1,842	305,842	166 04	1,771	385,134	217 47	1,747	302,391	173 09
" stationary	"	5,096	754,570	148,07	9,699	1,269,428	130 88	9,885	1,009,443	102 12
" traction	"	1,710	3,166,507	1,851 76	2,013	3,675,691	1,825 98	382	637,162	1,667 96

Steam. locomotives	"	107	472,046	4,411	64	160	1,182,993	7,393	71	86	502,253	5,840	15
" marine	"	3	18,000	6,000	00	79	26,838	339	72	35	100,857	2,881	63
" stationary	"	245	247,729	1,011	14	360	260,042	722	34	236	189,786	804	18
" traction	"	259	478,526	1,847	59	540	1,058,600	1,960	37	228	388,477	1,703	85
Engines, all other	"	.....	(a)	.....		1,450	871,371	600	95	1,336	444,255	332	53
All other engines and parts of	"	.....	1,910,440	.....		.....	1,436,820	.....		.....	988,735	.....	
Sugar-mill machinery	"	.....	24,431	.....		.....	35,761	.....		.....	186 567	.....	
Textile machinery	$	.....	(a)	.....		.....	858,568	.....		.....	670,799	.....	
Typesetting machines, linotype and others	"	.....	(a)	.....		.....	394,635	.....		.....	506,459	.....	
Typewriting machines and parts of	"	.....	944,600	.....		.....	954,904	.....		.....	602,792	.....	
Windmills and parts of	"	.....	71,044	.....		.....	59,720	.....		.....	72,099	.....	
Woodworking machinery, sawmill machinery	"	.....	382,752	.....		.....	439,173	.....		.....	221 283	.....	
Woodworking machinery, all other	"	.....	375,446	.....		.....	477,345	.....		.....	511 400	.....	
All other	"	.....	10,627,184	.....		.....	10,872,249	.....		.....	10,095,534	.....	
Railway track material (except rails and spikes) such as switches, frogs, fish-plates, splice-bars, etc	"	.....	(a)	.....		.....	732,617	.....		.....	793,134	.....	
Safes	No.	4,320	217,860	50	43	3,403	208,277	61	20	3,070	135,612	44	17
Scales, and balances	$	.....	159,851	.....		.....	158,349	.....		.....	134.191	.....	
Stoves, ranges and parts of	"	.....	1,041,935	.....		.....	1,314,725	.....		.....	975,460	.....	
Tools not elsewhere specified—													
Axes	No.	.....	(a)	.....		83,122	44,526	.....	54	70,548	38,493	.....	55
Hammers and hatchets	$	.....	(a)	.....		.....	74,947	.....		.....	38,979	.....	
Saws	"	.....	267,810	.....		.....	346,887	.....		.....	234,721	.....	
Shovels and spades	"	.....	(a)	.....		.....	23,099	.....		.....	14,087	.....	
All other	"	.....	1,686,924	.....		.....	1,866,713	.....		.....	1,371,832	.....	
Wire manufactures—woven wire fencing	"	.....	(a)	.....		.....	114,395	.....		.....	93,370	.....	
Wire manufactures—all others		.....	(a)	.....		.....	430,288	.....		.....	365,327	.....	
All other manufactures of steel		.....	10,100,055	.....		.....	7,877,122	.....		.....	7,375,163	.....	
		.....	46,020,989	.....		.....	54,673,774	.....		.....	40,731,318	.....	
Total value		.....	82,658,294	.....		.....	106,610,390	.....		.....	76,653,130	.....	

*Compiled from Commerce and Navigation of the United States, Washington, D.C.

(a) Not separately stated in 1912.

LEAD.

The production of lead in Canada in 1914 amounted to 36,337,765 pounds, valued at $1,627,568 as compared with 37,662,703 pounds valued at $1,754,705 in 1913, being a decrease in production of 3·5 per cent.

The statistics of lead production since 1909 as given in the accompanying table represent the quantity of refined lead produced in Canada from domestic ores, together with a small quantity of lead contained in lead ores exported. The production has been mainly from British Columbia with occasionally small amounts from Ontario. During 1914 there were no shipments from Ontario but there was a small production in the Yukon.

Annual Production of Lead.

Calendar Year.	Lbs.	Price per lb.	Value.	Calendar Year.	Lbs.	Price per lb.	Value.
		Cts.	$			Cts.	$
1887	204,800	5·400	9,216	1901	51,900,958	4·334	2,249,387
1888	674,500	4·420	29,812	1902	22,956,381	4·069	934,095
1889	165,100	3·930	6,488	1903	18,139,283	4·237	768,562
1890	105,000	4·480	4,704	1904	37,531,244	4·309	1,617,221
1891	88,665	4·350	3,857	1905	56,864,915	4·707	2,676,632
1892	808,420	4·090	33,064	1906	54,608,217	5·657	3,089,187
1893	2,135,023	3·730	79,636	1907	47,738,703	5·325	2,542,086
1894	5,703,222	3·290	187,636	1908	43,195,733	4·200	1,814,221
1895	16,461,794	3·230	531,716	1909	45,857,424	*3·690	1,692,139
1896	24,199,977	2·980	721,159	1910	32,987,508	*3·687	1,216,249
1897	39,018,219	3·580	1,396,853	1911	23,784,969	†3·480	827,717
1898	31,915,319	3·780	1,206,399	1912	35,763,476	†4·467	1,597,554
1899	21,862,436	4·470	977,250	1913	37,662,703	†4·659	1,754,705
1900	63,169,821	4·370	2,760,521	1914	36,337,765	†4·479	1,627,568

*In 1909 and 1910, average prices at Toronto as quoted by *Hardware and Metal*; in previous years average prices at New York, as quoted by *Engineering and Mining Journal*.
†Average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

Previous to 1904 lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces and exported in the form of base bullion to be refined abroad. A lead refinery employing the Betts electrolytic process is in operation at Trail, B.C., at the smelter there, treating the base bullion produced by the lead blast furnaces.

The North American Smelting Company erected a plant at Kingston, Ontario, which started operations during the latter part of 1912, treating scrap and lead dross as well as ores from the United States, British Columbia, and Ontario. This plant closed down November 1, 1913, and did not resume operations during 1914.

The production of refined lead, including pig lead and lead pipe, has been as follows:—

Year.	Refined lead produced.	Year.	Refined lead produeed.
	Lbs.		Lbs.
1904	7,519,440	1910	32,987,508
1905	15,804,509	1911	23,525,050
1906	20,471,314	1912	37,008,490
1907	26,607,461	1913	39,663,766
1908	36,549,274	1914	36,443,706
1909	41,883,614		

A small tonnage of lead ores from British Columbia and the Yukon was treated at the Tacoma Smelting Works, Tacoma, Washington, during 1914.

During the past two or three years there has been a very wide divergence between the record of lead recovery and the statements of lead contained in ores shipped from the mines. While the difference is due in part to smelter losses there was also during 1912 and 1913 especially, a considerable accumulation of lead ores at the Trail smelter.

The shipments of lead ores from mines and the metallic contents thereof have been, during the past three years, as follows:—

Year.	Lead ores shipped.	Lead contents.	Silver contents.
	Tons.	Pounds.	Ounces.
1912	59,814	45,896,537	2,366,294
1913	85,978	53,807,570	2,564,155
1914	70,207	50,537,130	2,501,820

Prices:—The average price for soft lead in 1914 on the London market was £18 13s. 9d. per long ton, as compared with £18 6s. 2d. in 1913, and £17 15s. 11d. in 1912.

The price of lead at Montreal, the main Canadian market, was higher in 1914 than the New York and London values.

The Toronto price in winter is about the same as that at Montreal, but the latter falls during the period of summer freight rates, about 10 cents per 100 pounds below the former.

The average prices of lead in Montreal in 1914 was 4·479 cents per pound, against 4·146 in London and 3·862 in New York.

The yearly average prices of lead in Montreal, London, and New York, for the last few years, is given in the following table:—

Yearly Average price of Lead in Montreal, London, New York, and St. Louis.

(Values in cents per pound.)

	1908.	1909.	1910.	1911.	1912.	1913.	1914.
Montreal	3·364	3·268	3·246	3·480	4·467	4·659	4·479
London	2·897	2·803	2·775	2·992	3·921	4·072	4·146
New York	4·200	4·273	4·446	4·420	4·471	4·370	3·862
St. Louis	.....	4·133	4·312	4·286	4·360	4·238	3·737

The monthly and yearly average prices for lead in Montreal for the past six years are given in the following table:—

Monthly Average Prices of Pig Lead at Montreal.*

(Value in cents per pound.)

Month.	1909.	1910.	1911.	1912.	1913.	1914.
January	3·35	3·48	3·31	3·93	4·32	4·78
February	3·38	3·40	3·32	3·97	4·18	4·73
March	3·42	3·34	3·34	4·03	4·05	4·57
April	3·35	3·21	3·26	4·10	4·42	4·41
May	3·26	3·13	3·20	4·08	4·66	4·54
June	3·23	3·15	3·27	4·34	4·98	4·55
July	3·12	3·13	3·33	4·57	4·93	4·49
August	3·08	3·11	3·45	4·84	5·02	4·48
September	3·14	3·11	3·63	5·47	5·02	4·42
October	3·26	3·23	3·77	5·07	4·99	4·07
November	3·28	3·31	3·93	4·53	4·82	4·29
December	3·34	3·35	3·95	4·55	4·52	4·41
Average	3·268	3·246	3·480	4·467	4·659	4·479

*Producers' prices for car-load quantities ex cars Montreal as furnished by Messrs. Thos. Robertson & Co., Ltd., of Montreal.

The average prices of lead in New York as quoted by the "Engineering and Mining Journal," are shown in the following table:—

Monthly Average Prices of Lead in New York.

(Values in cents per pound.)

Month.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
January	4·347	4·552	5·600	6·000	3·691	4·175	4·700	4·483	4·435	4·321	4·111
February	4·375	4·450	5·464	6·000	3·725	4·018	4·613	4·440	4·026	4·325	4·048
March	4·475	4·470	5·350	6·000	3·838	3·986	4·459	4·394	4·073	4·327	3·970
April	4·475	4·500	5·404	6·000	3·993	4·168	4·376	4·412	4·200	4·381	3·810
May	4·423	4·500	5·685	6·000	4·253	4·287	4·315	4·373	4·194	4·342	3·900
June	4·196	4·500	5·750	5·760	4·466	4·350	4·343	4·435	4·392	4·325	3·900
July	4·192	4·524	5·750	5·288	4·447	4·321	4·404	4·499	4·720	4·353	3·891
August	4·111	4·665	5·750	5·250	4·580	4·363	4·400	4·500	4·569	4·624	3·875
September	4·200	4·850	5·750	4·813	4·515	4·342	4·400	4·485	5·048	4·698	3·828
October	4·200	4·850	5·750	4·750	4·351	4·341	4·400	4·265	5·071	4·402	3·528
November	4·200	5·200	5·750	4·376	4·330	4·370	4·442	4·298	4·615	4·293	3·683
December	4·600	5·422	5·900	3·658	4·213	4·560	4·500	4·450	4·303	4·047	3·800
Average	4·309	4·707	5·657	5·325	4·200	4·273	4·446	4·420	4·471	4·370	3·862

The average monthly prices of soft lead in London, England, as published by Julius Matton, of London, were, from 1905 to 1914 inclusive, as follows:—

Average Monthly Prices of Lead in London.

(£ per Long Ton.)

Month.	1905.			1906.			1907.			1908.			1909.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	12	17	6	16	17	6	19	16	0	14	10	6	13	3	6
February	12	9	3	16	0	4	19	11	8	14	5	6	13	5	5
March	12	5	11	15	17	9	19	14	6	14	1	4	13	8	8½
April	12	13	2	15	16	6	19	16	7	13	13	10	13	7	0
May	12	15	3	16	13	6	19	17	7	13	2	7	13	5	3
June	13	0	0	16	15	6	20	6	0	12	15	7	13	2	4
July	13	12	2	16	11	7	20	8	2	12	19	6	12	13	3
August	13	19	2	17	1	3	19	0	3	13	9	10½	12	10	6
September	13	19	0	18	4	4	19	17	6	13	3	6	12	15	3
October	14	13	7	19	7	9	18	13	0	13	7	3	13	4	4
November	15	6	9	19	5	6	17	4	11	13	12	2	13	1	4½
December	17	1	0	19	12	6	14	9	4	13	3	6	13	2	11½
Yearly average	13	14	5	17	7	0	19	1	10	13	10	5	13	1	8

Month.	1910.			1911.			1912.			1913.			1914.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	13	3	11	13	0	8	15	11	3	17	1	11	18	19	10
February	13	7	3	13	1	11	15	13	9	16	8	5	19	2	8
March	13	2	9	13	2	11	15	19	8	15	19	8	19	2	3
April	12	13	9	12	18	5	16	6	6	17	8	10	17	19	8
May	12	11	8	12	19	2	16	10	2	18	14	3	18	4	8
June	12	13	9	13	5	5	17	11	8	19	10	8	18	13	11
July	12	11	8	13	10	11	18	8	9	19	7	10	18	8	6
August	12	10	10	14	1	4	19	5	8	19	15	8	20	9	9
September	12	12	6	14	15	1	21	9	0	19	14	10	18	16	3
October	13	2	0	15	6	1	20	8	0	19	9	5	17	9	8
November	13	4	6	15	15	5	18	4	7	18	13	9	17	19	9
December	13	3	9	15	13	4	18	1	6	17	8	8	18	18	6
Yearly average	12	19	0	13	19	3	17	15	11	18	6	2	18	13	9

The exports of lead contained in ore and concentrates during the calendar year 1914 were 246,100 pounds valued at $2,681, against 329,960 pounds valued at $9,136 in 1913.

The exports of pig lead in 1914 amounted to 510,573 pounds valued at $19,507. The following tables give the details of exports from 1909 to 1914 and the total exports of lead since 1873 to 1914:—

Exports of Lead, 1909 to 1914.

	Lead in ore, concentrates, etc.		Pig lead.	
	Lbs.	Value.	Lbs.	Value.
		$		$
1909.				
To United States	6,096,852	126,478	280	8
To other countries	129,216	6,100	11,301,680	361,056
Total	6,226,068	132,578	11,301,960	361,064
1910.				
To United States	46,800	1,308	59,605	2,295
To other countries	.....	.....	7,652,648	245,879
Total	46,800	1,308	7,712,253	248,174
1911.				
To United States	65,100	1,826	71,961	2,806
To other countries	.....	.....	.....	.....
Total	65,100	1,826	71,961	2,806
1912.				
To United States	299,240	8,193	.....	.....
To other countries	.....	.....	.....	.....
Total	299,240	8,193	.....	.....
1913.				
To United States	329,960	9,136	.....	.....
To other countries	.....	.....	.....	.....
Total	329,960	9,136	.....	.....
1914.				
To United States	246,100	2,681	510,573	19,507
To other countries	.....	.....	.....	.....
Total	246,100	2,681	510,573	19,507

The annual exports of lead since 1873 are shown in the following table:—

Exports of Lead, 1873 to 1914.

Calendar Year.	Lbs.	Value.	Calendar Year.	Lbs.	Value.
		$			$
1873	.....	1,993	1894	5,792,700	144,509
1874	.....	127	1895	23,075,892	435,071
1875	.....	7,510	1896	26,480,320	462,095
1876	.....	66	1897	43,802,697	925,144
1877	.....	720	1898	37,375,678	885,485
1878	.....	.....	1899	15,799,518	466,950
1879	.....	230	1900	57,642,029	1,917,690
1880	.....	.....	1901	45,590,995	1,804,687
1881	.....	.....	1902	17,761,484	457,170
1882	.....	32	1903	18,624,303	426,466
1883	.....	5	1904	25,868,823	559,461
1884	.....	36	1905	41,657,403	1,046,541
1885	.....	.....	1906	21,436,022	736,007
1886	.....	.....	1907	25,591,883	1,029,898
1887	.....	724	1908	18,454,594	622,454
1888	.....	18	1909	17,528,028	493,642
1889	.....	18	1910	7,759,053	249,482
1890	.....	.....	1911	137,061	4,632
1891	.....	5,000	1912	299,240	8,193
1892	.....	2,509	1913	329,960	9,136
1893	.....	3,099	1914	756,673	22,188

The production of lead as already shown was in 1914, 18,169 tons, while the exports were 378 tons, leaving a balance of 17,791 tons, as the consumption of Canadian lead.

The imports of lead in 1914 amounted to 10,924 tons valued at $1,042,538 against 10,884 tons valued at $1,215,433 in 1913. There was included herein certain manufactures of lead valued at $99,285 in 1914 and at $155,178 in 1913 for which no equivalent quantity is given.

Thus it will be found that the consumption of lead in 1914 exceeded 29,000 tons, and was about one thousand less than in 1913.

The principal imports of lead during 1912, 1913, and 1914 were as follows:—

Imports of Lead 1912, 1913, and 1914.

	Calendar year 1912.		Calendar year 1913.		Calendar year 1914.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
Old scrap, pig, and block	14,089	940,583	5,600	464,117	7,722	590,557
Bars and sheets	961	93,702	747	62,527	481	41,244
Pipe	344	32,423	233	21,679	283	26,282
Shot and bullets	239	23,163	215	19,582	90	10,542
Manufactures of lead	.....	144,571	.....	155,178	.....	99,285
Tea lead	1,606	167,716	1,737	217,009	844	108,097
Litharge	1,296	113,941	500	50,734	543	52,525
Total	18,535	1,516,099	9,032	990,826	9,963	928,532
Metallic lead contained in imported lead pigments	2,345	290,122	1,852	224,607	961	114,006
	20,880	1,806,221	10,884	1,215,433	10,924	1,042,538

Details of the annual imports since 1880 are given in the following tables:—

Imports of Lead in Pigs, Bars, Sheets, etc.

Fiscal Year.	Old, Scrap, and Pig.		Average price.	Bars, Blocks, Sheets.		Average price.	Total.	
	Cwt.	Value.		Cwt.	Value.		Cwt.	Value.
		$	$ cts.		$	$ cts.		$
1880							30,298	124,117
1881	16,236	56,919	3 51	18,222	70,744	3 88	34,458	127,663
1882	36,655	120,870	3 30	10,540	35,728	3 39	47,195	156,598
1883	48,680	148,759	3 06	8,591	28,785	3 35	57,371	177,544
1884	39,409	103,413	2 62	9,704	28,458	2 93	49,113	131,871
1885	36,106	87,038	2 41	9,362	24,396	2 61	45,468	111,434
1886	39,945	110,947	2 78	9,793	28,948	2 96	49,738	139,895
1887	61,160	173,477	2 84	14,153	41,746	2 95	75,313	215,223
1888	68,678	196,845	2 87	14,957	45,900	3 06	83,635	242,745
1889	74,223	213,132	2 87	14,173	43,482	3 07	88,396	256,614
1890	101,197	283,096	2 80	19,083	59,484	3 12	120,280	342,580
1891	86,382	243,033	2 81	15,646	48,220	3 08	102,028	291,253
1892	97,375	254,384	2 61	11,299	32,368	2 86	108,674	286,752
1893	94,485	215,521	2 28	12,403	32,286	2 60	106,888	247,807
1894	70,223	149,440	2 13	8,486	20,451	2 41	78,709	169,891
1895	67,261	139,290	2 07	6,739	16,315	2 42	74,000	155,605
1896	72,433	173,162	2 39	8,575	23,169	2 70	81,008	196,331
1897	65,279	158,381	2 43	10,516	29,175	2 77	75,795	187,556
	Old, Scrap, Pig, and Block.*			Bars, and Sheets.†			Total.	
1898	88,420	260,779	2 95	22,214	39,041	1 76	110,634	299,820
1899	114,659	283,432	2 47	44,796	39,833	0 89	159,455	323,265
1900	62,361	207,819	3 33	15,493	53,506	3 45	77,854	251,325
1901	(a) 85,321	97,011	1 14	16,295	78,316	4 81	101,616	175,327
1902	(a) 122,279	104,672	0 86	18,596	49,261	2 65	140,875	153,933
1903	(a) 98,530	67,821	0 69	11,535	35,398	3 07	110,065	103,219
1904	(a) 94,602	121,165	1 28	14,102	39,644	2 81	108,704	160,809
1905	(a) 57,074	133,775	2 34	17,792	51,972	2 92	74,866	185,747
1906	82,729	271,105	3 28	16,106	57,185	3 55	98,835	328,290
1907	79,575	277,470	3 49	13,710	56,630	4 13	93,285	334,100
1908	63,921	284,604	4 45	17,253	75,186	4 36	81,174	359,790
1909	50,110	151,173	3 02	13,754	46,093	3 35	63,864	197,266
Calendar year.								
1910	120,591	346,516	2 87	17,697	45,674	2 58	138,288	392,190
1911	199,774	495,923	2 48	30,837	55,458	1 80	230,611	551,381
1912	281,787	940,583	3 34	19,212	93,702	4 88	300,999	1,034,285
1913	111,995	464,117	4 14	14,944	62,527	4 18	126,939	526,644
1914	154,441	590,557	3 82	9,615	41,244	4 29	164,056	631,801

*Duty 15 per cent.
†Duty 25 per cent.
(a) Includes Canadian lead ore sent to the United States for refining, imported at price of refining only.

Imports of Lead Manufactures.

Calendar Year.	Pipe Lead.		Shot and Bullets.		Tea Lead.		Other manufactures of lead.
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
		$		$		$	$
1910	403,012	15,365	6,903	311	2,371,136	117,399	107,688
1911	512,737	19,426	8,912	1,053	2,688,211	134,160	108,012
1912	688,383	32,423	477,047	23,163	3,212,861	167,716	144,571
1913	466,753	21,679	429,656	19,582	3,475,171	217,009	155,178
1914	565,762	26,282	180,639	10,542	1,687,029	108,097	99,285

Imports of Litharge.

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
1880	3,041	$14,334	1893	7,685	$24,401	1906	10,165	$ 39,836
1881	6,126	22,129	1894	38,547	28,685	1907	11,311	49,183
1882	4,900	16,651	1895	11,955	32,953	1908	19,052	90,785
1883	1,532	6,173	1896	10,710	32,817	1909	12,117	43,597
1884	5,235	18,132	1897	12,028	34,538	Calendar year:—		
1885	4,990	16,156	1898	10,446	32,904			
1886	4,928	16,003	1899	9,530	32,518	1910	15,541	56,049
1887	6,397	21,865	1900	9,139	29,176	1911	17,979	65,743
1888	7,010	23,808	1901	11,132	51,944	1912	25,925	113,941
1889	8,089	31,082	1902	13,002	47,021	1913	10,009	50,734
1890	9,453	31,401	1903	13,921	47,761	1914	10,863	52,525
1891	7,979	27,613	1904	9,894	32,633			
1892	10,384	34,343	1905	17,865	57,736			

Imports of White and Red Lead in 1912, 1913, and 1914.

	Calendar Year 1912.		Calendar Year 1913.		Calendar Year 1914.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$
Lead, white, dry	2,499,725	138,627	1,162,082	61,424	363,136	20,279
Lead, white, ground in oil	714,362	37,916	1,057,683	59,444	546,961	31,654
Lead, red, dry and orange mineral	2,539,767	113,579	2,389,460	103,739	1,451,264	62,073
	5,753,854	290,122	4,609,225	224,607	2,361,361	114,006

Imports of Dry White and Red Lead and Orange Mineral, and White Lead Ground in Oil.

Fiscal Year.	Lbs.	Value.	Average price.	Fiscal Year.	Lbs.	Value.	Average price.
		$	Cts.			$	Cts.
1885.....	5,540,753	198,913	3·69	1901.....	10,241,601	461,368	4·50
1886.....	6,703,077	213,258	3·18	1902.....	15,584,164	603,582	3·87
1887.....	6,998,820	233,725	3·34	1903.....	19,208,786	758,371	3·95
1888.....	6,361,334	216,654	3·41	1904.....	16,925,585	662,098	3·91
1889.....	7,066,465	267,236	3·78	1905.....	17,376,588	638,381	3·67
1890.....	10,859,672	381,959	3·52	1906.....	10,412,891	417,444	4·01
1891.....	8,560,615	337,407	3·94	1907.....	5,956,626	290,629	4·88
1892.....	10,288,766	351,686	3·42	1908.....	7,830,860	420,537	5·37
1893.....	10,865,183	364,680	3·36	1909.....	4,687,416	195,258	4·17
1894.....	10,958,170	353,053	3·22	Calendar year:			
1895.....	8,780,052	282,353	3·22	1910.....	3,769,927	144,741	3·84
1896.....	11,711,496	367,569	3·14	1911.....	4,072,433	169,501	4·16
1897.....	10,310,463	347,539	3·37	1912.....	5,753,854	290,112	5·04
1898.....	12,682,808	448,659	3·54	1913.....	4,609,225	224,607	4·87
1899.....	14,507,945	514,842	3·55	1914.....	2,361,361	114,006	4·83
1900.....	14,679,920	634,492	4·32				

British Columbia.

Almost all of the lead ore mined in British Columbia is smelted and refined at Trail, B.C.

The production of refined lead together with a small quantity of lead in ores exported amounted, in 1914, to 36,289,845 pounds as against 37,626,899 pounds in 1913, a decrease of about 8·5 per cent.

According to the Provincial Department of Mines, 50,625,048 pounds of lead were contained in the lead ores shipped to the smelters during 1914.

The record given in the following table for the years 1909 to 1914 inclusive represents the recovery of lead at smelter or refinery as distinguished from the figures given for the same years in the table next succeeding, which indicate the quantities of lead contained in ore sent to the smelters.

British Columbia:—Production of Lead.

Calendar Year	Lbs.	Value.	Price per lb.	Calendar Year.	Lbs.	Value.	Price per lb.
		$	Cts.			$	Cts.
1887.....	204,800	9,216	4·40	1901.....	51,582,906	2,235,603	4·334
1888.....	674,500	29,813	4·42	1902.....	22,536,381	917,005	4·069
1889.....	165,100	6,488	3·93	1903.....	18,089,283	766,443	4·237
1890.....	Nil.	.....		1904.....	36,646,244	1,579,086	4·309
1891.....	Nil.	.....		1905.....	56,580,703	2,663,254	4·707
1892.....	808,420	33,064	4·09	1906.....	52,408,217	2,964,733	5·657
1893.....	2,131,092	79,490	3·73	1907.....	47,738,703	2,542,086	5·325
1894.....	5,703,222	187,636	3·29	1908.....	43,195,733	1,814,221	4·200
1895.....	16,461,794	531,716	3·23	1909.....	45,857,424	1,692,139	*3·690
1896.....	24,199,977	721,159	2·98	1910.....	32,987,508	1,216,249	*3·687
1897.....	38,841,135	1,390,513	3·58	1911.....	23,784,969	827,717	†3·480
1898.....	31,693,559	1,198,017	3·78	1912.....	35,763,476	1,597,554	†4·467
1899.....	21,862,436	977,250	4·47	1913.....	37,626,899	1,753,037	†4·659
1900.....	62,158,621	2,760,031	4·37	1914.....	36,337,765	1,627,568	†4·479

*Average prices at Toronto for years 1909 and 1910. For previous years average prices at New York.
†Average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

British Columbia:—Production of Lead by Districts.*

Shipments of Lead contained in Ore from Mines.

	1908.	1909.	1910.	1911.	1912.	1913.	1914.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Cassiar	.....	.....	1,695	238,578	41,512	6,579	.....
East Kootenay—							
Fort Steele	30,204,788	27,004,528	23,874,562	17,158,069	18,238,238	18,525,083	24,863,105
Other districts	358,270	18,724	66,010	.....	2,249,237	2,495,355	.....
West Kootenay—							
Ainsworth	4,790,216	10,298,343	2,558,353	289,009	4,863,894	9,027,861	8,069,525
Nelson	345,424	1,097,069	1,245,844	1,928,836	2,293,000	1,936,418	2,004,436
Slocan	6,572,268	4,976,199	6,406,358	6,705,571	16,944,811	22,648,766	15,233,910
Other districts	903,552	979,916	470,241	522,615	240,762	521,771	128,912
Yale	21,215	21,567	35,683	29,719	.....	45,982	1,678
Cariboo—							
Omineca	.....	.....	.....	.....	.....	156,862	323,482
	43,195,733	44,396,346	34,658,746	26,872,397	44,871,454	55,364,677	50,625,048

*From the Report of the Minister of Mines, B.C.

It will be noted that the Fort Steele district produced over 49 per cent of the total; Slocan 30 per cent; Ainsworth nearly 16 per cent, and Nelson nearly 4 per cent. The shipments from New Hazelton were over double those of the previous year.

Yukon.

A few small shipments of lead-bearing ores were made from the Yukon in 1914. Although not important contributors to the tonnage of lead produced, they draw attention to the possibilities of the Territory, where as yet little lode mining has been done.

Some activity was shown in the Windy Arm section, and also near Minto Bridge, Duncan Mining Division.

During the last few years several properties have been developed and have shipped occasionally, but they have been handicapped by the high cost of development and supplies and by the heavy transportation charges.

Bounties.—In 1901, and again in 1903, the Dominion Government, to encourage the lead industry, authorized the payment of a bounty on the production of lead. The Act of 1903 provided for the payment, under certain restrictions, of 75 cents per hundred pounds on lead contained in ore mined and smelted in Canada, provided that when the standard price of pig lead in London, England, exceeded £12 10s. per ton of 2,240 pounds, such bounty should be reduced proportionately by the amount of such excess. Thus, when the price of lead in London rose to £16, or over, per long ton, the bounty ceased. As the price of lead exceeded £16 sterling on the London market for a considerable period during 1906 and 1907 the bounty paid during those years was comparatively small.

The Act of 1903 provided that payment of bounty should cease on June 30, 1908, and as only a portion of the funds provided had been used, a new Act was passed in the latter year providing for further bounty payments at

the rate of 75 cents per hundred pounds, or approximately £3 10s. per ton of 2,240 pounds, subject to the restriction that when the price of lead in London exceeds £14 10s. the bounty shall be reduced by such excess.

The Act of 1908 expired in 1913, and a new Act was passed extending the bounty for a further period of five years, with the same provisions. The text of this Act follows:—

3-4 GEORGE V, CHAPTER 29.

An Act Respecting the Payment of Bounties on Lead Contained in Lead-bearing Ores Mined in Canada.

(*Assented to June 6, 1913.*)

Whereas, under the provisions of chapter 31 of the statutes of 1903 and of chapter 43 of the statutes of 1908, as amended by chapter 37 of the statutes of 1910, the amount of bounty payable on lead contained in lead-bearing ores mined in Canada was not to exceed two million four hundred and fifty thousand dollars; and whereas, the time within which the said amount is payable for the purpose aforesaid expires, under the provisions of the said chapter 43, on the thirtieth day of June, nineteen hundred and thirteen, and there will then remain unexpended of the said sum approximately six hundred thousand dollars: Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Lead Bounties Act, 1913.*

2. The Governor in Council may authorize the payment of a bounty of seventy-five cents per one hundred pounds on lead contained in lead-bearing ores mined in Canada, on and after the first day of July, nineteen hundred and thirteen, such bounty to be paid to the producer or vendor of such ores: Provided that the sum to be paid as such bounty shall not exceed two hundred and fifty thousand dollars in any year ending on the thirtieth day of June; provided also that when it appears to the satisfaction of the Minister charged with the administration of this Act that the standard price of pig lead in London, England, exceeds fourteen pounds ten shillings sterling per ton of two thousand two hundred and forty pounds, such bounty shall be reduced by the amount of such excess.

2. The total amount of bounty payable under the provisions of chapter 31 of the statutes of 1903, chapter 43 of the statutes of 1908 (as amended by chapter 37 of the statutes of 1910), and of this Act, shall not exceed two million four hundred and fifty thousand dollars.

3. Payment of the said bounty may be made from time to time to the extent of sixty per cent upon smelter returns showing that the ore has been delivered for smelting at a smelter in Canada. The remaining forty

per cent may be paid at the close of the fiscal year, upon evidence that all such ore has been smelted in Canada.

2. If at the close of any year it appears that during the year the quantity of lead produced on which the bounty is authorized, exceeds sixteen thousand six hundred and sixty-seven tons of two thousand pounds, the rate of bounty shall be reduced to such sum as will bring the payments for the year within the limit mentioned in section 2 of this Act.

4. If at any time it appears to the satisfaction of the Governor in Council that the charges for transportation and treatment of lead ores in Canada are excessive, or that there is any discrimination which prevents the smelting of such ores in Canada on fair and reasonable terms, the Governor in Council may authorize the payment of bounty at such reduced rates as he deems just, on the lead contained in such ores mined in Canada, and exported for treatment abroad.

5. If at any time it appears to the satisfaction of the Governor in Council that products of lead are manufactured in Canada direct from lead ores mined in Canada without the intervention of the smelting process, the Governor in Council may make such provision as he deems equitable to extend the benefits of this act to the producers of such ores.

6. The Governor in Council may make regulations for carrying out the intention of this Act.

7. The bounties payable under the provisions of this Act shall cease and determine on the thirtieth day of June, one thousand nine hundred and eighteen.

The regulations under which the Act is administered are as follows:

1. The Minister of Trade and Commerce is charged with the administration of this Act.

2. All producers or vendors of lead-bearing ores who desire to avail themselves of the provisions of the Act above quoted, and to be paid bounty, shall, before making claim for such bounty, notify the Minister of their intention to claim under the provisions of the Act, and shall declare the name of the mine producing such ore, its situation, the names of the president, secretary, and manager, as well as the name of the official authorized to make claim. Notice shall be given the Minister of changes in ownership and management. Where the bounty is claimed by lessees, the consent of the owner shall be shown.

3. All claims for the payment of bounty shall be made and substantiated under the oath of the manager of the mine or of the official authorized to make the claim.

4. Claims may be made monthly, that is, immediately after the close of each calendar month, and be in such form, and contain such evidence, as may seem to the Minister, from time to time, necessary.

5. No claims made otherwise than in conformity with these regulations, and in form required by the Minister, shall be recognized, allowed or paid by the Minister.

6. The smelting of all such ore shall at all times be under the supervision of the officers of the Department of Trade and Commerce, appointed or detailed for the purpose.

7. The supervising officer may at any time demand and receive a portion of the floor sample of any ore delivered at the smelter for smelting purposes.

8. The rate of bounty shall be computed according to the London quotation upon the day the ore is taken into stock at the smelter, such day not to be later than the last day of the calendar month during which the ore was unloaded from cars at the smelter grounds.

9. The lead contents of ore shall, for the purpose of this Act, be ascertained by fire assay, as used in ordinary commercial assaying.

10. The books of the claimants, and those of the smelting works at which the ore is smelted, shall be at all times open to the inspection of such supervising officer, and of any officer of the Department of Trade and Commerce who may be detailed by the Minister for the purpose.

11. All claims shall be substantiated by the oath of the Manager of the smelting works at which the ores are smelted, and shall be verified and certified to by the officer of the Department of Trade and Commerce appointed to supervise the smelting at the works where it has been carried on.

12. The cost of the supervision shall be paid by the claimants and may be deducted pro rata according to the quantity smelted during the fiscal year, from the amount payable to such claimants at the close of each fiscal year.

Throughout nearly the whole of 1914 the London price for lead was above that at which the Dominion Government bounty on lead ceases to be paid.

The Bounties paid on lead since 1899 are given in the following table:—

Statement of Bounties Paid on Lead during the Fiscal Years 1899 to 1915.

Year ending.	Bounty paid.	Year ending.	Bounty paid.
	$		$
June 30, 1899	76,665	March 31, 1907 (9 mos.)	1,995
" 30, 1900	43,335	" 31, 1908	51,001
" 30, 1901	30,000	" 31, 1909	307,433
" 30, 1902	.....	" 31, 1910	340,542
" 30, 1903	4,380	" 31, 1911	248,534
" 30, 1904	195,627	" 31, 1912	179,288
" 30, 1905	330,645	" 31, 1913	68,065
" 30, 1906	90,196	" 31, 1914	8,179
		" 31, 1915	3,217
		Total	1,979,102

MERCURY.

There has been no production of mercury since 1897. The small production reported in 1895 and 1897 was derived from the deposits at the western end of Kamloops lake, B.C. These deposits consist of quartz veins containing pockets of cinnabar in a zone of decomposed Tertiary volcanic rocks.

Elsewhere in Canada mercury has been reported as also occurring in ores of the Cobalt district, and in the neighbourhood of Field, B.C., and Sechart on the west coast of Vancouver island.

The imports of mercury during the calendar year 1914 were 204,229 pounds valued at $97,449.

Production of Mercury.

Calendar Year.	Flasks. (76½ lbs.)	Price per flask.	Value.
		$ cts.	$
1895	71	33 00	2,343
1896	58	33 44	1,940
1897	9	36 00	324

Imports of Mercury.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$			$
1882	2,443	965	1893	50,711	22,998	1904	151,107	80,658
1883	7,410	2,991	1894	36,914	14,483	1905	103,330	48,412
1884	5,848	2,441	1895	63,732	25,703	1906	150,364	69,505
1885	14,490	4,781	1896	77,869	32.353	1907 (9 mos.)	98,368	45,662
1886	13,316	7,142	1897	76,058	33,534	1908	178,411	76,549
1887	18,409	10,618	1898	59,759	36,425	1909	92,220	46,217
1888	27,951	14,943	1899	103,017	51,695	Calendar Year:		
1889	22,931	11,844	1900	85,342	51,987	1910	107,888	63,450
1890	15,912	7,677	1901	140,610	94,564	1911	118,336	67,416
1891	29,775	20,223	1902	97,283	56,615	1912	137,474	72,171
1892	30,936	15,038	1903	164,968	91,625	1913	219,442	109,493
						1914	204,229	97,449

MOLYBDENUM.

The commercial production of molybdenum in Canada has been practically negligible, nevertheless the mineral has been found in numerous localities and in many of these in sufficient quantity to make its possible recovery a question of considerable interest, an interest which doubtless has been greatly stimulated by the high price which the ore, concentrated to 85 or 90 per cent molybdenite (MoS_2), has commanded.

During 1913 and 1914 some work was done on a number of properties in Ontario, Quebec, and British Columbia.

Shipments were made during 1914 from Ontario and British Columbia. The Ontario shipments consisted of one-half ton of molybdenite hand picked from the ore, while from British Columbia 16 tons[1] of ore were reported as shipped to Denver, Col., where it was concentrated, producing 2,814 pounds of concentrates for which 20 cents a pound was received. The total shipments in the form of molybdenite were 3,814 pounds valued at $2,063.

In 1902, about 6,500 pounds of molybdenum ore valued at $400, were reported as having been taken from a deposit in the township of Laxton, county of Victoria, by John Webber of Toronto.

In 1903, Mr. A. W. Chisholm of Kingston, reported the shipment to the United States, and elsewhere, of 85 tons of molybdenum ore valued at $1,275, culled from about 500 or 600 tons of rock taken from the east half of lot 5, concession XIV, Sheffield township, Addington county.

Quebec:—During the year 1914, some development work was done by Mr. Charles Higgerty, of Ottawa, on a deposit of molybdenite situated in Eardley township, on lot 6, range XI. A vein is said to have been uncovered for a distance of 200 feet, and a few hundred pounds of molybdenite is said to have been produced from preliminary work.

The Aldfield Mineral Syndicate did a little work on lots 1 and 2, range III of Aldfield township.

Ontario:—The same Syndicate did a considerable amount of development on lots 16 and 17, concession XI of Brougham township, Renfrew county. A shipment of half a ton of cobbed ore valued at $1,500 was reported.

The Algunican Development Co., Ltd., was preparing to operate at Mount St. Patrick in the same district, Brougham township, concession XI, lot 8. Machinery had been purchased and the Company was preparing to install a mill with an output of 1,000 lbs. of concentrates per day when the declaration of war terminated negotiations.

The property of Mr. James Legree was under option to an American Syndicate.

[1] The Gold Commissioner of the district reports the shipment as 23½ tons.

In the county of Haliburton, lot 11, concession X of Cardiff township, a property known as the "Treasure Hill" mine, was worked. Some ore was recovered and concentrated by special process, but no record of tonnage was obtained.

British Columbia:—The molybdenite claims of Lost Creek, 14 miles from Salmo, are owned by Messrs. Ross, Bennett and Benson, and have been operated under lease by Bell Bros. of Salmo. The Gold Commission reports[1]:—

"Open-cuts have been run in on the dyke at intervals for a distance of 1,400 feet and ore encountered in all.

"In August a car of 23½ tons of the ore was shipped to the Henry E. Wood Ore Testing Company, Denver, Colorado. This, for testing purposes, was divided into three different lots secured from separate portions of the dyke: No. 1, of 822 lb., going 30·175 per cent; No. 2, 29,895 lbs., 10·25 per cent.; and No. 3, 17,119 lbs., 9·33 per cent. At 20 cents a pound, the rate it was agreed to sell for early in the year, the car netted the owners $815 clear of the cost of treatment and transportation.

"Another car of 25½ tons is now about ready for shipment at Salmo, and a table test shows same to run about 14 per cent. The owners expect to receive 70 cents a pound on this shipment, having already had several bids on same from different points in the United States.

"There is estimated to be about 1,000 tons of lower-grade ore on the dump at the present time."

Prices:—There has been a small annual production of molybdenite in Australia since 1900 and previous to 1914 the price varied generally between $400 and $600 per ton for ore containing a minimum of 85 per cent MoS_2.

In January of 1914 according to the Engineering and Mining Journal of New York "Such ore would be worth from $8 to $10 per unit, providing the ore be free from copper, arsenic, bismuth and tungsten. Any one of these elements will reduce the price of the ore. For instance: 90 per cent ore free from these elements is at present worth $12.50 per unit, practically twice the price of tungsten ore. Lower grade ores are worth much less."

In July the London Mining Journal on the 25th inst., quoted the London market at from £500 to £550 per ton for first grade ore.

In September molybdenite containing a minimum of 90 per cent MoS_2 was quoted in London at from 115s. to 120s. per unit (120s. per unit = £540 per ton for 90 per cent ore).

During December as high as 135s. per unit was quoted (= £607 per gross ton or $1.32 per pound for 90 per cent ore).

A special Report[2] describing the principal Canadian molybdenite occurrences discovered prior to 1910 has been published by the Mines Branch. The Department through its ore testing division has also under

[1] "Annual Report of the Minister of Mines, 1914, in the Province of British Columbia." pp. 328-329.
[2] No. 93, "Report on the Molybdenum Ores of Canada," by T. L. Walker, Ph.D., Mines Branch, Department of Mines, Ottawa, 1911.

taken an investigation of the concentration of these ores. This work is still in progress although a preliminary Report[1] has already been published in the Summary Report of the Mines Branch for 1913.

The following firms are believed to be purchasers of molybdenite; The Electro Metallurgical Company of America, New York; Primos Chemical Company, Primos, Penn.; DeGobia and Atkins, San Francisco, Cal.; Geo. G. Blackwood Sons & Co., The Albany, Liverpool, England; W. C. Willis & Co., 90 Mitchell St., Glasgow; J. Cameron, Swan & Co., 4 St. Nicholas Bldgs., Newcastle-on-Tyne, England; Sir A. G. Armstrong, Whitworth & Co., 8 Great George St., Westminster, London, England.

The annual production of molybdenite in Australia (Queensland and New South Wales) is shown in the accompanying table:—

Annual Production of Molybdenite in Australia.

Year.	Queensland (a).		New South Wales (b).	
	Long tons.	£	Long tons.	£
1900	11·00	561	.....	.....
1901	*26·00	1,609	.....	.....
1902	*41·00	5,502	15·00	1,841
1903	*24·00	2,100	29·00	4,458
1904	21·65	2,746	25·25	2·726
1905	*84·75	10,454	19·40	2,507
1906	*129·15	17,034	32·65	4,798
1907	*17·15	9,660	21·65	3,564
1908	*168·85	14,686	.....	.....
1909	*156·75	13,820	.....	.....
1910	*139·90	16,914	.....	.....
1911	*228·50	24,842	.....	.....
1912	*197·50	19,261	56·55	3,706
1913	66·00	.....	78·80	6,802
1914 (c)	78·00	38,190	61·00	11,451

[1] No. 285, "Summary Report, Mines Branch, Department of Mines," 1913, pp. 66-71.
(a) From the Annual Report of the Dept. of Mines, New South Wales.
(b) From the Annual Report of the Under-Secy. for Mines, Queensland.
(c) From the London Mining Journal, Oct. 16th, 1915.
*Includes bismuth and wolfram.

NICKEL.

The industry based on the mining and metallurgical treatment of the nickel-copper ores of the Sudbury district, Ontario, ranks among the most important of Canada. Not only is there a considerable production of copper but the nickel, which is the most important product, supplies a very large proportion of the world's consumption of the metal.

The past three years' development has very largely increased the known ore reserves of the district. These nickel-copper deposits have been the subject of special reports by the Mines Branch and Geological Survey at Ottawa, and by the Ontario Bureau of Mines, Toronto.[1]

The production of nickel ore, very active during the first six months of 1914, was checked on the declaration of war. Towards the end of the year the output was greatly increased, due no doubt to the great demand for nickel for war supplies, so that the production in 1914 was but little less than that of 1913, when the production of ore and its reduction to a Bessemer matte was the highest on record.

There were mined in 1914, 1,000,364 tons of ore, and smelted 947,053 tons; from which were produced 46,396 tons of Bessemer matte, carrying approximately 22,759 tons of nickel and 14,448 tons of copper, the net value of the matte being $7,187,031. Thus, in 1914, the matte showed an increase in copper content and a falling off in nickel due to the great increase in production of ores by the Mond Nickel Co., and their reduction in the Coniston Smelter and the curtailment of the Canadian Copper Company's output of ores which are relatively lower in copper content.

The nickel-copper ore is reduced in smelters and converters to a Bessemer matte containing from 77 to 82 per cent of the combined metals, having averaged for the past year 49·0 per cent nickel and 31·1 per cent copper, against 52·7 per cent nickel and 27·4 per cent copper in 1913.

For the production of monel metal, a special matte is produced with contents of about 22 per cent copper and 58 per cent nickel, which is included in the total given above. Monel metal is produced directly from this matte without the intermediate refining of either the nickel or the copper.

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[1] Report on Nickel and Copper Deposits of Sudbury, Ont., by A. E. Barlow, Geological Survey, Canada. No. 873, 1901.
The Sudbury Nickel Region, by A. P. Coleman, Ph.D., Bureau of Mines, Vol. XIV, Part III, 1904.
The Nickel Industry, with special reference to the Sudbury Region, Ont. Report by A. P. Coleman, Ph.D., Mines Branch, Ottawa, No. 170, 1913.

The following were the aggregate results of the production and treatment of nickel-copper ores in Ontario during the past four years:—

	1911. Tons of 2,000 lbs.	1912. Tons of 2,000 lbs.	1913. Tons of 2,000 lbs.	1914. Tons of 2,000 lbs.
Ore mined	612,511	737,726	784,697	1,000,364
Ore smelted	610,834	725,065	823,403	947,053
Bessemer matte produced	32,607	41,925	47,150	46,396
Copper content of matte	8,966	11,116	12,938	14,448
Nickel " "	17,049	22,421	24,838	22,759
Spot value of matte	$4,945,592	$6,303,102	$7,076,945	$7,189,031
Wages paid miners and smelters	$1,830,526	$2,626,609	$3,291,956	$3,096,911
Men employed	1,885	3,110	3,486	3,379

The annual production of nickel since 1889 is shown in the following table:—

Annual Production of Nickel.

Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.	Calendar Year.	Pounds of nickel in matte shipped.	Average price per lb.	Value.
		Cts.	$			Cts.	$
1889	*830,477	60	498,286	1902	10,693,410	47	5,025,903
1890	1,435,742	65	933,232	1903	12,505,510	40	5,002,204
1891	4,035,347	60	2,421,208	1904	10,547,883	40	4,219,153
1892	2,413,717	58	1,399,956	1905	18,876,315	40	7,550,526
1893	3,982,982	52	2,071,151	1906	21,490,955	42	8,948,834
1894	4,907,430	38½	1,870,958	1907	21,189,793	45	9,535,407
1895	3,888,525	35	1,360,984	1908	19,143,111	43	8,231,538
1896	3,397,113	35	1,188,990	1909	26,282,991	36	9,461,877
1897	3,997,647	35	1,399,176	1910	37,271,033	30	11,181,310
1898	5,517,690	33	1,820,838	1911	34,098,744	30	10,229,623
1899	5,744,000	36	2,067,840	1912	44,841,542	30	13,452,463
1900	7,080,227	47	3,327,707	1913	49,676,772	30	14,903,032
1901	9,189,047	50	4,594,523	1914	45,517,937	30	13,655,381

*Calculated from shipments made by rail.

The companies engaged in mining and smelting nickel ores are: The Canadian Copper Company, subsidiary to the International Nickel Company, with smelter at Copper Cliff, Ontario, and refinery at Bayonne, New Jersey; the Mond Nickel Company, Coniston, of London, England, with smelter at Coniston, Ont., and refinery at Clydach, Swansea, Wales. The British America Nickel Corporation continued development work. The Alexo mine, on the Porcupine Branch of the Timiskaming and Northern Ontario Railway, was again a producer, shipping nickel-copper ore to the Mond smelter at Coniston.

The above figures of the production of nickel do not include that recovered from the silver-cobalt ores of the Cobalt district. Returns are

received of the recovery as nickel-oxide at Canadian works, but a considerable amount of nickel is contained in ores exported for smelting for which no payment is received by the mines shipping and the amount finally recovered is impossible to ascertain.

The production of nickel-oxide during 1914 was reported as 392,512 pounds.[1]

The total quantity of ore contained in ores shipped from this district has been estimated by the Ontario Bureau of Mines as follows:—

Nickel content of Ores shipped from Cobalt District.

(Estimated by Ontario Bureau of Mines).

Calendar Year.	Ore and concentrates shipped.	Nickel content (estimated.)
	Tons	Tons
1904	158	14
1905	2,144	75
1906	5,335	160
1907	14,788	370
1908	25,624	612
1909	30,677	766
1910	34,282	604
1911	26,653	392
1912	21,933	429
1913	20,877	377

Prices:—The price of refined nickel in New York during 1914 was quoted at 40 to 45 cents per pound for nickel shot, blocks or plaquettes, and electrolytic nickel 5 cents higher per pound.

The price of nickel in Europe in 1914, as given by London Mining Journal, was, from January until August, £167 10s. to £171 per long ton. No quotations were given during August, but in September the price started at £185 for the home trade, and was firm for the rest of the month at from £200 to £206 per long ton. In November quotations dropped to £186 (40½ cents per lb.) rising again at the end of December to from £186 to £206 per long ton.

[1] See chapter on "Cobalt."

Statistics of the average yearly prices in Europe, as given by the "Metallgesellschaft" are as follows:—

Yearly Average Prices of Nickel in Europe in Cents per Pound, and Marks per Kilogram.

Year.	Prices in marks. per kilo.	Cents per lb.	Year.	Prices in marks per kilo.	Cents per lb.
1889	4·50	48·6	1902	3·20	34·6
1890	4·50	48·6	1903	3·30	35·6
1891	4·50	48·6	1904	3·30	35·6
1892	4·50	48·6	1905	3·30	35·6
1893	3·80	41·0	1906	3·80	41·0
1894	3·60	38·9	1907	3·50	37·8
1895	2·60	28·1	1908	3·25	35·2
1896	2·50	27·0	1909	3·25	35·2
1897	2·50	27·0	1910	3·25	35·2
1898	2·50	27·0	1911	3·25	35·2
1899	2·50	27·0	1912	3·25	35·2
1900	3·00	32·4	1913	3·25	35·2
1901	3·00	32·4			

As a result of the increased capacity of the Mond Nickel Co's. smelter, the exports of nickel to Great Britain in 1914 were almost double those of 1913. The exports to the United States fell off nearly 20 per cent.

The exports by countries during the past four years and the annual exports since 1890 are shown in the accompanying tables:—

——.	1911. Lbs.	1912. Lbs.	1913. Lbs.	1914. Lbs.
To Great Britain	5,023,393	5,072,867	5,164,512	10,291,979
To United States	27,596,578	39,148,993	44,224,119	36,015,642
To other countries	.....	.....	70,386	220,706
	32,619,971	44,221,860	49,459,017	46,528,327

Exports of Nickel Contained in Ore, Matte, or Other Product.

Calendar Year.	Value.	Calendar Year.	Lbs.	Value.	Average price.
	$			$	Cts.
1890	89,568	1903	12,699,227	1,116,099	8·78
1891	667,280	1904	11,233,869	1,091,349	9·71
1892	293,149	1905	17,318,059	1,569,693	9·06
1893	629,692	1906	20,653,845	2,042,965	9·89
1894	559,356	1907	19,376,335	2,280,374	11·76
1895	521,783	1908	19,419,893	1,866,624	9·61
1896	658,213	1909	25,616,398	2,676,483	10·45
1897	723,130	1910	36,014,782	4,030,040	11·19
1898	1,019,363	1911	32,619,971	3,676,396	11·27
1899	939,915	1912	44,221,860	4,661,758	10·54
1900	1,031,030	1913	49,459,017	5,195,560	10·50
1901	751,080	1914	46,528,327	5,149,427	11·07
1902	1,007,211				

The imports of nickel are classed with those of nickel-silver and German silver and manufactures of these metals. There is also a considerable import of nickel-plated ware.

The imports of nickel, nickel-silver, German silver, etc., during 1913 and 1914 have been as follows:—

Imports of Nickel, Nickel-Silver and German Silver, 1913 and 1914.

	1913.		1914.	
	Lbs.	$	Lbs.	$
Nickel, nickel-silver & German silver in ingots or blocks	42,726	14,705	70,564	25,362
Nickel, nickel-silver and German silver in bars and rods and also in strips, sheets or plates	549,765	147,815	549,288	130,065
Manufactures of German, Nevada and nickel-silver, not plated	.....	86,672	.....	83,185

In view of the large export of nickel from Canada to the United States and its refinement in that country, a record of the imports into, and exports of nickel from the United States, may be of special interest and is shown below as compiled from the "Foreign Commerce of the United States." The values of the United States exports which are not quoted in the tables, range from 31 to 39 cents per pound, and averaged about 34 cents in 1914.

United States:—Imports and Exports of Nickel.

Imports of Nickel into United States.	1911.	1912.	1913.	1914.
Gross tons of ore and matte.....Tons	23,993	33,101	37,623	29,564
Nickel contents.....Lbs.	29,545,967	42,168,769	47,194,101	35,006,700
Exports of nickel from United States—				
To France.....Lbs.	5,463,358	5,083,947	3,631,858	3,457,157
To Netherlands..... "	9,101,150	7,387,447	6,622,811	855,168
To United Kingdom..... "	7,196,259	8,191,364	8,221,640	10,836,369
To other countries..... "	3,338,819	5,152,258	10,096,779	12,446,458
Total..... "	25,099,586	25,815,016	29,173,088	27,595,152

Bounty on Refined Nickel and Nickel-oxide:—Under the terms of "The Metal Refining Act, 1907" of the Province of Ontario (7 Edward VII, Chap. XIV) a bounty is authorized to be paid on nickel, cobalt, copper, and arsenic under certain conditions and restrictions during a period of five years following the passing of the Act (April, 1907). In March, 1912, the Act was amended to cover a further period of five years.

The sections affecting nickel ore are as follows:—

"The Treasurer of the Province may under the authority of such regulations as may from time to time be made in that behalf by the Lieu-

tenant Governor in Council pay in each year to the refiners of the metals or metal compounds hereinafter specified when refined in the Province from ores raised and mined in the Province, a bounty on each pound of such metal or compound so refined as follows:—

"Class 1. On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel-oxide, but nickel on which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form, and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all $60,000 in any one year."

The full text of the Act will be found in the chapter on "Cobalt."

Nickel Production in Other Countries.

New Caledonia.

The only other important producer of nickel ore outside of Canada is the French Colony, New Caledonia. The exports from this source since 1898 have been as follows, in metric tons:—

Exports of Nickel Ore and Matte from New Caledonia.*

Year.	Nickel ore. Metric tons	Year.	Nickel ore. Metric tons	Year.	Nickel ore. Metric tons	Nickel matte. Metric tons.
1898	74,614	1904	98,655	1909 (*a*)	86,000	.....
1899	103,908	1905	125,289	1910 (*b*)	115,342	768
1900	100,319	1906 (*a*)	118,890	1911 (*b*)	120,059	2,993
1901	132,814	1907 (*a*)	120,106	1912 (*b*)	74,314	5,908
1902	129,653	1908 (*a*)	108,000	1913 (*b*)	93,190	5,893
1903	77,360			1914 (*c*)	94,154	5,287

*Statistique de l'Industrie Minérale en France et en Algérie, Paris.
(*a*) The figures represent production.
(*b*) Statistics are taken from Mining Journal, London, May 14th, 1914.
(*c*) From the "Mineral Industry," 1914, Vol. XXIII, p. 545.

Assuming the nickel in the ore to average 6 per cent, and in the matte 45 per cent, the production of nickel metal from New Caledonia ores since 1909 has been approximately as follows:—

Year.	*Metric tons* (2204 pounds).
1909	5,160
1910	7,267
1911	8,550
1912	7,117
1913	8,243
1914	8,028

Norway.

The following statistics showing the production of nickel ore and of nickel metal in Norway, from 1901 to 1911, have been compiled from the Annual Reports on "Mines and Quarries," published by the Home Office, London, Eng.

Year.	Production of Nickel ore.	Ore smelted at Evje, Norway, and Nickel and Copper produced.		
	Metric tons.	Ore smelted. Tons.	Nickel produced. Tons.	Copper produced. Tons.
1901	2,018	.....	.....	.....
1902	4,040	.....	.....	.....
1903	5,670	.....	.....	.....
1904	5,352	.....	.....	.....
1905	5,477	4,639	78	51
1906	6,081	4,809	81	53
1907	5,781	5,493	81	53
1908	5,190	4,820	62	39
1909	5,770	5,400	60	37
1910	19,639	.....	172	.....
1911	27,743	.....	488	.....
*1912	30,692	.....	390	.....
**1913	.....	.....	600	.....
***1914	.....	.....	800	.....

* *In 1912.* According to "Mineral Industry," New York, 29,500 tons of ore from two mines in Norway, and 3,000 tons of ore imported from Greece were smelted at Evje and the matte refined at Christiansand producing 400 tons of nickel and 200 tons of copper.

** *In 1913.* The production has been officially reported as 600 metric tons of nickel.

*** *In 1914.* The London Mining Journal of Sept. 19th, 1914, reports that "the Evje nickel works, near Christiansand which were temporarily shut down have with a new supply of raw material been started again on their former scale." The production is reported to have exceeded that of 1913, and is estimated on reliable authority at 800 tons.

Prussia.

The annual production of nickel ore in Prussia from 1902 to 1911, as compiled from the "Mines and Quarries," Home Office Report is given herewith:—

Year.	Metric tons.	Year.	Metric tons.
1902	11,816	1908	8,238
1903	14,058	1909	10,095
1904	13,518	1910	10,053
1905	10,743	1911	9,608
1906	7,472	1912*	12,091
1907	7,557	1913*	13,538

*Engineering and Mining Journal, Dec. 26, 1914.

This production is obtained chiefly from one mine the ore from which is reported to average less than 2 per cent in nickel.

Greece.

The production of nickel ore in Greece from 1909 to 1912 is reported as follows by the same authority:—

Year.	*Metric tons.*
1909	104
1910	110
1911	7,983
1912	15,111

"In Greece in 1909 garnierite was discovered at Thebes and Lokeis. The ore contained 4 to 5½ per cent nickel and altogether 24,000 tons were exported." (Probably total exports 1909 to 1912 inclusive).‡

The production of raw nickel at smelting works (partly estimated) is given by "Metallgesellschaft," as follows:—

Production of Raw Nickel at Smelting Works, in Metric Tons.

Producing country.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
United States of North America and Canada	6,500	6,500	7,000	9,000	10,000	12,000	15,000	.....	.....
England	3,200	3,200	3,000	3,200	3,500	4,500	5,200	.....	.....
Germany*	2,800	2,600	3,000	3,500	4,500	5,000	5,000	.....	.....
France	1,800	1,800	1,400	1,200	1,500	2,000	2,100	.....	.....
Other countries	.....	.....	200	400	600	1,000	1,200	.....	.....
Total production†	14,300	14,100	14,600	17,300	20,100	24,500	28,500	30,000	.....

*The figures of production stated for Germany only cover the output in the Kingdom of Prussia; nickel is also produced in the Kingdom of Saxony, but no data are obtainable of this production which is, however, not important.

†The entire production of nickel, apart from quite insignificant quantities obtained in Germany, Norway, and the United States of America, comes from New Caledonia and Canadian ores.

‡From the "Mineral Industry," 1912, p. 617.

PLATINUM AND PALLADIUM.

In past years the chief source of the platinum production of Canada was the placer gravels of British Columbia, principally in the Similkameen district. During 1913 operators in the Cariboo district of British Columbia report a recovery of 18 crude ounces of platinum valued at $489. More attention is being paid to the recovery of this metal especially in the Similkameen where it is proposed to re-work some of the old placers.

One or two companies operating in the Quesnel River district report small quantities of platinum with placer gold but the information is not sufficiently definite for record.

Annual Production of Platinum.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Crude Ozs.	Value.
	$		$			$
1887	5,600	1894	950	1901		457
1888	6,000	1895	3,800	1902		46,502
1889	3,500	1896	750	1903		33,345
1890	4,500	1897	1,600	1904		10,872
1891	10,000	1898	1,500	1905		500
1892	3,500	1899	825	1906		*
1893	1,800	1900	Nil.	1907-1912		**
				1913	18	489

*See under Palladium.
**See explanation in text.

Annual Production of Palladium.

	Ozs.	Value.
1902 Palladium	4,411	$ 86,014
1903 "	3,177	61,952
1904 "	952	18,564
1905 Metals of the platinum group	1,562	28,116
1906 " "	314	5,652
1907-1914	*	.....

*See explanation in text.

The nickel-copper ores of the Sudbury district also carry small quantities of the metals of the platinum group, and since 1902 considerable quantities of these metals have been recovered from the residues resulting from the treatment of the mattes from Sudbury.

The International Nickel Company have been good enough to inform us that the recovery of gold, silver, platinum, and palladium at their works in New Jersey for the six years ending December 31, 1912, was as follows:—

Year.	Gold.	Silver.	Platinum.	Palladium.
	Ozs.	Ozs.	Ozs.	Ozs.
1907	993·572	63,400·70	226·800	607·300
1908	5,238·181	139,329·29	172·316	382·287
1909	2,113·669	63,138·66	546·627	1,270·598
1910	2,649·799	60,256·83	258·325	522·804
1911	2,203·052	70,954·38	665·552	753·363
1912	2,476·558	62,169·66	496·850	680·130
	15,674·831	459,249·52	2,366·470	4,216·482

In view, however, of the fact that other material has been treated in the Company's works in addition to the nickel-copper mattes from Copper Cliff, Ontario, it is impossible to state what proportion of the above recoveries was from Canadian sources, although it is, of course, safe to assume that part of these metals has been derived from the Sudbury District mattes. The Company reported there had been no production in 1913 and 1914 from Canadian ores.

Average Prices of Platinum.[1]

(In dollars per ounce troy).

	1910.	1911.	1912.	1913.	1914.
	$	$	$	$	$
New York refined platinum	32·70	43.12	45.55	44.88	45.14
St. Petersburg, Russia, 83%	26.96	35.21	37.08	36.54	.....
Ekaterinburg Crude Metal Platinum	26.37	35.09	37.05	36.25	.....

[1] From quotation in Engineering and Mining Journal, p. 77, January 9th, 1915.

Annual Imports of Platinum.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1883	113	1894	7,151	1905	61,719
1884	576	1895	3,937	1906	54,494
1885	792	1896	6,185	1907 (9 mos.)	113,485
1886	1,154	1897	9,031	1908	60,390
1887	1,422	1898	9,781	1909	45,534
1888	13,475	1899	9,671	Calendar Year.	
1889	3,167	1900	57,910	1910	102,318
1890	5,215	1901	20,263	1911	176,101
1891	4,055	1902	19,357	1912	232,163
1892	1,952	1903	21,251	1913	145,674
1893	14,082	1904	28,112	1914*	79,614

*Platinum wire and platinum in bars, strips, sheets or plates; platinum retorts, pans, condensers, tubing and pipe, imported by manufacturers of sulphuric acid for use in their works; crucibles. Duty free.

SILVER.

In 1914 the total production of silver, including that produced as bullion, and the metal estimated as recovered from ores sent to smelters or otherwise treated, was 28,449,821 fine ounces, valued at $15,593,630, compared with 31,845,803 fine ounces, valued at $19,040,924 in 1913, showing a falling off of 3,395,982 fine ounces or 10·6 per cent in quantity, and $3,447,294, or 18·2 per cent in value.

Statistics of the annual production of silver since 1887 are given in the following table:—

Annual Production of Silver 1887-1914.

Year.	Ozs.	Value.	Average price per oz.	Year.	Ozs.	Value.	Average price per oz.
		$	Cts.			$	Cts.
1887	355,083	347,271	98·00	1901	5,539,192	3,265,354	58·95
1888	437,232	410,998	94·00	1902	4,291,317	2,238,351	52·16
1889	383,318	358,785	93·60	1903	3,198,581	1,709,642	53·45
1890	400,687	419,118	104·60	1904	3,577,526	2,047,095	57·22
1891	414,523	409,549	98·00	1905	6,000,023	3,621,133	60·35
1892	310,651	272,130	86·00	1906	8,473,379	5,659,455	66·79
1893	.....	330,128	77·00	1907	12,779,799	8,348,659	65·33
1894	847,697	534,049	63·00	1908	22,106,233	11,686,239	52·86
1895	1,578,275	1,030,299	65·28	1909	27,529,473	14,178,504	51·50
1896	3,205,343	2,149,503	67·06	1910	32,869,264	17,580,455	53·49
1897	5,558,456	3,323,395	59·79	1911	32,559,044	17,355,272	53·30
1898	4,452,333	2,593,929	58·26	1912	31,955,560	19,440,165	60·83
1899	3,411,644	2,032,658	59·58	1913	31,845,803	19,040,924	59·79
1900	4,468,225	2,740,362	61·33	1914	28,449,821	15,593,630	54·81

From 1887 to 1893 the production ranged in value between $300,000 and $400,000, and was derived chiefly from Ontario and Quebec. The next three years saw a rapid increase in production, due to the development of the silver-lead deposits of British Columbia, and in 1896 a production of over $2,000,000 is recorded. From that year until 1905 the production varied between $2,000,000 and $3,500,000 rising rapidly during the next six years to $17,580,455 in 1910, as a result of the discovery of the rich ores of the Cobalt district. Since then there has been a falling off in quantity, but owing to the higher price of the metal the total value was higher in 1912 and 1913.

Ontario in 1905 produced 40·9 per cent of the output of Canada; in 1911 its percentage was 93·8, while in 1914 its percentage was 88·4 and that of British Columbia was 11·1.

Statistics of the annual production in each province are shown in the table following:—

Production of Silver by Provinces, 1887-1914.

Calendar Year.	Ontario.		Quebec.		British Columbia.		Yukon Territory.	
	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.
		$		$		$		$
1887	190,495	186,304	146,898	143,666	17,690	17,301	.....	.....
1888	208,064	195,580	149,388	140,425	79,780	74,993	.....	.....
1889	181,609	169,986	148,517	139,012	53,192	49,787	.....	.....
1890	158,715	166,016	171,545	179,436	70,427	73,666	.....	.....
1891	225,633	222,926	185,584	183,357	3,306	3,266	.....	.....
1892	41,581	36,425	191,910	168,113	77,160	67,592	.....	.....
1893	.....	8,689	.....	126,439	.....	195,000	.....	.....
1894	.....	.....	101,318	63,830	746,379	470,219	.....	.....
1895	.....	.....	81,753	53,369	1,496,522	976,930	.....	.....
1896	.....	.....	70,000	46,942	3,135,343	2,102,561	.....	.....
1897	5,000	2,990	80,475	48,116	5,472,971	3,272,289	.....	.....
1898	85,000	49,521	74,932	43,655	4,292,401	2,500,753	.....	.....
1899	202,000	120,352	40,231	23,970	2,939,413	1,751,302	230,000	137,034
1900	161,650	99,140	58,400	35,817	3,958,175	2,427,548	290,000	177,857
1901	151,400	89,250	41,459	24,440	5,151,333	3,036,711	195,000	114,953
1902	145,000	75,632	42,500	22,168	3,917,917	2,043,586	185,900	96,985
1903	17,777	9,502	28,600	15,287	2,996,204	1,601,471	156,000	83,362
1904	206,875	118,376	15,000	8,583	3,222,481	1,843,935	133,170	76,201
1905	2,451,356	1,479,442	19,620	11,841	3,439,417	2,075,757	89,630	54,093
1906	5,401,766	3,607,894	17,686	11,813	2,990,262	1,997,226	63,665	42,522
1907	9,982,363	6,521,178	16,000	10,452	2,745,448	1,793,519	35,988	23,510
1908	19,398,545	10,254,847	13,299	7,030	2,631,389	1,391,058	63,000	33,304
1909	24,822,099	12,784,126	13,233	6,815	2,649,141	1,364,387	45,000	23,176
1910	30,366,366	16,241,755	7,593	4,061	2,407,887	1,287,883	87,418	46,756
1911	30,540,754	16,279,443	18,435	9,827	1,887,147	1,005,924	112,708	60,078
1912	29,214,025	17,772,352	9,465	5,758	2,651,002	1,612,737	81,068	49,318
1913	28,411,261	16,987,377	34,573	20,672	3,312,343	1,980,483	87,626	52,392
1914	25,139,214	13,779,055	57,737	31,646	3,159,897	1,731,971	92,973	50,959

Prices:—The average weekly price of fine silver in New York during 1914 varied between 59 cents per ounce towards the end of April, and a minimum of 48½ cents in the last week of October, the average monthly price for the year being 54·811 cents per ounce, as against 59·791 cents in 1913, and 60·835 cents in 1912.

In London the average monthly price of silver in 1914 was 25·313 pence per standard ounce 0·925 fine, as against 27·576 pence in 1913.

The normal differential between the official prices at London and New York is about 1½ cents per ounce, but the European war caused this to run up to 6 cents per ounce and even higher.

The average monthly prices of silver in New York from 1910 to 1914 and in London during 1914 are shown in tabulated form following.

Average Monthly Prices of Silver.

Months.	New York.—Cents per fine ounce					London.—Pence per Standard ounce (a).
	1910.	1911.	1912.	1913.	1914.	1914.
January	52·375	53·795	56·260	62·938	57·572	26·553
February	51·534	52·222	59·043	61·642	57·506	26·573
March	51·454	52·745	58·375	57·870	58·067	26·788
April	53·221	53·325	59·207	59·490	58·519	26·958
May	53·870	53·308	60·880	60·361	58·175	26·704
June	53·462	53·043	61·290	58·990	56·471	25·948
July	54·150	52·630	60·654	58·721	54·678	25·219
August	52·912	52·171	61·606	59·293	54·344	25·979
September	53·295	52·440	63·078	60·640	53·290	24·260
October	55·490	53·340	63·471	60·793	50·654	23·199
November	55·635	55·719	62·792	58·995	49·082	22·703
December	54·428	54·905	63·365	57·760	49·375	22·900
Avcrage for the year	53·486	53·304	60·835	59·791	54·811	25·313

(a) 925 parts fine.

Important quantities of silver are being produced in Canada both as fine metal and as silver bullion ranging in fineness from 850 to 998·2. Fine silver is produced at Trail, B.C., by the Consolidated Mining and Smelting Company of Canada, Limited, being derived chiefly from the silver-lead ores of that Province, and finds a market in Canada, the United States, and China.

The annual production of fine silver at Trail since 1904 has been as follows:—

Year.	Fine ozs.	Year.	Fine ozs.
1904	551,450	1910	1,798,960
1905	1,088,328	1911	1,325,601
1906	1,263,809	1912	1,896,999
1907	1,631,422	1913	2,433,002
1908	1,956,039	1914	2,043,868
1909	2,003,003	Total	17,992,481

In Ontario ores from the Cobalt district are treated by:—

The Coniagas Reduction Co., Thorold, Ont.
The Deloro Mining and Reduction Co., Deloro, Ont.
The Buffalo and Ontario Smelting and Refining Co., Kingston, Ont.
Dominion Refineries, Limited, North Bay, Ont.
Standard Smelting and Refining Co., North Bay, Ont.
Metals Chemical Co., Welland, Ont.
Canada Refining and Smelting Co., Orillia, Ont.

Silver bullion of a fineness varying from 850 to 998·2 is produced at the works, other products being white arsenic, nickel and cobalt-oxides and mixed oxides. The silver bullion as a rule finds a market in the United States and in England.

Bullion shipped by these Ontario smelters in 1907 contained 4,449,722 fine ounces of silver; in 1908, 11,168,689 ounces; in 1911, 17,753,167 ounces; in 1913, 11,356,707 ounces; and in 1914, 9,042,993 fine ounces.

The decrease is accounted for by the treatment of the greater part of the high grade ore in the camp itself.

The bullion shipped from the mines and mills in the Cobalt district in 1914, is reported as 10,335,527 fine ounces.

United States smelters report the receipt of 7,206 tons of ore containing 3,966,301 fine ounces of silver.

The imports of silver bullion into Canada in 1914 were valued at $629,279, as against imports to the value of $840,245 in 1913 and $1,100,344 in 1912.

The exports of silver during 1914 were 28,020,089 fine ounces valued at $15,584,813, as against exports of 37,371,569 fine ounces valued at $21,441,220 in 1913, and 34,911,922 fine ounces valued at $19,494,416 in 1912.

Statistics of silver contained in ore, matte or other form exported from Canada since 1886 as compiled from the reports of Trade and Navigation, and published by the Customs Department, are shown in the following table:—

Exports of Silver in Ore, etc.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1886	25,957	1896	2,271,959	1906	5,686,444
1887	206,284	1897	3,576,391	1907	9,941,849
1888	219,008	1898	2,902,277	1908	12,403,482
1889	212,163	1899	1,623,905	1909	15,719,909
1890	204,142	1900	2,341,872	1910	15,649,537
1891	225,312	1901	2,026,727	1911	15,807,366
1892	56,688	1902	1,820,058	1912	19,494,416
1893	213,695	1903	1,989,474	1913	21,441,220
1894	359,731	1904	1,904,394	1914	15,584,813
1895	994,354	1905	2,777,218		

Quebec.

The small quantity of silver credited to Quebec province for a number of years represents a small silver content of the pyritic ores mined at Eustis and Weedon, in the Eastern Townships. The production in 1914 was 57,737 fine ounces valued at $31,646, as against 34,573 fine ounces valued at $20,672 in 1913.

Ontario.

The production of silver in Ontario increased from 17,777 fine ounces in 1903 to 2,451,356 fine ounces in 1905 and reached a maximum of 30,540,754 fine ounces in 1911. The maximum value $17,772,352 was reached in 1912.

In 1914 the production was 25,139,214 fine ounces valued at $13,779,055, a decrease from 1913 of 11·5 per cent in quantity and 18·9 per cent in total value. The production includes 56,259 ounces contained in gold bullion in addition to the production of the Cobalt and adjacent silver camps.

The silver ores of the Cobalt district, which in the early days of the camp were all exported for treatment, are being reduced to an increasing extent each year within the camp in cyanide and other mills, with recovery of silver bullion. During 1914 over 41 per cent of the output was thus recovered as bullion in the district, while 36 per cent of the total was recovered by the silver smelters in Ontario, so that over 77 per cent of the Ontario production was recovered in the form of bullion within the Province.

There was shipped from the Cobalt district during 1914, as closely as could be ascertained, about 16,197 tons of ore and concentrates, containing, after deducting 5 per cent for the smelter losses, 14,747,428 ounces of silver. Over 745,000 tons of ore were treated during the year in the various mills of the district. The recovery of bullion in the district as metallics and from cyanide and high grade mills was 10,335,527 ounces.

In the following table a record of shipments since 1904 is given, the figures of the first three years being those published by the Ontario Bureau of Mines.

Silver Ore and Bullion Shipments from Cobalt Mines, 1904-1914.

Year.	Shipments.		Silver content.		Silver in ounces. per ton.		Silver bullion shipments. Fine ounces.	Total value of silver.
	Ore. Tons.	Concentrate. Tons.	Ore. Ozs.	Concentrate. Ozs.	Ore.	Concentrate.		
								$
1904	158	.....	206,875	.....	1,309	.....	.....	118,376
1905	2,144	.....	2,451,356	.....	1,143	.....	.....	1,473,192
1906	5,335	.....	5,401,766	.....	1,013	.....	.....	3,607,894
1907	14,644	.....	9,982,363	.....	682	.....	.....	6,521,178
1908	25,682	(a)	19,398,545	(a)	755	(a)	.....	10,254,847
1909	27,835	3,059	22,349,717	3,627,819	803	1,186	143,440	12,784,126
1910	28,684	6,943	23,797,111	7,111,579	830	1,024	1,003,111	16,241,755
1911	15,417	9,329	20,065,621	8,118,231	1,300	870	3,766,022	16,279,443
1912	17,899	11,217	15,929,289	9,774,697	890	871	4,778,852	17,762,384
1913	(b) 29,741	10,838	13,601,286	8,260,888	457	762	7,599,929	16,962,105
1914	5,235	12,376	7,652,374	9,061,191	1,462	732	10,335,527	13,748,219

(a) Included in ore.
(b) Includes some ore treated in customs mills in the District.

While the greater number of the mining companies, hold unrestricted titles to their properties, several are operated on a royalty basis on mining lands owned and leased by the Timiskaming and Northern Ontario Railway Commission. Mr. A. A. Cole, Mining Engineer to the Commission has in his annual report some interesting statistics from which the following tables and extracts have been drawn:—

Ore Shipments from the Cobalt District for the Years 1904 to 1914

Mine.	1904 to 1909 Incl.	1910.	1911.	1912.	1913.	1914.	Totals 1904–1914.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Badger	.....	.....	27·10	.....	.....	.....	27·10
Bailey	155·65	.....	20·00	41·57	150·35	20·50	388·07
Beaver	51·38	140·06	790·81	402·97	292·21	392·07	2,069·50
Buffalo	3,620·90	1,185·77	1,275·19	1,251·64	66·13	.....	7,399·63
Casey-Cobalt	18·50	48·40	277·74	214·34	401·54	608·30	1,568·82
Chambers-Ferland	741·77	885·92	622·85	501·29	223·78	308·06	3,283·67
City of Cobalt	1,378·47	329·40	281·30	230·00	105·14	495·71	2,820·02
Comet Cobalt (Drummond)	2,798·33	2,194·41	714·83	458·85	610·06	587·03	7,363·51
Cobalt Lake	321·44	296·80	2,111·32	1,085·22	1,196·33	919·01	5,930·12
Cobalt Townsite	348·28	310·99	703·51	1,944·77	2,762·54	1,950·73	8,020·82
Colonial	55·38	178·60	114·10	86·48	21·56	.....	456·12
Coniagas	4,317·17	1,261·46	1,813·89	2,119·87	1,620·40	1,217·26	12,350·05
Crown Reserve	3,824·87	2,814·25	977·32	561·65	791·15	1,067·00	10,036·24
Foster	818·08	.....	.....	.....	.....	4·50	822·58
Green Meehan	135·42	.....	102·98	.....	12·96	.....	251·36
†Hargrave	28·45	343·68	102·44	17·35	.....	.....	491·92
Hudson Bay	1,987·40	260·33	898·88	694·55	609·14	647·95	5,098·25
Imperial Cobalt	14·61	.....	.....	.....	.....	.....	14·61
Kerr Lake	2,366·72	5,088·78	1,292·58	788·10	933·35	628·42	11,097·95
King Edward (Watts)	534·89	134·12	20·00	.....	87·21	.....	776·22
LaRose	15,938·35	5,131·53	3,581·54	3,511·40	3,275·14	1,582·54	33,020·50
‡Lawson	75·73	.....	.....	.....	.....	.....	75·73
Lost and Found	.....	.....	.....	65·20	8·80	.....	74·00
Lumsden	.....	.....	.....	.....	20·00	.....	20·00
McKinley-Darragh	4,154·84	2,393·39	3,238·64	2,673·40	2,865·66	2,903·50	18,229·43
Mg. Corporation of Canada	.....	.....	.....	.....	.....	756·77	756·77
Nancy Helen	347·74	.....	.....	.....	.....	.....	347·74
Nipissing	15,248·84	6,833·81	2,952·20	1,869·27	1,950·22	1,235·07	30,089·41
North Cobalt	6·87	.....	3·00	.....	.....	.....	9·87
Nova Scotia	778·90	.....	.....	.....	.....	.....	778·90
O'Brien	6,510·73	608·57	628·44	711·43	703·43	523·21	9,685·81
*Penn Canadian	604·23	285·62	22·40	126·35	332·18	460·53	1,831·41
Peterson Lake Leases	.....	.....	.....	.....	.....	122·52	122·52
Gould	.....	.....	.....	.....	9·00	50·65	59·65
(Little Nipissing)	80·29	313·76	28·45	.....	.....	.....	422·50
(Nova Scotia)	121·15	.....	.....	.....	.....	.....	121·15
Seneca Superior	.....	.....	.....	432·97	457·93	398·96	1,289·86
Provincial	75·84	52·05	100·54	22·22	.....	.....	250·65
‡Princess	3·93	.....	.....	.....	.....	.....	3·93
Red Rock	45·71	.....	.....	.....	.....	.....	45·71
Right of Way	2,534·65	981·41	666·06	243·24	146·12	184·16	4,755·64
Rochester	.....	28·30	.....	.....	.....	.....	28·30
Silver Bar	0·58	.....	2·72	.....	20·00	20·00	43·30
Silver Cliff	309·50	156·84	92·30	.....	48·05	.....	606·69
Silver Leaf	252·39	.....	.....	.....	.....	.....	252·39
Silver Queen	1,856·58	.....	.....	31·25	201·98	105·42	2,195·23
Timiskaming	1,851·66	1,119·12	855·60	967·31	406·26	417·56	5,617·51
Timiskaming-Cobalt	88·45	.....	.....	.....	.....	.....	88·45
Trethewey	3,814·83	536·64	602·98	579·10	587·54	613·28	6,734·37
‡University	231·51	.....	.....	.....	.....	.....	231·51
Victoria	0·47	.....	.....	.....	.....	.....	0·47
Violet	36·00	.....	.....	.....	.....	.....	36·00
Waldman	.....	38·81	.....	.....	.....	.....	38·81
Wyandoh	.....	24·15	.....	.....	.....	.....	24·15
Total	78,487·58	33,976·97	24,921·71	21,631·79	20,916·16	18,220·71	198,154·92

†The shipment in 1905 was made by the White Silver Mining Co., the former owner of the Hargrave property.

‡Shipments from Lawson, Princess, and University, since 1907, included with La Rose.

*Shipments up to the end of 1911 made by the Cobalt Central Mining Company former owner of the Penn Canadian.

The total amount of low grade ore treated at the concentrating and cyanide mills during 1914 was 743,531 tons, as against 664,845 tons in 1913, an increase of 11·8 per cent, while that in 1913 was 46 per cent over the previous year.

The tonnage of ore milled and concentrates produced during 1914 is given in the following table.

Mills and mines.	Tons milled.	Concentrates			Concentration ratio.
		Jigs.	Tables.	Total.	
Beaver	27,069	121·2	227·8	349·0	78–1
Buffalo	55,254	.....	.....	832·0	66–1
Casey-Cobalt	24,236	21·3	534·4	555·7	43–1
Cobalt Lake	53,753	272·7	824·6	1,097·3	49–1
Cobalt Reduction	92,021	.....	.....	2,717·4	34–1
Colonial:—					
Right of Way	7,470	.....	.....	146·0	51–1
Coniagas	54,646	124·0	625·0	749·0	73–1
Hudson Bay	11,304	96·2	261·2	357·4	31–1
McKinley-Darragh	66,765	161·0	2,344·0	2,505·0	27–1
Northern Customs:—					
La Rose	52,273	.....	1,233·1	1,233·1	42–1
Chambers Ferland	10,625	.....	311·0	311·0	34–1
Cobalt Alladin	1,120	.....	38·6	38·6	29–1
Cariboo-Cobalt	1,042	.....	37·4	37·4	28–1
O'Brien	51,892	97·0	189·0	286·0	181–1
Penn Canadian	25,478	98·3	278·8	377·1	68–1
Seneca Superior	2,526	40·9	67·4	108·4	23–1
Timiskaming	18,779	82·8	292·8	375·6	50–1
Trethewey	35,215	53·2	553·4	606·6	58–1
Total	591,468			12,682·6	47–1

Cyanide mills.	Tons of ore treated.	Ozs. bullion produced.
Dominion Reduction:—		
Comet (Drummond)	20,160·2	1,586,783
Crown Reserve	31,503·0	
Drummond Fraction	3,674·0	
Kerr Lake	17,601·5	
Nipissing, Low Grade	79,125·0	2,261,023
Total	152,063·7	3,847,806

Total tons milled by water concentrating mills	591,468
Total tons milled by cyanide mills	152,063
Total tons milled, 1914	743,531

At the Buffalo mine the cyanide plant, which forms part of the low grade mill, treated 9,105 tons of slimes, producing 67,429 ounces.

The Cobalt Reduction Mill, which now forms part of the Mining Corporation of Canada, Ltd., has been extended by the addition of a cyanide plant for the treatment of slimes doing away with the use of vanners.

At the Dominion Reduction Mill, besides the silver bullion there were produced 1,764 tons of amalgamation residues, which were shipped to the smelters.

In the O'Brien Mill the jig concentrates contained 139,022 ounces and the table concentrates 278,045 ounces. The tailings from the concentrating tables amounting to 51,606 tons were cyanided, and produced 448,720 fine ounces silver.

The Buffalo High Grade Mill treats the concentrates from the Low Grade Mill, as well as metallics, and hand picked raw ore from the mines.

The residues from this mill have been stored for a possible further treatment for the nickel, cobalt, and other valuable constituents.

They have already been re-treated and the mercury extracted that was taken up in the amalgamation process used for the extraction of the silver. The mill treated 14 tons of raw ore and 792 tons of concentrates and metallics, producing 930,551 fine ounces in bullion.

The Nipissing High Grade Mill treated 1,885 tons, containing 4,454,180 ounces, and shipped 1,238 tons of residues, most of which was shipped to Birmingham, England, the value being in the cobalt contents.

British Columbia.

The chief sources of the silver production in this Province are the silver-lead ores of the East and West Kootenays, supplemented by the silver contained in the gold-copper ores of Rossland, the Boundary, and Coast districts. The production in 1914 based on smelter recoveries, was 3,159,897 ounces, valued at $1,731,971.

The leading silver producers of the Province, in order of importance were: Silver-lead mines—the Standard, Sullivan, Number One, Rambler-Cariboo, Silver Standard, Vancouver, Silver King, Slocan Star, and Blue Bell.

Among the copper-gold mines might be mentioned the Granby, at Phoenix, Hidden Creek at Anyox, and the Centre Star-Le Roi and Le Roi No. 2 groups in Rossland.

In the Minister of Mines Report for British Columbia, for 1914, it is stated that, "The Slocan District, including the Ainsworth, Slocan, Slocan City and Trout Lake Mining Divisions—produced about 59 per cent of the total provincial output of silver this year, and the Fort Steele Mining Division about 13·7 per cent, all from argentiferous galena. The remainder is chiefly derived from the smelting of copper ores carrying silver."

"The Slocan, and Slocan City Divisions, alone produced about 49·4 per cent."

The production of silver by districts, as reported by the Minister of Mines, is shown in the following table:—

Production of Silver in British Columbia by Districts, 1909-1914.*

(Silver Contents of Ores shipped.)

——	1910.	1911.	1912.	1913.	1914.
	Ozs.	Ozs.	Ozs.	Ozs.	Ozs.
Cariboo—					
Omineca division	.....	.....	.....	46,298	135,265
Cassiar	1,454	29,976	5,868	4,714	131,509
Kootenay, East—					
Fort Steele division	501,475	330,235	376,918	362,311	492,080
Other divisions	243	.....	7,405	4,756	.....
Kootenay, West—					
Ainsworth division	233,010	77,375	301,755	447,015	329,586
Nelson division	45,787	76,774	164,182	129,011	150,268
Slocan division	964,634	793,926	1,657,105	1,841,226	1,775,975
Trail Creek division	87,833	88,076	87,530	109,585	136,185
Other divisions	107,753	67,884	43,536	23,397	11,757
Yale—					
Boundary	460,945	326,849	389,341	394,048	347,981
Yale division	3	343	.....	461	.....
Coast and other districts	47,104	100,926	98,468	103,034	91,574
Total	2,450,241	1,892,364	3,132,108	3,465,856	3,602,180

*From the Minister of Mines Reports, British Columbia.

Yukon.

The figures of the silver production of the Yukon given in the following table represent the silver alloyed with the placer gold, together with a small amount from the lode mines of the district. On an average about one ounce of silver is contained in each five ounces of crude bullion from the alluvial workings.

The production may be given as follows:—

Annual Production of Silver in the Yukon District.

	Placer ozs.	Value.	Lode ozs.	Value.	Total ozs.	Value.
		$		$		$
1909	45,000	23,176	.....	.....	45,000	23,176
1910	50,000	26,743	37,418	20,013	87,418	46,756
1911	50,300	26,812	62,408	33,206	112,708	60,078
1912	60,302	36,685	20,766	12,633	81,068	49,318
1913	63,522	37,980	24,104	14,412	87,626	52,392
1914	55,744	30,554	37,229	20,405	92,973	50,959

TIN.

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important, perhaps, being the discovery of cassiterite, near New Ross, Lunenburg county, Nova Scotia. Reports upon it may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines, for 1907, 1908, 1910, 1911, and 1912.

Tin in Black Sands.

During 1913 a sample shipment of one ton of black sand was made from the Atlin district of British Columbia, which is reported to have assayed 6·71 per cent tin. The black sand was obtained from alluvial sluice boxes in this camp. Stream tin has also been found in some of the Yukon placer deposits and a small quantity, recovered in the gold dredging operations, is reported to have been marketed, though no direct returns of production have been obtained.

The imports of tin in 1914 included tin in blocks, pigs and bars 3,382,700 pounds valued at $1,191,466; tin foil 1,244,628 pounds valued at $173,088; tin crystals valued at $7,759; and tinware and manufactures of tin valued at $650,987.

There is also a large annual import of "tin plate," the quantity and value in 1914 being 101,581,800 pounds, valued at $3,151,385.

The annual imports of tin since 1910 are shown herewith.

Annual Imports of Tin.

Calendar Year.	Tin in blocks, pigs and bars.		Tin foil.		(a) Tinware, etc.	Tin crystals.	Bichloride of tin.	
	Pounds.	Value.	Pounds.	Value.	Value.	Value.	Pounds.	Value.
		$		$	$	$		$
1910	3,231,100	1,058,778	866,751	114,602	389,040	3,903	31,219	3,846
1911	4,047,500	1,623,670	1,531,877	176,602	461,029	4,370	25,797	3,876
1912	4,894,700	2,134,221	1,316,882	183,707	540,599	6,308	36,045	5,595
1913	5,085,700	2,252,324	1,074,131	188,779	667,158	8,077	19,114	2,422
1914	3,382,700	1,191,466	1,244,628	173,088	650,987	7,759	200	29

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin n.e.s.

Prices:—The price of tin in New York was about 50 cents per pound in January of 1913 but contraction in consumption caused a gradual decline throughout the year. In January 1914 the price of tin was 37·779 cents per pound, and raised to 39·830 cents in February, decreasing to 30·284 cents in October, and increasing again to 33·601 in December.

TUNGSTEN.

No production of tungsten is reported during 1914.

Scheelite was discovered in Halifax county, Nova Scotia, in 1908. Mr. Faribault, of the Geological Survey, visited this deposit again in 1909, and a preliminary report thereon will be found in the Summary Report of the Geological Survey for 1909, pages 228 to 234. During 1910 and 1912 these deposits were developed by the Scheelite Mines, Limited, who constructed a mill and made a shipment of 14 tons of tungsten concentrates—the first shipment from Nova Scotia—carrying 72 per cent tungstic acid.

The occurrence of wolframite has also been noted in association with molybdenite, by Dr. Walker, in New Brunswick, near the confluence of Burnt Hill brook and southwest Miramichi river. The property was tested by Mr. Freeze, of Doaktown, New Brunswick, and Mr. Matthew Lodge, of Moncton, who formed the Acadia Tungsten Mines Company. This Company has done a little development.

Prices:—"During the first 7 months of 1914, the price of tungsten was about $0.67 per pound. Since the war lots for immediate shipment have sold as high as $1.35 per pound."—(Engineering & Mining Journal).

ZINC.

The production of zinc ore in Canada in 1914, as obtained by direct returns from producers, was 10,893 tons, valued at $262,563, the greater part being from British Columbia. The zinc content of these shipments was returned as 9,101,460 pounds, which, if valued at the average New York price of spelter during the year, 5·213 cents, would be worth $474,459.

The ore shipped from British Columbia contains also a varying silver content, for which payment is made by the smelters, and without which, on account of the import duty to the United States and the long rail haul, it would not in many cases pay to ship.

The British Columbia shipments were heavy as a result of the activity of the Slocan mines and mills. There were also shipments from Notre Dame des Anges, Portneuf county, Quebec.

During 1913 the new United States customs tariff came into effect, considerably reducing the duties payable on Canadian ores, the new items affecting Canadian shipments being:—

Zinc ores containing 25 per cent or more zinc: 10 per cent on zinc contained therein.

Lead bearing ore: $\frac{3}{4}$ cent per pound on lead contained therein.

Although not paid for by the United States smelters, the lead in ore is considered as dutiable and as there is often a small lead content in the zinc ore or concentrates shipped, the lead duty applies. The result of the decreased duties has been a considerable increase in zinc shipments.

During 1914 there were received at American smelting works from Canadian mines 12,171·5 tons of zinc concentrates, containing 10,008,478 pounds of zinc.

In 1913 these works reported the receipt of 7,074 tons containing 5,941,727 pounds of zinc; and in 1912, 7,190 tons containing 6,393,983 pounds of zinc.

Statistics of the production of zinc since 1898 are given in the following table:—

Annual Production of Zinc.

Calendar Year.	Zinc ore shipped.		Metallic zinc in ore shipped.	
	Tons.	Spot value.	Lbs.	Final value.
		$		$
1898	1,162	11,000	788,000	36,011
1899	865	18,165	814,000	46,805
1900	261	4,810	212,000	9,342
1901	.....	.....	.....	.....
1902	158	1,659	142,200	6,882
1903	1,000	10,500	900,000	48,660
1904	597	3,700	477,568	24,256
1905	9,413	139,200	*	*
1906	1,154	23,800	*	*
1907	1,573	49,100	*	*
1908	452	3,215	*	*
1909 (a)	18,371	242,699	16,468,204	906,245
1910	5,063	120,003	4,361,712	240,766
1911	2,590	101,072	2,346,849	135,132
1912	6,415	215,149	5,354,700	371,777
1913	7,889	186,827	7,069,800	399,302
1914	10,893	262,563	9,101,460	474,459

*Figures not available.
(a) Includes 7,424 tons shipped late in 1908.

The imports of zinc, taken as an index of consumption, show a fairly steady increase. The total imports of zinc in blocks and pigs and spelter, were in 1880 some 744 tons; in 1889 they had risen to 1,427 tons and remained fairly stationary the next ten years. In 1899 they were 1,213 tons and rose to 4,110 for the fiscal year 1909.

During the calendar year 1914 the imports were 7,003 tons valued at $740,816, in addition to which there were 4,723 tons zinc white valued at $389,796, zinc manufactures to the value of $36,355; also zinc dust 181 tons valued at $34,295; and sulphate and chloride of zinc 176 tons valued at $9,390.

The imports are given, in detail, in the following tables:—

Imports of Zinc in Blocks, Pigs, and Sheets.

Fiscal Year.	Cwt.	Value	Fiscal Year.	Cwt.	Value	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	13,805	67,881	1892	21,881	127,302	1904	25,553	138,057
1881	20,920	94,015	1893	26,446	124,360	1905	25,141	141,514
1882	15,021	76,631	1894	20,774	90,680	1906	24,462	158,438
1883	22,765	94,799	1895	15,061	63,373	1907 (9 mos.)	18,427	126,221
1884	18,945	77,373	1896	20,223	80,784	1908	30,362	191,081
1885	20,954	70,598	1897	11,946	57,754	1909	26,222	141,066
1886	23,146	85,599	1898	35,148	112,785	Calendar Year:		
1887	26,142	98,557	1899	18,785	107,477	1910	31,660	191,051
1888	16,407	65,827	1900	28,748	156,167	1911	33,678	206,859
1889	19,782	83,935	1901	20,527	103,457	1912	100,095	617,836
1890	18,236	92,530	1902	34,871	141,560	1913	47,226	291,368
1891	17,984	105,023	1903	26,646	142,827	1914	31,609	189,785

Imports of Spelter.*

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
		$			$			$
1880	1,073	5,301	1892	13,909	62,550	1904	33,952	164,751
1881	2,904	12,276	1893	10,721	49,822	1905	37,941	206,244
1882	1,654	7,779	1894	8,423	35,615	1906	50,137	290,686
1883	1,274	5,196	1895	9,249	30,245	1907 (9 mos.)	42,465	269,044
1884	2,239	10,417	1896	10,897	40,548	1908	65,593	314,369
1885	3,325	10,875	1897	8,342	32,826	1909	55,981	310,688
1886	5,432	18,238	1898	2,794	13,561	Calendar Year:		
1887	6,908	25,007	1899	5,450	29,687	1910	109,084	561,170
1888	7,772	29,762	1900	5,836	29,416	1911	116,996	654,097
1889	8,750	37,403	1901	14,621	58,283	1912	117,845	686,585
1890	14,570	71,122	1902	18,356	80,757	1913	126,051	661,207
1891	6,249	31,459	1903	23,159	110,817	1914	108,454	551,031

*Spelter in blocks and pigs.

Imports of Manufactures of Zinc.

Fiscal Year	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	8,327	1892	7,563	1904	12,682
1881	20,178	1893	7,464	1905	11,912
1882	15,526	1894	6,193	1906	12,917
1883	22,599	1895	5,581	1907 (9 mos.)	12,556
1884	11,952	1896	6,290	1908	19,240
1885	9,459	1897	5,145	1909	15,621
1886	7,345	1898	10,503	Calendar Year:	
1887	6,561	1899	14,661	1910	21,829
1888	7,402	1900	11,475	1911	30,862
1889	7,233	1901	6,882	1912	46,336
1890	6,472	1902	6,683	1913	54,898
1891	7,178	1903	9,754	1914	36,355

Imports of Zinc White, Zinc Dust, and Zinc Sulphate and Chloride.

Calendar Year.	Zinc white.		Zinc Dust.		Zinc Sulphate and Chloride.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
		$		$		$
1910	8,496,399	312,779	97,461	4,859	237,466	6,470
1911	8,537,498	314,194	86,242	5,718	414,500	15,930
1912	10,505,944	425,714	308,239	18,944	941,780	29,104
1913	12,682,126	525,643	412,294	26,403	634,634	17,424
1914	9,445,397	389,796	362,109	34,295	352,715	9,390

Average Price of Spelter in Cents per Pound at New York.*

Month.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
January	4·863	6·190	6·487	6·732	4·513	5·141	6·101	5·452	6·442	6·931	5·262
February	4·916	6·139	6·075	6·814	4·785	4·889	5·569	5·518	6·499	6·239	5·377
March	5·057	6·067	6·209	6·837	4·665	4·757	5·637	5·563	6·626	6·078	5·250
April	5·219	5·817	6·087	6·687	4·645	4·965	5·439	5·399	6·633	5·641	5·113
May	5·031	5·434	5·997	6·441	4·608	5·124	5·191	5·348	6·679	5·406	5·074
June	4·760	5·190	6·096	6·419	4·543	5·402	5·128	5·520	6·877	5·124	5·000
July	4·873	5·396	6·006	6·072	4·485	5·402	5·152	5·695	7·116	5·278	4·920
August	4·866	5·706	6·027	5·701	4·702	5·729	5·279	5·953	7·028	5·658	5·568
September	5·046	5·887	6·216	5·236	4·769	5·796	5·514	5·869	7·454	5·694	5·380
October	5·181	6·087	6·222	5·430	4·801	6·199	5·628	6·102	7·426	5·340	4·909
November	5·513	6·145	6·375	4·925	5·059	6·381	5·976	6·380	7·371	5·229	5·112
December	5·872	6·522	6·593	4·254	5·137	6·249	5·624	6·301	7·162	5·154	5·592
Year	5·100	5·822	6·198	5·962	4·726	5·503	5·520	5·758	6·943	5·648	5·213

*From the Engineering and Mining Journal, N.Y.

Average Prices of Spelter, Ordinary Brands, in London.*

Month.	1905.			1906.			1907.			1908.			1909.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	24	19	9	28	8	2	27	7	1	20	6	3	21	6	3
February	24	10	6	26	2	4	26	1	5	21	0	7	21	8	9
March	23	13	6	24	15	3	26	4	8	21	1	5	21	8	8
April	23	14	3	25	19	3	25	17	5	21	6	1	21	10	1
May	23	11	8	27	0	2	25	14	2	20	2	10	21	19	1
June	23	16	8	27	9	9	24	10	2	19	2	2	21	19	11
July	23	19	6	26	15	11	23	18	11	18	14	1	21	18	9
August	24	14	6	27	0	5	22	1	7	19	6	9	22	0	3
September	26	8	3	27	12	5	21	0	11	19	10	3	22	17	1
October	28	1	7	27	18	10	21	12	11	19	15	1	23	3	4
November	28	5	11	27	15	1	21	8	4	20	17	1	23	2	1
December	28	14	11	27	19	3	20	3	3	20	19	2	23	1	3
Year	25	7	7	27	1	5	23	16	9	20	3	6	22	2	11

Month.	1910.			1911.			1912.			1913.			1914.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
January	23	4	3	23	16	7	26	9	11	25	19	1	21	6	6
February	23	3	1	23	3	10	26	6	5	25	4	3	21	7	6
March	23	3	7	22	19	2	25	19	11	24	11	4	21	7	7
April	22	9	11	23	13	8	25	8	11	25	2	4	21	10	2
May	22	1	1	24	6	1	25	11	2	24	10	4	21	5	9
June	22	3	2	24	9	7	25	11	11	21	19	10	21	6	0
July	22	5	6	24	13	10	25	13	1	20	11	2	21	6	7
August	22	14	0	26	11	2	26	1	2	20	14	0	29	0	9
September	23	2	7	27	12	7	26	17	0	21	3	10	25	14	0
October	23	16	6	27	4	10	27	5	10	20	13	9	23	13	6
November	24	1	9	26	13	2	26	14	3	20	14	4	24	14	10
December	23	17	7	26	13	7	26	0	4	21	6	8	27	6	10
Year	23	0	0	25	3	2	26	3	3	22	14	3	23	6	8

*From the annual publication of the "Metal Information Bureau," London, E.C.

World's Production of Spelter in Short Tons.*

Country.	1908.	1909.	1910.	1911.	1912.	1913.
Australia	1,198	.....	560	1,904	2,531	4,105
Austria and Italy	14,063	13,931	14,666	18,602	21,609	23,928
Belgium	181,851	184,194	190,233	215,050	220,678	217,928
France and Spain	61,512	61,859	65,191	70,791	79,543	78,289
Germany	239,062	242,594	251,046	276,008	298,794	312,075
Great Britain	60,029	65,422	69,531	73,803	63,086	65,197
Holland	19,017	21,548	23,121	25,059	26,380	26,811
Poland	9,740	8,758	9,514	10,952	9,659	8,389
United States	210,424	255,760	269,184	286,526	338,806	346,676
Norway	.....	.....	.....	7,363	8,959	10,237
Total	796,896	854,066	893,046	986,058	1,070,045	1,093,635

*Mineral Resources of the United States.

World's Consumption of Spelter in Short Tons.*

Country.	1908.	1909.	1910.	1911.	1912.	1913.
Austria-Hungary	35,935	36,155	37,258	47,950	51,588	44,533
Belgium	74,956	71,209	84,326	81,240	85,098	84,216
France	85,869	73,744	62,059	90,389	90,389	89,286
Germany	198,634	207,343	203,374	241,734	248,899	255,734
Great Britain	152,669	171,408	195,989	193,674	204,146	214,508
Holland	4,189	4,409	4,409	4,409	4,409	4,409
Italy	9,259	9,039	8,929	11,133	11,795	12,015
Russia	19,621	20,282	27,447	31,856	30,754	36,707
Spain	5,512	4,960	4,630	5,291	5,181	6,503
United States	214,167	270,730	245,884	280,059	340,372	295,370
Other countries	11,023	9,921	13,669	19,621	21,715	23,038
Total	811,834	879,200	887,974	1,007,356	1,094,346	1,066,319

*Mineral Resources of the United States

NON-METALLIC PRODUCTS.

[1]A recent publication of the Mines Branch of the Department of Mines, gives a collection of interesting data with regard to the non-metallic minerals used in Canadian manufacturing industries, indicating the sources of these non-metallic minerals, and the various uses to which they are put.

ABRASIVES.

The abrasives produced in Canada are: corundum, the various sandstone abrasives, as grindstones, pulpstones, scythestones, etc., and tripolite, or infusorial earth.

CORUNDUM.

The 1914 production of grain corundum was the lowest since 1901 amounting to only 1,095,500 pounds, valued at $72,176, or an average price of 6·59 cents per pound. This is less than half of the 1913 production, which was 2,353,845 pounds, valued at $137,036, or an average of 5·8 cents per pound. Sales in Canada were 26,800 pounds or 2·4 per cent, and sales for export were 1,068,700 pounds or 97·6 per cent of the year's production.

Grain corundum to the amount of 1,389,700 pounds was recovered from 12,111 tons of rock milled, a recovery of 5·7 per cent. The recovery in 1913 was 6·2 per cent, and in 1912 it was 4·4 per cent. The recovery of corundum during the earlier years of the industry was about 10 per cent, but during recent years has fallen as low as 3·9 per cent, a much lower grade of rock being now milled than heretofore.

Statistics concerning the annual production are given in the following table:—

Production of Corundum Ore and Corundum.

Calendar Year.	Corundum-bearing rock treated.	Grain corundum graded.	Grain corundum sold in Canada.	Grain corundum exported.	Total of grain corundum.	Value.	Average price.
	Tons.	Tons.	Tons.	Tons.	Tons.	$	Cts.
1900.....	.....	60	3	.....	3	300	5·00
1901.....	4,134	444	85	302	387	46,415	5·97
1902.....	7,996	806	106	662	768	84,465	5·49
1903.....	(a) 8,877	839	85	618	703	77,510	5·51
1904.....	28,187	1,654	116	877	993	109,545	5·51
1905.....	23,571	1,681	140	1,504	1,644	149,153	4·48
1906.....	45,719	2,914	162	2,112	2,274	204,973	4·50
1907.....	60,532	2,682	164	1,728	1,892	177,922	4·70
1908.....	2,678	106	99	990	1,089	100,398	4·60
1909.....	35,894	1,579	129	1,362	1,491	162,492	5·45
1910.....	37,183	1,686	106	1,764	1,870	198,680	5·31
1911.....	41,795	1,641	92	1,380	1,472	161,873	5·50
1912.....	36,879	1,620	63	1,897	1,960	239,091	6·10
1913.....	12,290	763	23	1,154	1,177	137,036	5·82
1914.....	12,111	695	14	534	548	72,176	6·59

(a) In addition to this amount which was milled in Canada, 267 tons of ore were mined and shipped to the United States for treatment there.

[1] "Non-Metallic Minerals in Canadian Manufacturing," Frechette, Mines Branch, Department of Mines, Ottawa, 1914, No. 305.

Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the Province of Ontario. The industry made its appearance there in 1900, the production reaching a maximum in 1906. From 1907 to 1913 the yearly production was smaller but fairly uniform.

The Manufacturers Corundum Company has been the only operator for the last five years, and for 1914 it reports only one of its properties operating.

Only a small proportion of the graded grain corundum is sold in Canada. The balance goes to the United States, Great Britain, France, and Germany.

Those desiring detailed information concerning the mines and mills of the corundum district can find the same in the Annual Reports of the Ontario Bureau of Mines, and in the Geological Survey publications.[1] The treatment of the corundum-bearing rock consists of crushing, concentration, magnetic separation of the iron, air separation of the mica, and sizing. The magnetic sand now finds a sale for use in the manufacture of school black-boards.

GRINDSTONES, PULPSTONES, ETC.

The total production of grindstones, pulpstones, and scythestones for 1914 was 3,976 tons, valued at $54,504, as compared with a production in 1913 of 4,837 tons, valued at $51,325, which is a decrease of 17 per cent in tonnage, but an increase of about 5 per cent in value.

The production as usual, was confined to Nova Scotia and New Brunswick. Reports were made by five operating companies, the quarries operated being at Mic Mac Point and Quarry Island, Pictou county, N.S., at Stonehaven and Clifton, Gloucester county, at Quarryville, Northumberland county, and at Woodpoint, Westmorland county, N.B.

The grindstones are shipped chiefly in the finished condition, and are marketed in Canada, Newfoundland, and the United States, the price realized being around $12 to $13 per ton. The number of pulpstones sold to Canadian pulp mills was the same as last year, but the price realized was slightly greater. These stones average about 2½ tons in weight. The weight of scythestones, both finished and in the rough, shipped during the year was approximately 153 tons. One quarry shipped 38 tons of grit for marble polishing.

The output of pulpstones comes from The Miramichi Quarry Company's property at Quarryville, Northumberland county, N.B. The operators claim "that Miramichi pulp grinding stones are fully equal to the best imported" and that they have many customers whom they have been supplying regularly for years. The Company's most important product is an excellent building stone for which a market is being built up in Ontario and Quebec.

[1] "The Geology of the Haliburton and Bancroft Area," Adams, Geol. Sur. Can., Memoir No. 6.
"Corundum, Its Occurrence, Distribution, Exploitation and Uses." Barlow, Geol. Sur. Can., Memoir No. 57.

A table showing the production of grindstones by provinces since 1886 follows.

Annual Production of Grindstones.

Calendar Year.	Nova Scotia.		New Brunswick.		Total.		Average value per ton.
	Tons.	Value.	Tons.	Value.	Tons.	Value.	
		$		$		$	$
1886	1,765	24,050	2,255	22,495	4,020	46,545	11 58
1887	1,710	25,020	3,582	38,988	5,292	64,008	12 10
1888	1,971	20,400	3,793	30,729	5,764	51,129	8 87
1889	712	7,128	2,692	23,735	3,404	30,863	9 07
1890	850	8,536	4,034	33,804	4,884	42,340	8 67
1891	1,980	19,800	2,499	22,787	4,479	42,587	9 51
1892	2,462	27,610	2,821	23,577	5,283	51,187	9 69
1893	2,112	21,000	2,488	17,379	4,600	38,379	8 34
1894	2,128	16,000	1,629	16,717	3,757	32,717	8 71
1895	1,400	14,000	2,075	17,932	3,475	31,932	9 19
1896	1,450	14,500	2,263	18,810	3,713	33,310	8 97
1897	1,407	17,500	3,165	24,840	4,572	42,340	9 26
1898	1,422	12,350	3,513	32,425	4,935	44,775	9 07
1899	1,378	10,300	3,133	32,965	4,511	43,265	9 59
1900	1,411	12,600	4,128	40,850	5,539	53,450	9 65
1901	358	3,200	4,223	42,490	4,581	45,690	9 97
1902	1,074	8,118	3,559	36,000	4,633	44,118	9 52
1903	1,337	9,562	4,201	38,740	5,538	48,302	8 72
1904	1,029	7,332	3,620	35,450	4,649	42,782	9 20
1905	1,020	10,200	4,520	52,175	5,540	62,375	11 25
1906	1,023	9,680	4,340	50,134	5,363	59,814	11 15
1907	551	4,480	4,863	55,896	5,414	60,376	11 15
1908	473	4,803	3,370	43,325	3,843	48,128	12 52
1909	312	3,204	3,963	51,460	4,275	54,664	12 79
1910	387	3,496	3,586	43,700	3,973	47,196	11 88
1911	380	3,382	4,186	49,560	4,566	52,942	11 59
1912	374	3,760	4,038	48,330	4,412	52,090	11 81
1913	350	4,900	4,487	46,425	4,837	51,325	10 61
1914	350	5,270	3,626	49,234	3,976	54,504	13 71

The value of exports of grindstones finished and in the rough during the calendar year 1914, according to the records of the Department of Customs, was $24,407 (finished valued at $24,413, and rough at $294) as compared with an export in 1913 of finished stones only valued at $54,867.

Out of the total 1914 Canadian production of grindstones, valued at $54,504, the sales in Canada amounted to only approximately $15,573. To meet Canadian requirements in Ontario and Quebec chiefly there was imported during the same year grindstones to the value of $98,872, which is a decrease in value of 32 per cent from the 1913 imports. Other abrasives imported during the year were burrstones to the value of $16; emery $29,127; manufactures of emery $88,881; pumice stone $16,976, sandpaper $138,415; iron sand for glass or granite polishing, or for sawing stone $13,743; or a total value, including grindstones, of $386,030, a decrease in value as compared with 1913, of 27 per cent. In 1913 the imports were: grindstones $145,247; burrstones $1,784; emery $48,995; manufactures of emery $135,654; pumice stone $17,861; sandpaper $171,516; iron sand for glass or granite polishing, or for sawing stone $10,168, a total value, including grindstones, of $531,225. In 1912 the value of the imports of abrasives of all kinds was $515,055.

Tables showing values of exports of grindstones and imports of abrasive materials into Canada follow.

Exports of Grindstones.*

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1884	28,186	1894	12,579	1904	35,612
1885	22,606	1895	16,723	1905	24,868
1886	24,185	1896	19,139	1906	31,978
1887	28,769	1897	18,807	1907	32,534
1888	28,176	1898	25,588	1908	19,721
1889	29,982	1899	23,288	1909	13,942
1890	18,564	1900	42,128	1910	23,502
1891	28,433	1901	29,130	1911	29,206
1892	23,567	1902	24,489	1912	26,535
1893	21,672	1903	27,659	1913	54,867
				1914	24,407

* Including stone for the manufacture of grindstones.

Imports of Abrasive Materials.

Fiscal Year.	Grind-stones. Value.	Burrstones (c) Value.	Emery (a) Value.	Mfrs. of emery (b) Value.	Pumice stone. (d) Value.	Iron Sand (e) Value.	Sandpaper. (f) Value.
	$	$	$	$	$	$	$
1880	11,714	12,049	.....	.....	.....	.....	.....
1881	16,895	6,337	.....	.....	.....	.....	.....
1882	30,654	15,143	.....	.....	.....	.....	.....
1883	31,456	13,242	.....	.....	.....	.....	.....
1884	30,471	5,365	.....	.....	.....	.....	.....
1885	16,065	4,517	5,066	4,920	9,384	.....	.....
1886	12,803	4,062	11,877	5,832	2,777	.....	.....
1887	14,815	3,545	12,023	4,598	3,594	.....	.....
1888	18,263	4,753	15,674	4,001	2,890	.....	.....
1889	25,564	5,465	13,565	3,948	3,232	.....	.....
1890	20,569	2,506	16,922	5,313	3,003	.....	.....
1891	16,991	2,089	16,179	6,665	3,696	.....	.....
1892	19,761	1,464	17,782	6,492	3,282	.....	.....
1893	20,987	3,552	17,762	5,606	3,798	.....	.....
1894	24,426	3,029	14,433	2,223	4,160	.....	.....
1895	22,834	2,172	14,569	7,775	3,609	.....	.....
1896	26,561	2,049	16,287	11,913	3,721	.....	.....
1897	25,547	1,827	16,318	11,231	2,903	.....	.....
1898	22,217	1,813	17,661	15,478	3,829	.....	.....
1899	27,476	1,759	21,454	22,343	5,973	.....	.....
1900	34,382	1,546	19,312	25,615	5,604	.....	.....
1901	39,068	5,762	16,311	22,190	5,516	.....	.....
1902	40,838	2,559	14,476	23,892	7,254	.....	.....
1903	53,388	586	18,058	22,177	6,152	.....	.....
1904	46,039	35	21,626	29,273	6,557	.....	.....
1905	49,747	2,607	21,980	33,250	8,447	.....	.....
1906	59,627	2,661	21,781	42,080	9,053	.....	.....
1907 (9 mos.)	40,780	245	20,498	41,086	5,745	.....	.....
1908	65,125	3,396	26,159	57,760	8,917	.....	.....
1909	56,692	1,141	25,931	47,700	8,117	.....	.....
Calendar Year.							
1910	71,394	854	40,400	92,890	14,829	6,647	148,384
1911	123,356	1,642	46,274	104,170	18,779	8,340	164,474
1912	112,020	1,409	46,616	130,571	21,310	13,347	189,782
1913	145,247	1,784	48,995	135,654	17,861	10,168	171,516
1914	98,872	16	29,127	88,881	16,976	13,743	138,415

(a) Emery in bulk, crushed or ground. Duty free.
(b) Emery and carborundum wheels and manufactures of emery or carborundum.
(c) Burrstones in blocks, rough or unmanufactured, not bound up or prepared by binding into millstones.
(d) Pumice and pumice stone, ground or unground. Duty free.
(e) Iron sand or globules for polishing glass or granite, or for sawing stone. Duty free.
(f) Sandpaper, glass, flint, and emery paper or emery cloth.

The following is a list of the operators reporting production of grindstones, pulpstones, and scythestones for 1914.

The Mic Mac Grindstone Co., Ltd., New Glasgow, N. S.
Jos. W. Sutherland, West Merigomish, N. S.
The Read Stone Company, Stonehaven, N. B.
Sackville, "
J. L. C. Knowles, Clifton, N. B.
The Miramichi Quarry Co., Ltd., Quarryville, N. B.

TRIPOLITE.

Recent requests for information concerning the possibility of securing supplies of tripolite or diatomaceous earth in Canada have prompted this summary of information on the subject.

In its natural state tripolite contains from 25 to 45 per cent of moisture which is expelled at 100°C, and is a pure white to brownish, very light, soft, easily abraded material. It is rarely pure, being usually contaminated with varying proportions of carbonates of lime and magnesia, clay, etc., the silica contents varying between 75 and 90 per cent.

In the Annual Report of the Geological Survey of Canada for 1902-03 there appears a resume of the information then available re infusorial earth.[1] This bulletin, prepared by Mr. Theo. Denis, described particularly the mode of formation, and uses of this mineral, and enumerated all known Canadian occurrences.

Since this publication appeared the uses to which tripolite may be put have increased many fold. The various physical and chemical properties of the substance which are responsible for the widening field in which it is being used are described in the Mineral Industry for 1913.[2] It is there stated that the effectiveness of infusorial earth as a thermal insulator has led to its extensive use "for the production of fireproof, and incombustible insulator in the form of loose powder, solid natural blocks, burned insulating brick and tile, pipe covering, etc., for both high temperatures in ovens, cookers, furnaces, annealing pits, boilers, evaporators, stills, and for low temperatures in cold storage and refrigerator plants, ice-houses, ice-boxes, coolers, and similar purposes. It has the advantage over the organic insulating materials, some of which have a somewhat higher thermal resistivity, in that it is unaffected by extreme heat or cold, and is not subject to decomposition, decay, or any physical change with time." The refractory nature of the substance, with its low thermal conductivity, "opens up a wide field for its use in the ceramic industries for the production of light weight brick and tile, for insulating and refractory purposes. Owing to the low apparent density of the pulverized tripolite it has found extensive application for fire protection in buildings as a light fireproof wall-filler.

[1] Geol. Sur. Can. Annual Report, 1902-03, Vol. XV, p. 195s.
[2] Diatomaceous Earth, by P. A. Boeck, Mineral Industry, Vol. XXII, 1913.

On account of its smothering effect caused by the exclusion of oxygen from the vicinity of the flame, it is also used as a fireproofing and insulating material in safes, ovens, fireless cookers, electric fuse protectors, etc."

At present, in addition to its oldest uses as a polishing material, and a thermal insulator, it finds a wide application being used as a filler for rubber goods, and records for talking machines, a wood-filler in paints, for water filters, and beet sugar solution filters, as an absorbent for artificial fertilizers, for glazing tiles and pottery, and in the manufacture of water glass, ultramarine and various pigments, analine and alizarine colours, paper, sealing wax, fireworks, matches, gutta percha articles, solidified bromine, papier-mache, and many other articles.

The preparation of tripolite and its uses are described in a recent report[1] of the Mines Branch, which contains also a record of consumption in-so-far as such information could be obtained. Mr. Fréchette states, referring to its preparation, that the tripolite as removed from the deposit "is washed, dried, ground, and very carefully sized. The finest sizes are obtained by air-floating the undersize from the last bolting." The drying is done in kilns, and the grinding between burrstones, with a final crushing between rolls.

"For the finer polishing grades, and for some other purposes a pure white product is specified. The darker material finds a market principally for rubber-filling for which purpose careful sizing is not essential."

As a polishing material tripolite is prepared in three forms:—

"(1) Dry powder to be moistened or otherwise prepared by the user.

(2) Mixed with about one-third its weight of tallow or other hard grease and moulded into bricks or sticks—"grease brick." This is used on buffing wheels.

(3) Mixed with some form of cleansing liquid in the form of the well-known liquid metal polishes."

The total Canadian production of tripolite to the end of 1914 has been 7,779 tons valued at $128,234. Recent sales of crude tripolite were reported at $20 per short ton. The shipments from year to year have varied very much, and in some seasons the producing companies shipped from stock only.

From 1902 to the present, Nova Scotia has been the only province producing tripolite, and three companies only have appeared on the list of shippers. These are the Premier Tripolite Company with deposits (unworked for several years) at St. Ann's in Victoria county, Cape Breton Island. The Fossil Flour Company, formerly operating at Bass River lake, Colchester county, near Castlereagh; and the Oxford Tripoli Company operating at Silica lake (formerly Bass River lake), Colchester county, the latter Company having taken over the property of the Fossil Flour Company.

[1] Non-Metallic Minerals in Canadian Manufacturing, Fréchette, Mines Branch Publication No. 305.

At the plant of the Oxford Tripoli Company, the crude product is dried and treated on the spot in a 10-ton mill, after which it is exported to the United States.

The references to tripolite in Canadian geological and mining literature during recent years are few.

A sample of infusorial earth from Sabody Pond, Middle river, near Chester, Lunenburg county, N. S., was received at the Geological Survey Museum in 1904[1] but no further mention of this occurrence has been made.

Recently, a new occurrence in this Province has been described.[2] This is near Loon Lake falls on the Liverpool river, $8\frac{1}{2}$ miles west of Caledonia, the terminus of the Halifax and Southwestern Railway. When seen by M. Faribault, the deposit was undeveloped but the chances of it being a few feet thick and extending over a considerable area seemed fair.

The occurrence at Fitzgerald lake, near St. John, New Brunswick, mentioned by Mr. Denis, has been referred to in subsequent Geological Survey publications[3]; but no shipments for other than experimental purposes are known to have been made.

No mention of tripolite deposits in Quebec has been made for several years.

In Ontario, a reported occurrence in Muskoka was made in the Bureau of Mines Report for the year 1910; but no additional information has appeared.

In British Columbia a deposit of unknown size on the Queen Charlotte Ids. was reported to the Mines Branch in 1914. On Vancouver Island within 10 miles of the city of Victoria there is a deposit of diatomaceous earth described by Mr. Clapp of the Gelogical Survey Branch[4] as follows:—

"A deposit of diatomaceous earth, or as it is commonly, although incorrectly called, 'infusorial earth,' occurs below the surface soil in the wide valley north of Prospect lake in Lake District. Its extent and thickness is not definitely known, but it must occur in considerable amounts, since it may be seen at intervals for at least half a mile north of Prospect lake, and is at least two or three feet thick. It is light grey, uniform in appearance and free from grit. Microscopically it is seen to consist of the siliceous tests of diatoms, largely broken to submicroscopic grains, although many straight columnar forms are present, mixed with a considerable amount of fine argillaceous matter. The following is a partial analysis of it by Mr. H. A. Leverin, of the Mines Branch, of the Department of Mines:—

[1] Geol. Sur. Can. Annual Report, Vol. XVI, Part A. p. 246.
[2] Geol. Sur. Can. Summary Report for 1914, p. 106.
[3] Geol. Sur. Can. Publication No. 983, Ells, p. 127.
" " " Summary Report for 1913, p. 242.
[4] Geol. Sur. Can. Memoir No. 36, Clapp, p. 137.

	%
Silica	75·92
Alumina	8·23
Ferric-oxide	3·43
Magnesia	1·28
Lime	1·85
Soda	1·39
Potash	0·94
Carbon dioxide	1·08
Combined water	5·40
	99·52

"As may be seen from the description and analysis, the deposit is of a moderate degree of purity, and is suitable for many of the varied uses to which diatomaceous earth may be put, such as polishing powders, absorbents, non-conductors, fertilizers, and many other products."

The following is a list of producers of tripolite operating in Canada in recent years:—

Producers of Tripolite.

Operator.	Address.	Location of Property.	Mine Office.	Manager or Representative.
Oxford Tripoli Company	Oxford, N.S.....	Silica Lake (formerly Bass R. Lake). Colchester co.	Silica L., N.S.	A. M. Hinckley.
Premier Tripolite Company	159 Maiden Lane, New York, N.Y.	Munro Pt. St. Ann's Victoria co., Cape Breton Id., N.S.	St. Ann's, Victoria co., N.S.	A. Fraser.

Tables showing the annual consumption of tripolite both crude and in grease brick, in Canada, so far as information could be secured, follow, being taken from Mr. Frechette's monograph already mentioned.

Consumption of Crude Tripolite.

Location.	No. of firms reporting consumption.	Domestic.	Imported.
		Tons.	Tons.
Maritime Provinces	1	Nil.	7/20
Quebec	4	"	43–10/20
Ontario	8	"	17– 5/20
Prairie Provinces	1	"	35 —
British Columbia	—	—	
Canada	Total consumption.	—	96– 2/20

Consumption of Tripolite Grease Brick.

Location.	No. of firms reporting consumption.	Domestic	Imported	Equivalent amount in crude.
		Tons.	Tons.	Tons.
Maritime Provinces	14	Nil.	1– 2/20	·8
Quebec	12	"	8–16/20	6·6
Ontario	102	"	101–3/20	75·9
Prairie Provinces	10	"	2–10/20	1·9
British Columbia	7	"	2–2/20	1·6
Canada	Total consumption.	—	115–13/20	86·8

The following table gives statistics of the Canadian production from 1896 to date, all of which has been exported.

Annual Shipments of Tripolite.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1896	644	9,960	1906	Nil.	Nil.
1897	15	150	1907	30	225
1898	1,017	16,660	1908	30	195
1899	1,000	15,000	1909	Nil.	Nil.
1900	336	1,950	1910	22	134
1901	850	15,300	1911	20	122
1902	1,052	16,470	1912	38	230
1903	835	16,700	1913	620	12,138
1904	320	6,400	1914	650	13,000
1905	300	3,600			

A record of analyses of tripolite or diatomaceous earth from Canadian deposits follows, together with a table of analyses of samples from various other localities quoted for purposes of comparison.

Tripolite: Analyses of Canadian Samples.

Locality.	1	2	3	4	5	6
Sample from.	H. S. deSchmid.	H. S. deSchmid.	R. W. Ells.	H. S. deSchmid.	E. A. D. Morgan.	C. H. Clapp.
Silica	72·10	81·30	80·487	74·98	79·20	75·92
Alumina	—	—	3·146	3·81	3·98	8·23
Ferric oxide	—	—	·951	·72	·57	3·43
Ferrous oxide	·51	·38	—	·64	·51	—
Lime	—	—	·342	·54	·68	1·85
Magnesia	—	—	·283	·36	·33	1·28
Soda	—	—	—	·65	·94	1·39
Potash	—	—	—	·25	·39	·94
Water—below 110 C.	6·10	5·16	13·321	5·74	8·26	
Water—above 110 C.	10·70	9·34		9·56	3·84	5·40
Organic matter	6·30	·82		2·72	1·80	
Carbon dioxide	Nil.	Nil.	·011	Nil.	Nil.	1·08
Total	—	—	—	99·97	100·50	99·52

Analyses by Laboratory of Mines Branch, Ottawa.

Key to Localities:—
1. St. Ann's, Victoria co., N.S. Operator, Premier Tripolite Co., 159 Maiden Lane, New York.
2. Silica Lake, Colchester co., N.S. Operator, Oxford Tripoli Co., Oxford, N.S.
3. Pollet River lake, Mechanic's Settlement, Kings co., N.B.
4. Fitzgerald lake, St. John co., N.B.
5. Chertsey tp., Range V, Lot 15, Montcalm co., Que.
6. Prospect lake, Lake District, near Victoria, B.C.

Tripolite: Analyses of Representative Samples.

Locality.	Hanover.	Germany.	Scotland.	Auvergne, France.	Maryland, U.S.A.	Virginia, U.S.A.
Silica	86·4	68·01	92·0	87·2	81·53	75·85
Alumina	1·6	7·13	——	2·0	3·43	9·88
Ferric oxide	1·5	6·82	2·5	——	3·33	2·92
Lime	1·3	——	——	——	2·61	·29
Magnesia	——	——	——	——	5·63	1·63†
Water	6·9	8·45	——	10·0	3·47	8·37
Other volatile and organic matter	2·3	8·17	5·5	——	——	——
Total	100·0	98·58	100·0	99·2	100·0	98·95

† Including potash and soda.

Below is tabulated a brief record of all reported occurrences of tripolite or diatomaceous earth in Canada.

Tripolite: Canadian Occurrences.

County.	Location.	Owner or Operator.	Description.
	NOVA SCOTIA.		
Antigonish	Lochaber L.[3]	.....	.....
Cape Breton	Ainsley L.[3]	.....	.....
Colchester	Silica L.[3 10] (Formerly Bass River L.) 12 mi. from Thompson, I.C.R.	Oxford Tripoli Co., Oxford, N.S.	Area: 12 acres. Earth removed from whole area. Mill on property.
	Folly L.[3] (I.C.R.)	.....	Area: 135 acres. Worked to small extent prior to 1903.
	Mackintosh L.[3]	.....	.....
	Earltown L.[3]	.....	.....
	Gully L.[3]	.....	.....
Cumberland	Fountain L.[3] 8 mi. from I.C.R.	.....	Worked to slight extent prior to 1903.
	Cobequid Mts. area[3]	.....	Small deposits in many lakes.
Digby	Meteghan River[2]	.....	.....
Halifax	Dartmouth L.[12] (near Halifax city)	.....	Beds reported 8′ thick.
	Grand L.[12] (Near Halifax city).	.....	Beds reported 8′ thick.
	Paint L.[8] (Near head of Chezzetcook).	.....	.....
Inverness	River Denys,[3] on I.C.R.	.....	Small amount work done.
Lunenburg	Sabody Pond,[4] on Middle River near Chester.	Capt. Lordley, Chester, N.S.	.....
Pictou	Upper Barney River[3]	Alex. Sutherland	Extent not known. Thickness 2′.
	Mackay L.[3]	.....	.....
	Black Brook Lake[3]	.....	.....
	Garden of Eden L.[3]	.....	.....
	Grant L.[3]	.....	.....
	McLean L.[3]	.....	.....
	Calder L.[3]	.....	.....
	Forbes L.[3]	.....	.....
	Ben L.[3]	.....	.....
	Toney L.[3]	.....	.....
Queens	Loon L. Falls,[6] on Liverpool River, 8½ mi. from Caledonia, N.S.	.....	Undeveloped. Chances of tonnage fair.
Victoria	St. Ann's P.O. Munro Pt.,[3 10] 25 mi. from North Sydney.	Premier Tripolite Co. (Lessee). 159 Maiden Lane, New York.	Area: 12 acres. Only partially worked over. Not operated in recent years.
	Englishtown,[3] 22 mi. from North Sydney.	F. Torrence	.....

County.	Location.	Owner or Operator.	Description.
	NEW BRUNSWICK.		
Kings.....	Pollet River L.[3, 7] Mechanic's Settlement, P.O. 11 mi. from I.C.R.	.....	Thickness 4′. Lake drained and preparation made for working.
	Pleasant L.[3] 1 mi. s.w. of Pollet L.	.....	.....
	Westfield[7]—across St. John river from,	.....	No information. Occurrence noted on Mineral Map of New Brunswick. Map No. 969 Geol. Sur. Can.
St. John.....	Fitzgerald L.[3, 5, 7, 10] 7 mi. from St. John city.	Wm. Murdock, St. John city. (Owner). Boston & St. John Tripolite Company. (Lessees).	Area: 50 acres. Thickness 10′. Shipments for experimental purposes *only* to date.
	QUEBEC.		
Maskinonge.....	St. Justin,[3] Con. Trompe Souris.	.....	Small quantities in a sand bank.
Montcalm.....	Chertsey Tp. R.V., Lot 15[3, 11]	E. A. D. Morgan, Montreal, P.Q.	Area: 4 acres. Thickness 18″.
Montmorency.....	Laval Settlement.[3]..... R. II, Lot 20. At Junction Bras & Montmorency Rivers.	.....	Thickness 15″. Overburden 50′.
St. Maurice (or Champlain).	Shawenegan,[3] near.....	.....	.....
Quebec.....	Stoneham, Tp. Lot 69[3].....	.....	.....
	ONTARIO.		
Muskoka.....	Bala, near,[13].....	Thos. Orgill, Glen Orchard..	Believed to be in deposits of workable size.
	BRITISH COLUMBIA.		
	Blackwater River[1].....	.....	.....
	Mission City, opposite[3] on Fraser river.	.....	.....
	Queen Charlotte Ids.[11].....	Merton A. Merrill, Regina, Sask.	Quality reported satisfactory.
	Vancouver Id. At Prospect lake,[9] 10 mi. from Victoria	.....	Quality fair. Thickness not known. Prospects fair.

Key to References.

[1] Geol. Sur. Can. Report 1875-76, p. 256.
[2] " " " Ann. Report Vol. IX, Sec. A. p. 93.
[3] " " " " " " XV, " S. pp. 25–28.
[4] " " " " " " XVI, " A. p. 346.
[5] " " " Summ. Report, 1913, p. 242.
[6] " " " " " 1914, p. 106.
[7] " " " Geology & Mineral Resources of New Brunswick, Ells, Publication No. 983.
[9] " " " Memoir No. 20–E, p. 300.
[9] " " " " No. 36, p. 137.
[10] Mines Branch Summ. Report 1914.
[11] " " Files.
[12] Mines and Minerals of Nova Scotia, Gilpin, 1880, p. 115.
[13] Ontario Bureau of Mines. Reports Vol. XX, p. 45.

ACTINOLITE.

The production of actinolite in Canada has been confined to Elzevir and Kaladar townships in Hastings and Addington counties, Province of Ontario, the centre for the industry being the village of Actinolite. The earliest operations date back to about 1883. Deposits have been worked only at intervals long apart when sufficient rock was broken to meet the demand for several subsequent years. As a rule there is ground each year just sufficient rock to meet the market requirements of that year. The only statistics of production prior to 1909 now available are for the years 1901, 1902 and 1903 when the output was valued at $3,126, $6,150, and $1,650 respectively.

Actinolite is used as an ingredient of a coal-tar roofing compound, the grinding of the crude material being done in such a way as not to destroy the fibre.

An interesting review of the industry appearing in the Ontario Bureau of Mines Reports[1] was quoted in last year's report on the Mineral Production of Canada.

The only shipper in recent years is the Actinolite Mining Company at Bloomfield, New Jersey, U. S. A., which owns deposits of actinolite in Kaladar and Elzevir townships, and a mill for grinding the same at Actinolite, Ontario.

Statistics of production during recent years are given in the following table.

Annual Production of Actinolite.

Calendar Year.	Tons.	Value.	Average Price.
		$	$ cts.
1909	Nil.	Nil.	.....
1910	30	330	11.00
1911	67	736	11.00
1912	92	1,000	10.87
1913	66	720	10.91
1914	119	1,304	10.96

[1] Ontario Bureau of Mines, Vol. XXII, Part II, p. 117.

ALUNITE AND PYROPHYLLITE.

The Provincial Mineralogist of British Columbia in his Annual Report for 1914 states: "Besides some development work done, the San Juan Mining and Manufacturing Company, has shipped 75 tons of natroalunite ore from its property, situated on Kyuquot Sound and has now 250 tons ready for shipment."

This occurrence of alunite and pyrophyllite at Kyuquot, Vancouver Island, is considered of sufficient interest to reproduce herewith the report[1] on an examination of the deposits by Mr. Charles H. Clapp for the Geological Survey.

"In the southwestern part of Kyuquot sound, which is one of the large fiords indenting the west coast of Vancouver island, the metamorphic volcanic rocks, which comprise the greater part of Vancouver island, have been peculiarly altered to rocks containing large amounts of alunite and pyrophyllite. These deposits of alunite and pyrophyllite, which are the only deposits of their kind known in Canada, were "staked" in 1908, and during the last few years the pyrophyllite rock has been quarried by the British Columbia Pottery Company as a "fireclay," and by the San Juan Mining and Manufacturing Company as a base of a powdered "household cleanser." Of late years alunite has attracted considerable attention as a possible source of "potash," as well as a source of alum, so that the writer was directed to make an examination of the Kyuquot deposits during the summer of 1913. Accordingly, he spent four days during July examining the deposits and in making a reconnaissance in a launch of the neighboring shores. He was accompanied throughout the examination by the late Mr. William J. Sutton, of Victoria, at the time geologist for the Canadian Collieries (Dunsmuir) Company, and one of the best informed men concerning the natural resources of Vancouver island; by Mr. Wally, chemist of the San Juan Mining and Manufacturing Company, and J. L. Hangi of the British Columbia Pottery Company.

"The principal alunite and pyrophyllite deposits are situated in a small peninsula in the northwestern part of Kyuquot sound between Kokshittle arm and a small inlet called Easy creek. The peninsula has a general northwest trend and is slightly over 2 miles in length and from 1,500 to 3,000 feet in width. The deposits occur in the outer northwestern portion within an area of somewhat more than 1 square mile. Kyuquot sound is reached by the C. P. R. steamer Princess Maquinna, which plies between Victoria and the ports of the west coast of Vancouver island. It touches at Kyuquot village at the entrance to Kyuquot sound twice a month and, if there is freight, calls at the quarries of the British Columbia

[1] Extract from Report by Charles H. Clapp. Summary Report Geological Survey 1913, p. 109.

Pottery Company and of the San Juan Mining and Manufacturing Company in the pyrophyllite and alunite deposits. Other coasting vessels occasionally call at Kyuquot sound, and the deposits may be safely reached during the greater part of the year by launches from Alberni or Clayoquot sound.

"The alunite in the Kyuquot Sound deposits is the sodic variety, natroalunite, and it occurs, mixed with quartz, diaspore, sericite, and other minerals in masses of quartz-alunite rock, of which the alunite forms from 20 to 45 per cent. As yet the San Juan Mining and Manufacturing Company, who own the alunite deposits, have not used the alunite rock, although they have announced their intention of manufacturing alum. Alunite is at present considered to be of value not only for alum, which is now extracted from it, but also as a source of "potash salts" for fertilizers, and as a possible source of aluminium ore. Since the Kyuquot Sound deposits contain a large percentage of impurities, and since the alunite is of the sodic variety, they are not very promising as a source of alum or other potash salts. It is, however, to be hoped, considering the large quantities of alunite available, that some use for it may be found.

"The compact variety of pyrophyllite is found in the Kyuquot Sound deposits mixed with 20 to 50 per cent of quartz and a little sericite. The quartz-pyrophyllite rock has been used successfully by the British Columbia Pottery Company as a "fireclay" to mix with surface clays and Cretaceous shales to increase the refractiveness of the mixture, which is used to manufacture sewer-pipe and fireproofing. It has also been used by the San Juan Mining and Manufacturing Company, who have taken advantage of the extremely fine-grained character and slipperiness of the rock to manufacture a powdered "household cleanser," a metal polish, and a mechanic's soap. It is probable that the pyrophyllite rock might be employed as a substitute for powdered massive talc in other uses. It is to be hoped that an increasing use for the material may be found; and although the deposits are not large, they are doubtless large enough to meet any demand that is likely to be put upon them for a great many years."

ALUNITE.

General Relations and Size of Deposits.

"Alunite is a hydrous sulphate of aluminium and potassium having the formula K_2O, $3Al_2O_3$, $4SO_3$, $6H_2O$. When pure it contains 11·4 per cent of potash (K_2O), 37·0 per cent of alumina, Al_2O_3, and 38·6 per cent of water. However, alunite is usually found in nature in an impure state, mixed with quartz, diaspore, sericite, and other minerals and containing more or less ferric oxide (Fe_2O_3) and soda (Na_2O). The sodic variety, which is the variety found in the Kyuquot Sound deposits, is properly called natroalunite.[1] Alunite occurs in a rather coarse-grained crystalline

[1] Hillebrand, W. F. and Penfield, S.L. Some additions to the Alunite-Jarosite group of minerals in Bull. U. S. Geol. Surv., No. 262, 1905, pp. 37-41.

form, but more commonly, as at Kyuquot Sound, as a fine-grained to dense, massive variety.

"A detailed description of the Kyuquot Sound alunite deposits and of the physical and chemical character of the alunite rocks has already been given. The alunite mixed with quartz and other minerals occurs in masses of quartz-alunite rocks, which have resulted from the metasomatic replacement of chiefly fragmental volcanic rocks, dacites, and feldspathic andesites. Only one large deposit is known: it occurs on the Morris claim, and is about 4½ acres in area. This deposit extends to and below sea-level and contains above sea-level about 600,000 tons. Another much smaller deposit occurs along the shore to the east on the Snowstorm claim. As presented under a previous section, it is believed that the alunite deposits have been formed by uprising thermal waters, so that it is probable that the deposits extend below sea-level for an indefinite distance, which, however, is probably not more than a few hundred feet.

"Alunite forms from 20 to at least 45 per cent of the alunite rocks and it is mixed chiefly with quartz varying from 40 to 50 per cent, sericite varying from virtually nothing to 14 per cent, a little diaspore, and usually pyrite. The pyritiferous alunite rocks are bluish-grey in colour and are found chiefly near sea-level, at or below the present ground-water level and have been leached of their pyrite by descending rain waters. A part of the iron of the pyrite has been removed by the waters and has cemented the beach rubble fringing the alunite deposit, into a fairly firm rock. The remaining iron of the pyrite has been oxidized to limonite, which gives the surface rocks their reddish colour. Free sulphur has also resulted from the oxidation of the pyrite, and occurs, mixed with the limonite and with kaolin. According to the analysis of the samples collected by the writer, it appears as if the reddish to white surface rocks contain more alunite than the bluish-grey, unoxidized rocks; it thus appearing as if part of the alunite in the surface rocks was the result of the oxidation of sulphur in the pyrite and its reaction with the alumina and alkalies remaining from the original volcanics. However Mr. Wally, chemist of the San Juan Mining and Manufacturing Company, who has tested the deposit carefully, claims that the bluish-grey rocks contain on the whole more alunite than the reddish to white rocks, and he believes that alunite as well as pyrite has been leached from the latter rocks."

Future Possibilities.[1]

"Alunite has been mined for alum and aluminium sulphates at several localities in other continents, chiefly at Tolfa, Italy, about 35 miles northwest of Rome, and near the village of Bulla Delah, New South Wales, Australia. At present no use has been made of the several deposits of alunite known in

[1] The commercial availability of alunite, its occurrence in the United States and elsewhere, and the process employed in the manufacture of alum and aluminium sulphates from alunite are excellently and concisely summarized by B. S. Butler and H. S. Gale in Bull. U. S. Geol. Surv. No. 511, 1912, pp. 38-64, and the following material has been largely taken from this publication.

the United States, although they have lately attracted considerable interest on account of the increased demand for potash salts, which are used chiefly and very extensively in the manufacture of fertilizers. The United States Geological Survey has also drawn attention to the possibility of using alunite not only as a source of alum and of other potash salts, but as a source of alumina. This suggestion is based on the results of the laboratory experiments on fairly pure alunite by W. T. Schaller, who has made the following observations:—

" 'Laboratory experiments showed that on igniting the powdered alunite all of the water and three-quarters of the sulphuric acid are volatilized. On leaching the residue with water the potassium sulphate is dissolved, leaving the insoluble aluminum oxide behind.

" 'The average amount of potassium sulphate leached from the ignited mineral powder is 17·9 per cent of the original material used. As the coarsely crystallized alunite was found to contain 19·4 per cent of potassium sulphate, 92 per cent of the total potash present was obtained by simple ignition and subsequent leaching.

" 'It is worth noting that, according to the laboratory experiments, 32·7 per cent of the ignited alunite consists of available potassium sulphate, which can be extracted by simple water leaching and evaporation. The remaining 67·3 per cent consists of nearly pure aluminum oxide.

"It is suggested that in commercial practice the potassium in the alunite be utilized in the form of the simple sulphate instead of alum, thus leaving as a by-product the insoluble and nearly pure aluminium oxide, which might possibly be used as a substitute for the mineral bauxite in the manufacture of metallic aluminum.

"Since the Kyuquot Sound deposits certainly do not contain on the average more than 45 per cent of alunite, and since the alunite is the sodic variety (natroalunite), the deposits, to judge from the fact that all the alunite rock in the Bulla Delah deposits carrying over 10 per cent of silica is discarded,[1] are not very promising as a commercial source of alum or other potash salts, unless the alunite rock might also be used as an ore for aluminum or for some other use. Whether or not the alunite rock might be used as an aluminum ore is questionable, since as yet no attempt has been made to produce aluminum from alunite. Considering the relatively large quantities of alunite in the Kyuquot deposits, it is greatly to be hoped that some use for it may be found."

PYROPHYLLITE.

General Relations and Size of Deposits.

"Pyrophyllite is a hydrous silicate of alumina, H_2O, Al_2O_3, $4SiO_2$, that occurs in two varieties, as a foliated and often radiated mineral, and as a compact massive mineral with a soapy feel, frequently called agalmatolite. This compact variety is the variety found in the Kyuquot Sound deposits,

[1] Loc. cit. p. 60. Quotation from Pitman, E.P. Alunite or alumstone in New South Wales, Rept. Geol. Surv., New South Wales, 1901, pp. 419-429.

although, as already described, it occurs mixed with considerable quartz, from 20 to 50 per cent, and more or less sericite, from virtually nothing to 8 per cent. There are two deposits of the fairly pure quartz-pyrophyllite rock, one of about 3 acres in area on the Deertrail claim extending east to the Morris claim, and the other about 1 acre in area on the Monteith claim. The deposits, as shown by the quarries already opened up in them and by their outcrops, extend to sea-level, and the tonnage in each of the deposits above sea-level is about 400,000 tons in the Deertrail claim deposit and 100,000 tons in the Monteith claim deposit."

Development of Uses.

"So far as known to the writer pyrophyllite is not used very extensively and the only uses to which pyrophyllite has been put are, as listed in the various books on mineralogy, for slate pencils, French chalk, and as an easily carved ornamental stone, the Orientals using it to carve images and small ornaments. It is also used as a substitute for talc and is usually sold under that name. Pyrophyllite is, however, less valuable than true talc, although it is claimed that for bleaching cotton cloth, pyrophyllite is better than talc.[1] Thus the uses to which the Kyuquot pyrophyllite has been put, as a fireclay and as a "household cleanser" are rather unique. The British Columbia Pottery Company have been quarrying the deposit on the Monteith claim since 1910 to obtain a refractory material, virtually a fireclay, to mix with the surface clays dug near their plant in Victoria West, and with the Cretaceous shales from Comox, in order to increase the refractiveness of the mixture. The mixture has been used successfully for the manufacture of sewer-pipe and fireproofing. By itself, even the most highly weathered of the quartz-pyrophyllite rock, that rock containing most kaolin, is of poor plasticity. Ries and Keele[2] give the following results of laboratory tests made on a sample taken from the stock pile at the British Columbia Pottery Company's factory:—

"The San Juan Mining and Manufacturing Company has taken advantage of the fact that the quartz-pyrophyllite rock breaks up into an extremely fine powder, which, for the greater part, contains no grit coarse enough to feel between the fingers or the teeth, to use the powdered rock as a polishing powder and as a base for a "household cleanser," a metal polish and a mechanic's soap. Since pyrophyllite has a hardness of only 1 to 2, it is of no value in itself as a polishing powder, but the Kyuquot pyrophyllite is, as described, mixed with 20 to 50 per cent of quartz, which occurs in very fine grains, averaging less than 0·001 mm. in diameter, and this quartz serves as the abraiding substance. The pyrophyllite on account of its softness and slipperiness is, however, probably of value in the polishing powder,

[1]Diller, J. S. Talc and Soapstone in Mineral Resources of the United States for 1912. Part II, 1913, pages 1139-1143.

[2] Ries, H. and Keele, J., Clay and Shale Deposits of the Western Provinces. Memoir No. 24, Geol. Surv., Can., 1912, pp. 148-150.

serving to keep the quartz from scratching. The softness and soapy feel of the pyrophyllite, like that of talc, makes the material of value as a base for soap, although for this use, except for the lower grades of soap, the quartz seems undesirable. The chief difficulty experienced in the manufacture of these products is in getting rid of the coarse grains of quartz; but if this is done satisfactorily the resulting products would seem to be of fairly good grade. As yet the San Juan Mining and Manufacturing Company have opened up only a small quarry in the Deertrail claim deposit and have been manufacturing their products spasmodically since 1911 in their factory in Esquimalt, west of Victoria."

ARSENIC.

Canada's production of white arsenic up to 1903 was secured from a plant at Deloro, Ontario, which treated mispickel residues from which the gold content had been extracted by amalgamation, and bromo-cyanide treatment. Since 1903 though, even in spite of a bounty offered in 1907 by the Ontario Government on "white arsenic, otherwise known as arsenious oxide, produced from mispickel ores, and not from ores carrying smaltite, niccolite, or cobaltite" the industry has been dormant.

In 1906 plants treating cobalt ores made provision for the recovery of white arsenic as a by-product, and since then white arsenic has been produced each year, the production for the last five years being fairly constant in quantity. On this white arsenic no bounty is payable.

The plants which have been producing white arsenic from cobalt ores are located at Deloro, Thorold, Orillia and Copper Cliff, all in the Province of Ontario. In 1914 only two of these were operating, viz: the Deloro plant of the Deloro Mining and Reduction Company, and the Thorold plant of the Coniagas Reduction Company.

Arsenical ore concentrates were shipped for several years by a gold mining company in Nova Scotia, but the last of these was made in 1910.

The total production of white arsenic in 1914 was 1,737 tons, valued at $104,015, as compared with 1,692 tons, in 1913, valued at $101,463, and 2,045 tons in 1912, valued at $89,262.

The exports of white arsenic in 1914, according to the records of the Department of Customs were 3,751,900 pounds (1,876 tons) valued at $132,567, as compared with 2,606,767 pounds (1,303 tons) in 1913, valued at $107,094.

The imports of white arsenic, or arsenious oxide, in 1914 were 5,012 pounds, valued at $249, as compared with 18,788 pounds in 1913, valued at $1,061. Imports of sulphide of arsenic in 1914 were 11,494 pounds, valued at $756, as compared with imports in 1913 of 455,394 pounds, valued at $17,759. There was also imported during 1914, arseniate, bi-arseniate and stannate of soda to the amount of 14,389 pounds, valued at $604, as compared with 22,892 pounds in 1913, valued at $987.

Annual Production of Arsenic.

Calendar Year.	Arsenical Ore.		White Arsenic.	
	Tons.	Value.	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
1892–3			Nil.	Nil.
1894			7	420
1895–8			Nil.	Nil.
1899			57	4,872
1900			303	22,725
1901			695	41,676
1902			800	48,000
1903			257	15,420
1904–5				
1906			201	14,058
1907	656	11,094	330	36,209
1908	986	17,506	715¼	41,060
1909	224	3,346	1,129	64,100
1910	547	5,716	1,502	75,328
1911			2,097	76,237
1912			2,045	89,262
1913			1,692	101,463
1914			1,737	104,015

Exports of White Arsenic.

Calendar Year.	Pounds.	Value.	Calendar Year.	Pounds.	Value.
		$			$
1902	547,698	16,192	1909	3,111,249	119,673
1903	395,573	10,583	1910	4,512,673	173,932
1904	146,000	6,900	1911	4,125,558	81,761
1905	108,000	5,400	1912	3,847,906	101,310
1906	271,063	5,981	1913	2,606,767	107,094
1907	613,504	10,850	1914	3,751,900	132,567
1908	1,913,732	43,493			

Annual Imports of Arsenic, 1880-1906.

Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.
		$			$			$
1880	18,197	576	1889	69,269	2,434	1898	291,967	14,270
1881	31,417	1,070	1890	138,509	4,474	1899	582,383	24,203
1882	138,920	3,962	1891	115,248	4,027	1900	230,730	11,035
1883	51,953	1,812	1892	302,958	9,365	1901	159,263	8,361
1884	19,337	773	1893	447,079	12,907	1902	106,857	6,004
1885	49,080	1,566	1894	292,505	10,018	1903	298,375	11,824
1886	30,181	961	1895	1,115,697	31,932	1904	414,065	12,421
1887	32,436	1,116	1896	664,854	27,523	1905	268,274	7,661
1888	27,510	1,016	1897	152,275	8,378	1906 Duty free	446,975	19,169

Imports of Arsenious Oxide and Sulphide of Arsenic.

Calendar Year.	Arsenious oxide.*		Arsenic, sulphide of.*		Total.
	Pounds.	Value.	Pounds.	Value.	
		$		$	$
1907	622,888	42,245	64,014	4,249	46,494
1908	127,942	4,043	302,970	12,754	16,797
1909	23,857	1,285	309,141	12,371	13,656
1910	260,415	6,891	257,451	8,946	15,837
1911	7,338	158	330,170	6,665	6,823
1912	76,528	1,722	451,928	19,431	21,153
1913	18,788	1,061	455,394	17,759	18,820
1914	5,012	249	11,494	756	1,005

* Duty free.

Imports of Arseniate, Bi-Arseniate, and Stannate of Soda.

Calendar Year.	Pounds.	Value.
		$
1907	307,247	3,919
1908	7,617	468
1909	22,889	975
1910	26,174	549
1911	47,532	1,908
1912	41,977	1,595
1913	22,892	987
1914	14,389	604

ASBESTOS.

Asbestos production in Canada has for many years been confined to the Eastern Townships district of the Province of Quebec—Black Lake, Thetford, Robertsonville, Danville, and East Broughton being the shipping points. Other occurrences are known; but these are not of economic interest at present.

The asbestos deposits, and the asbestos industry (up to 1910) have been described fully in a special report of the Mines Branch.[1]

There is no uniform classification of the different grades of marketable, crude and milled asbestos in use by the producers. In the absence of such a classification an arbitrary one based on valuation has been adopted by the Statistical Division of the Mines Branch for the Annual Reports on Mineral Production. According to the present classification which has been in use since 1910 the various grades represent material valued as follows:—

Crude No. 1. Value $200 per ton, and upwards.
Crude No. 2. Value under $200 per ton.
Mill stock No. 1. Value $30 and upwards per ton.
Mill stock No. 2. Value $15—$30 per ton.
Mill stock No. 3. Value under $15 per ton.

"Asbestic," also mentioned in the tables of statistics, is a fine asbestos powder which now enters largely into the construction and inside finish of fireproof buildings: it is manufactured from the sand and tailings from the shaking screens of some of the asbestos mills.

The 1914 returns from operators, in comparison with 1913 figures, show a decided falling off in both output and sales. The principal cause of this was the outbreak of the European war, since, during the first six months of 1914, the shipments exceeded those of the first six months of 1913. The immediate effect of the declaration of war was to deprive the producers of the German and Austrian markets, which had taken either directly or indirectly, a good share of the Canadian production. The 1914 shipments were exceeded only by those of the three previous years during each of which substantial gains were shown. The output in 1914 shows a decrease of 10·87 per cent from that of 1913, and the sales showed a decrease of 29·50 per cent in quantity. Because of slightly higher prices realized on 1914 sales the decrease in total value of sales was only 24·50 per cent.

In 1914 the output of asbestos was 107,669 tons as compared with 132,564 tons in 1913, and 102,759 tons in 1912. The total sales (not including asbestic) in 1914 were 96,542 tons valued at $2,892,266 or an average of $29·96 per ton, as compared with sales in 1913 of 136,951 tons

[1] Chrysotile Asbestos: Its Occurrence, Exploitation, Milling and Uses," by Fritz Cirkel. Mines Branch, Department of Mines, Ottawa, No. 69.

valued at $3,830,909 or an average of $27.97 per ton: and in 1912 of 111,561 tons valued at $3,117,572 or an average of $27.95 per ton. Sales of asbestic in 1914 were 21,031 tons valued at $17,540 or an average of 83 cents per ton, and in 1913 sales were 24,135 tons valued at $19,016 or an average of 79 cents per ton. Stocks of asbestos on hand Dec. 31st, 1914, were reported as 31,171 tons valued at $1,100,267 or an average of $35.30 per ton, as compared with stocks on Dec. 31st, 1913, of 20,787 tons valued at $939,720 or an average of $45.21 per ton, and with stocks at Dec. 31st, 1912, of 23,288 tons valued at $1,083,202 or an average of $46.51 per ton.

The average number of men employed in mines and mills during 1914 was 2,992 at a wage cost of $1,283,977, as compared with 2,951 men in 1913 at a wage cost of $1,687,957.

The total quantity of asbestos rock sent to mills during 1914 is reported as 1,717,629 tons, which, with a mill production of 103,607 tons, shows an average estimated recovery of 6·03 per cent. In 1913 the recovery was 6·04 per cent, and in 1912 it was 6·01 per cent.

Statistics showing the output, sales, and stocks on hand on Dec. 31st, by grades, for the past three years are shown in the following tables:—

Output, Sales, and Stocks of Asbestos in 1914.

	Output.	Sales.			Stock on hand, Dec. 31.		
	Tons.	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.
			$	$ cts.		$	$ cts.
Crude, No. 1	1,450·6	1,335·9	402,417	301 23	984·3	301,237	306 04
" No. 2	2,611	2,812	370,776	131 87	1,411	187,338	132 78
Mill stock, No. 1	16,144	19,388	932,893	48 12	4,616	229,361	49 69
" No. 2	58,362	47,851	963,973	20 15	15,114	305,809	20 23
" No. 3	29,101	25,155	222,207	8 83	9,046	76,522	8 46
Total asbestos	107,668·6	96,541·9	2,892,266	29 96	31,171·3	1,100,267	35 30
Asbestic	.....	21,031	17,540	0 83	.....	.....	.....

Output, Sales, and Stocks of Asbestos in 1913.

	Output.	Sales.			Stock on hand, December 31.		
	Tons.	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.
			$	$ cts.		$	$ cts.
Crude, No. 1	2,015·4	1,853·3	531,200	286 62	880·5	247,877	281 52
" No. 2	3,010	3,807	457,962	120 29	1,522	178,789	117 47
Mill stock No. 1	23,444	26,198	1,229,908	46 95	6,755	350,165	51 84
" No. 2	58,592	60,164	1,201,215	19 97	4,809	108,285	22 52
" No. 3	45,503	44,929	410,624	9 14	6,820	54,604	8 01
Total asbestos	132,564·4	136,951·3	3,830,909	27 97	20,786·5	939,720	45 21
Asbestic	.....	24,135	19,016	0 79	.....	.....	.....

Output, Sales, and Stocks of Asbestos in 1912.

	Output.	Sales.			Stock on hand, December 31.		
	Tons.	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.
			$	$ cts.		$	$ cts.
Crude, No. 1	1,458¾	1,937·9	510,154	263 25	866·8	221,289	255 29
" No. 2	3,290	3,725	380,197	102 07	2,789	303,063	108 66
Mill stock, No. 1	21,522	21,679	945,994	43 64	8,059	379,904	47 14
" No. 2	36,872	44,819	895,322	19 97	6,301	132,970	21 10
" No. 3	39,616	39,400	385,905	9 79	5,272	45,976	8 72
Total asbestos	102,758¾	111,560·9	3,117,572	27 95	23,287·8	1,083,202	46 51
Asbestic	.....	24,740	19,707	0 80	.....	.....	.....

The shipment of crude asbestos and mill stock since 1903 are separately shown in the next table. The 1914 shipments of crude were 4,148 tons, a decrease of 23·1 per cent from the average of the three preceding years, and of 26·7 per cent from the 1913 shipments. The average price per ton, though, for 1914 has been exceeded only in 1907, 1908, and 1909. The shipments of mill stock in 1914 were 92,394 tons, a decrease of 29·6 per cent from 1913 shipments. The average price realized on 1914 mill stock, $22.94 per ton, was higher than that of the three preceding years.

Tables showing yearly shipments of asbestos, both crude and milled, and of asbestos of all grades, and asbestic follow:—

Annual Shipments of Crude and Mill Stock Asbestos, 1903-14.

Calendar Year.	Crude.			Mill stock.		
	Short tons.	Value.	Per ton.	Short tons.	Value.	Per ton.
		$	$ cts.		$	$ cts.
1903	3,134	361,867	115 46	27,995	554,021	19 79
1904	4,410	534,874	121 28	31,201	678,628	21 75
1905	3,767	472,859	125 53	46,902	1,013,500	21 61
1906	3,841	635,345	165 41	56,920	1,401,083	24 61
1907	4,327	830,632	191 97	57,803	1,654,135	28 62
1908	3,345·5	669,232	200 04	63,202	1,886,129	29 84
1909	3,074·3	575,510	187 20	60,275	1,709,077	28 35
1910	3,740	664,508	177 66	73,768	1,891,466	25 64
1911	4,864·1	744,962	153 15	96,529	2,177,100	22 55
1912	5,662·9	890,351	157 23	105,898	2,227,221	21 03
1913	5,660·3	989,162	174 75	131,291	2,841,747	21 64
1914	4,147·9	773,193	186 42	92,394	2,119,073	22 94

Annual Shipments of Asbestos and Asbestic.

Calendar Year.	Asbestos.			Asbestic.		
	Short tons.	Value.	Per ton.	Short tons.	Value.	Per ton.
		$	$ cts.		$	$ cts.
1880 (a)	380	24,700	65 00			
1881 (a)	540	35,100	65 00			
1882 (a)	810	52,650	65 00			
1883 (a)	955	68,750	71 99			
1884 (a)	1,141	75,097	65 82			
1885 (a)	2,440	142,441	58 38			
1886 (a)	3,458	206,251	59 64			
1887	4,619	226,976	48 92			
1888	4,404	255,007	57 90			
1889	6,113	426,554	69 78			
1890	9,860	1,260,240	127,81			
1891	9,279	999,878	107 76			
1892	6,082	390,462	64 20			
1893	6,331	310,156	86 81			
1894	7,630	420,825	55 15			
1895	8,756	368,175	42 05			
1896	10,892	423,066	38 84	1,358	6,790	5 00
1897	13,202	399,528	29 99	17,240	45,840	2 66
1898	16,124	475,131	29 47	7,661	16,066	2 10
1899	17,790	468,635	26 34	7,746	17,214	2 22
1900	21,621	729,886	33 76	7,520	18,545	2 47
1901	32,892	1,248,645	37 96	7,325	11,114	1 52
1902	30,219	1,126,688	37 28	10,197	21,631	2 20
1903	31,129	915,888	29 42	10,548	13,869	1 31
1904	35,611	1,213,502	34 08	12,854	12,850	1 00
1905	50,669	1,486,359	29 33	17,594	16,900	0 96
1906	60,761	2,036,428	33 52	21,424	23,715	1 11
1907	62,130	2,484,767	39 99	28,296	20,275	0 72
1908	66,548	2,555,361	38 40	24,225	17,974	0 74
1909	63,349	2,284,587	36 06	23,951	17,188	0 72
1910	77,508	2,555,974	32 98	24,707	17,629	0 71
1911	101,393	2,922,062	28 82	26,021	21,046	0 81
1912	111,561	3,117,572	27 95	24,740	19,707	0 80
1913	136,951	3,830,909	27 97	24,135	19,016	0 79
1914	96,542	2,892,266	29 96	21,031	17,540	0 83

(a) Exports.

EXPORTS AND IMPORTS.

From 1903 to 1914 inclusive the exports of asbestos from Canada have been 86·15 per cent of the total shipments. The exports to Great Britain, United States, Germany, and to other countries during recent years are shown in the following table. Not all the asbestos consumed by each country mentioned is imported directly, a great deal of the European demands being supplied through United States firms, and a great deal of the German and Austrian demands through Belgium, Holland, and Italy. Asbestic sand is not included in the following tables; of this there was exported 18,991 tons valued at $108,548 in 1914, and 24,766 tons valued at $138,737 in 1913.

Exports of Canadian Asbestos by Countries, 1903-1914.

Calendar Year	To Great Britain.		To United States.		To Germany.		To other countries.		Total exports.		Value per ton.
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
		$		$		$		$		$	$ cts.
1903...	2,743	40,120	24,252	714,781	1,429	25,150	3,356	110,982	31,780	891,033	28 04
1904...	6,602	210,175	25,957	762,300	2,463	94,141	2,250	94,271	37,272	1,160,887	31 15
1905...	9,731	305,056	29,696	811,080	2,969	100,061	4,635	169,918	47,031	1,386,115	29 47
1906...	9,435	318,313	39,767	1,058,513	3,654	82,117	6,998	230,314	59,854	1,689,257	28 22
1907...	5,432	200,909	44,861	1,312,582	225	8,195	6,235	147,613	56,753	1,669,299	29 41
1908...	5,221	288,290	50,503	1,314,337	341	9,470	5,145	230,666	61,210	1,842,763	30 11
1909...	5,227	204,978	45,675	1,243,795	693	17,706	5,376	263,378	56,971	1,729,857	30 36
1910...	6,700	280,452	57,939	1,505,477	440	15,925	6,406	306,778	71,485	2,108,632	29 50
1911...	7,511	192,993	62,551	1,732,541	361	20,494	4,697	121,231	75,120	2,067,259	27 52
1912...	9,387	208,464	69,222	1,871,770	1,155	43,898	8,244	225,221	88,008	2,349,353	26 69
1913...	7,220	211,861	78,157	2,120,314	840	36,491	17,595	479,381	103,812	2,848,047	27 43
1914...	11,197	382,482	58,302	1,555,339	2,749	94,967	8,833	265,858	81,081	2,298,646	28 35

The next table shows the aggregate exports of asbestos from 1892 to 1914. The 1914 exports were exceeded only by those in 1912 and 1913.

Annual Exports of Asbestos, Calendar Years 1892-1914.

Calendar Year.	Tons.	Value.	Value per ton.	Calendar Year.	Tons.	Value.	Value. per ton.
		$	$ cts.			$	$ cts.
1892.....	5,380	373,103	69 35	1903.....	31,780	891,033	28 04
1893.....	5,917	338,707	57 24	1904.....	37,272	1,160,887	31 14
1894.....	7,987	477,837	59 82	1905.....	47,031	1,386,115	29 47
1895.....	7,442	421,690	56 66	1906.....	59,854	1,689,257	28 22
1896.....	11,842	567,967	47 96	1907.....	56,753	1,669,299	29 41
1897.....	15,570	473,274	30 40	1908.....	61,210	1,842,763	30 11
1898.....	15,346	494,012	32 19	1909.....	56,971	1,729,857	30 36
1899.....	17,883	473,148	26 46	1910.....	71,485	2,108,632	29 50
1900.....	16,993	693,105	39 61	1911.....	75,120	2,067,259	27 52
1901.....	32,269	1,069,918	33 16	1912.....	88,008	2,349,353	26 69
1902.....	31,074	995,071	32 02	1913.....	103,812	2,848,047	27 43
				1914.....	81,081	2,298,646	28 35

Canada, though the leading country in the world in the production of asbestos, does not yet manufacture all the asbestos goods needed to supply the domestic market. Consequently, there is a considerable importation annually of asbestos goods under the Customs classification of "Asbestos in any form other than crude, and all manufactures thereof," the duty being 25 per cent. The 1914 imports were valued at $282,053, those of 1913 at $520,082, and those of 1912 at $461,449.

Annual Imorts of Asbestos 1885-1914.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1885	674	1895	26,094	1905	116,836
1886	6,831	1896	23,900	1906	137,974
1887	7,836	1897	19,032	1907 (9 mos.)	127,509
1888	8,793	1898	26,389	1908	190,980
1889	9,943	1899	32,607	1909	180,598
1890	13,250	1900	43,455	Calendar Year.	
1891	13,298	1901	50,829	1910	230,849
1892	14,090	1902	52,464	1911	319,815
1893	19,181	1903	75,465	1912	461,449
1894	20,021	1904	83,827	1913	520,082
				1914*	282,053

*Asbestos in any form other than crude, and all manufactures of. Duty 25 per cent.

The imports of asbestos into the United Kingdom are of interest as indicating the market in that country, and the sources from which it is supplied. From 1907 to 1912 inclusive the imports ranged between a low limit of 6,477 and a high limit of 8,620 tons. In 1913 there was a sudden increase to 12,995 tons, and in 1914 a further increase to 16,480 tons. Except in the years 1909, 1911, and 1912 direct imports from Canada comprised over 50 per cent of the total, and in 1914 they reached the proportion of 68·7 per cent of the total imports.

Statistics as to these imports, indicating the sources of supply, appear in the following table.

Imports of Raw Asbestos into the United Kingdom.*

Country.	1912.		1913.		1914.	
	Short tons.	Value.	Short tons.	Value.	Short tons.	Value.
		$		$		$
Russia	2,170	267,477	1,770	218,966	1,403	140,072
Germany	203	24,903	392	40,836	296	44,160
Portuguese East Africa	32	1,465	216	19,773	329	28,446
Italy	44	7,076	101	12,653	84	21,131
United States	1,201	30,100	1,239	27,599	1,800	80,704
Other foreign countries	117	7,762	174	11,992	172	13,067
Total foreign	3,767	338,783	3,892	331,819	4,084	327,580
Cape of Good Hope	692	47,596	635	41,148	932	91,868
Natal	.....	.....	5	453	80	9,169
Canada	4,146	195,426	8,443	359,943	11,326	448,449
Other British possessions	15	852	20	1,324	58	3,849
Total British possessions	4,853	243,874	9,103	402,868	12,396	553,335
Grand total	8,620	582,657	12,995	734,687	16,480	880,915

*British Trade Report.

Following is a list of the firms reporting production of asbestos during 1914.

Operator and Head Office Address.	Name of Mine.	Location.		Mine Office.
		Township.	Range and Lot.	
Asbestos Corp. of Canada, Limited, 263 St. James St., Montreal, Can.	Kings	Thetford	V 26; VI 26.	Thetford Mines.
	Beaver	Coleraine	C 31, 32.	"
	British Canadian.	"	Black Lake.	Black Lake.
Bell Asbestos Mines, Thetford Mines, Que.	Bell	Thetford	V N-E½ 27.	Thetford Mines.
Black Lake Asbestos and Chrome Co., Ltd., 60 Victoria, Toronto.	Union	Coleraine	B 27, 28.	Black Lake.
	Imperial			
	Southwark			
Jacobs Asbestos Mining Co. of Thetford, Ltd., 282 St. Catherine W. Montreal.	Jacobs	Thetford	VI 28.	Thetford Mines.
Johnson's (Asbestos) Company, Thetford, Mines, Que.	Johnson	Thetford	VI 27.	Black Lake.
	Johnson	Coleraine	B 27.	Thetford Mines.
Ling Asbestos Company, Ltd., East Broughton, Que.	Ling	Broughton	VI 13b.	East Broughton.
The Asbestos and Asbestic Co., Ltd., Asbestos, Que.	Jeffrey	Shipton	III 8, 9, 10.	Asbestos.
The B. and A. Asbestos Company, Robertsonville, Que.	B. and A.	Thetford	V 9.	Robertsonville.
The Martin-Bennett Asbestos Mines, Ltd., Thetford, Mines, Que.	Ward-Ross	Thetford	V 27.	Thetford Mines.

BARYTES AND STRONTIUM.

BARYTES.

During recent years the only barytes deposit worked in Canada is one at Lake Ainslie, Inverness county, N. S., (Post Office, Scotsville), owned by Barytes, Limited, of Halifax, N. S. Another deposit which may become a producer, is located on Mining Claim R. S. C. 216, Langmuir township, near Porcupine, Ontario.

The 1914 shipments of ground barytes are reported as 612 tons valued at $6,169, as compared with 641 tons in 1913 valued at $6,410 and 464 tons in 1912 valued at $5,104. During the last five years practically all the Canadian production finds a domestic market. Statistics of annual production and exports of barytes follow:—

Annual Production of Barytes.

Calendar Year.	Tons.	Value.	Average Value.	Calendar Year.	Tons.	Value.	Average Value.
		$	$ cts.			$	$ cts.
1885	300	1,500	5 00	1900	1,337	7,605	5 69
1886	3,864	19,270	4 98	1901	653	3,842	5 89
1887	400	2,400	6 00	1902	1,096	3,957	3 61
1888	1,100	3,850	3 50	1903	1,163	3,931	3 38
1889	.....	.....	.....	1904	1,382	3,702	2 68
1890	1,842	7,543	4 09	1905	3,360	7,500	2 23
1891	.....	.....	.....	1906	4,000	12,000	3 00
1892	315	1,260	4 00	1907	1,344	3,000	2 23
1893	.....	.....	.....	1908	4,312	19,021	4 41
1894	1,081	2,830	2 62	1909	179	1,120	6 26
1895	.....	.....	.....	1910	.....	.....	.....
1896	145	715	4 93	1911	50	400	8 00
1897	571	3,060	5 36	1912	464	5,104	11 00
1898	1,125	5,533	4 92	1913	641	6,410	11 00
1899	720	4,402	6 11	1914	612	6,169	10 08

Exports of Barytes.

Calendar Year.	Cwt.	Value.	Calendar Year.	Cwt.	Value.
		$			$
1901	208	3,820	1908	3,509	13,690
1902	.....	.....	1909	.....	.....
1903	406	368	1910	5	150
1904	13,080	5,178	1911	.....	.....
1905	34,488	14,343	1912	68	114
1906	1,350	6,750	1913	Nil.	.....
1907	550	2,750	1914	Nil.	.....

Imports of barytes have not been separately shown in the Customs Department classification since 1890, but certain barium compounds are

specifically mentioned. Imports of barium peroxide for the manufacture of hydrogen peroxide for the last nine months of 1913 were 26 tons valued at $3,600, and for 1914 were 42 tons valued at $5,722. Imports of blanc fixé (artificial sulphate of barium) and satin white again showed an increase being 1,854 tons valued at $39,849 as compared with 1,698 tons in 1913 valued at $38,043.

Statistics of imports appear in the following tables.

Imports of Barytes.

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

Imports of Blanc Fixé and Satin White.

Calendar Year.	Tons.	Value. $	Average. $ cts.
1910	1,016	22,726	22 37
1911	1,315	29,796	22 66
1912	1,635	34,794	21 28
1913	1,698	38,043	22 40
1914	1,854	39,849	21 49

STRONTIUM.

Strontium minerals have not been mined in Canada, but in view of enquiry that has recently been made, the accompanying notes respecting Canadian occurrences of this mineral may be of interest.

Certain manufacturers of paints and varnishes appear to be of the opinion that strontium sulphate if obtainable at suitable prices might be substituted for sulphate of barium of which it is claimed there is a consumption in Great Britain of from 50,000 to 100,000 tons per annum at prices ranging from 40s. to 60s. and 70s. per ton.

The principal use of strontium in the form of strontium nitrate has been in the manufacture of signal lights and fireworks. Strontium hydroxide has also been extensively used, more particularly in Germany, in the refining of beet sugar molasses.

The occurrence of strontianite and celestite has been noted at several places in Canada, but in most cases apparently of mineralogical interest only.

The various occurrences that have been recorded are listed below. The veins of celestite found in the counties of Frontenac, Leeds, and Ren-

frew, Ontario, might be worthy of investigation as possible sources of supply should a demand for this mineral arise.

Nova Scotia.

Cape Breton. Sydney river. Dominion Steel Co's dam.

Celestite occurs in a 12 inch bed at this place, the only locality in the province.

(Nova Scotia Mines Report 1903—p. 39).

Quebec.

St. Helens Island.

Strontianite occurs in the form of white fibrous tufts in cracks in concretionary limestone masses in the Utica slate of St. Helens Island, Montreal.

(Geol. Survey of Canada, 1888-89—61T).

Ontario.

Carleton county. Nepean Tp. Con. A, lot 31.

On the south shore of the Ottawa river a short distance below the road leading down to the old Skead mill, strontianite occurs in the form of veins traversing the lower part of the Chazy limestone, which vary from four to six inches in width. The mineral occurs below high water line and thus can only be seen at a low stage of water.

An analysis of carefully selected material consisting of crystals dried at 100C gave:—

Carbonic acid	30·54%
Strontia	65·43%
Lime	3·38%
Insoluble	0·17%
	99·52%

(G.S.C. 1899—44G).

Essex county. Amherstburg.

Specimens of celestite were obtained in the course of excavating the bed of the Detroit river at Amherstburg.

(G.S.C. 1904—347A).

Frontenac county. Loughboro Tp., Con. XII, S. ½ lot 5.

Sufficient development work is said to have been done on this property to give assurance that the celestite occurs in considerable quantity and an analysis of a fair sample showed 94·1 per cent pure strontium sulphate. There was said to be 50 tons of mineral on the dump at this place in 1907.

Grenville county. Oxford Tp.

Samples of barytocelestite brought to Mines Branch reported as having been obtained near Burritts Rapids on the Rideau river.

Leeds county. Lansdowne Tp., Con. VIII, lot 2.

Celestite has been found in considerable abundance in a well-defined vein traversing crystalline limestone on this lot. The vein is said to have been traced for a quarter of a mile running nearly due north-west and south-east, and to have an average width of about two feet. In some parts it consists wholly of nearly pure celestite, whilst in other parts this mineral associated with celestite constitutes the gangue through which galena is irregularly distributed in crystals and small masses.

An analysis of a sample showed the following composition:—

Sulphuric acid	43·51%
Strontia	56·31%
Baryta	trace.
Lime	0·11%
	99·93%

(G.S.C. 1894—10R).

Manitoulin Island. East side of Manitowaning bay, and at Cape Robert, Grand Manitoulin Island, and on Bayard Island.

Celestite specimens were collected by Dr. Robert Bell in 1865.

(G.S.C. 1899—19R).

Prescott county. Hawkesbury East Tp.

A specimen of celestite from the Little Rideau river was submitted by Thos. Ross of Little Rideau in 1900.

(G.S.C. 1900—174A).

Renfrew county. Bagot Tp. Con. X, lot 7.

Massive celestite is met with forming a vein traversing Laurentian strata. The vein which has been traced for over two hundred yards, has been stripped at several points along its course for a distance of some sixty feet and found to have a width of from eight to ten feet. There are also indications it is said of the existence of another vein of this mineral running parallel with and not far removed from this one. An analysis of a sample from this locality gave the following results:—

Strontium sulphate	85·63 %
Barium	14·38%
Calcium	trace.
	100·01%

(G.S.C. 1893—19R).

Cariboo District. Horsefly river.

Horsefly Hydraulic Mining Co's property.

Strontianite occurs incrusting boulders or filling irregular cavities in the lower or cemented portion of the auriferous gravels and is also found disseminated in hard clayey concretionary masses formed beneath the auriferous gravels in the decomposed superficial parts of the underlying Tertiary (Miocene) shales which constitute the bed rock at this mine.

CALCIUM CARBIDE AND CYANAMID.

Although this report deals primarily with mineral resources, brief reference may be made to certain products in the manufacture of which the mining industry is directly interested.

CALCIUM CARBIDE.

Calcium carbide, which is made in electric furnaces from lime and coke, is manufactured in several plants in Ontario and Quebec. These include: The Union Carbide Company, Welland, Ont. The Canada Carbide Company, Merritton, Ont., and Shawenegan Falls, Que.

CYANAMID.

The fixation of atmospheric nitrogen which is accomplished in the manufacture of cyanamid has had commercial application for the past ten years. In Canada cyanamid has been manufactured by the American Cyanamid Company, at Niagara Falls, Ont., since January of 1910. We are informed by the Company, whose head office is at Nashville, Tenn., that on December 31, 1914, the capacity of the plant at Niagara Falls, Ont., was 64,000 tons of cyanamid per annum, this representing an increase of approximately 54,000 tons over the capacity of the initial plant at Niagara Falls, which started commercial operations during the month of January 1910. The actual production during the twelve months ended December 1914, fell somewhat short of capacity, due in part to the fact that some of the plant extensions were not completed and placed in operation until the middle of the year, and in part to curtailment of operations during the latter half of the year, owing to conditions brought on by the European war.

Cyanamid as defined by Pranke[1] is a trade name for the completely hydrated material prepared for use as a fertilizer; it contains about 45 per cent calcium cyanamide ($CaCN_2$), 27 per cent calcium hydroxide and no carbide.

As briefly described by Pranke: "The first step in the manufacture of commercial cyanamid is the preparation of calcium carbide. This is brought about in the usual manner by fusing in an electric furnace a mixture of lime and coke.

"The carbide is removed from the furnace at regular intervals, is cooled, crushed to a fine powder, and packed in the nitrifying ovens. These are cylindrical, perforated steel cans, set in heat-insulated brick ovens. A carbon pencil through the axis of the can is used to heat the carbide to the combining temperature. On admission of the nitrogen to the cans the following reaction takes place:

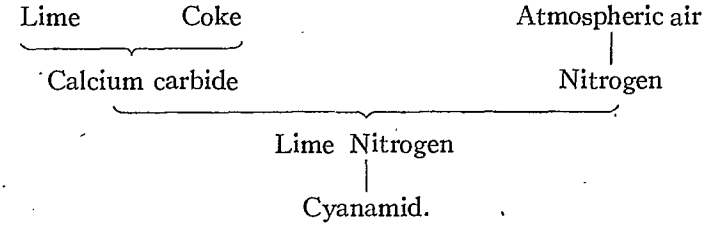
$$CaC_2 + N_2 = CaCN_2 + C.$$

[1] "Cyanamid, Manufacture, Chemistry and Uses."

"Nitrogen is obtained either by fractional distillation of liquid air, or by means of the copper oxide process. In the latter, air is passed through a red-hot mass of finely divided copper, suspended in asbestos or other inert material. The copper combines with the oxygen and allows the nitrogen to pass through. The copper oxide is easily recovered for use by reduction in situ with a suitable gas, such as natural gas."

The following notes respecting the Niagara Falls plant are taken from a description[1] published in "Metallurgical and Chemical Engineering:"

"The whole operation may be concisely sketched as follows:



"The manufacture of calcium carbide is carried out in continuous operation in eight 20-ton 3,000-h.p. three-phase electric furnaces, each with three large carbon electrodes at the top.

"The lime plant consists of twelve Doherty-Eldred limekilns, equipped with the Eldred process and operated with induced draught. The first installation comprised six kilns and six more were erected last year."

For the production of nitrogen from the air, two different processes are being used at Niagara.

"The newer method, installed for the latest extension of the plant last year, uses liquid air produced by the Claude process. The oxygen is separated from the nitrogen by fractional distillation of the liquid air.

"The older method used is the so-called copper sponge method, in which retorts filled with copper sponge are employed. When a series of these retorts is heated and air blown through the copper sponge, the oxygen of the air combines with the copper, forming cupric oxide and leaving the nitrogen free. The flow of air is then diverted to a second series of heated retorts, also containing copper sponge, while coal gas is passed through the first series of retorts so as to reduce the cupric oxide to copper sponge. This is then used again for combining with the oxygen in a fresh amount of air and setting the nitrogen free, and so on. The process is therefore cyclic."

The coal gas plant has a capacity of 500,000 cubic feet per 24 hours and as will be seen from the above description, serves a double purpose, providing coke for the carbide manufacture and coal gas for the reduction of cupric oxide in the separation of nitrogen gas from atmospheric air.

The standard coal gas process is not used. The retort benches are run very hot to produce a gas rich in hydrogen, and coke low in volatile matter.

[1] "Metallurgical and Chemical Engineering," New York, April 1915, p. 218.

The nitrification of the carbide is carried out in individual ovens holding from ½ to 2½ tons of carbide. The product recovered from these ovens is a black hard coke, which analyses 22 per cent nitrogen and about 1 per cent unnitrified carbide. This material is called lime-nitrogen and in preparation for agricultural purposes is finely ground and partly hydrated to insure decomposition of the carbide it contains, and is then oiled to render it dustless, and stored in bulk or packed immediately into sacks and shipped to the fertilizer mixer.

Argon Gas from Cyanamid.[1]

"Quite recently the American Cyanamid Company has been using the "cyanamid" process as a means of producing argon gas in quantities, producing the nitrogen by means of the copper process and later eliminating the nitrogen by continued reabsorption in the cyanamid ovens leaving argon as the final gas. Thousands of feet of this gas, highly concentrated, is being sold to the lamp industry, chiefly for American use, but in part to consumers abroad at the home of the chemical industry."

[1] "The Cyanamid Process," by Frank S. Washburn, Transactions American Electrochemical Society, 1915.

CHROMITE.

The production of chromite has been confined to the vicinity of Black Lake and Coleraine, Megantic county, Quebec. No ore has been mined since 1909, though shipments have been made from stock in 1910, 1911, and 1914.

Late in 1914 one of the previous operators, The Black Lake Asbestos and Chrome Company, commenced some exploratory work at one of its properties. The Dominion Chrome Company made a shipment of 136 tons of ore from stock to Windsor Mills, Quebec.

Statistics of production from 1886 are shown in the following table. Material classed as high grade includes both ore and concentrates ranging from 48 per cent upwards in Cr_2O_3 while low grade composed chiefly of crude ore, includes all running below 48 per cent in Cr_2O_3.

Annual Production of Chromite in Canada, 1886-1914.

Calendar Year.	High Grade.			Low Grade.			Total.		
	Short tons.	Value.	Average price.	Short tons.	Value.	Average price.	Short tons.	Value.	Average price.
		$	$ cts.		$	$ cts.		$	$ cts.
1886	.....	.....	.....	.....	.....	.....	60	945	15 75
1887	.....	.....	.....	.....	.....	.....	38	570	15 00
1888 to 1893	.....	.....	.....	.....	.....	.....	.....	No output	.....
1894	.....	.....	.....	.....	.....	.....	1,000	20,000	20 00
1895	.....	.....	.....	.....	.....	.....	3,177	41,300	13 00
1896	.....	.....	.....	.....	.....	.....	2,342	27,004	11 53
1897	.....	.....	.....	.....	.....	.....	2,637	32,474	12 31
1898	.....	.....	.....	.....	.....	.....	2,021	24,252	12 00
1899	.....	.....	.....	.....	.....	.....	2,010	21,842	10 86
1900	.....	.....	.....	.....	.....	.....	2,335	27,000	11 56
1901	.....	.....	.....	.....	.....	.....	1,274	16,744	13 14
1902	.....	.....	.....	.....	.....	.....	900	13,000	14 44
1903	2,842	44,280	15 58	667	6,849	20 17	3,509	51,129	14 57
1904	4,650	53,976	16 08	1,424	13,170	9 25	6,074	67,146	11 05
1905	.....	.....	.....	8,575	93,301	10 88	8,575	93,301	10 88
1906	4,975	57,484	11 55	4,060	34,375	8 47	9,035	91,859	10 17
1907	3,545	41,931	11 83	3,651	30,970	8 48	7,196	72,901	10 13
1908	3,472	45,300	13 05	3,753	36,708	9 78	7,225	82,008	11 35
1909	54	720	13 33	2,416	25,884	10 71	2,470	26,604	10 77
1910	25	430	17 20	274	3,304	12 06	299	3,734	12 49
1911	137	2,327	16 98	20	260	13 00	157	2,587	16 48
1912	.....	.....	.....	.....	.....	.....	.....	.....	.....
1913	.....	.....	.....	.....	.....	.....	.....	.....	.....
1914	.....	.....	.....	136	1,210	8 90	136	1,210	8 90

A table of imports of Canadian chromite into the United States from 1904-1914, and a table showing the total United States imports of chromium of recent years, with sources of the same follow.

Imports of Chromite into the United States from Canada.[1]

Twelve months ending June 30.	Short tons.	Value.	Twelve months. ending June 30.	Short tons.	Value.
		$			$
1904	2,790	36,322	1909	4,455	50,042
1905	6,489	70,934	1910	269	2,892
1906	9,951	107,580	1911	17	150
1907	6,179	66,115	1912	14½	258
1908	6,505	69,009	1913	Nil.	.....
			1914	597	9,283

[1] The Foreign Commerce and Navigation of the United States, Washington, long ton in original changed to short ton.

Imports of Chromite into the United States,[1] Years Ending June 30, 1913 and 1914.

	1913.			1914.		
	Long tons.	Value.	Per ton.	Long tons.	Value.	Per ton.
		$	$ cts.		$	$ cts.
Portugal	5,000	60,831	12 16	.....	.....	.....
Canada	.....	.....	.....	533	9,283	17 42
French Oceania	6,620	47,913	7 24	25,970	166,915	6 43
Greece	.....	.....	.....	8,450	87,931	10 41
British India	.....	.....	.....	.....	.....	.....
Japan	322	2,712	8 42	.....	.....	.....
Netherlands	.....	.....	.....	.....	.....	.....
Portuguese Africa	24,000	291,981	12 12	30,001	364,989	12 17
Turkey in Asia	13,830	100,227	7 25	14,830	107,292	7 23
United Kingdom	.....	.....	.....	58	717	12 36
Total	49,772	503,664	10 12	79,842	737,127	9 23

[1] The Foreign Commerce and Navigation of the United States.

COAL.

The term "production" in the text and tables of this report is used to represent the tonnage of coal actually sold, or used, by the producer, as distinguished from the term "output" which is applied to the total coal extracted from the mine, and which includes, in some cases, coal lost or unsaleable, or coal carried into stock on hand at the end of the year.

The total production of coal during 1914 was 13,637,529 short tons (12,176,365 long tons) valued at $33,471,801, or an average of $2.45 per ton. This coal was produced by 221 operating companies who employed an average of 27,571 men, and paid out in wages approximately $19,060,011. The 1914 production, on comparison with that of 1913, which was 15,012,178 short tons (13,403,730 long tons) valued at $37,334,940, shows a decrease of 1,374,649 tons, or 9·16 per cent. Compared with 1912 a decrease in production of 875,300 tons is shown; but the 1914 production is greater than that of any year prior to 1912. The values mentioned are partially estimated or assumed since complete returns have not been received with respect to amounts realized from coal sales. In the case of Nova Scotia an average value of $2.50 per long ton is placed upon the total production, while for British Columbia an average value of $3.50 per long ton is used. The values placed upon the Alberta production are those furnished by the operating companies.

The decrease of approximately 10 per cent in the production of 1914, as compared with that of 1913, is due chiefly to the unsettled industrial conditions existing generally throughout the Dominion, which were aggravated by the outbreak of the European war in August, and in a lesser degree to the decrease of ocean trade (particularly on the Pacific coast) during the first few months of the war, due to the presence of enemy cruisers on the high seas.

The total exports of domestic coal from Canada in 1914 were 1,423,126 tons valued at $3,880,175 as compared with 1,562,020 tons valued at $3,961,351 in 1913. There is also a small export of coal "not the produce of Canada".

The total imports of coal in 1914 were 14,721,057 tons valued at $39,801,498, as compared with imports in 1913 of 18,201,953 tons valued at $47,949,119.

The total consumption of coal in 1914 was 26,852,323 tons or 3·325 tons per capita, as compared with 31,582,545 tons, or 4·071 tons per capita in 1913.

According to statistics published by the Department of Railways and Canals, the total consumption of coal in locomotives for the year ending June 30, 1914, was 8,273,457 tons, as compared with a consumption of 9,045,625 tons for the previous year, a decrease of 8·5 per cent. The

consumption of oil for fuel in locomotives for the same year was 40,652,743 gallons, as compared with a consumption of 31,087,252 gallons for the previous year, an increase of 9,565,491 gallons or 30·7 per cent.

A statement prepared by the Department of Customs of "Imports of petroleum, crude, fuel, and gas oils ·8235 sp. gr. or heavier at 60°" into the Provinces of Manitoba, Saskatchewan, Alberta, and British Columbia, shows the aggregate imports for the fiscal years ending March 31, 1913, 1914, and 1915, to have been respectively, 82,589,680 gallons, 112,839,526 gallons, and 111,604,186 gallons.

These statements do not cover exactly the same periods, yet it would appear from the record given that only about one-third of the fuel oil imported is used in railway locomotives. Consequently the consumption of oil for fuel is evidently increasing very generally, and during the year ending March 31, 1915, fuel oil has probably displaced about 1,100,000 tons of coal of Nanaimo grade in the western markets, chiefly in British Columbia.

Almost all varieties of coal are produced in Canada. Bituminous coal constitutes by far the largest proportion of the annual production. Lignite only is produced in Saskatchewan, and in Alberta it forms a large proportion of the Province's production. Of anthracite there is an almost negligible amount, less than 200,000 tons annually from one mine, at Bankhead, Alberta.

Statistics of the production of coal by provinces in 1914 and 1913, and comparisons of 1914 production with that of 1913, and of the production of 1913 with that of 1912, are given in the tables following:—

Production of Coal by Provinces, 1914.

Province.	Average No. of men employed.	Wages paid.	Production of coal.		Average value per ton.	Per cent of total quantity.
			Short Tons.	Value.		
		$		$	$ cts.	
Nova Scotia	14,080	8,270,869	7,370,924	16,452,955	2 23	54·05
Alberta	7,334	5,912,718	3,683,015	9,350,392	2 54	27·01
British Columbia	5,541	4,503,283	2,239,799	6,999,374	3 12	16·42
Saskatchewan	336	200,578	232,299	374,245	1 61	1·70
New Brunswick	236	138,547	98,049	241,075	2 46	0·72
Yukon Territory	44	34,016	13,443	53,760	4 00	0·10
	27,571	19,060,011	13,637,529	33,471,801	2 45	100·00

Production of Coal by Provinces, 1913.

Province.	Average No. of men employed.	Wages paid.	Production of coal.		Average value per ton.	Per cent of total quantity.
			Short Tons.	Value.		
		$		$	$ cts.	
Nova Scotia	13,697	9,328,613	7,980,073	17,812,663	2 23	53·15
Alberta	7,509	6,811,372	4,014,755	10,418,941	2 59	26·75
British Columbia	6,162	5,587,145	2,714,420	8,482,562	3 12	18·08
Saskatchewan	350	205,970	212,897	358,192	1 68	1·42
New Brunswick	160	95,000	70,311	166,637	2 37	0·47
Yukon Territory	39	37,041	19,722	95,945	4·86	0·13
	27,917	22,065,141	15,012,178	37,334,940	2 49	100·00

Comparison of Production 1912 with 1913, and 1913 with 1914.

Province.	(i) Increase or (d) Decrease.					
	Years 1912 and 1913.			Years 1913 and 1914.		
		Tons.	Per cent.		Tons.	Per cent.
Nova Scotia	(i)	196,185	2·52	(d)	609,149	7·63
British Columbia	(d)	494,577	15·41	(d)	474,621	17·48
Alberta	(i)	774,178	23·89	(d)	331,740	8·26
Saskatchewan	(d)	12,445	5·52	(i)	19,402	9·11
New Brunswick	(i)	25,531	57·01	(i)	27,738	39·45
Yukon Territory	(i)	10,477	113·31	(d)	6,279	31·94
Total for Canada	(i)	499,349	3·44	(d)	1,374,649	9·16

These tables show a decreased production for each producing province, except the Provinces of New Brunswick and Saskatchewan, the combined production of which is only about 2·50 per cent of Canada's total production.

The proportions of the total production contributed by the different provinces are almost identical with the proportions they conrtibuted in 1913. Nova Scotia with a production of 609,149 tons less than in 1913, (a decrease of 7·6 per cent) heads the list of producers with 54·05 per cent

of the total. Alberta, with a decrease of 331,740 tons from 1913 production (equivalent to 8·2 per cent) maintains its position gained in 1912 of being the second largest producer. Its 1914 production of 3,683,015 tons is the second largest in its history. British Columbia production was 17·4 per cent less than in 1913, being 2,239,799 tons, the smallest production since the year 1906. In this Province all factors which affected the Canadian production were operative. The Saskatchewan production of 232,299 tons is an increase of 9·11 per cent over the 1913 production, and the New Brunswick production of 98,049 tons is an increase of 39·45 per cent over that of the previous year.

The relative importance of the different provinces as coal producers for a number of years past is shown in the next table, in which is set forth the proportional contribution of each province to the total tonnage of coal produced in Canada. The coal-fields on the Atlantic sea-board still continue to produce more than half the total, although from 1910 onwards the combined production of the western provinces has only been a little less than 50 per cent of the total.

Province.	1874.	1890.	1900.	1905.	1910.	1911.	1912.	1913.	1914.
	%	%	%	%	%	%	%	%	%
Nova Scotia.....	91	71	62·9	65·5	50·25	62·35	53·94	53·62	54·77
New Brunswick.....									
Saskatchewan*.....	.....	.....	0·7	1·2	1·40	1·83	1·55	1·42	1·70
Alberta*.....	.....	4	5·4	10·8	22·42	13·34	22·33	26·75	27·01
British Columbia.....	8	25	31·0	22·4	25·80	22·45	22·12	18·08	16·42
Yukon Territory.....	.....	.....	.....	0·1	0·13	0·03	0·06	0·13	0·10

*Alberta and Saskatchewan were established as provinces on September 1, 1905. For the purpose of comparison, the coal production during the years previous to that date has been separated according to the present boundaries of these Provinces.

The following tables show the production and the distribution of coal mined by provinces during recent years. The 1914 sales for Canadian consumption were 10,359,390 tons, a decrease of 1,022,570 tons from the 1913 sales, the sales for export to the United States were 1,181,536 tons, a decrease of 73,865 tons from the 1913 sales, and the sales for export to other countries were 239,927 tons, a decrease of 23,262 tons from the 1913 sales. The total sales of Canadian coal were 11,780,853 tons as compared with 12,900,550 tons in 1913. Upwards of 591,331 tons were used by colliery operators in the manufacture of briquettes and coke, in steel plants, and in brick plants, etc., the exact figure for that made into briquettes not being available; 1,265,345 tons were used in the operation of collieries, and by workmen. The loss due to breakage, washing, unmarketable stock, etc., so far as returns were furnished, was 434,337 tons. To arrive at the total Canadian output for 1914 there must be deducted from the aggregate of Canadian coal sold and used 83,123 tons, the decrease in quantity of coal in stock on December 31, as compared with the quantity in stock on January 1, which gives 13,988,743 tons as the 1914 output.

Production and Distribution of Coal Mined, by Provinces, 1914.

———	Nova Scotia.	New Brunswick.	Saskatchewan.	Alberta.	Yukon.	British Columbia.	Total.
Sales in Canada	5,851,735	94,455	217,898	3,218,234	7,547	969,521	10,359,390
Sales for export to U.S.	399,533	1,185	.....	105,699	.....	675,119	1,181,536
Sales for export to other countries	239,927	.....	.....	.....	.....	.....	239,927
Total sales	6,491,195	95,640	217,898	3,323,933	7,547	1,644,640	11,780,853
Used by producers in making coke, steel, brick, etc.	*145,915	.....	3,050	44,249	.....	398,117	†591,331
Used by producers for colliery consumption and by workmen	733,814	2,409	11,351	314,833	5,896	197,042	1,265,345
Total used	879,729	2,409	14,401	359,082	5,896	595,159	1,856,676
Production*	7,370,924	98,049	232,299	3,683,015	13,443	2,239,799	13,637,529
Stock on hand Jan. 1	231,840	405	.....	68,741	4,623	19,666	325,275
Stock on hand Dec. 31	138,774	1,596	6	53,545	4,645	43,586	242,152
Difference	−93,066	+ 1·191	+ 6	−15,196	+ 22	+23,920	−83,123
Losses due to breakage or other causes	170,184	.....	7,995	75,853	.....	180,305	434,337
Total output	7,448,042	99,240	240,300	3,743,672	13,465	2,444,024	13,988,743

*Production is obtained by adding coal sold and coal used. †Not complete.

Production and Distribution of Coal Mined, by Provinces, 1913.

	Nova Scotia.	New Brunswick.	Saskatchewan.	Alberta.	Yukon.	British Columbia.	Total.
Sales in Canada	6,269,722	68,311	195,954	3,527,772	8,558	1,311,643	11,381,960
Sales for export to U.S.	417,035	.....	.....	139,536	10	698,820	1,255,401
Sales for export to other countries	263,189	.....	.....	.....	0	.....	263,189
Total sales	6,949,946	68,311	195,954	3,667,308	8,568	2,010,463	12,900,550
Used by producers in making coke, steel, brick, etc.	307,060	.....	7,742	104,077	10,271	485,271	914,421
Used by producers for colliery consumption and by workmen	723,067	2,000	9,201	243,370	883	218,686	1,197,207
Total used	1,030,127	2,000	16,943	347,447	11,154	703,957	2,111,628
Production*	7,980,073	70,311	212,897	4,014,755	19,722	2,714,420	15,012,178
Stock on hand Jan. 1	256,221	.....	.....	67,123	3,903	58,209	385,456
" Dec. 31	352,308	.....	.....	127,456	4,623	16,090	500,477
Difference	96,087	.....	.....	+ 60,333	+ 720	− 42,119	+ 115,021
Losses due to breakage or other causes	58,944	.....	6,748	114,448	0	225,539	405,679
Total output	8,135,104	.....	219,645	4,189,536	20,442	2,897,840	15,532,878

*Production is obtained by adding coal sold and coal used.

Distribution of Coal Mined During the Years 1909-10-11-12.

	1909.	1910.	1911.	1912.
Sales in Canada	7,468,880	8,956,450	8,559,952	10,572,365
Sales for export to United States	1,173,772	1,847,943	1,068,572	1,537,585
" other countries	171,388	291,273	280,235	314,410
Total sales	8,814,040	11,095,666	9,908,759	12,424,360
Used by producers for the manufacture of coke	752,976	759,703	452,354	870,885
" colliery consumption and workmen	934,459	1,053,783	962,275	1,217,584
Production	10,501,475	12,909,152	11,323,388	14,512,829
Stock on hand Jan. 1	202,432	200,019	265,046	314,742
" Dec. 31	219,569	263,666	307,755	282,069
Difference	+ 17,137	+ 63,647	+ 42,709	− 32,673
Loss due to washing, breakage, or other causes	154,162	243,716	182,567	167,291
Total output	10,672,774	13,216,515	11,548,664	14,647,447

Statistics of the annual production of coal in Canada from 1785 to date are given in the following table. The total production has been 226,702,157 tons. Of this amount Nova Scotia has produced 145,297,509 tons, or 64·09 per cent; British Columbia 50,812,657 tons, or 22·41 per cent; Alberta 27,478,901 tons or 12·12 per cent; Saskatchewan 2,302,719 tons or 1·02 per cent; New Brunswick 696,102 tons or 0·31 per cent, and Yukon Territory 114,269 tons or 0·05 per cent. It should be noted though, that, in spite of the adverse conditions, the 1914 production is the third largest in Canada's history, having been exceeded by that of 1912 and 1913 only. The total production averaged 1·688 tons per capita of population—as compared with 1·936 tons per capita in 1913.

Annual Production of Coal Showing the Increase or Decrease Each Year.

Year.	Tons.	Value.	Average value per ton.	Increase (i) or decrease (d) in tonnage.	Increase (i) or decrease (d) per cent.
		$	$ cts.		
1785 to 1873	*8,592,150	.....	.....	.....	.....
1874	1,063,742	1,763,423	1 66	.....	.....
1875	1,039,974	1,747,016	1 68	(d) 23,768	(d) 2·2
1876	994,762	1,729,546	1 74	(d) 45,212	(d) 4·3
1877	1,036,670	1,794,415	1 73	(i) 41,908	(i) 4·2
1878	1,089,744	1,941,285	1 78	(i) 53,074	(i) 5·1
1879	1,126,497	2,050,639	1 82	(i) 36,753	(i) 3·4
1880	1,482,714	2,657,194	1 79	(i) 356,217	(i) 31·6
1881	1,537,106	2,688,621	1 75	(i) 54,392	(i) 3·7
1882	1,848,148	3,248,446	1 76	(i) 311,042	(i) 0·2
1883	1,818,684	3,109,635	1 71	(d) 29,464	(d) 21·6
1884	1,984,959	3,593,831	1 81	(i) 166,275	(i) 9·1
1885	1,920,977	3,417,807	1 78	(d) 63,982	(d) 3·2
1886	2,116,653	3,739,840	1 77	(i) 195,676	(i) 10·2
1887	2,429,330	4,388,206	1 81	(i) 312,677	(i) 14·8
1888	2,602,552	4,674,140	1 80	(i) 173,222	(i) 7·1
1889	2,658,303	4,894,287	1 84	(i) 55,751	(i) 2·1
1890	3,084,682	5,676,247	1 84	(i) 426,379	(i) 16·0
1891	3,577,749	7,019,425	1 96	(i) 493,067	(i) 16·0
1892	3,287,745	6,363,757	1 94	(d) 290,004	(d) 8·1
1893	3,783,499	7,359,080	1 95	(i) 495,754	(i) 15·1
1894	3,847,070	7,429,468	1 93	(i) 63,571	(i) 1·7
1895	3,478,344	6,739,153	1 94	(d) 368,726	(d) 9·6
1896	3,745,716	7,226,462	1 93	(i) 267,372	(i) 7·7
1897	3,786,107	7,303,597	1 93	(i) 40,391	(i) 1·1
1898	4,173,108	8,224,288	1 97	(i) 387,001	(i) 10·2
1899	4,925,051	10,283,497	2 09	(i) 751,943	(i) 18·0
1900	5,777,319	13,742,178	2 38	(i) 852,268	(i) 17·3
1901	6,486,325	12,699,243	1 96	(i) 709,006	(i) 12·3
1902	7,466,681	15,210,877	2 04	(i) 780,356	(i) 15·1
1903	7,960,364	15,942,833	2 00	(i) 493,683	(i) 6·6
1904	8,254,595	16,592,231	2 01	(i) 294,231	(i) 3·7
1905	8,667,948	17,520,263	2 02	(i) 413,353	(i) 5·0
1906	9,762,601	19,732,019	2 02	(i) 1,094,653	(i) 12·6
1907	10,511,426	24,381,842	2 32	(i) 748,825	(i) 7·7
1908	10,886,311	25,194,573	2 31	(i) 374,885	(i) 3·5
1909	10,501,475	24,781,236	2 36	(d) 384,836	(d) 3·5
1910	12,909,152	30,909,779	2 39	(i) 2,407,677	(i) 22·93
1911	11,323,388	26,467,646	2 34	(d) 1,585,764	(d) 12·28
1912	14,512,829	36,019,044	2 48	(i) 3,189,441	(i) 28·04
1913	15,012,178	37,334,940	2 49	(i) 499,349	(i) 3·44
1914	13,637,529	33,471,801	2 45	(d) 1,374,649	(d) 9·16

*The total production for the years 1785 to 1873 is made up as follows:—

Nova Scotia (1785 to 1873).....8,053,670 tons of 2,000 pounds.
British Columbia (1836 to 1873)..... 538,480 " 2,000 "

Exports of Canadian Coal.

Statistics of the exports of coal, according to the records of the Department of Customs, are given in the following table. The exports of Canadian coal in 1914 were 1,423,126 tons, valued at $3,880,175 or an average of $2·73 per ton, as compared with exports in 1913 of 1,562,020 tons valued at $3,961,351, or an average of $2.54 per ton, and exports in 1912 of 2,127,133 tons valued at $5,821,593 or an average of $2·74 per ton. The 1914 exports, compared with those of 1913 show a decrease of 8·89 per cent in tonnage, and 2·04 per cent in value. Besides Canadian coal exported there is also a small export of "coal not the produce of Canada".

Annual Exports of Coal.

Calendar Year.	Produce of Canada.	Not the produce of Canada.	Calendar Year.	Produce of Canada.	Not the produce of Canada.
	Tons.	Tons.		Tons.	Tons.
1873	420,683	5,403	1894	1,103,694	89,786
1874	310,988	12,859	1895	1,011,235	96,836
1875	250,348	14,026	1896	1,106,661	116,774
1876	248,638	4,995	1897	986,130	101,848
1877	301,317	4,829	1898	1,150,029	99,189
1878	327,959	5,468	1899	1,293,169	101,004
1879	306,648	8,468	1900	1,787,777	62,776
1880	432,188	14,217	1901	1,573,661	53,894
1881	395,382	14,245	1902	2,090,268	23,453
1882	412,682	37,576	1903	1,954,629	27,138
1883	486,811	44,388	1904	1,557,412	27,308
1884	474,405	62,665	1905	1,635,287	86,792
1885	427,937	71,003	1906	1,835,041	44,758
1886	520,703	78,443	1907	1,894,074	101,778
1887	580,965	89,098	1908	1,729,833	102,071
1888	588,627	84,316	1909	1,588,099	161,098
1889	665,315	89,294	1910	2,377,049	159,859
1890	724,486	82,534	1911	1,500,639	133,943
1891	971,259	77,827	1912	2,127,133	46,706
1892	823,733	93,988	1913	1,562,020	69,566
1893	960,312	102,827	1914	1,423,126	83,137

A table showing the destination of coal exported during recent years follows.

Exports of Coal Produced During 1912-13-14.

Exported to	1912.			1913.			1914.		
	Tons.	Per cent.	Value.	Tons.	Per cent.	Value.	Tons.	Per cent.	Value.
			$			$			$
Great Britain	59,302	2·8	202,151	12,098	0·8	39,103	25,576	1·8	86,674
United States	1,603,145	75·4	4,042,803	1,250,769	80·1	2,978,067	1,088,983	76·5	2,742,425
Newfoundland	167,519	7·9	482,194	220,147	14·1	653,346	174,921	12·2	523,728
Other countries	297,167	13·9	1,094,445	79,006	5·0	290,835	133,646	9·5	527,258
Total	2,127,133	100·0	5,821,593	1,562,020	100·0	3,961,351	1,423,126	100·0	3,880,175

These figures show a decrease of 12·9 per cent in exports to the United States, which, however, with an importation from Canada of 1,088,983 tons, took 76·5 per cent of Canada's exports. Exports to Newfoundland showed a decrease of 20·58 per cent. Those to Great Britain showed an increase of 111·4 per cent, the total for the year reaching 25,576 tons. Under exports to other countries of 133,646 tons is included 40,978 tons to Australia, as compared with 13,889 tons in 1913.

Imports of Coal.

The fact that the populous Provinces of Quebec and Ontario have no coal-fields and can secure most of their requirements more cheaply from the coal-fields of Pennsylvania, Ohio, and Virginia, than from Canadian coal-fields accounts for Canadian imports exceeding 50 per cent of Canada's annual coal consumption. The 1914 imports were 14,721,057 tons, a decrease from the 1913 imports of 3,480,896 tons.

Imports of coal into Canada are subdivided into three classes as follows: anthracite, including anthracite dust; bituminous, round and run of mine; and bituminous slack such as will pass through a $\frac{3}{4}$-inch screen.

The imports of anthracite represent, practically, Canada's consumption of coal of this variety, as less than 200,000 tons is produced yearly by Canada's one anthracite coal mine at Bankhead, Alberta. The 1914 imports were 4,435,010 tons valued at $21,241,924 an average of $4.79 per ton, which is a decrease of 207,047 tons, or 4·46 per cent from the 1913 imports. In bituminous coal of all classes the imports were 10,286,047 tons valued at $18,559,574, a decrease in quantity of 24·14 per cent. It may be noted here that the imports of bituminous coal of all classes (according to returns of the Customs Department) into Fort William and Port Arthur, and into the Provinces of Manitoba, Saskatchewan, Alberta, and British Columbia, for the fiscal years ending March 31, 1913, 1914, and 1915, were respectively 2,774,687 tons, 3,331,114 tons, and 1,854,559 tons. The imports for the last fiscal year for use west of Lake Superior are thus shown to be 44·32 per cent below those of the year previous, and are even 33·16 per cent below those of the fiscal year ending March 31, 1913.

The following table gives details of the imports of the different classes of coal into Canada from 1880 to 1914.

Annual Imports of Coal.

Fiscal Year.	Bituminous coal.		Anthracite coal and Anthracite dust.		Bituminous coal dust.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
1880	457,049	1,220,761	516,729	1,509,960	3,565	8,877
1881	587,024	1,741,568	572,092	2,325,937	337	666
1882	636,374	1,992,081	638,273	2,666,356	471	900
1883	911,629	2,996,198	754,891	3,344,936	8,154	10,082
1884	1,118,615	3,613,470	868,000	3,831,283	12,782	14,600
1885	1,011,875	3,197,539	910,324	3,909,844	20,185	20,412
1886	930,949	2,591,554	995,425	4,028,050	36,230	36,996
1887	1,149,792	3,126,225	1,100,165	4,423,062	31,401	33,178
1888	1,231,234	3,451,661	†2,138,627	5,291,875	28,808	34,730
1889	1,248,540	3,255,171	1,291,705	5,199,481	39,980	47,139
1890	1,409,282	3,528,959	1,201,335	4,595,727	53,104	29,818
1891	1,598,855	4,060,896	1,399,067	5,224,452	60,127	36,130
1892	1,615,220	4,099,221	1,479,106	5,640,346	82,091	39,840
1893	1,603,154	3,967,764	1,500,550	6,355,285	109,585	44,474
1894	1,359,509	3,315,094	1,530,522	6,354,040	117,573	49,510
1895	1,444,928	3,321,387	1,404,342	5,350,627	181,318	52,221
1896	1,538,489	3,299,025	1,574,355	5,667,096	210,386	53,742
1897	1,543,476	3,254,217	1,457,295	5,695,168	225,562	59,609
1898	1,684,024	3,179,595	1,460,701	5,874,685	229,445	45,556
1899	2,171,358	3,691,946	1,745,460	6,490,509	276,547	44,717
1900	2,439,764	4,310,964	1,654,401	6,602,912	330,174	98,349
1901	2,516,392	4,956,025	1,933,283	7,923,950	414,432	275,559
1902	3,047,392	5,712,058	1,652,451	7,021,939	489,548	264,550
1903	3,511,412	7,776,717	1,456,713	7,028,664	550,883	420,317
1904	4,053,900	9,108,208	2,275,018	10,461,223	608,041	544,128
1905	4,176,274	8,002,896	2,604,137	12,093,371	650,261	343,456
1906	4,495,550	8,360,348	2,200,863	10,304,308	747,251	489,180
Calendar Year.	Bituminous round and run of the mine.				Bituminous slack such as will pass through a ½" screen.	
1907	6,370,152	13,232,445	3,141,873	14,506,129	1,139,256	1,121,949
1908	6,025,574	12,516,748	3,160,110	14,478,536	1,111,811	1,355,677
1909	5,625,063	11,455,818	3,017,844	13,906,152	1,230,017	1,469,889
1910	5,966,466	11,919,341	3,266,235	14,735,062	1,365,281	1,795,598
1911	8,905,815	18,407,603	4,020,577	18,794,192	1,632,500	2,090,796
1912	8,491,840	16,846,727	4,184,017	20,080,388	1,919,953	2,550,922
1913	a 10,743,473	21,756,658	(b) 4,642,057	22,034,839	(c) 2,816,423	4,157,622
1914	a 7,776,415	14,954,321	(b) 4,435,010	21,241,924	(c) 2,509,632	3,605,253

(a). Duty, 53 cents per ton. (b). Coal, anthracite, and anthracite coal dust; duty free. (c). Duty 14 cents per ton.

† In the anthracite column the imports show a very considerable increase in 1888 over 1887, an increase of over 94 per cent, the falling off again in 1889 being quite as remarkable. The average values per ton for the three years 1887, 1888, and 1889, were $4.02, $2.47, and $4.03, respectively. Although a duty of 50 cents per ton on anthracite coal was removed May 13, 1887, it is hardly thought this would account for the changes indicated, and unless some error may possibly have crept into the Trade and Navigation report, no explanation is available.

Consumption of Coal.

The consumption of coal during 1914 was 26,852,323 tons, a decrease of 4,730,222 tons, or 14·98 per cent from the 1913 figures, and was almost the same as the 1912 consumption which was 26,934,800 tons. On an estimated population of 8,075,000 people, the per capita consumption during 1914 was 3·325 tons, as compared with 4·071 tons in 1913, and 3·596 tons in 1912.

Consumption of Coal 1913-1914.

	1913.		1914.	
	Tons.	Tons.	Tons.	Tons.
Production	15,012,178	.....	13,637,529	.....
Exports of Canada	1,562,020	.....	1,423,126	.....
Home consumption of Canadian coal	.....	13,450,158	.....	12,214,403
Imports	18,201,953	.....	14,721,057	.....
Exports not produce of Canada	69,566	.....	83,137	.....
Canadian consumption of imported coal	.....	18,132,387	.....	14,637,920
Total consumption of coal in Canada	.....	31,582,545	.....	26,852,323

Annual Consumption of Coal.

Calendar Year.	Canadian.	Imported.	Total.	Percentage Canadian.	Percentage imported.	Consumption per capita.
	Tons.	Tons.	Tons.	%	%	Tons.
1886	1,595,950	1,884,161	3,480,111	45·9	54·1	0·758
1887	1,848,365	2,192,260	4,040,625	45·7	54·3	0·871
1888	2,013,925	3,314,353	5,328,278	37·8	62·2	1·137
1889	1,992,988	2,490,931	4,483,919	44·4	55·6	0·946
1890	2,360,196	2,581,187	4,941,383	47·8	52·2	1·031
1891	2,606,490	2,980,222	5,586,712	46·7	53·3	1·153
1892	2,464,012	3,082,429	5,546,441	44·4	55·6	1·133
1893	2,823,187	3,110,462	5,933,649	47·6	52·4	1·198
1894	2,743,376	2,917,818	5,661,194	48·5	51·5	1·130
1895	2,467,109	2,933,752	5,400,861	45·7	54·3	1·066
1896	2,639,055	3,206,456	5,845,511	45·1	54·9	1·140
1897	2,799,977	3,124,485	5,924,462	47·3	52·7	1·143
1898	3,023,079	3,274,981	6,298,060	48·0	52·0	1·200
1899	3,631,882	4,092,361	7,724,243	47·0	53·0	1·454
1900	3,989,542	4,361,563	8,351,105	47·8	52·2	1·561
1901	4,912,664	4,810,213	9,722,877	50·5	49·5	1·810
1902	5,376,413	5,165,938	10,542,351	51·0	49·0	1·927
1903	6,005,735	5,491,870	11,507,605	52·2	47·8	2·055
1904	6,697,183	6,909,651	13,606,834	49·2	50·8	2·346
1905	7,032,661	7,343,880	14,376,541	48·9	51·1	2·362
1906	7,927,560	7,398,906	15,326,466	51·7	48·3	2·425
1907	8,617,352	10,549,503	19,166,855	45·0	55·0	2·947
1908	9,156,478	10,195,424	19,351,902	47·3	52·7	2·820
1909	8,913,376	9,711,826	18,625,202	47·9	52·1	2·682
1910	10,532,103	10,438,123	20,970,226	50·2	49·8	2·960
1911	9,822,749	14,424,949	24,247,698	40·5	59·5	3·384
1912	12,385,696	14,549,104	26,934,800	46·0	54·0	3·596
1913	13,450,158	18,132,387	31,582,545	42·6	57·4	4·071
1914	12,214,403	14,637,920	26,852,323	45·5	54·5	3·325

Nova Scotia.

During 1914, twelve operating companies in Nova Scotia produced 7,370,924 tons, as compared with eleven companies operating in 1913, which produced 7,980,073 tons. The decrease in tonnage is 7·63 per cent.

The Dominion Coal Company continued as the largest operator, producing 5,250,748 tons, which is 71·23 per cent of the Province's production, and 38·5 per cent of the Canadian production.

The coal produced by Nova Scotia in 1914 was disposed of as follows: 5,851,735 tons was sold for consumption in Canada; 399,533 tons for export to the United States; 239,927 tons for export to other countries; 733,814 tons was used for colliery consumption, and by workmen; and 145,915 tons was used by colliery operators in making coke and in steel making; and a small quantity, not reported, was used in making briquettes. The quantity in stock at the close of the year was 93,066 tons less than at January 1. The sales show decreases ranging from 4 per cent to 9 per cent as compared with the 1913 sales.

The tonnage of coal absorbed in the manufacture of coke showed a remarkable decrease falling from 1,109,629 tons in 1913 to 595,868 tons in 1914[1] this decrease being due to the stagnation in the iron and steel industry.

Cape Breton maintained its position as the premier coal-producing county with 77·44 per cent of coal raised in the Province. Cumberland county raised 9·4 per cent, Pictou county 9·2 per cent, and other counties 4 per cent.

Tables giving statistics regarding the coal trade for the calendar year follow:—

[1] See tables of Coke Production.

Coal Production by Companies in Nova Scotia, 1914, in Short Tons.

	Total sales.	Used.			Production.[2]	Stocks.		Losses.[3]	Output.
		For coke.[1]	Colliery consumption	Workmen.		Jan. 1.	Dec. 31.		
Inverness Ry. and Coal Co	225,807	742	31,216	7,374	265,139	1,942	2,604	30,823	296,624
Sydney Coal Co., Ltd	7,840	.....	280	280	8,400	48	.....	.....	8,352
Dominion Coal Co., Ltd	4,412,463	.....	314,939	61,642	4,789,044	206,289	89,971	129,518	4,802,244
Cape Breton Coal, Iron and Ry. Co	37,119	.....	8,548	655	46,322	2,174	9,914	.....	54,062
Nova Scotia Steel and Coal Co., Ltd	615,041	139,625	58,543	24,302	837,511	15,120	10,892	9,128	842,411
The Colonial Coal Co. Ltd	54,645	.....	4,914	707	60,266	486	382	335	60,497
Acadia Coal Co. Ltd	382,879	.....	46,596	12,714	442,189	2,000	1,536	.....	441,725
Intercolonial Coal Mining Co	182,636	5,548	31,397	8,613	228,194	785	11,842	380	239,631
Maritime Coal Ry. and Power Co	126,377	.....	26,788	3,349	156,514	.....	2,856	.....	159,370
Dominion Coal Co., Ltd. (Springhill)	382,029	.....	67,030	12,645	461,704	2,974	8,777	.....	467,507
Minudie Coal Co., Ltd	61,965	.....	8,644	2,367	72,976	.....	.....	.....	72,976
Atlantic Grindstone Coal and Ry. Co	714	.....	45	58	817	22	.....	.....	795
Royal Coal Co., Ltd	1,680	.....	112	56	1,848	.....	.....	.....	1,848
	6,491,195	145,915	599,052	134,762	7,370,924	231,840	138,774	170,184	7,448,042

[1] Includes also coal used by producers for steel making and other purposes.
[2] Production is obtained by adding sales and coal used.
[3] Complete records of losses are not furnished by all producers.

Coal Production by Companies in Nova Scotia, 1913, in Short Tons.

——	Total Sales.	Used.			Production.[2]	Stocks.		Losses.	Output.
		For Coke.[1]	Colliery consumption.	Workmen.		Jan. 1.	Dec. 31.		
Inverness Ry. and Coal Co.	291,086	7,421	21,631	7,475	327,613	478	1,942	31	329,108
Sydney Coal Co., Ltd	5,950	.....	50	50	6,050	10	30	.....	6,070
Dominion Coal Co., Ltd	4,773,766	.....	333,990	59,790	5,167,546	239,579	326,919	52,961	5,307,847
Nova Scotia Steel and Coal Co., Ltd	572,835	282,176	30,733	19,277	905,021	8,960	15,120	1,481	912,662
The Colonial Coal Co., Ltd	71,943	.....	4,863	1,207	78,013	1,238	486	.....	77,261
Acadia Coal Co., Ltd	3,325	.....	3,680	401	7,406	.....	2,029	.....	9,435
Intercolonial Coal Mining Co	521,717	.....	69,461	13,677	604,855	3,040	2,000	.....	603,815
Cumberland Ry. and Coal Co	155,479	17,463	33,385	7,034	213,361	784	785	.....	213,362
Maritime Coal, Ry., and Power Co	145,880	.....	22,881	3,115	171,876	.....	.....	.....	171,876
Minudie Coal Co., Ltd	347,039	.....	67,451	11,873	426,363	2,132	2,975	.....	427,206
Atlantic Grindstone, Coal and Ry. Co	58,099	.....	8,983	1,865	68,947	.....	.....	4,471	73,418
Riverside Mine (Eastern Coal Co., Ltd.)	2,827	.....	110	85	3,022	.....	22	.....	3,044
	6,949,946	307,060	597,218	125,849	7,980,073	256,221	352,308	58,944	8,135,104

[1] Includes also coal used by producers for steel making and other purposes.
[2] Production is obtained by adding sales and coal used.
[3] Complete records of losses are not furnished by all producers.

Output, Sales, Colliery Consumption, and Production of Coal in Nova Scotia.

Calendar Year.	Output, tons. 2,240 lbs.	Sold or used, tons, 2,240 lbs.	Colliery consumption, tons, 2,240 lbs.	Production,* tons, 2,240 lbs.	Output, tons, 2,000 lbs.	Sold or used, tons, 2,000 lbs.	Colliery consumption, tons, 2,000 lbs.	Production,* tons, 2,000 lbs.	Price per ton, 2,240 lbs.	Value of production.
									$ c.	$
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	1,503,259	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	2,239,808	2,537,706	2,202,447	216,132	2,508,579	1 75	3,919,355
1897	2,340,031	2,044,672	181,716	2,226,388	2,020,835	2,290,032	203,522	2,493,554	1 75	3,806,170
1898	2,262,656	2,121,126	187,428	1,288,554	2,584,175	2,375,661	187,519	2,563,180	1 75	4,004,970
1899	2,865,443	2,633,989	177,460	2,811,449	3,209,296	2,950,067	138,775	2,148,822	2 00	5,622,808
1900	3,298,791	2,998,737	236,563	3,235,300	3,694,646	3,358,585	264,051	3,623,536	2 50	8,088,250
1901	3,821,033	3,411,127	301,434	3,712,561	4,279,557	3,820,462	337,606	4,158,068	1 75	6,496,982
1902	4,725,480	4,229,120	379,198	4,608,318	5,292,538	4,736,614	424,702	5,161,316	2 00	9,216,636
1903	5,215,562	4,565,720	481,903	5,047,623	5,841,429	5,113,607	539,731	5,653,338	2 00	10,095,246
1904	5,131,985	4,551,740	144,904	4,996,644	5,747,823	5,097,949	498,292	5,596,241	2 00	9,993,288

Output, Sales, Colliery Consumption, and Production of Coal in Nova Scotia.

Calendar Year.	Output tons, 2,240 lbs.	Sold or used, tons, 2,240 lbs.	Colliery consumption, tons, 2,240 lbs.	Production,* tons, 2,240 lbs.	Output, tons, 2,000 lbs.	Sold or used, tons, 2,000 lbs.	Colliery consumption, tons, 2,000 lbs.	Production*, tons, 2,000 lbs.	Price per ton, 2,240 lbs.	Value of production.
									$ c.	$
1905	5,197,877	4,613,818	427,774	5,041,592	5,821,622	5,167,476	479,107	5,646,583	2 00	10,083,184
1906	5,844,813	5,093,131	460,891	5,554,022	6,546,191	5,704,307	516,198	6,220,505	2 00	11,108,044
1907	5,775,503	5,236,077	437,256	5,673,333	6,468,563	5,864,406	489,727	6,354,133	2 25	12,764,999
1908	6,076,330	5,224,787	576,509	5,939,767	6,805,489	5,851,761	645,690	6,652,539	2 25	13,364,476
1909	5,106,135	4,524,029	522,479	5,046,508	5,718,871	5,066,912	585,177	5,652,089	2 25	11,354,643
1910	5,817,109	5,199,715	542,376	5,742,091	6,515,162	5,823,681	607,461	6,431,142	2 25	12,919,705
1911	6,362,099	5,676,857	577,089	6,253,946	7,125,551	6,358,080	646,340	7,004,420	2 25	14,071,379
1912	6,995,289	6,296,940	652,960	6,949,900	7,834,724	7,052,573	731,315	7,783,888	2 50	17,374,750
1913	7,263,485	6,479,469	645,596	7,125,065	8,135,104	7,257,006	723,067	7,980,073	2 50	17,812,663
1914	6,650,038	5,925,991	655,191	6,581,182	7,448,042	6,637,110	733,814	7,370,924	2 50	16,452,955

*This production is obtained by adding sales and colliery consumption.

Coal Trade by Counties in Nova Scotia, in Short Tons, Calendar Years Since 1906.

Calendar Year.	Cumberland.		Pictou.		Cape Breton.		Other counties.		Total.	
	Raised.	Sales.	Raised.	Sales.	Raised.	Sales.	Raised.	Sales.	Raised.	Sales
1906	659,734	566,308	769,496	657,310	4,804,407	4,221,293	312,554	259,396	6,546,191	5,704 307
1907	534,047	445,288	840,533	729,043	4,698,147	4,346,180	395,836	343,895	6,468,563	5,864,406
1908	662,157	530,648	849,802	678,025	4,840,653	4,267,346	452,877	375,742	6,805,489	5,851,761
1909	494,919	403,371	743,860	599,743	4,081,333	3,723,135	398,759	340,663	5,718,871	5,066,912
1910	350,363	288,706	714,846	588,678	5,035,800	4,571,347	414,153	374,950	6,515,162	5,823,681
1911	538,296	436,125	833,956	691,852	5,405,355	4,917,902	347,944	312,201	7,125,551	6,358,080
1912	716,914	595,138	765,678	641,890	6,039,296	5,530,765	312,836	284,780	7,834,724	7,052,573
1913	675,544	553,845	817,177	694,659	6,313,275	5,709,995	329,108	298,507	8,135,104	7,257,006
1914	702,496	572,765	681,356	571,063	5,767,566	5,266,733	296,624	226,549	7,448,042	6,637,110

Sales include coal used for making coke and steel.

Production and Sales of Coal by Companies, in Nova Scotia, Year Ending September 30, 1914, in Short Tons.

Name of company.	Output.	Sales.	Colliery consumption.	Supplied workmen.	On bank at close of year.	Difference on bank compared with 1913.	
						Increase.	Decrease.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Dominion Coal Co., Ltd.	5,097,589	4,562,867	325,917	60,918	98,297	19,193	.....
Nova Scotia Steel & Coal Co., Ltd.	890,262	797,017	54,116	26,217	44,395	12,912	.....
Cumberland Railway & Coal Co., Ltd.	448,824	361,769	67,409	11,869	10,340	7,777	.....
Acadia Coal Co.	511,269	443,240	53,716	13,079	3,137	1,233	.....
Maritime Coal, Railway & Power Co.	160,376	142,679	13,230	3,180	1,288	1,288	.....
Inverness Railway & Coal Co.	308,134	248,759	31,821	7,381	3,048	1,720	.....
Intercolonial Coal Co.	247,441	200,483	29,424	8,090	10,300	9,444	.....
Sydney Coal Co.	5,825	5,543	149	177	22	.....	44
Colonial Mining Co.	63,587	56,872	5,661	1,054	.....	.....	.....
Minudie Coal Co.	69,582	55,617	9,317	2,130	1,176	1,176	.....
Atlantic Grindstone & Coal Co.	962	883	57	78	.....	.....	56
Cape Breton Coal, Iron & Railway Co.	42,269	28,623	8,207	492	6,587	4,947	.....
Total	7,846,120	6,904,352	599,024	134,665	178,590	59,690	100

The statistics prepared and published by the Provincial Department of Mines cover the fiscal years ending September 30; the long ton of 2,240 pounds is used exclusively in these reports. A number of tables appearing in the Provincial report for the fiscal year 1914 are reproduced below, the figures having been changed to show tons of 2,000 pounds.

The table of "Distribution of Coal Sold" shows the consumption by Nova Scotia of coal produced within the Province in 1914 to have been only 35·74 per cent of the total production, as compared with 40·12 per cent the year previous. The tonnage shipped to the Province of Quebec during the same period increased from 33·85 per cent of the Province's production in 1913 to 38·63 per cent in 1914.

Output of Coal in Nova Scotia by Collieries, During Fiscal Years Ending September 30, 1912-13-14.

Colliery.	1912. Tons. of 2,000 lbs.	1913. Tons of 2,000 lbs.	1914. Tons of 2,000 lbs.
Cape Breton County.			
Dominion Coal Company	4,852,198	5,285,968	5,097,589
Nova Scotia Steel and Coal Co	919,705	908,806	890,262
North Atlantic Collieries	4,819	.....	.....
Cape Breton Coal, Iron and Railway Co	.....	.....	42,269
Sydney Coal Company	5,143	6,089	5,825
Colonial Mining Co	39,448	64,632	63,587
Cumberland County.			
Cumberland Railway and Coal Co	470,939	438,964	448,824
Maritime Coal, Railway, and Power Co., Chignecto	169,465	183,558	160,376
" " " Joggins			
Minudie Coal Co	68,179	70,926	69,582
Atlantic Grindstone and Coal Co	163	3,040	962
Pictou County.			
Acadia Coal Co	492,213	570,501	511,269
Intercolonial Coal Co	272,616	217,512	247,441
Inverness County.			
Inverness Coal and Railway Co	324,469	318,387	308,134

Distribution of Coal Sold by Nova Scotia Producers.

Markets.	Fiscal years ending September 30.									
	1910.		1911.		1912.		1913.		1914.	
	Tons of 2,000 lbs.	Per cent.	Tons of 2,000 lbs.	Per cent.	Tons of 2,000 lbs.	Per cent.	Tons of 2,000 lbs.	Per cent.	Tons of 2,000 lbs.	Per cent
Nova Scotia—										
Transported by land	1,681,052	30·65	2,007,192	32·25	2,197,213	31·76	2,530,566	34·88	2,099,186	30·40
" sea	342,787	6·25	354,514	5·70	373,594	5·40	380,363	5·24	368,551	5·34
Total Nova Scotia	2,023,839	36·90	2,361,706	37·95	2,570,807	37·16	2,910,929	40·12	2,467,737	35·74
New Brunswick	594,288	10·84	606,582	9·74	732,411	10·59	724,239	9·98	762,150	11·04
Prince Edward Island	89,031	1·62	90,314	1·45	103,378	1·49	107,612	1·48	107,275	1·55
Quebec Province	2,001,382	36·49	2,315,971	37·22	2,418,086	34·95	2,456,416	33·85	2,667,372	38·63
Newfoundland	19,224	3·62	206,299	3·32	224,719	3·25	235,810	3·25	252,660	3·66
United States	325,548	5·93	372,177	5·98	462,035	6·68	524,262	7·23	336,741	4·88
St. Pierre	8,405	0·15	10,107	0·16	10,535	0·15	7,449	0·10	9,673	0·14
Bunker coal	243,807	4·45	229,243	3·68	265,142	3·83	262,278	3·62	278,645	4·04
Other countries	.....	.....	(a) 30,841	0·50	(b) 131,816	1·90	(c) 27,160	0·37	(d) 22,099	0·32
Total	5,484,524	100·00	6,223,240	100·00	6,918,929	100·00	7,256,155	100·00	6,904,352	100·00

	(a) Tons.	Per cent.	(b) Tons.	Per cent.	(c) Tons.	Per cent.	(d) Tons.	Per cent.
For time chartered boats	28,610	0·46	28,972	0·42	23,958	0·33	20,787	0·30
Other countries	2,231	0·04	102,844	1·48	3,202	0·04	1,312	0·02
	30,841	0·50	131,816	1·90	27,160	0·37	22,099	0·32

Number and Classes of Workmen Employed at Each Mine in Nova Scotia, Year Ending September 30, 1914.

Company.	Underground.				Surface.				Construction.			Totals.		Horses.		Days.
	Skilled labour.	Labourers.	Boys.	Days.	Skilled labour.	Labourers.	Boys.	Days.	Skilled labour.	Labourers.	Days.	Persons.	Days.	Above.	Below.	Pit days.
Dominion Coal Co.	3,552	2,102	273	1,528,469	638	398	70	283,520	....	....	.....	7,033	1,811,989	79	443	263
Nova Scotia Steel and Coal Co.	1,069	959	260	616,270	161	246	29	129,114	....	....	.....	2,724	745,384	3	72	281
Cumberland Railway and Coal Co.	486	298	52	240,577	83	99	14	56,299	4	4	634	1,040	297,510	10	48	282
Acadia Coal Co.	461	468	58	234,516	88	233	18	94,764	....	....	.....	1,326	329,280	22	49	216
Intercolonial Coal Co.	368	140	56	144,442	69	97	24	51,340	4	4	1,818	762	197,600	12	25	253
Joggins Mines	315	70	4	90,364	24	44	4	19,584	5	2	1,284	468	111,232	5	9	243
Chignecto Mines	50	7	3	5,980	4	7	3	1,810	....	....	.....	74	7,790	1	1	139
Inverness Railway and Coal Co.	316	164	25	133,071	49	70	16	35,421	....	....	.....	640	168,492	7	39	263
Sydney Coal Co.	8	4	....	2,715	2	2	....	1,202	....	....	.....	16	3,917	1	2	262
Minudie Coal Co.	148	24	16	41,423	34	26	10	18,784	4	1	872	263	61,079	4	3	222
Colonial Coal Co.	76	24	....	26,720	20	17	....	9,274	....	....	.....	137	35,994	3	18	254
Atlantic Grindstone and Coal Co.	4	1	....	988	1	.....	1	592	....	....	.....	7	1,580	....	....	164
Cape Breton Coal, Iron and Railway Co.	45	31	....	25,727	16	40	....	17,171	11	5	5,041	148	47,939	6	3	302
Totals	6,898	4,292	747	3,091,262	1,189	1,279	189	718,875	28	16	9,649	14,638	3,918,786	153	712	.....

New Brunswick.

From returns made by operators, to the Mines Branch, the production of coal in New Brunswick in 1914 is computed as 98,049 tons. This figure exceeds the 1913 production by 27,738 tons, or 39·45 per cent.

Prior to 1914 the figures used in the Table of Annual Production were computed from statistics of coal shipments furnished by the New Brunswick Department of Public Works.

The coal-producing area is the Grand Lake coal-field in Queens and Sunbury counties. The chief operator is The Minto Coal Company, with a production in 1914 of 78,794 tons. The Rothwell Coal Company produced 12,898 tons, the Northfield Coal Company 5,965 tons, and A. J. McEvoy 392 tons.

Annual Production of Coal in New Brunswick.

Calendar Year.	Tons.	Value.	Value per ton.	Calendar Year.	Tons.	Value.	Value per ton.
		$	$ cts.			$	$ cts.
1887	10,040	23,607	2 35	1901	17,630	51,857	2 94
1888	5,730	11,050	1 93	1902	18,795	39,680	2 11
1889	5,673	11,733	2 07	1903	16,000	40,000	2 50
1890	7,110	13,850	1 95	1904	9,112	18,224	2 00
1891	5,422	11,030	2 03	1905	29,400	58,800	2 00
1892	6,768	9,375	1 39	1906	34,076	68,152	2 00
1893	6,200	9,837	1 59	1907	34,584	77,814	2 25
1894	6,469	10,264	1 59	1908	60,000	135,000	2 25
1895	9,500	14,250	1 50	1909	49,029	98,496	2 25
1896	7,500	11,250	1 50	1910	55,455	110,910	2 00
1897	6,000	9,000	1 50	1911	55,781	111,562	2 00
1898	6,160	9,240	1 50	1912	44,780	89,560	2 00
1899	10,528	15,792	1 50	1913	70,311	166,637	2 37
1900	10,000	15,000	1 50	1914	98,049	241,075	2 46

Saskatchewan.

The coal deposits of Saskatchewan furnish coal of the lignite variety only. As some of the physical characteristics of this lignite in its raw state prevent its successful and economical use, the yearly production of recent years shows only a slight increase, in no way comparable with the increase in population of the Province, and the consequent increased demand for fuel for heating, and for generation of power. The importance of devising better methods for utilizing this lignite, of which vast quantities exist in the adjacent Province of Alberta, as well as in the Province of Saskatchewan, has prompted both the Government of the Province of Saskatchewan, and the Fuel Testing Division of the Mines Branch, Ottawa, to undertake investigations of western lignites. The results of these investigations are now available.[1]

[1] "The carbonizing and briquetting of Lignite," by S. M. Darling, 1915. Investigation for the Government of the Province of Saskatchewan.
Results of the Investigation of Six Lignite Samples obtained from the Province of Alberta, by Haanel and Blizard, 1915. Mines Branch publication No. 331.

The 1914 production (from 27 separate collieries) amounted to 232,299 tons valued at $374,245, an increase of 19,402 tons, or 9·1 per cent over the production of 1913. The total 1914 sales, amounting to 217,898 tons were sold for consumption in Canada, and 14,401 tons were used by producers for colliery consumption, by workmen, and in brick making.

The output of coal comes chiefly from the vicinity of Estevan, located on the Souris river, near the southeastern corner of the Province. Coal deposits exist for 75 or 100 miles in a northwest southeast direction along the Souris river, on Big Muddy creek draining Willowbunch lake (only lately reached by a branch line railway) and on the north branch of the Saskatchewan river about 100 miles southwest of Saskatoon.

Annual Production of Coal in Saskatchewan.

Calendar Year.	Tons.	Value.	Average value per ton.	Calendar Year.	Tons.	Value.	Average value per ton.
		$	$ cts.			$	$ cts.
1887	(a) 400	800	2 00	1902	70,400	112,640	1 52
1890	200	200	1 00	1903	116,703	169,618	1 45
1891	.....	.....	.....	1904	124,885	187,021	1 50
1892	5,400	9,325	1 73	1905	107,596	152,334	1 42
1893	8,325	12,485	1 50	1906	108,398	164,146	1 51
1894	(b) 15,051	15,153	1 01	1907	151,232	252,437	1 67
1895	15,769	31,538	2 00	1908	150,556	253,790	1 69
1896	16,706	25,059	1 50	1909	192,125	296,339	1 54
1897	25,000	37,500	1 50	1910	181,156	293,923	1 62
1898	25,000	37,500	1 50	1911	206,779	347,248	1 68
1899	25,000	37,500	1 50	1912	225,342	368,135	1 63
1900	40,500	60,750	1 50	1913	212,897	358,192	1 68
1901	45,000	72,000	1 60	1914	232,299	374,245	1 61

(a) From Turtle Mountain district, Manitoba.
(b) Including a small quantity from the Turtle Mountain district, Manitoba.

Alberta.

Lignite, bituminous, and anthracite coals are all produced in Alberta. Bituminous coal comprises over 50 per cent of the production; lignite, between 40 and 45 per cent, and anthracite, less than 5 per cent.

As mentioned in the notes on the Saskatchewan production, the vast tonnage of lignites available in the western provinces has prompted investigations with a view to the better utilization of these lignites. The results of the investigation of Alberta samples by the Fuel Testing Division of the Mines Branch, Ottawa, are now available.[1]

In 1914 the total production of coal in Alberta, as computed from returns from operators, was 3,683,015 tons valued at $9,350,392 or an average of $2.54 per ton as compared with a production in 1913 of 4,014,755 tons, valued at $2.59 per ton, a decrease in tonnage of 8·26 per cent.

This was the second largest year's production in the history of the Province, and as it exceeded the British Columbia production, Alberta maintained its position as the second largest coal-producing province.

[1] Results of the Investigation of Six Lignite Samples obtained from the Province of Alberta, by Haanel and Blizard, 1915, Mines Branch publication No. 331.

Many new operators are producing coal each year, and it is difficult to keep an accurate list of them. The figures of production as compiled by this Division, and by the Provincial Department of Public Works are not in exact agreement, though the differences are now comparatively small. There were 35 companies with a production of over 10,000 tons each, which contributed over 91 per cent of the 1914 production. Nine of these, with a production of over 100,000 tons each, contributed 64·6 per cent of the total.

As shown in tables on page 207, the 1914 sales for export to the United States were 105,699 tons, a decrease from 1913 exports of 24·24 per cent, and for domestic consumption 3,218,234 tons, a decrease of 8·77 per cent.

Tables of the production of coal by companies in 1914 and 1913, and of the annual production as compiled from the records of this Division, follow.

Production of Coal in Alberta, in 1914, by Principal Collieries.

Name of company.	Days in operation.	Total sales.	Total colliery consumption*	Total production.
Alberta Coal Mfg. Co., Cardiff	175	46,690	3,000	49,690
Battle River Collieries, Rosenroll	224	10,298	1,267	11,565
Brazeau Collieries, Ltd., Nordegg	290	153,011	2,311	155,322
Canada West Coal Co., Taber	87	45,744	15,064	60,808
Can. Coal & Coke Co., Ltd., Beaver Mines	112	28,055	5,323	33,378
" " " Lethbridge	151	98,381	13,065	111,446
" " " Pacific Pass	283	85,709	4,208	89,917
Canmore Coal Co., Ltd., Canmore	241	158,137	12,385	170,522
Can. Pacific Railway, Bankhead	237	(a) 151,513	(b) 34,657	186,170
" " Lethbridge No. 1	184	135,965	32,057	168,022
" " " No. 2	189	230,071	39,104	269,175
Capital Coal Co., Cardiff	179	33,363	1,591	34,954
Cardiff Collieries, Ltd., Cardiff	176	126,000	5,025	131,025
Chinook Coal Co., Canmore	191	59,771	8,710	68,481
City of Lethbridge Coal Mine, Lethbridge	261	11,323	.....	11,323
Davenport Coal Co., Burmis	70	10,560	647	11,207
Dawson Coal Co., Edmonton	249	21,340	650	21,990
Dobell Coal Co., Tofield	269	18,479	1,874	20,353
Edmonton Standard Coal Co., Edmonton	293	12,869	1,606	14,475
Franco-Can. Collieries, Ltd., Frank	268	29,423	13,317	42,740
Georgetown Collieries Ltd. (The), Canmore	266	35,318	3,581	38,899
Hillcrest Collieries, Ltd., Hillcrest	211	203,308	10,672	213,980
Humberstone Coal Co., Clover Bar	285	69,000	5,600	74,600
International Coal & Coke Co., Coleman	226	(c) 218,543	21,049	239,592
Jasper Park Collieries, Ltd., Pocahontas	279	74,213	4,014	78,227
Leitch Colliery, Ltd., Passburg	243	57,401	4,024	61,425
McGillivray Ck. Coal & Coke Co., Coleman	252	184,965	5,646	190,611
Midland Collieries, Ltd., Drumheller	165	15,000	1,750	16,750
Mountain Park Coal Co., Ltd., Bickerdike	273	79,210	3,783	82,993
Newcastle Coal Co., Drumheller	211	60,000	950	60,950
Pembina Coal Co., Ltd., Evansburgh	276	31,896	6,920	38,816
Redcliff Brick & Coal Co., Redcliff	191	10,662	.....	10,662
Rock Springs Coal & Brick Co., Elcan	169	17,655	2,200	19,855
Rosedale Coal & Clay Products Co., Rosedale	203	21,211	177	21,388
Tofield Coal Co., Tofield	284	21,351	1,200	22,551
Twin City Coal Co., Edmonton	235	36,914	3,553	40,467
West Can. Collieries, Bellevue	228	389,960	16,471	406,431
" " Blairmore	38	18,931	1,117	20,048
Two other companies each producing over 10,000 tons	.....	51,440	7,815	59,255
		3,063,680	296,383	3,360,063
All other companies each under 10,000 tons		304,502	18,450	322,952
Total production, Alberta	.....	3,368,182	314,833	3,683,015

* Same as 1913 report.
(a) Briquettes 107,809; (b) Briquettes 1,261; (c) For manufacture of coke 44,249.

Production of Coal in Alberta, in 1913, by Principal Collieries.

Name of company.	Days in operation.	Total sales.	Total for colliery use.*	Total production.
Alberta Coal Mining Co., Cardiff	227	55,000	3,000	58,000
Canada West Coal Co., Taber	264	106,521	10,041	11,656
Can. Coal & Coke Co., Beaver Mines	216	72,869	3,742	76,611
" " Lethbridge	252	117,995	29,278	147,273
" " Pacific Pass	285	36,432	10,101	46,533
Canmore Coal Co., Ltd., Canmore	227 297	242,662	11,516	254,178
Canadian Pacific Ry., Dept. Nat. Res., Bankhead	290	(a) 162,899	(b) 35,276	198,175
" " " Lethbridge	255	364,600	3,933	368,533
Capital Coal Co., Cardiff	202	34,374	1,090	35,464
Cardiff Collieries, Ltd., Cardiff	256	120,000	4,900	124,900
Chinook Coal Co., Canmore	282	65,242	4,859	70,101
City of Lethbridge Coal Mine, Lethbridge	237	11,641	.....	11,641
Coalbeck C. & Clay Prod. Co., Castor	235	10,950	165	11,115
Davenport Coal Co., Burmis	255	71,374	2,970	74,344
Dawson Coal Co., Edmonton	267	12,860	600	13,460
Diamond Coal Co., Ltd., Diamond City	119	16,952	1,603	18,555
Dobell Coal Co., Tofield	290	18,717	1,595	20,312
Edmonton Standard Coal Co., Edmonton	287	19,500	1,400	20,900
Great West Coal Co., Clover Bar	288	46,835	5,121	51,956
Hillcrest Collieries, Ltd., Hillcrest	289	310,732	11,737	322,469
Humberstone Coal Co., Clover Bar	240	22,608	1,125	23,733
International Coal and Coke Co., Coleman	297	(c) 387,030	26,536	413,566
Jasper Park Collieries, Ltd., Pocahontas	272	132,844	2,185	135,029
Keith & Fulton Coal Co., Clover Bar	249	10,239	25	10,264
Leitch Colliery, Ltd., Passburg	271	104,093	4,494	108,587
McGillivray Creek Coal and Coke Co., Coleman	286	189,091	6,158	195,249
Newcastle Coal Co., Drumheller	.....	24,279	1,200	25,479
Ottewell Coal Co., Clover Bar	278	11,316	150	11,466
Pembina Coal Co., Ltd., Evansburgh	300	5,826	4,323	10,149
Rock Springs Coal and Brick Co., Elcan	190	16,500	2,300	18,800
Tofield Coal Co., Tofield	223	15,120	1,150	16,270
Twin City Coal Co., Ltd., Edmonton	280	60,985	5,618	66,603
West Canadian Collieries, Bellevue	270	426,756	7,301	434,057
" " Blairmore	278	159,870	4,202	164,072
Yellowhead Pass Coal and Coke Co., Ltd., *via* Bickerdike	297	27,772	2,327	30,099
Four other companies, each producing over 10,000 tons	.....	70,653	17,995	88,648
All other companies, each producing under 10,000 tons	.....	3,563,137	230,016	3,793,153
	.....	208,248	13,354	221,602
Total production, Alberta	.....	3,771,385	243,370	4,014,755

*Includes consumption under boilers, etc., and coal used by workmen.
(a) " 129,493 tons of briquettes.
(b) " 1,275 "
(c) " 104,012 tons for coke manufacturing.

Annual Production of Coal in Alberta.

Calendar Year.	Tons.	Value.	Average value per ton.	Calendar Year	Tons.	Value.	Average value per ton.
		$	$ cts.			$	$ cts.
1887.....	74,152	157,577	2 13	1901.....	340,275	850,687	2 50
1888.....	115,124	183,354	1 59	1902.....	402,819	960,601	2 38
1889.....	97,364	179,640	1 85	1903.....	495,893	1,117,541	2 25
1890.....	128,753	198,298	1 54	1904.....	661,732	1,404,524	2 12
1891.....	174,131	437,243	2 51	1905.....	931,917	1,993,915	2 14
1892.....	178,970	460,605	2 57	1906.....	1,246,360	2,614,762	2 10
1893.....	230,070	586,260	2 55	1907.....	1,591,579	3,836,286	2 41
1894.....	184,940	473,827	2 56	1908.....	1,685,661	4,127,311	2 45
1895.....	169,885	382,526	2 25	1909.....	1,994,741	4,838,109	2 43
1896.....	209,162	581,832	2 78	1910.....	2,894,469	7,065,736	2 44
1897.....	242,163	630,408	2 60	1911.....	1,511,036	3,979,264	2 63
1898.....	315,088	788,720	2 50	1912.....	3,240,577	8,113,525	2 50
1899.....	309,600	774,000	2 50	1913.....	4,014,755	10,418,941	2 59
1900.....	311,450	778,625	2 50	1914.....	3,683,015	9,350,392	2 54

Statistics prepared by Mr. John T. Stirling, Chief Inspector of Coal Mines, in Alberta, covering coal mining operations in 1914 are given in the following tables. The output as given by Mr. Stirling is 3,821,739 tons. Sales for consumption in Alberta are stated as 2,352,184 tons, which is 61·5 per cent of the total production. In making briquettes 80,592 tons were used, and in making coke 44,249 tons. As compared with 1913 the Crowsnest Pass District production showed a decrease of 33 per cent, Calgary an increase of 37 per cent, Lethbridge a decrease of 19 per cent, and Edmonton an increase of 8·6 per cent.

Output of Coal in Alberta, 1914

Tons of 2,000 lbs.	Crowsnest pass.	Calgary.	Lethbridge.	Edmonton.	Total.
Sold for consumption in Alberta.....	948,803	515,107	196,522	691,752	2,352,184
Sold for consumption in other provinces.....	70,006	145,981	455,166	118,671	789,824
Sold for export to the United States..	102,116	2,853	1,118	.....	106,087
Total Sales.....	1,120,925	663,941	652,806	810,423	3,248,095
Used in making briquettes.....	.....	80,592	.....	.....	80,592
Used in making coke.....	44,249	.....	.....	.....	44,249
Used under colliery boilers.....	63,942	59,777	102,527	58,716	284,962
Difference in stocks.....	+ 10,396	+ 1,318	− 2,884	+ 1,088	+ 9,918
Slack put on waste heap.....	285	55,794	30,241	67,603	153,923
Total output.....	1,239,797	861,422	782,690	937,830	3,821,739

Output of Bituminous Coal in Alberta, 1914

Tons of 2,000 lbs.	Crowsnest pass.	Calgary.	Lethbridge.	Edmonton	Total.
Sold for consumption in Alberta....	948,803	328,022	.....	286,945	1,563,770
Sold for consumption in other provinces.....	70,006	18,290	.....	23,065	111,361
Sold for export to the United States..	102,116	2,643	.....	.....	104,759
Total sales.....	1,120,925	348,955	.....	310,010	1,779,890
Used in making coke.....	44,249	.....	.....	.....	44,249
Used under colliery boilers.....	63,942	18,097	.....	15,408	97,447
Difference in stocks.....	+ 10,396	+ 448	.....	+ 644	+ 11,488
Slack put on waste heap.....	285	11,233	.....	8,775	20,293
Total.....	1,239,797	378,733	.....	334,837	1,953,367

Output of Anthracite Coal in Alberta, 1914

Tons of 2,000 lbs.	Calgary District.	
	Coal.	Briquettes.
Sold for consumption in Alberta.....	24,158	94,195
Sold for consumption in other provinces.....	19,456	14,693
Sold for export to the United States.....	210	30
Total sales.....	43,824	108,918
Used under colliery boilers.....	33,276	162
Used in making briquettes.....	80,592	.....
Difference in stock.....	+ 95	+ !
Stock put on waste heap.....	13,184	.....
Total.....	170,971	109,082

Output of Lignite Coal in Alberta, 1914.

Tons of 2,000 lbs.	Crowsnest pass.	Calgary.	Lethbridge.	Edmonton	Total.
Sold for consumption in Alberta	.....	162,927	196,522	404,807	764,256
Sold for consumption in other provinces	.....	108,235	455,166	95,606	659,007
Sold for export to the United States	.....	.....	1,118	.....	1,118
Total sales	.....	271,162	652,806	500,413	1,424,381
Used under colliery boilers	.....	8,404	102,527	43,308	154,239
Slack put on waste heap	.....	31,377	30,241	58,828	120,446
Difference in stocks	.....	+ 775	− 2,884	+ 444	− 1,665
Total output	.....	311,718	782,690	602,993	1,697,401

Output of Coal in Alberta by Districts, 1914.

District.	Number of persons employed.	Lignite.	Bituminous.	Anthracite.
Crowsnest Pass	1,939	.....	1,208,342	.....
Pincher Creek	108	.....	31,455	.....
Lethbridge	1,512	638,342	.....	.....
Taber	399	121,033	.....	.....
Bow Island	69	11,587	.....	.....
Milk River	26	3,704	.....	.....
Banff	826	.....	221,382	170,971
Medicine Hat	177	38,445	.....	.....
Okotoks	25	5,516	.....	.....
Aldersyde	25	8,024	.....	.....
Carstairs	15	590	.....	.....
Carbon	28	7,972	.....	.....
Trochu	24	5,309	.....	.....
Drumheller	508	161,755	.....	.....
Three Hills	84	8,283	.....	.....
Lacombe	138	42,691	.....	.....
Wetaskiwin	129	41,157	.....	.....
Brazeau	342	.....	157,351	.....
Edmonton	526	254,904	.....	.....
St. Albert	67	10,420	.....	.....
Tofield	95	49,056	.....	.....
Cardiff	248	229,991	.....	.....
Pembina	124	58,622	.....	.....
Yellowhead Pass	581	.....	253,647	.....
Jasper Park	155	.....	81,190	.....
Total	8,170	1,697,401	1,953,367	170,971

Average Number of Persons Employed in Alberta Coal Mines.

Character of labour.	Bituminous.		Anthracite.		Lignite.		Total.	
	Above.	Below.	Above.	Below.	Above.	Below.	Above.	Below.
Supervision and clerical assistance	116	121	10	11	146	166	272	298
Miners and helpers	.....	1,714	.....	158	.....	2,264	.....	4,136
Mechanics or skilled labour	221	64	56	1	229	157	506	222
Other employees	560	733	126	60	654	603	1,340	1,396
Total	897	2,632	192	230	1,029	3,190	2,118	6,052

British Columbia.

In 1914 the total production of coal in British Columbia was 2,239,799 tons valued at $6,999,374 as compared with 2,714,420 tons in 1913 valued at $8,482,562, a decrease of over 17 per cent in tonnage. By districts the production was as follows: Crowsnest and East Kootenay 1,066,724 tons, a decrease of 21·8 per cent; Nicola and Princeton 155,392 tons, a decrease of 47·2 per cent, and Vancouver island 1,017,683 tons, an increase of 9·6 per cent.

As to the cause of the decrease from the 1913 production the Provincial Mineralogist in his annual report for 1914 says:—

"The decreased coal output is undoubtedly entirely attributable to the war, not acting directly but through the allied industries which serve as consumers of colliery products, an illustration of the interlocking modern commercial business."

In the interior of the Province the immediate effect of the war was the closing of metal mines and smelters, owing to the disturbance of the metal markets. This cut off at once a large market for coal and resulted in lessened consumption of fuel by the railways.

On the coast, the war affected the coal production through the decrease of ocean trade caused by the presence of German cruisers on the Pacific. According to the Provincial Mineralogist, although a strike was "nominally in progress" on Vancouver island until August, this did not affect the production as much as in the previous year; and, as to the competition of California crude oil, for fuel, he says this "continued to be felt though not in a larger degree than in 1913."

The 1914 production on comparison with that of recent years is seen to be the smallest since 1906. This is probably explained by the increasing use of crude oil for fuel, the 1914 importation of fuel oil into the four western provinces, as mentioned earlier in this report, having displaced approximately 1,100,000 tons of coal of Nanaimo grade. Had such an additional tonnage of coal been produced in 1914 the year's production would have been the largest on record.

The consumption of British Columbia coal is confined to the Province and to the adjacent States of Montana and Washington. In 1914 the sales for domestic consumption were 43 per cent of the production, and those for export 30 per cent of the total, coke manufacture absorbed 18 per cent, and 9 per cent was used around collieries and by workmen. The domestic consumption in 1914 fell off 26 per cent from that of 1913 and the consumption for coke-making 18 per cent, while sales for export to the United States showed a decrease of only 3·3 per cent.

The three largest operators were the Crowsnest Pass Coal Company with 867,891 tons, the Canadian Collieries (Dunsmuir), Limited, with 433,889 tons, and the Western Fuel Company with 340,676 tons. These

three companies contributed over 73 per cent of the Province's production. In all there were eleven operating companies.

There is a wide variation in the prices realized on coal sales in different parts of the Province. In East Kootenay as low a price as $2.25 per long ton is paid, while on Vancouver island the price may reach $4.50. For purposes of this report a value of $3.50 is assumed.

Coal Production by Districts in British Columbia, 1914.

Coal.	Vancouver Island.	Nicola and Princeton.	Crowsnest and East Kootenay.	Total.
	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	674,928	134,995	159,598	969,521
Sold for export to United States	236,004	3,006	436,109	675,119
Sold for export to other countries	.....	.....	.....	.....
Total sales	910,932	138,001	595,707	1,644,640
Used for making coke or brick	.....	.....	398,117	398,117
Used for colliery consumption, etc	106,751	17,391	72,900	197,042
Production	1,017,683	155,392	1,066,724	2,239,799

Coal Production by Districts in British Columbia, 1913.

Coal.	Vancouver Island.	Nicola and Princeton.	Crowsnest and East Kootenay.	Total.
	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	715,259	276,528	319,856	1,311,643
Sold for export to United States	107,885	.....	590,935	698,820
Sold for export to other countries	.....	.....	.....	.....
Total sales	823,144	276,528	910,791	2,010,463
Used for making coke or brick	.....	.....	485,271	485,271
Used for colliery consumption, etc	104,736	17,903	96,047	218,686
Production	927,880	294,431	1,492,109	2,714,420

Coal Production by Collieries in British Columbia, in 1914, in Short Tons.

	Colliery	Sales.			Used in making coke.	Used under colliery boilers. etc.	Production	Lost in washing, etc.	Stocks		Output.
		In Canada.	To United States.	Total.					First of year.	Last of year.	
1.	Protection, No. 1	149,677	140,711	290,388	.....	49,505	339,893	.....	290	7,699	347,302
	Northfield and Reserve	248	40	288	.....	495	783	.....	295	44	532
2.	New East Wellington	100,294	8,111	108,405	.....	10,793	119,198	.....	4,279	5,099	120,018
3.	Ladysmith (Wellington)	88,396	16,953	105,349	.....	9,352	114,701	26,113	830	4,738	144,722
	Cumberland (Comox)	247,616	54,005	301,621	.....	17,567	319,188	115,386	11,656	19,180	442,098
4.	Fiddick, Richardson, Suquash and Morden	88,697	16,184	104,881	.....	19,039	123,920	21,116	1,148	2,434	146,322
5.	Michel	39,857	71,720	111,577	93,882	18,466	223,925	.....	.....	1,312	225,237
	Coal Creek	60,423	304,231	364,654	237,790	41,522	643,966	.....	105	2,714	646,575
6.	Hosmer	39,109	.....	39,109	66,445	10,048	115,602	17,064	330	0	132,336
7.	Corbin	20,209	60,158	80,367	.....	2,864	83,231	.....	.....	.....	83,231
8.	Middlesboro	58,491	.....	58,491	.....	9,796	68,287	.....	688	366	67,965
9.	Inland	57,782	.....	57,782	.....	2,952	60,734	.....	.....	.....	60,734
10	Princeton	14,862	2,806	17,668	.....	3,523	21,191	626	45	0	21,772
11	Other mines	3,860	200	4,060	.....	1,120	5,180	.....	.....	.....	5,180
	Total	969,521	675,119	1,644,640	398,117	197,042	2,239,799	180,305	19,666	43,586	2,444,024

1. Western Fuel Co.
2. Vancouver-Nanaimo Coal Mining Co.
3. The Canadian Collieries (Dunsmuir), Ltd.
4. Pacific Coast Collieries, Ltd.
5. Crowsnest Pass Coal Co., Ltd.
6. The Hosmer Mines Ltd. (Can. Pac. Railway, Dept. of Natural Resources).
7. Corbin Coal and Coke Co., Ltd.
8. Nicola Valley Coal and Coke Co., Ltd.
9. Inland Coal and Coke Co., Ltd.
10. Princeton Coal and Land Co., Ltd.
11. {Coalmont Collieries, Ltd. / Pacific Coast Colliery Co. of B. C

Coal Production by Collieries in British Columbia, in 1913, in Short Tons.

Colliery.	Sales.			Used in making coke.	Used under colliery boilers, etc.	Production.	Lost in washing, etc.	Stocks.		Output.
	In Canada.	To United States.	Total.					First of year.	Last of year.	
1. Protection, No. 1	133,702	34,557	168,259	.....	25,785	194,044	.....	1,525	290	192,809
Northfield	17,909	22,390	40,299	.....	13,388	53,687	.....	56	294	53,925
2. New East Wellington	89,665	21,861	111,526	.....	5,650	117,176	3,098	4,594	1,182	116,862
3. Ladysmith (Wellington)	47,474	520	47,994	.....	6,344	54,338	9,732	102	830	64,798
Cumberland (Comox)	348,680	27,882	376,562	.....	39,566	416,128	144,397	3,115	11,656	569,066
4. Fiddick and Richardson	75,197	675	75,872	.....	13,279	89,151	43,102	46,182	650	86,721
Suquash	2,632	.....	2,632	.....	724	3,356	.....	875	.....	2,481
5. Michel	143,490	476,397	619,887	261,313	43,017	924,217	.....	115	105	924,207
Coal Creek	50,703	55,737	106,440	113,299	22,547	242,286	.....	115	0	242,171
6. Hosmer	106,162	.....	106,162	110,659	27,260	244,081	21,856	778	330	265,489
7. Corbin	19,501	58,801	78,302	.....	3,223	81,525	.....	.....	.....	81,525
8. Diamond Vale	6,700	.....	6,700	.....	435	7,135	.....	.....	.....	7,135
9. Middlesboro	114,221	.....	114,221	.....	12,878	127,099	.....	483	622	127,238
10. Inland	127,040	.....	127,040	.....	1,769	128,809	.....	.....	.....	128,809
11. Princeton	26,765	.....	26,765	.....	2,810	29,575	3,354	269	51	32,711
12. Other mines	1,802	.....	1,802	.....	11	1,813	.....	.....	80	1,893
Total	1,311,643	698,820	2,010,463	485,463	218,686	2,714,420	225,539	58,209	16,090	2,897,840

1. Western Fuel Co.
2. Vancouver-Nanaimo Coal Mining Co.
3. The Canadian Collieries (Dunsmuir), Ltd.
4. Pacific Coast Collieries, Ltd.
5. Crowsnest Pass Coal Co., Ltd.
6. The Hosmer Mines, Ltd. (Can. Pac. Railway, Dept of Natural Resources.)
7. Corbin Coal and Coke Co., Ltd.
8. Diamond Vale Collieries, Ltd.
9. Nicola Valley Coal and Coke Co., Ltd.
10. Inland Coal and Coke Co., Ltd.
11. Princeton Coal and Land Co, Ltd.
12. {United Empire Coal Co., Ltd. {Coalmont Collieries. {Grand Trunk, B. C. Coal Co.

Annual Production of Coal in British Columbia.

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, 2,240 lbs.	Value.
						$ cts.	$
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.....	35,080				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
1897.....	802,296	290,310	619,860	910,170	1,019,390	3 00	2,730,510
1898.....	1,136,485	375,423	752,863	1,128,286	1,263,680	3 00	3,384,858
1899.....	1,306,324	526,058	751,711	1,277,769	1,431,101	3 00	3,833,307
1900.....	1,590,178	685,667	914,184	1,599,851	1,791,833	3 00	4,799,553
1901.....	1,691,557	799,666	914,163	1,713,829	1,919,488	3 00	5,141,487
1902.....	1,641,626	837,871	776,809	1,614,680	1,808,441	3 00	4,844,040
1903.....	1,450,663	947,499	549,449	1,496,948	1,676,581	3 00	4,490,844
1904.....	1,685,698	1,129,465	533,593	1,663,058	1,862,625	3 00	4,989,174
1905.....	1,736,696	1,089,667	647,343	1,737,010	1,945,452	3 00	5,211,030
1906.....	1,899,076	1,236,476	679,829	1,916,305	2,146,262	3 00	5,748,915
1907.....	2,219,602	1,438,402	673,114	2,111,516	2,364,898	3 50	7,390,306
1908.....	2,111,931	1,486,511	597,157	2,083,668	2,333,708	3 50	7,292,838
1909.....	2,388,196	1,585,232	741,667	2,326,899	2,606,127	3 50	8,144,147
1910.....	3,152,207	1,798,873	1,175,007	2,973,880	3,330,745	3 50	10,408,580
1911.....	2,304,794	1,657,422	612,696	2,270,118	2,542,532	3 50	7,945,413
1912.....	2,857,345	1,898,213	966,963	2,865,176	3,208,997	3 50	10,028,116
1913.....	2,587,357	1,799,643	623,946	2,423,589	2,714,420	3 50	8,482,562
1914.....	2,182,164	1,397,036	602,785	1,999,821	2,239,799	3 50	6,999,374

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

†52,935 tons of this amount were exported as sales without the division into 'Home Consumption' and 'Sold for Export.'

‡Two months only.

Yukon.

As in 1914 there were two producing companies, the Five Fingers Coal Company, operating at Tantalus, and the Northern Light, Power and Coal Company, on Coal creek. The combined output was 13,443 tons, a decrease of 31·8 per cent.

Annual Production of Coal in Yukon Territory.

Calendar Year.	Tons.	Value.	Average value per ton.
		$	$ cts.
1901	*5,864	86,230	14 70
1902	4,910	37,280	7 59
1903	1,849	29,584	16 00
1904	.....	.....	.....
1905	7,000	21,000	3 00
1906	7,000	28,000	4 00
1907	15,000	60,000	4 00
1908	3,847	21,158	5 50
1909	7,364	49,502	6 72
1910	16,185	110,925	6 85
1911	2,840	12,780	4 50
1912	9,245	44,958	4 86
1913	19,722	95,945	4 86
1914	13,443	53,760	4 00

*Part of this production was mined in 1900.

COKE.

Both domestic and imported coal is used in the manufacture of coke in Canadian coke-oven plants. In 1914, 1,038,235 tons of domestic, and 503,312 tons of imported coal were used to produce an output of 1,015,253 tons of coke showing a return of 0·658 tons of coke per ton of coal charged. Coke from by-product ovens comprised 67 per cent of the total.

In 1913 there were 1,698,912 tons of domestic coal, and 549,001 tons of imported coal used to produce an output of 1,517,133 tons of coke. The coke output of 1914 showed, therefore, a decrease of 33 per cent.

The amount of coke sold or used by coke producers was 1,023,860 tons, a decrease of 33·1 per cent. Besides the tonnage sold or used by producers, there was imported during the calendar year 553,046 tons of coke. The exports totalled 67,838 tons. The Canadian consumption for 1914 was therefore 1,509,068 tons, a decrease of 30·97 per cent from 1913. This is the smallest consumption since 1909, the consumption of recent years having been as follows: 1,285,228 tons in 1908, 1,449,369 tons in 1909, 1,581,832 tons in 1910, 1,677,188 tons in 1911, 1,981,832 tons in 1912, and 2,186,170 tons in 1913.

For the first time in its history Ontario led in production with 386,314 tons, all of which was produced by the Algoma Steel Corporation.

At the close of the year there were 2,298 ovens idle, and only 797 in operation.

Coke Production, 1914.

Province.	Coal charged to ovens.	Output of coke.	Stock on hand.		Coke sold or used.	Per cent of total prod.	Value. of sales, etc.
			Jan. 1.	Dec. 31.			
	Tons.	Tons.	Tons.	Tons.	Tons.	%	$
Nova Scotia	595,868	345,880	3,386	5,877	343,289	33·53	1,118,614
Ontario	(a)503,312	377,514	11,753	2,953	386,314	37·73	1,352,099
Alberta	44,249	28,541	518	0	29,059	2·84	116,236
British Columbia	398,118	263,318	4,977	3,097	265,198	25·90	1,071,565
Total	1,541,547	1,015,253	20,634	12,027	1,023,860	100·00	3,658,514

(a) All imported coal.

Coke Production, 1913.

Province.	Coal charged to ovens.	Output of coke.	Stock on hand.		Coke sold or used.	Per cent of total prod.	Value of sales, etc.
			Jan. 1.	Dec. 31.			
	Tons.	Tons.	Tons.	Tons.	Tons.	%	$
Nova Scotia	1,109,629	720,526	4,898	3,386	722,038	47·17	2,352,153
Ontario	(a) 549,001	411,643	19,397	11,753	419,287	27·40	1,991,613
Alberta	104,012	65,104	2,817	518	67,403	4·41	269,612
British Columbia	485,271	319,860	6,814	4,903	321,771	21·02	1,306,218
Total	2,247,913	1,517,133	33,926	20,560	1,530,499	100·00	5,919,596

(a) All imported coal.

Distribution of Coke Production, 1914.

——	Nova Scotia.	Ontario.	Alberta.	British Columbia.	Total.
Sold in Canada	4,647	595	28,984	204,231	238,457
Sold for export	.....	.....	.....	60,831	60,831
Total sales	4,647	595	28,984	265,062	299,288
Used by maker in blast furnace or otherwise	338,642	385,719	75	136	724,572
Total sold or used	343,289	386,314	29,059	265,198	1,023,860
Number of ovens in operation December 31	238	55	0	504	797
Number of ovens idle December 31	710	155	367	1,066	2,298
Number of ovens building December 31	0	0	0	0	0

Annual Production of Coke.

Calendar Year.	Tons.	Value.	Value per ton.	Calendar Year.	Tons.	Value.	Value per ton.
		$	$ cts.			$	$ cts.
1886	35,396	101,940	2 88	1901	365,531	1,228,225	3 36
1887	40,428	135,951	3 36	1902	502,043	1,519,185	3 03
1888	45,373	134,181	2 96	1903	561,318	1,734,404	3 09
1889	54,539	155,043	2 84	1904	554,083	2,032,048	3 66
1890	56,450	166,298	2 95	1905	700,488	2,436,211	3 48
1891	57,084	175,592	3 08	1906	782,055	2,863,503	3 66
1892	56,135	160,249	2 85	1907	842,003	3,583,468	4 26
1893	61,078	161,790	2 65	1908	858,257	3,449,361	4 02
1894	58,044	148,551	2 56	1909	862,011	3,484,393	4 04
1895	53,356	143,047	2 68	1910	902,715	3,462,872	3 84
1896	49,619	110,257	2 22	1911	935,651	3,630,410	3 88
1897	60,686	176,457	2 91	1912	1,411,229	5,164,331	3 66
1898	87,600	286,000	3 26	1913	1,530,499	5,919,596	3 87
1899	100,820	350,022	3 47	1914	1,023,860	3,658,514	3 55
1900	157,134	649,140	4 13				

Annual Production of Coke by Provinces.

Calendar Year.	Nova Scotia.		Ontario.		British Columbia.		Alberta.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$		$
1897	41,532	90,950	.....	.....	19,154	85,507	.....	.....
1898	48,400	111,000	.....	.....	39,200	175,000	.....	.....
1899	62,459	178,767	.....	.....	38,361	171,255	.....	.....
1900	61,767	223,395	.....	.....	95,367	425,745	.....	.....
1901	222,694	590,560	.....	.....	142,837	637,665	.....	.....
1902	363,330	899,930	.....	.....	138,713	619,255	.....	.....
1903	371,745	888,094	.....	.....	189,573	846,310	.....	.....
1904	275,927	808,022	.....	.....	257,172	1,148,090	20,984	78,936
1905	386,366	1,054,712	.....	.....	269,256	1,202,035	44,866	179,464
1906	476,364	1,540,976	.....	.....	236,205	1,054,485	69,486	268,042
1907	524,110	1,688,070	.....	.....	241,572	1,049,432	76,321	297,595
1908	505,929	1,658,151	.....	.....	276,683	1,482,191	75,645	309,019
1909	492,992	1,608,092	.....	.....	281,786	1,509,567	87,233	366,734
1910	508,058	1,655,775	24,685	148,110	248,394	1,172,675	121,578	486,312
1911	557,554	1,814,977	259,554	1,318,303	82,327	350,879	36,216	146,251
1912	625,918	1,840,129	379,854	1,709,343	299,773	1,190,832	105,684	424,027
1913	722,038	2,352,153	419,287	1,991,613	321,771	1,306,218	67,403	269,612
1914	343,289	1,118,614	386,314	1,352,099	265,198	1,071,565	29,059	116,236

Annual Exports of Coke.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1897	2,987	6,078	1906	37,003	168,571
1898	3,774	8,394	1907	70,617	320,357
1899	5,557	18,726	1908	58,708	248,759
1900	41,529	131,278	1909	74,067	329,051
1901	57,505	176,990	1910	57,971	250,715
1902	62,568	180,920	1911	9,852	39,823
1903	32,608	135,957	1912	57,744	252,763
1904	102,463	345,031	1913	68,235	308,410
1905	116,071	509,908	1914	67,838	306,117

Annual Imports of Oven Coke.

Fiscal Year.	Tons.	Value.	Fiscal Year.	Tons.	Value.
		$			$
1880	3,837	19,353	1898	135,060	347,040
1881	5,492	26,123	1899	141,284	362,826
1882	8,157	36,670	1900	187,878	506,839
1883	8,943	38,588	1901	308,786	680,138
1884	11,207	44,518	1902	267,142	842,815
1885	11,564	41,391	1903	256,723	1,222,756
1886	11,858	39,756	1904	221,050	765,123
1887	15,110	56,222	1905	371,593	807,842
1888	25,487	102,334	1906	480,222	1,311,375
1889	29,557	91,902	1907*	400,536	1,132,680
1890	36,564	133,344	1908	619,269	2,166,036
1891	38,533	177,605	1909	466,292	1,136,624
1892	43,499	194,429	1910	702,053	1,695,603
1893	41,821	156,277	1911	763,114	1,887,493
1894	42,864	176,996	1912	641,903	1,637,091
1895	43,235	149,434	1913	710,109	2,023,253
1896	61,612	203,826	1914†	708,777	2,060,914
1897	83,330	267,540			

*For nine months only. †Duty free.

In Nova Scotia the Stellarton and Londonderry plants were idle throughout the year, but coke was made at Sydney, Sydney Mines, and Westville.

In Ontario, the Atikokan Iron Company's plant at Port Arthur was idle throughout the year. The whole production of the Province came, therefore, from the Algoma Steel Corporation's plant at Sault Ste. Marie.

In Alberta, the plants at Lille and Passburg were idle, and one at Coleman was in operation part of the year.

In British Columbia, coke was made by the Crowsnest Pass Coal Company at Fernie and Michel, and by Hosmer Mines, Limited, at Hosmer.

The coke production of the eastern provinces is used almost entirely in the iron and steel industry, while that of the western provinces is used chiefly by the copper and lead smelters, finding a market in the United States as well as in Canada.

In Nova Scotia at the close of 1914 there were 238 ovens in operation and 710 idle. The Dominion Iron and Steel Company had only 208 of its 620 ovens in operation. All these ovens are of the Otto-Hoffman by-product type, from which are recovered tar, sulphate of ammonia, and gas. The gas is used in the Company's steel plant operations, and the sulphate of ammonia in the crystallized state is disposed of to the trade. The crude tar is sold to the Dominion Tar and Chemical Company, who have a plant close at hand for the separation of a variety of coal-tar products. The Nova Scotia Steel and Coal Company's Bernard ovens were idle at the close of the year, but its 30 Bauer ovens were in operation. The surplus gas from the Baur ovens is used in generating steam for general colliery use, while that from the Bernard ovens is used for the production of steam for the power generating plant. All other ovens in the Province were idle at the end of the year.

In Ontario, the Atikokan Iron Company's 100 Beehive ovens at Port Arthur were idle throughout the year, but the Algoma Steel Company's 110 Koppers Regenerative By-product ovens at Sault Ste. Marie were in operation most of the year, though 55 were idle on December 31. At the Sault Ste. Marie plant, crude tar, crystallized sulphate of ammonia, and gas, are recovered. The tar is sold to the Dominion Tar and Chemical Company, who have a plant close at hand for the separation of coal-tar products. The sulphate of ammonia is sold in the open market and the surplus gas is used in the Company's steel plant operations.

In Alberta, all of the Western Canadian Collieries' 50 Bernard ovens at Lille, all of the Leitch Collieries' 101 Mitchell rectangular ovens at Passburg, and some of the International Coal and Coke Company's 216 Beehive ovens at Coleman, were idle throughout the year. There were none in operation on December 31.

In British Columbia too, the coke trade was adversely affected though not to the same extent as in Alberta and Nova Scotia. At the end of the

year the Crowsnest Pass Coal Company had 50 of its 454 Beehive ovens at Fernie idle, and 386 of its 486 at Michel idle; its 240 Beehive ovens at Carbonado have been idle for some years. The 240 Beehive ovens of Hosmer Mines, Limited, at Hosmer, were idle throughout the year, as were also those of the Canadian Collieries (Dunsmuir) Limited, at Comox, on Vancouver island.

The exports for 1914 were 67,838 tons, all from British Columbia. This was a slight decrease from 1913 when the exports were 68,235 tons.

Coke Oven By-products.

As in 1913, coke oven by-products were recovered only at Sydney, N.S., and Sault Ste. Marie, Ontario. The 1914 recoveries were as follows: 5,714,172 gallons tar and 8,572 tons of sulphate of ammonia. In 1913 the recoveries were 8,371,600 gallons of tar, and 10,608 tons of sulphate of ammonia.

Annual Production of Coke Oven By-products.

Year.	Tar.	Sulphate of ammonia.	Year.	Tar.	Sulphate. of ammonia.
	Gals.	Tons of 2,000 lbs.		Gals.	Tons of 2,000 lbs.
1901	2,662,612	1,614	1908	4,450,166	3,342
1902	4,094,135	2,393	1909	4,016,824	3,416
1903	3,281,249	3,207	1910	3,963,591	3,491
1904	1,649,197	1,773	1911	6,464,155	7,124
1905	3,407,784	2,500	1912	8,428,896	11,289
1906	3,725,723	2,364	1913	8,371,600	10,608
1907	4,424,615	1,738	1914	5,714,172	8,572

FELDSPAR.

The 1914 production of feldspar was the largest on record being 18,060 tons valued at $70,824, or an average of $3.92 per ton. The 1913 production was 16,790 tons valued at $60,795 or an average of $3.62 per ton, and the 1912 production was 13,733 tons valued at $30,916 or an average of $2.25 per ton.

Almost all the feldspar shipped from Canadian mines goes to United States consumers, the 1914 exports being 18,072 tons valued at $74,100, or an average of $4.10 per ton.

Statistics of production and exports of feldspar are given in the following table:—

Production and Exports of Feldspar.

Calendar Year.	Production.			Exports.		
	Tons.	Value. $	Average.	Tons.	Value. $	Average.
1890	700	3,500	5 00	.....	.....	.....
1891	685	3,425	5 00	.....	.....	.....
1892	175	525	3 00	.....	.....	.....
1893	575	4,525	7 87	50	500	10 00
1894	Nil.	Nil.	.....	Nil.	Nil.	.....
1895	.....	*2,545	.....	.....	2,545	.....
1896	972	*2,583	2 66	972	2,583	2 66
1897	1,400	3,290	2 35	3,078	5,637	1 83
1898	2,500	6,250	2 50	1,542	4,396	2 85
1899	3,000	6,000	2 00	1,757	5,126	2 92
1900	318	1,112	3 50	379	1,116	2 94
1901	5,350	10,700	2 00	4,367	10,973	2 51
1902	7,576	15,152	2 00	7,374	13,708	1 86
1903	13,928	18,966	1 36	13,760	23,319	1 69
1904	11,083	22,166	2 00	13,960	29,263	2 10
1905	11,700	23,400	2 00	9,161	27,660	3 02
1906	16,948	40,890	2 41	18,183	60,312	3 32
1907	12,584	29,819	2 37	12,068	37,932	3 14
1908	7,877	21,099	2 68	9,524	34,045	3 57
1909	12,783	40,383	3 16	10,834	35,234	3 25
1910	15,809	47,667	3 02	15,601	47,962	3 07
1911	17,723	51,939	2 93	16,150	56,085	3 47
1912	13,733	30,916	2 25	12,779	44,114	3 45
1913	16,790	60,795	3 62	15,966	62,767	3 93
1914	18,060	70,824	3 92	18,072	74,100	4 10

*Exports.

The Canadian production of feldspar comes chiefly from the counties of Frontenac and Lanark in Ontario. A small proportion comes from the Villeneuve mine, Township of Villeneuve, Labelle county, Quebec, where an exceptionally pure white feldspar, suitable for the manufacture of artificial teeth, is mined. Deposits in Ottawa county, Quebec, have been operated in past years to some extent; but they are now idle. At Manicouagan Bay, on the north shore of the River St. Lawrence, there has been some development work done, but no production of feldspar has been yet reported.

In Ontario there are small deposits in Muskoka and Parry Sound districts, on which a little work has been done.

The shipping firms in 1914 were: The Kingston Feldspar Mining Company, Kingston, operating the Richardson and Reynolds mines, Frontenac county, Ontario. The Dominion Feldspar Company, Limited, 30 Adelaide W., Toronto, operating quarries near Bobs Lake, Frontenac county, Quebec. The Dominion Improvement and Development Company, P. O. Box 26, Perth, Ontario, operating a quarry in North Burgess township, Lanark county, Ontario. Messrs. O'Brien and Fowler, Beech street, Ottawa, Canada, operating Villeneuve mine, Villeneuve township, Labelle county, Quebec.

FLUORSPAR.

In 1914 as in 1913, there were no shipments of fluorspar.

Several occurrences of fluorspar are known near Madoc, in Huntingdon and Madoc townships, in Hastings county, Ontario. In 1905 Mr. Stephen Wellington opened a deposit on Lot 1, Con. IV, Madoc township, and made a shipment of 12 tons to Port Hope, Ontario. In 1910 Messrs. Gillespie and Wellington mined from a deposit on Lot 10, Con. XIV, of the Township of Huntingdon, about 200 tons of material from which 2 tons of fluorspar valued at $15 were shipped. Additional work in succeeding years resulted in shipments in 1911 of 34 tons, valued at $238, to the smelter at Deloro and to steel foundries at Welland, and in 1912 of 40 tons, valued at $240 to the Copper Cliff smelter. This property is known as the Rogers Fluorspar mine. It is now owned by Messrs. Cross and Wellington, Madoc, Ontario. Other occurrences of fluorspar have been noted on Lots 11 and 12, Con. XIII, Huntingdon township, and on Lot 2, Con. III, Madoc township.

Imports of fluorspar cannot be stated accurately as they are not shown separately in the Reports of the Customs Department. The consumption in steel works though is considerable and reports from steel companies covering their operations show the consumption from 1910 to 1914 inclusive to have been respectively: 7,461 tons, 8,067 tons, 9,709 tons, 10,687 tons, and 7,842 tons.

Imports of hydrofluosilicic acid used in the lead refinery at Trail, B. C., during recent years have been as follows:—

Imports of Hydrofluosilicic Acid.

		Pounds	$
Calendar year,	1910	187,785	10,813
"	1911	223,706	9,173
"	1912	302,918	24,891
"	1913	1,182,293	46,517
"	1914	1,384,087	41,576

GRAPHITE.

In 1914, milled or refined graphite only was shipped by Canadian producers, the total shipments amounting to 1,647 tons, valued at $107,203, or an average of $65.10 per ton. The 1913 production of refined graphite was 1,762 tons valued at $87,882 or an average of $49.88 per ton, and in 1912 it was 1,850 tons, valued at $115,757, or an average of $62.57 per ton. The shipments of crude in 1913 were 400 tons valued at $2,400, and in 1912 they were 210 tons valued at $1,365.

The value of the 1914 shipments showed an increase of 18·74 per cent over the value of the 1913 shipments, and is the second largest recorded.

The following table gives statistics of annual production since 1886.

Annual Production of Graphite.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	500	4,000	1900	1,922	31,040
1887	300	2,400	1901	2,210	38,780
1888	150	1,200	1902	1,095	28,300
1889	242	3,160	1903	728	23,745
1890	175	5,200	1904	452	11,760
1891	260	1,560	1905	541	16,735
1892	167	3,763	1906	387	18,300
1893	Nil.	Nil.	1907	579	16,000
1894*	3	223	1908	251½	5,565
1895	220	6,150	1909	864	47,800
1896	139	9,455	1910	1,392	74,087
1897	436	16,240	1911	1,269	69,576
1898	.....	13,698	1912	2,060	117,122
1899	1,130	24,179	1913	2,162	90,282
			1914	1,647	107,203

*Exports.

In 1914, mills in the Buckingham district of Quebec shipped 261 tons, valued at $18,886, and mills at Harcourt, Wilberforce, and Calabogie, Ontario, made shipments aggregating 1,386 tons, valued at $88,317. In 1913, the Quebec shipments were 103 tons valued at $9,620, and the Ontario shipments 2,059 tons valued at $80,662, and in 1912 the shipments from Quebec were 604 tons, and from Ontario 1,456 tons.

Exports of graphite are classified as crude ore and concentrates, and manufactures of plumbago. In 1914 the value of these exported was $123,246 which is the second highest year's exportation on record. During the last six years the tonnage of crude and refined graphite exported is

equivalent to 72·5 per cent of the production during the same period. Statistics of the exports of graphite follow:—

Exports of Graphite.

Year.	Crude ore and concentrates.		Manufactures.	Total value.
	Tons.	Value.	Value.	
		$	$	$
1886	.....	.....	.....	3,586
1887	.....	.....	.....	3,017
1888	.....	.....	.....	1,080
1889	.....	.....	.....	538
1890	.....	.....	.....	1,529
1891	.....	.....	.....	72
1892	.....	.....	.....	3,952
1893	1	38	10	48
1894	3	223	.....	223
1895	544	4,803	30	4,833
1896	136	9,126	354	9,480
1897	205	2,988	1,337	4,325
1898	591	11,527	1,571	13,098
1899	1,237	19,326	3,164	22,490
1900	1,550	40,132	6,065	46,197
1901	1,194	30,535	4,567	35,102
1902	886	23,097	1,742	24,839
1903	412	26,230	17,412	43,642
1904	177	9,609	6,958	16,567
1905	254	7,596	518	8,114
1906	106	2,468	5,274	7,742
1907	121	3,036	2,847	5,883
1908	385	10,158	876	11,034
1909	1,004	52,438	864	53,302
1910	788	53,008	66,658	119,666
1911	813	43,249	33,956	77,205
1912	1,654	70,763	58,920	129,683
1913	1,642	85,368	24,284	109,652
1914	919	50,528	72,718	123,246

An analysis of the exports of recent years showing destinations is given in the following table:—

Exports of Graphite by Countries.

Calendar Year.	Crude ore and concentrates.						Manufactures of plumbago.		
	Great Britain.		United States.		Other Countries.		Great Britain.	United States.	Other Countries.
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Value.	Value.	Value.
		$		$		$	$	$	$
1909	83	9,035	905	41,558	16	1,845	.....	.....	.....
1910	223	16,453	556	35,555	9	1,000	3,051	63,466	141
1911	30	3,631	752	36,295	31	3,323	2,289	30,062	1,605
1912	59	4,984	1,550	62,680	45	3,099	3,932	46,796	8,192
1913	19	1,700	1,618	82,758	5	910	3,278	20,279	727
1914	77	6,730	814	41,168	28	2,630	12,051	58,816	1,851

An examination of the above table shows the tonnage of graphite exported during the past six years to have been distributed as follows: To

Great Britain, 7·2 per cent; to United States 90·8 per cent, and to other countries 2·0 per cent. Of manufactures of plumbago valued at $256,536, Great Britain took 9·6 per cent; United States 85·5 per cent, and other countries 4·9 per cent.

Statistics of imports of graphite are given in the next table. The imports for the calendar year 1914 were valued at $100,192, and comprised: plumbago, not ground $801; black lead $6,798, plumbago, ground and manufactures $42,680, and crucibles of clay or plumbago $49,913.

Imports of Raw and Manufactured Graphite.

Fiscal Year.	Plumbago not ground.	Black lead.	Ground and manufactures.	Crucibles, clay or plumbago.	Total.
	$	$	$	$	$
1880	1,677	18,055	2,738	.....	22,470
1881	2,479	26,544	1,202	.....	30,225
1882	1,028	25,132	2,181	.....	28,341
1883	3,147	21,151	2,141	.....	26,439
1884	2,891	24,002	2,152	.....	29,045
1885	3,729	24,487	2,805	.....	31,021
1886	5,522	23,211	1,408	.....	30,141
1887	4,020	25,766	2,830	.....	32,616
1888	3,802	7,824	22,604	.....	34,230
1889	3,546	11,852	21,789	.....	37,187
1890	3,441	10,276	26,605	.....	40,322
1891	7,217	8,292	26,201	.....	41,710
1892	2,988	13,560	23,085	.....	39,633
1893	3,293	16,595	23,051	.....	42,939
1894	2,177	17,614	15,196	1,490	36,477
1895	2,586	13,922	16,361	5,627	38,496
1896	2,865	18,434	12,090	7,407	40,796
1897	1,406	17,863	14,768	5,906	39,943
1898	1,862	19,638	20,120	12,533	54,153
1899	4,979	21,334	22,140	14,350	62,803
1900	4,437	22,078	17,869	20,571	64,955
1901	2,357	25,646	11,016	38,874	77,893
1902	3,649	20,467	15,021	28,635	67,772
1903	2,870	22,559	12,493	34,624	72,546
1904	1,802	26,053	12,737	28,773	69,365
1905	2,499	30,743	13,192	31,353	77,787
1906	2,791	33,907	19,058	32,950	88,706
1907 (9 mos.)	3,176	16,646	13,740	27,271	60,833
1908	3,030	9,042	31,428	40,092	83,592
1909	1,408	11,009	26,918	37,213	76,548
Calendar Year.					
1910	4,867	10,048	45,042	52,896	112,853
1911	4,940	14,172	37,020	56,814	112,946
1912	7,249	9,587	56,324	82,324	155,484
1913	9,375	8,633	64,254	73,971	156,233
1914	801	6,798	42,680	49,913	100,192

The market for graphite in Great Britain is to some extent indicated by the imports into that country, which for 1913 and 1914 were as follows:—

Imports of Plumbago into Great Britain 1913 and 1914.

	1913.			1914.		
	Tons (short).	Value.	Per ton.	Tons. (short).	Value.	Per ton.
		$	$ cts.		$	$ cts.
Germany	3,376	133,196	39 50	1,590	64,941	40 84
France	199	10,541	52 90	225	13,393	59 52
Madagascar	4,519	449,578	99 50	4,932	460,362	93 34
Italy	1,400	26,942	19 20	1,258	24,844	19 75
Austria-Hungary	502	11,500	22 90	96	3,669	38 22
Japan	4,324	131,006	31 30	4,667	142,000	30 43
United States	421	36,495	86 69	431	33,994	78 87
Other foreign countries	1,016	36,315	35 74	282	9,174	32 53
British India	539	31,482	58 41	.....	.....	.....
Ceylon and dependencies	6,707	793,816	118 36	2,938	277,818	94 56
Australia	88	1,801	20 46	.....	.....	.....
Canada	64	5,840	91 25	187	14,172	75 79
Other British possessions	.....	.....	.....	2	146	73 00
Total	23,155	1,668,512	72 06	16,608	1,044,513	62 89

[1] British Trade Report.

Prices of refined graphite in London, England, as quoted by the Mining Journal, for the last week of the calendar years 1909, 1910, 1911, 1912, 1913, and 1914 have remained constant at the following figures:—

Graphite Purified, Milled and Ground.

Ceylon, 97 to 99 per cent £59 to £63 per ton f.o.b. London.
" 90 to 91 " 40 to 42 " " "
" 80 to 81 " 30 to 32 " " "
" 70 to 71 " 27 to 28 " " "
American, large flake, 45 to 49 " " "
" small " 35 to 45 " " "

The following is a list of the principal firms operating graphite properties in recent years.

Operator and address.	Location.			Mine office.
	County.	Township.	Range or concession and lot.	
Quebec.				
The Canadian Graphite Co., Ltd., Montreal, 34 Coristine Building.	Argenteuil...	Wentworth ..	III, 1A, 1B.....	Lachute.
*Graphite Limited, Montreal, 811 Mullin St	Labelle	Amherst.....	VI, VII, 16.....	St. Remi d'Amherst.
*The Quebec Graphite Co., Ltd., Buckingham.	"	Buckingham.	IV, 1, 2, 3, ¼4, ¼5....	Buckingham.
	"	Lochaber....	IV, 28.....	
Buckingham Graphite Co., Ltd., Buckingham.	"	Buckingham.	VI, 28.....	"
The Bell Graphite Co., Ltd., Friars House, London, Eng.	"	" .	V, 1, 2, 3.....	"
Dominion Graphite Co., Toronto, 15 Wellington St. W.	"	" .	V, 20.....	In liquidation.
Peerless Graphite Co., 32 Thorndale Terrace, Rochester, N.Y.	"	" .	IX, X, 12, 13.....	Buckingham.
Ontario.				
*Black Donald Graphite Co., Calabogie....	Renfrew.....	Brougham...	III, IV, near Whitefish Lake.	Calabogie.
The Globe Refining Co., 32 Adelaide E., Toronto.	Lanark.....	Elmsley N...	VI, 23.....	Port Elmsley.
	"	Burgess N...	V, 21, VI, 22.....	"
*Tonkin-du-Pont Graphite Co., Ltd., Wilberforce.....	Hastings....	Monteagle...	XIII, 23.....	Maynooth.
	Haliburton .	Monmouth. .	XVI, S ½ 35.....	Wilberforce.
Matthews and Foster, 18 Toronto St., Toronto.....	Hastings ...	Monteagle...	XIII, 24.....	Maynooth.
*New York Graphite Co., Harcourt.....	Haliburton ..	Cardiff.....	XXII, 9, 10, 11.....	Harcourt.

* Operating in 1914.

ARTIFICIAL GRAPHITE.

Artificial graphite has been manufactured in electric furnaces at Niagara Falls, Ontario, for several years by the International Acheson Graphite Company. The production has been as follows:—

Calendar year.	*Quantity.*
1906.....	445,047 pounds.
1907.....	407,779 "
1908.....	428,540 "
1909.....	513,436 "
1910.....	2,442,166 "
1911.....	2,172,098 "
1912.....	2,302,625 "
1913.....	2,184,472 "
1914.....	1,234,233 "

GYPSUM.

A report[1] on the gypsum industry in Canada has lately been issued by the Mines Branch of the Department of Mines, Ottawa. This describes in detail the operating deposits in the different provinces, and the methods of treatment followed in preparing gypsum for the market.

The provinces producing gypsum are: Nova Scotia, New Brunswick, Ontario, Manitoba, and British Columbia. Since 1886 the total production from these provinces has been as follows: Nova Scotia, 6,279,802 tons; New Brunswick, 2,449,157 tons; Ontario, 339,457 tons; Manitoba, 266,037 tons; and British Columbia, 980 tons. Manitoba's first shipments were made in 1901, and British Columbia has made shipments in 1911 and 1913 only. In Manitoba the industry is comparatively young, but it has made rapid strides. In British Columbia the industry is in its infancy.

The total shipments of gypsum products of all varieties in 1914 were 516,880 tons valued at $1,156,207, as compared with 636,370 tons in 1913 valued at $1,447,739, and 578,458 tons in 1912 valued at $1,324,620.

In 1914 the total quantity of crude gypsum mined was 579,841 tons as compared with 684,726 tons in 1913, and 549,856 tons in 1912. The quantity calcined in 1914 was reported as 138,212 tons, as compared with 147,532 tons in 1913, and 133,392 tons in 1912. The total shipments in 1914 included 351,729 tons of "lump" valued at $400,521, or an average of $1.14 per ton, 49,441 tons of "crushed" valued at $61,686, or an average of $1.25 per ton; 6,097 tons of "fine-ground" valued at $14,496, or an average of $2.38 per ton, and 109,613 tons of "calcined" valued at $679,504 or an average of $6.20 per ton. In 1913 the shipments were classified as follows:— "Crude" 499,460 tons valued at $615,493, or an average of $1.23 per ton; "ground" 10,281 tons valued at $20,576 or an average of $2.00 per ton, and "calcined" 126,629 tons valued at $811,670, or an average of $6.41 per ton.

The total quantity of gypsum mined and the total quantity calcined during the past ten years is shown in the following table:—

Gypsum Mined and Gypsum Calcined.

(Short Tons.)

Year.	Total gypsum mined.	Gypsum calcined.	Year.	Total gypsum mined.	Gypsum calcined.
	Tons.	Tons.		Tons.	Tons.
1905	443,569	26,855	1910	548,019	69,889
1906	492,759	28,831	1911	515,979	76,718
1907	489,962	34,752	1912	549,856	133,392
1908	375,444	48,727	1913	684,726	147,532
1909	493,068	63,670	1914	579,841	138,212

[1] Gypsum in Canada: Its Occurrence, Exploitation, and Technology, L. H. Cole, Mines Branch, Dept. of Mines, Ottawa, Canada, 1915, No. 245.

Over 60 per cent of the gypsum mined in 1914 was shipped in lump form as quarried, and of this over 90 per cent went to calcining mills in the United States. Almost all of the shipments of crude lump are made from the Maritime provinces from which cheap transportation by water is easily secured. There was calcined 138,212 tons, or 23·8 per cent of the tonnage mined. There was shipped as crushed, and fine ground, 55,538 tons or 9·4 per cent of the tonnage mined. The balance mined was probably represented in stock accumulated at the end of the year.

For the 1914 production of gypsum and gypsum products a modification of the classification of recent years has been adopted. Consequently these figures appear by themselves. Statistics of the shipments of crude and calcined gypsum from 1905-1913, and of the annual production of gypsum products since 1886, are shown in the tables following:—

Shipments of Crude and Calcined Gypsum, 1914.

Grade.	Tons.	Value.	Average per ton.
		$	$ cts.
Lump	351,729	400,521	1 14
Crushed	49,441	61,686	1 25
Fine ground	6,079*	14,496	2 38
Calcined	109,603	679,504	6 20
Total	516,880	1,156,207	2 24

Shipments of Crude and Calcined Gypsum, 1905-1913.

Calendar Year.	Crude (Lump).			Crude (Ground).			Calcined.		
	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.	Tons.	Value.	Per ton.
		$	$ cts.		$	$ cts.		$	$ cts.
1905...	412,155	409,146	0 99	3,255	8,779	2 70	26,748	168,243	6 29
1906...	442,132	473,960	1 07	3,195	9,823	3 07	23,695	159,511	6 73
1907...	454,668	473,831	1 04	6,732	16,268	2 42	24,521	156,815	6 40
1908...	298,188	307,532	1 03	9,504	25,468	2 68	33,272	242,701	7 29
1909...	423,474	457,038	1 08	8,814	26,159	2 97	40,841	326,435	7 99
1910...	469,573	508,686	1 08	6,121	17,390	2 84	49,552	408,370	8 24
1911...	449,823	481,077	1 07	7,149	23,125	3 23	61,411	489,192	7 97
1912...	453,577	525,345	1 16	15,487	29,244	1 89	109,394	770,031	7 04
1913...	499,460	615,493	1 23	10,281	20,576	2 00	126,629	811,670	6 41

Annual Production of Gypsum.

Calendar Year.	Tons.	Value.	Per ton.	Calendar Year.	Tons.	Value.	Per ton.
		$	$ cts.			$	$ cts.
1886	162,000	178,742	1 10	1900	252,101	259,009	1 02
1887	154,008	157,277	1 02	1901	293,799	340,148	1 16
1888	175,887	179,393	1 01	1902	333,599	379,479	1 14
1889	213,273	205,108	0 96	1903	314,489	388,459	1 24
1890	226,509	194,033	0 86	1904	345,961	373,474	1 08
1891	203,605	206,251	1 01	1905	442,158	586,168	1 32
1892	241,048	241,127	1 00	1906	469,022	643,294	1 37
1893	192,568	196,150	1 02	1907	485,921	646,914	1 33
1894	223,631	202,031	0 90	1908	340,964	575,701	1 69
1895	226,178	202,608	0 89	1909	473,129	809,632	1 71
1896	207,032	178,061	0 86	1910	525,246	934,446	1 78
1897	239,691	244,531	1 02	1911	518,383	993,394	1 92
1898	219,256	232,515	1 06	1912	578,458	1,324,620	2 29
1899	244,566	257,329	1 05	1913	636,370	1,447,739	2 27
				1914	516,880	1,156,207	2 24

The production by provinces during 1914 was as follows: Nova Scotia 303,155 tons; Ontario 81,219 tons; New Brunswick 79,083 tons, and Manitoba 53,423 tons. On the basis of value of production the provinces rank as follows: Manitoba $382,563; Nova Scotia $368,931; Ontario $204,033, and New Brunswick $200,680. The different ranking of the provinces in the two comparisons is largely due to the fact that almost the entire production of Nova Scotia and New Brunswick is shipped as quarried, the Ontario production is composed of goodly proportions of crushed, fine ground and calcined gypsum, and that of Manitoba is practically all calcined.

Annual Production of Gypsum by Provinces.

Calendar Year.	Nova Scotia.		New Brunswick.		Ontario.		Manitoba.		British Columbia.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$		$		$
1887	116,346	116,346	29,102	29,216	8,560	11,715	.....	.....	.....	.....
1888	124,818	120,429	44,369	48,764	6,700	10,200	.....	.....	.....	.....
1889	165,025	142,850	40,866	49,130	7,382	13,128	.....	.....	.....	.....
1890	181,285	154,972	39,024	30,986	6,200	8,075	.....	.....	.....	.....
1891	161,934	153,955	36,011	33,996	5,660	18,300	.....	.....	.....	.....
1892	197,019	170,021	39,709	65,707	4,320	5,399	.....	.....	.....	.....
1893	152,754	144,111	36,916	41,846	2,898	10,193	.....	.....	.....	.....
1894	168,300	147,644	52,962	48,200	2,369	6,187	.....	.....	.....	.....
1895	156,809	133,929	66,949	63,839	2,420	4,840	.....	.....	.....	.....
1896	136,590	111,251	67,137	59,024	3,305	7,786	.....	.....	.....	.....
1897	155,572	121,754	82,658	118,116	1,461	4,661	.....	.....	.....	.....
1898	132,086	106,610	86,083	121,704	1,087	4,201	.....	.....	.....	.....
1899	126,754	102,055	116,792	151,296	1,020	3,978	.....	.....	.....	.....
1900	138,712	108,828	112,294	145,850	1,095	4,331	.....	.....	.....	.....
1901	170,100	136,947	121,595	189,709	1,504	5,692	600	7,800	.....	.....
1902	206,087	181,425	124,041	170,153	1,917	7,699	1,554	20,202	.....	.....
1903	189,427	173,881	119,182	172,080	2,720	21,988	3,160	20,510	.....	.....
1904	218,580	153,600	190,991	187,524	2,390	18,350	4,000	14,000	.....	.....
1905	272,252	298,248	163,553	232,586	1,853	23,834	4,500	31,500	.....	.....
1906	333,312	345,414	131,246	250,960	2,965	24,420	3,200	22,500	.....	.....
1907	357,411	380,859	118,106	213,638	10,404	52,417	.....	.....	.....	.....
1908	234,455	230,433	81,620	191,312	10,389	42,456	14,500	111,500	.....	.....
1909	345,682	364,379	98,716	226,975	11,731	48,278	17,000	170,000	.....	.....
1910	400,455	458,638	90,236	213,579	15,055	67,229	19,500	195,000	.....	.....
1911	353,999	406,457	93,205	115,044	27,399	98,018	43,000	372,000	780	1,875
1912	376,082	481,493	82,757	185,821	53,119	176,056	66,500	481,250	.....	.....
1913	404,801	479,515	103,954	279,395	62,315	208,029	65,100	479,500	200	1,300
1914	303,155	368,931	79,083	200,680	81,219	204,033	53,423	382,563	.....	.....

EXPORTS AND IMPORTS.

Statistics of exports and imports of gypsum as compiled from the Reports of Trade and Navigation, are shown in the accompanying tables. The exports of crude gypsum during the calendar year 1914 were 345,830 tons, valued at $404,234, or an average of $1.17 per ton, as compared with exports in 1913 of 417,302 tons, valued at $504,383, or an average of $1.21 per ton. There were also exports of ground gypsum in 1914 valued at $35,490, as compared with exports in 1913 valued at $5,795. The total value of exports of gypsum, both crude and ground, was $439,724 as compared with exports in 1913 valued at $510,178.

The imports of gypsum of all grades during the calendar year reached a value of $75,031, and included crude gypsum 3,572 tons valued at $16,448 or an average of $4.60 per ton, ground gypsum 536 tons, valued at $4,301, or an average of $8.02 per ton, and Plaster of Paris 7,739 tons, valued at $54,282, or an average of $7.01 per ton. For purposes of comparison the imports during 1913 are given herewith. The total value was $188,252 which included crude gypsum 4,522 tons valued at $21,763 or an average of $4.81 per ton, ground gypsum valued at $11,770, and Plaster of Paris 20,113 tons valued at $154,719 or an average of $7.69 per ton. The imports of gypsum, crude and ground, and Plaster of Paris for years past have been very erratic, sudden increases, or sudden decreases from year to year being the rule, e.g., imports of crude from 1910-1914 inclusive were respectively 12,271 tons, 2,035 tons, 3,503 tons, 4,522 tons, and 3,572 tons; and imports of ground were 6,690 tons in 1910, 1,681 tons in 1911, 7,072 tons in 1912, and 536 tons in 1914; and imports of Plaster of Paris from 1910-1914 inclusive were respectively: 19,045 tons, 28,518 tons, 32,496 tons, 20,113 tons, and 7,739 tons. The average importation of Plaster of Paris during the last five years was 21,582 tons as compared with an average of 7,267 tons for the preceding five year period. The average values of imports, too, have ranged between wide limits.

Exports of Crude Gypsum.

Calendar Year.	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
1897	122,984	116,665	66,222	80,485	.....	.....	189,206	197,150
1898	99,215	93,474	70,399	81,433	.....	.....	169,614	174,907
1899	104,795	99,984	96,831	108,094	*½	12	201,626	208,090
1900	.....	.....	.....	.....	.....	.....	188,262	201,912
1901	.....	.....	.....	.....	.....	.....	236,247	231,594
1902	.....	.....	.....	.....	.....	.....	289,600	295,215
1903	.....	.....	.....	.....	.....	.....	287,496	311,580
1904	.....	.....	.....	.....	.....	.....	298,211	316,436
1905	.....	.....	.....	.....	.....	.....	359,246	388,474
1906	.....	.....	.....	.....	.....	.....	404,464	462,814
1907	.....	.....	.....	.....	.....	.....	375,026	424,794
1908	.....	.....	.....	.....	.....	.....	280,091	324,574
1909	.....	.....	.....	.....	.....	.....	315,201	372,286
1910	.....	.....	.....	.....	.....	.....	346,081	416,725
1911	.....	.....	.....	.....	.....	.....	362,102	425,161
1912	.....	.....	.....	.....	.....	.....	364,643	423,208
1913	.....	.....	.....	.....	.....	.....	417,302	504,383
1914	.....	.....	.....	.....	.....	.....	345,830	404,234

*Exported from British Columbia.

Exports of Ground Gypsum.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1890	105	1898	6,448	1906	2,934
1891	588	1899	8,123	1907	557
1892	20,255	1900	19,834	1908	9,765
1893	22,132	1901	15,337	1909	2,787
1894	20,054	1902	5,101	1910	12,306
1895	22,233	1903	12,457	1911	4,429
1896	21,267	1904	2,333	1912	6,495
1897	6,763	1905	2,673	1913	5,795
				1914	35,490

Imports of Gypsum.

Fiscal Year.	Crude Gypsum.		Ground Gypsum.		Plaster of Paris.	
	Tons.	Value.	Lbs.	Value.	Lbs.	Value.
		$		$		$
1880	1,854	3,203	1,606,578	5,948	667,676	2,376
1881	1,731	3,442	1,544,714	4,676	574,006	2,864
1882	2,132	3,761	759,460	2,576	751,147	4,184
1883	1,384	3,001	1,017,905	2,579	1,448,650	7,867
1884	.....	3,416	687,432	1,936	782,920	5,226
1885	1,353	2,354	461,400	1,177	689,521	4,809
1886	1,870	2,429	224,119	675	820,273	5,463
1887	1,557	2,492	13,266	73	594,146	4,342
1888	1,236	2,193	106,068	558	942,338	6,662
1889	1,360	2,472	74,390	372	1,173,996	8,513
1890	1,050	1,928	434,400	2,136	693,435	6,004
1891	376	640	36,500	215	1,035,605	8,412
1892	626	1,182	310,250	2,149	1,166,200	5,595
1893	496	1,014	140,830	442	552,130	3,143
1894	.....	1,660	23,270	198	422,700	2,386
1895	603	960	20,700	88	259,200	1,619
1896	1,045	848	64,500	198	297,000	2,000
1897	.....	772	45,000	123	969,900	4,489
1898	1,147	1,742	35,700	293	329,600	2,025
1899	325	692	33,900	338	496,300	3,120
1900	77	958	6,300	69	849,100	6,492
1901	286	1,125	65,400	1,097	502,200	3,978
1902	541	1,697	56,700	249	475,300	2,641
1903	1,076	2,187	68,700	228	630,800	3,599
1904	249	663	106,800	559	625,100	2,885
1905	2,344	7,386	2,255,700	2,681	7,924,100	37,643
1906	6,332	22,008	1,968,600	1,799	12,866,500	43,742
1907 (9 mos.)	9,189	23,410	609,600	1,619	19,849,400	58,364
1908	9,393	36,510	382,500	1,781	15,020,000	51,328
1909	10,317	35,268	6,286,200	5,765	17,009,000	64,849
Calendar Year.						
1910	12,271	21,073	13,380,600	13,242	38,090,300	135,483
1911	2,035	11,792	3,362,400	3,619	57,035,700	190,371
1912	3,503	16,254	14,144,000	19,651	64,991,600	232,198
1913	4,522	21,763	.....	11,770	40,226,400	154,719
1914	3,572	16,448	1,072,600	4,301	15,477,500	54,282

Crude gypsum, duty free. Ground gypsum, duty 15 per cent. Plaster of Paris, duty 12½c. per 100 lbs.

The Nova Scotia production, and the larger part of the New Brunswick production as well, is almost all disposed of in the United States market. The large deposits and the excellent facilities for water transportation are responsible for the gypsum being shipped as quarried to grinding and calcining plants outside these provinces.

Returns from Nova Scotia operators show the tonnage of gypsum mined during recent years to have been as follows: 339,747 tons in 1914, 423,977 tons in 1913, 330,442 tons in 1912, and 337,605 tons in 1911. The decrease in 1914 is partially attributable to the destruction by fire of a large calcining mill in New York which drew its regular supply of crude gypsum from Nova Scotia. Of the total tonnage mined in 1914 about 83 per cent was extracted from quarries in Hants county near Windsor, Walton, and Cheverie, and the rest came from quarries at Quarry St. Ann's, Iona, and McKinnon Harbour, Victoria county, and a quarry near Cheticamp, Inverness county.

In New Brunswick only two properties were operating, both near Hillsborough in Albert county. The tonnage of gypsum mined in 1914

was 86,912 tons as compared with 112,739 tons in 1913, and 82,348 tons in 1912. About 68 per cent of the output was shipped in crude form, either lump or ground, and the balance was calcined, the latter being marketed in Canada.

In Ontario there was an increase over 1913 in quantity of gypsum mined, the figures for recent years being as follows: 89,159 tons in 1914, 71,310 tons in 1913, and 57,086 tons in 1912. The total sales in 1914 including crushed, fine ground, and calcined (both that sold as such, and as an ingredient of wall plaster), amounted to 81,219 tons valued at $204,033. The total sales of crude, ground and calcined gypsum in 1913 were 62,315 tons valued at $208,029, the sales including a quantity of alabastine manufactured by one firm and valued at about $50 per ton.

Manitoba's shipments of gypsum are almost entirely of the calcined grade. In 1914 there was for the first time in the history of the industry in this Province, a conspicuous decrease as compared with the previous year's production. In spite of this though, Manitoba for the first time led all the provinces in value of shipments. The total quantity mined was 64,023 tons as compared with 76,500 tons in 1913, 80,000 tons in 1912, and 53,000 in 1911. The shipments were 53,423 tons chiefly calcined valued at $382,563, as compared with shipments of 65,100 tons in 1913 valued at $479,500 and in 1912 of 66,500 tons valued at $481,250.

The following is a list of the principal active operators:—

Location.		Operator and Address.
County.	Post Office.	
NOVA SCOTIA.		
Cumberland	Nappan	Maritime Gypsum Co., Ltd., 381 Fourth Ave., New York.
Hants	Minasville	Geo. Hamilton, Minasville, N.S.
	Newport Landing	Newport Plaster Mining & Manufacturing Co., Ltd., Windsor, N.S.
	Walton, Cheverie	Rock Plaster Manufacturing Company, 381 Fourth Ave., New York.
	Noel	Noel Plaster Company, Noel, N.S.
	Three Mile Plains	Nova Scotia Gypsum Co., Three Mile Plains, N.S.
	Wentworth	Wentworth Gypsum Company, Wentworth, N.S.
	Newport Station	Windsor Gypsum Company, Newburgh, N.Y.
	Brooklyn and West Gore	Windsor Plaster Company, Ltd., Windsor, N.S.
Inverness	Eastern Harbour	Cheticamp Gypsum and Plaster Company, 108 Dominion Express Bldg., Montreal, P.Q.
Victoria	Iona	Iona Gypsum Company, Ltd., Sydney, N.S. Box 362.
	Port Hastings	Nova Scotia Cement and Plaster Company, 9 Toronto St., Toronto, Ont.
	McKinnon's Harbour	Newark Plaster Company, 17 Battery Place, New York, N.Y.
	Quarry St. Anns	Victoria Gypsum & Manufacturing Co., Quarry St. Anns, N.S
NEW BRUNSWICK.		
Albert	Hillsborough	Albert Manufacturing Company, Hillsborough, N.B.
	"	Hillsboro Plaster Company, Hillsborough, N.B.
Victoria	Plaster Rock	Stinson-Reeb Builders Supply Company, 45 Adelaide St, Montreal, P.Q.
	"	John E. Stewart, Andover, N.B.
Westmorland	Cape Maringouin (Near Rockport).	New Brunswick Gypsum Company, Hillsborough, N.B.
ONTARIO.		
Haldimand	Caledonia	The Alabastine Company, Ltd., Paris, Ont.
	Lythmore	The Crown Gypsum Company, Lythmore, Ont.
	Nelles Corners	Grand Gypsum Limited, 32 Stinson St., Hamilton, Ont.
	Caledonia	Haldimand Gypsum Company, Buffalo, N.Y.
	"	Wm. Smith, Caledonia, Ont., P.O. Box 83.
MANITOBA.		
Tp. 32. Range 9, Tp. 33. Ranges 8 and 9.	Gypsumville	Manitoba Gypsum Company, Ltd., Winnipeg, Man.
	"	Dominion Gypsum Company, P.O. Box 537, Winnipeg, Man
BRITISH COLUMBIA.		
	Princeton	E. P. Gaillac, Princeton, B.C.
	Grand Prairie	B. C. Gypsum Company, Victoria, Tr. Bldg., Victoria, B.C.
	Merritt	Dr. Geo. Schumacher, Merritt, B.C.

MAGNESITE.

Magnesite production in Canada has been confined to Grenville township, Argenteuil county, Quebec. Deposits are also known to exist in the Eastern Townships of Quebec, and in Atlin, B.C.

The industry in Argenteuil county is still of small proportions, and during the last years mining operations have been at a standstill, but shipments have been made from stock.

The only producer has been The Canadian Magnesite Company (superseded by the North American Magnesite Company), with head office in Montreal. This Company has on its property a calcining mill and a grinding mill. Shipments from the mine are hauled 12 miles to Calumet on the Canadian Pacific Railway. The crude magnesite has been disposed of to manufacturers of carbon dioxide gas, and the calcined material to sulphite mills, and manufacturers of composition flooring. The North American Magnesite Company now state that they "are regularly supplying steel mills with dead burned magnesite."

The use of magnesite for refractory products constitutes its most important application in the industries. Made into refractory bricks, it is used as linings for basic steel furnaces. In "dead burnt" calcined form as originally burned, or as brick, the magnesia is used as a refractory lining for open-hearth furnaces and converters in the steel industry, for copper converter linings, for rotary kiln linings in Portland cement manufacture, for furnace hearths, crucibles, cupels, etc. In spite of a prejudice against the presence of lime, silica, oxide of iron, and alumina, analyses of magnesite imported for use in the metallurgical industry in the United States generally show 3 to 4 per cent of silica, 6 to 8 per cent of iron, and 4 per cent of lime. Magnesite also finds extensive use for the manufacture of magnesium, bisulphate, used in the pulp and paper industry. To a lesser extent it is used in the manufacture of carbon dioxide gas, as an ingredient of oxychloride, or Sorel cement, which is used for composition flooring and interior finishings, as a heat insulating pipe covering, as an adulterant in paint, as a binder for briquetting coal, as a fireproof or fire retarding paint, and in the form of refined magnesia salts for medicinal and toilet purposes.

The greater part of the world's supply of magnesite has come from Hungary and Greece. The supply from Hungary was of course cut off from most consumers by the outbreak of the European war, with the result that in Canada, as elsewhere, there have been numerous inquiries concerning the possibility of getting requirements filled from local sources. The shortage in the supply has already caused several parties to make efforts to enter the field as producers among whom may be noted, The Grenville Lumber Company, with head office in Montreal, and a syndicate represented by Newton W. Emmons, Rogers Building, Vancouver, B.C.

Imports of magnesite, and of magnesian fire brick are not shown separately under the classification of the Department of Customs but very considerable quantities have been imported yearly for refractory linings, for kilns, furnaces, and converters.

Statistics of sales of magnesite and of imports of magnesia follow:—

Calendar Year.	Sales of Magnesite.		Imports of Magnesia.	
	Tons.	Value.	Tons.	Value.
		$		$
1908	120	840	.....	.....
1909	330	2,508	.....	.....
1910	323	2,160	233	10,847
1911	991	5,531	253	11,012
1912	1,714	9,645	379	29,641
1913	515	3,335	145	12,226
1914	358	2,240	127	16,429

MANGANESE.

The mining of manganese ores in Canada reached considerable proportions between 1880 and 1890 when the annual production ranged from 1,200 to 1,800 tons valued at from $30,000 to $50,000. In 1891 the production fell away, and only once since (in 1899) did it exceed 500 tons. In 1907, 1908, 1909, and 1910 there was no production. In 1910 the Nova Scotia Manganese Company started operations on a property at New Ross, Lunenburg county, N.S., and since then they have made small shipments in 1911, 1912, and 1914.

In 1914 production of manganese ore is reported as 28 tons valued at $1,120, the 1913 production was nil, and the 1912 production was 75 tons valued at $1,875. The 1914 exports are reported by the Department of Customs as 30 tons valued at $750, as compared with 8 tons in 1913 valued at $303 and 10 tons in 1912 valued at $300. Statistics of annual production and of exports of manganese ore follow:—

Annual Production of Manganese Ore.

Calendar Year.	Tons.	Value.	Value per ton.	Calendar Year.	Tons.	Value.	Value per ton.
		$	$ cts.			$	$ cts.
1886	1,789	41,499	23 20	1900	30	1,800	60 00
1887	1,245	43,658	35 07	1901*	440	4,820	10 95
1888	1,801	47,944	26 62	1902*	172	4,062	23 62
1889	1,455	32,737	22 50	1903	91	2,775	30 49
1890	1,328	32,550	24 51	1904	66	2,740	41 51
1891	255	6,694	26 25	1905*	22	1,720	78 18
1892	115	10,250	89 13	1906*	93	925	9 95
1893	213	14,578	68 44	1907*	1	22	22 00
1894	74	4,180	56 49	1908	Nil.	.....	.....
1895	125	8,464	67 71	1909	Nil.	.....	.....
1896*	123½	3,975	32 19	1910	Nil.	.....	.....
1897*	15¼	1,166	76 46	1911	5½	300	54 55
1898	50	1,600	32 00	1912	75	1,875	25 00
1899	1,581	20,004	12 65	1913	Nil.	Nil.	.....
				1914	28	1,120	40 00

*Exports.

Exports of Manganese Ore.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1873	1,031	20,192	1894	56	3,120
1874	782	16,973	1895	108·3	6,351
1875	203	5,514	1896	123·5	3,975
1876	412	8,039	1897	15·3	1,166
1877	891	15,909	1898	11	325
1878	626	10,860	1899	70	2,410
1879	1,886	27,436	1900	34	1,720
1880	2,179	34,797	1901	440	4,820
1881	1,704	40,554	1902	172	4,062
1882	894	25,747	1903	135	1,889
1883	1,326	25,343	1904	123	2,706
1884	603	20,089	1905	22	1,720
1885	1,684	34,649	1906	93	925
1886	(a) 1,818	58,338	1907	1	22
1887	1,415	34,802	1908	.....	.....
1888	1,181	21,832	1909	3	434
1889	1,436	29,350	1910	4	160
1890	1,906	36,831	1911	4	225
1891	255	6,694	1912	10	300
1892	143	8,205	1913	8	303
1893	133	12,521	1914	30	750

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

The manganese ores which have been mined in Canada are pyrolusite, manganite, psilomelane, and bog manganese. These were mostly ores with a high manganese content, and fairly free from deleterious constituents. The largest part of the production was consequently put to those uses where a high grade raw material is desired, e.g., as an oxidizing agent in the manufacture of chlorine, bromine, manganates, and permanganates, as a decolorizer of glass, porcelain, and enamels, as a colouring material in dyeing and pottery and paint manufacture, as a drier in paints and varnishes, in the manufacture of dry and Leclanche cells, etc.

By far the greater part of the world's production of manganese, though, enters the market as spiegeleisen, and ferro-manganese. These are used principally in the steel industry where they are added to both Bessemer and open-hearth steels, the manganese acting as a deoxidizer, recarbonizer, and neutralizer of sulphur.

Over 50 per cent of the world's annual production of manganese ore has been coming from Russian territory in the vicinity of the Black sea, and a large share from British India. Because of the supply coming from the sources mentioned and because during the early days of the European war, the exportation of manganese from British ports to destinations other than those within the British Empire, or in France or Russia, was prohibited, the ferro-manganese market during the closing months of 1914 was in a most disturbed condition. In this country the difficulty experienced by manufacturers of steel products in securing their requirements has led to considerable inquiry as to the possibility of securing manganese from Canadian sources.

The yearly consumption of pyrolusite in Canada has been stated in a recent publication of the Mines Branch[1] to be upwards of 1,363 tons, of which less than 2 per cent is of domestic origin. No separate record of imports of manganese ores is kept in the classification of the Customs Department, but statistics for imports of "oxide of manganese" are listed. In 1914 these imports were 1,702 tons valued at $42,287 or an average of $24.85 per ton, as compared with 2,588 tons in 1913 valued at $46,990, or an average value of $18.16 per ton. In 1912 the average value per ton was $22.05, in 1911 it was $23.50, and in 1910 it was $26.40. Imports of ferro-silicon, spiegeleisen, and ferro-manganese for 1914 were 22,147 tons valued at $549,485, as compared with 30,355 tons in 1913 valued at $940,443.

Statistics of imports of oxide of manganese follow:—

Imports of Oxide of Manganese.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1884	3,989	258	1900	126,725	4,155
1885	36,778	1,794	1901	272,134	8,176
1886	44,967	1,753	1902	476,331	5,360
1887	59,655	2,933	1903	279,611	8,051
1888	65,014	3,022	1904	275,696	7,051
1889	52,241	2,182	1905	235,289	6,832
1890	67,452	3,192	1906	244,620	5,508
1891	92,087	3,743	1907 (9 mos.)	386,404	11,087
1892	76,097	3,530	1908	732,242	17,863
1893	94,116	3,696	1909	382,137	6,561
1894	101,863	4,522	Calendar Year.		
1895	64,151	2,781	1910	1,297,020	17,133
1896	108,590	4,075	1911	1,924,520	22,612
1897	70,663	2,741	1912	2,512,610	27,707
1898	130,456	5,047	1913	5,175,195	46,990
1899	141,356	5,539	1914	3,404,863	42,287

A recent publication[2] of the Geological Survey Branch of the Department of Mines enumerates the following localities in which occurrences of manganese ores are known:—

Province of Nova Scotia.

Antigonish	county.	Pomquet river, Afton.
Colchester	"	Wasson Bluff, Salmon River, Onslow, Londonderry.
Cumberland	"	Salem, Parrsboro, River Hebert (near Westchester.)
Cape Breton	"	South side of Grand Mira.
Halifax	"	Musquodoboit, Watt Section of Sheet Harbour.
Hants	"	Cheverie, Kennetcook Corners, Minasville, Tennycape, Walton, Douglas.
Kings	"	Horton Mt., Morristown, North Alton River (near Kentville), Prospect, South Mountain.
Lunenburg	"	Wallaback Lake (near New Ross).
Pictou	"	Bridgeville, Springville, Piedmont.

[1] "Non-Metallic Minerals: In Canadian Manufacturing," Fréchette. Mines Branch, Dept. of Mines, Ottawa, Canada, 1915, No. 305.

[2] A List of Canadian Mineral Occurrences, R.A.A. Johnston, Geol. Survey Branch, Dept. of Mines, Ottawa, Memoir No. 74.

Province of New Brunswick.

Albert county.	Shepody Mt., Gowland Mt., Elgin, Dawson Settlement, Meldona Creek, Sawmill Creek.
Carleton "	Woodstock.
Charlotte "	Lyndfield, Moore Mills.
Gloucester "	Tetagouche Falls.
Kent "	Richibucto.
Kings "	Bull Moose Hills, Jordan Mt., Markhamville.
St. John's "	Quaco.
York "	Queensbury.

Province of Quebec.

All believed to be of limited extent.

Beauce county.	Aubert-Gallion, Tring and Ste. Marie.
Brome "	Bolton XII 20.
Magdalen Islands.	Amherst Island.
Quebec county.	On St. Louis Road near Quebec city.
Richmond "	Cleveland XIII 16.
Stanstead "	Stanstead X 9.
Temiscouata "	Cacouna.

MICA.

Most of the various minerals of the mica group have been found in Canada. Lepidolite occurrences have been noted in British Columbia, Nova Scotia, and Quebec; biotite occurrences in Ontario and Quebec; muscovite occurrences in British Columbia, Manitoba, Nova Scotia, Ontario, and Quebec; and phlogopite occurrences in Baffinland, Ontario, and Quebec. Only the phlogopite (or amber mica) occurrences of Ontario and Quebec have been proven to be of economic interest. These have been the subject of special investigation by the Mines Branch, Ottawa.[1] The muscovite occurrences at Tete Jaune Cache, and Big Bend in British Columbia have also been specially investigated by the Mines Branch[2] but as yet they have made no production.

Canada's production of mica has come exclusively from two fields: one, in the Province of Quebec, a short distance to the north of the city of Ottawa, and the other embracing parts of the counties of Lanark, Leeds, and Frontenac, in the Province of Ontario. The city of Ottawa (and the adjacent city of Hull) lying between these two fields is the centre to which almost all the production of the various mines and numerous small prospects is shipped for trimming, grading, and marketing. In preparation for the market a considerable proportion of the tonnage received is cobbed out, with the result that the exports, though of smaller tonnage than the shipments from the mines, usually exceed them in total value because of being of much higher grade.

The statistics as to value of production should be considered with discretion and with due regard to the conditions under which the industry is conducted. The condition in which mica is shipped from the mines varies greatly: one operator ships his output cleaned and trimmed, while the output of another is in a rough cobbed state, with consequent noteworthy differences in prices realized. And further, companies operating trimming shops as well as mines may place only a nominal value on shipments from mines to trimming shops.

Shipments of mica from mines in Canada in 1914 showed a 46 per cent decrease from 1913 shipments, but were about equal in quantity to the 1911 and 1912 shipments. The value of the shipments was the smallest since 1897.

The decrease in production in recent years is no doubt due partly to general decreased industrial activity, but, as pointed out by Mr. de Schmid[3] it may also be largely due to lack of uniformity in grading of mica for export. This lack of uniformity in grading of Canadian exports (which are exclusively amber mica, superior in many respects to muscovite and biotite) prevents

[1] "Mica: Its Occurrence, Exploitation and Uses." H. S. deSchmid, Mines Branch, Dept. of Mines, Ottawa, No. 118.
[2] Mines Branch, Dept. of Mines, Ottawa, Summary Report, 1913, p. 42.
[3] "Mica: Its Occurrence, Exploitation and Uses," H. S. deSchmid, Mines Branch, Dept. of Mines, Ottawa, No. 118. pp. 24 and 55-58.

the Canadian article successfully competing in foreign markets with the carefully graded output of India, the world's greatest producer of mica. An increasing production of phlogopite from Ceylon, South Africa, and South America, is probably another factor preventing Canadian exports finding a wider market.

The shipments from mines in 1914 according to returns received from producers were 595 tons valued at $109,061 or an average of $183.30 per ton, as compared with shipments in 1913 of 1,104 tons valued at $194,304, and in 1912 of 580 tons valued at $143,976. The contributions to the year's production by provinces were as follows: Quebec, 246 tons valued at $62,794, or an average of $255.26 per ton, and Ontario, 349 tons valued at $46,267, or an average of $132.57 per ton.

Tables showing the annual production by provinces during recent years, and the total value of the annual production from 1886 to 1908 follow:—

Annual Production of Mica by Provinces.

Calendar Year.	Quebec.			Ontario.			Total.		
	Tons.	Value.	Average.	Tons.	Value.	Average.	Tons.	Value.	Average.
		$	$ cts.		$	$ cts.		$	$ cts.
1909...	128	93,298	728 89	241	54,484	226 07	369	147,782	400 49
1910...	316	87,295	276 25	442	103,090	233 24	758	190,385	251 17
1911...	217	69,465	320 12	373	59,212	158 75	590	128,677	218 10
1912...	196	81,044	413 48	384	62,932	163 89	580	143,976	248 23
1913...	626	125,488	200 46	478	68,816	143 97	1,104	194,304	176 00
1914...	246	62,794	255 26	349	46,267	132 57	595	109,061	183 30

Annual Production of Mica, 1886-1908.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1886.....	29,008	1894.....	45,581	1902.....	135,904
1887.....	29,816	1895.....	65,000	1903.....	177,857
1888.....	30,207	1896.....	60,000	1904.....	160,777
1889.....	28,718	1897.....	76,000	1905.....	178,235
1890.....	68,074	1898.....	118,375	1906.....	303,913
1891.....	71,510	1899.....	163,000	1907.....	312,599
1892.....	104,745	1900.....	166,000	1908.....	139,871
1893.....	75,719	1901.....	160,000		

During the past six years the total quantity of mica exported is equivalent to about 60 per cent of the shipments from the mines during the same period. The average value of the exports per ton for the period 1909-1914 inclusive is $669.22, while the average value per ton of mica shipped from mines for the same period was only $228.77. As usual, by far the larger proportion of the exports went to United States consumers.

Tables showing the annual exports and the distribution of the exports by countries during recent years follow:—

Annual Exports of Mica.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Tons.	Value.
	$		$			$
1887	3,480	1896	47,756	1905		179,049
1888	23,563	1897	69,101	1906	912	581,919
1889	30,597	1898	110,507	1907	558	422,172
1890	22,468	1899	158,002	1908	290	198,839
1891	37,590	1900	146,750	1909	359	256,834
1892	86,562	1901	152,553	1910	469	330,903
1893	70,081	1902	391,812	1911	347	242,548
1894	38,971	1903	196,020	1912	448	334,054
1895	48,525	1904	198,482	1913	409	240,775
				1914	335	178,940

Exports of Mica by Countries, 1912, 1913, and 1914.

	1912.		1913.		1914.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
To Great Britain	68	35,959	71	33,273	70	37,969
To United States	379	297,345	333	202,155	242	126,220
To other countries	1	750	5	5,347	23	14,751
Total	448	334,054	409	240,775	335	178,940

As shown in the last table almost the entire quantity of mica exported finds a market in the United States and Great Britain. Imports into the United States from Canada in 1914 were about the same as in 1911 and 1912, being 340 tons (or 42·2 per cent of the total United States imports) with an average value of $367.01 per ton. Imports from other countries had an average value of $857.66 per ton.

Statistics of the imports of mica into the United States, and Great Britain, showing the relative importance of Canada as a source of supply for each are given in the following tables:—

Imports of Mica into the United States.[1]

Year ending June 30.	Imports from Canada.		Total imports from all countries.	
	Short tons.	Value.	Short tons.	Value.
		$		$
1895	273	30,637	410	127,515
1896	310	57,908	632	214,997
1897	208	54,630	441	187,845
1898	233	53,854	313	94,294
1899	512	131,310	808	259,228
1900	549	136,981	1,019	314,882
1901	484	161,741	1,011	369,644
1902	427	184,287	903	384,818
1903	417	196,470	973	414,953
1904	287	137,191	693	306,937
1905	253	121,560	594	296,362
1906	539	328,991	1,206	731,484
1907	767	596,321	1,724	1,295,606
1908	172	140,166	655	567,550
1909	167	132,941	403	313,525
1910	434	333,196	1,008	682,539
1911	316	239,964	872	612,936
1912	362	213,750	742	513,792
1913	639	218,365	1,634	1,003,158
1914	340	124,785	466	399,669

[1]The Foreign Commerce and Navigation of the United States.

Imports of Mica into Great Britain.*

	1912.		1913.		1914.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
		$		$		$
Germany	100,800	18,946	109,312	16,751	69,552	14,220
United States	113,680	6,035	99,568	4,983	206,640	12,395
Brazil	3,584	788	.....	.....	.....	.....
Other foreign countries	149,520	27,263	144,032	14,240	54,768	30,947
British India	3,995,264	653,876	4,499,936	700,123	2,745,008	460,392
Canada	120,736	42,797	154,896	43,591	137,200	37,040
Other British possessions	59,696	14,123	35,392	9,607	38,080	5,787
Total	4,543,280	763,828	5,043,136	789,295	3,251,248	560,781

*British Trade Report.

The following is a list of the operators of mica mines who have sent in returns to the Statistical Division of the Mines Branch in 1913 and 1914.

Operator and Address.	Location of Mine.	
	County.	Township and Lot.
Ontario.		
John H. Adams & Co., Brockville, Ont.	Lanark	N. Burgess, Tully lots.
Dom. Improvement & Development Co., P.O. Box 26, Perth, Ont.	"	" V, 3, 9, 15.
Smith & Sewell, Stanleyville, Ont., R.R. No. 3.	"	" VII, 9.
W. L. McLaren, Nevis Cottage, Perth, Ont.	"	" VI, E½ 13.
Kent Bros., Kingston, Ont.	"	" IX, 4.
	"	" VIII, W½ 2, E½ 3.
Jas. Richardson & Sons, Kingston, Ont.	"	" V, W½ 13.
	Frontenac	Loughborough X, W½ 1.
Loughboro Mining Company, Schenectady, N.Y.	"	" VII, W½ 11
Frontenac Mica Company, Sydenham, Ont.	"	" VIII, N½ 10.
The Birch Lake Mining Company, 115 York, Ottawa, Ont.	"	" IX, 6, X, S½ 6
J. W. Trousdale, Sydenham, Ont.	"	" X, 8.
S. H. Orser, Perth Road, Ont.	"	" VIII, 12, 13.
J. P. Tett & Bro., Bedford Mills, Ont.	"	Bedford VIII, 4.
Kent Bros. & J. Stoness, Kingston, Ont.	"	" IV, 12, VI, 30.
Anglin Mica Company, Ltd., Kingston, Ont.	"	" Devils Lake.
G. M. Macdonnell, Kingston, Ont.	"	Storrington XIV, N½ 8.
Quebec.		
William Argall, Laurel, Que.	Argenteuil	Harrington, IV, 9. Wentworth, X, 19a, 19b.
E. Rodier, Montreal, Que., Box 2415	"	Wentworth, X, E½ 21.
Adelard Morin, Val de Bois, Que.	Labelle	Bowman, III, 17.
J. B. Gorman, Buckingham, Que.	"	Lochaber XIII, 19. Buckingham, IV, 21.
J. B. Gauthier, Buckingham, Que.	"	Villeneuve, II, W½ 2.
H. T. Flynn, Hull, Que., 108 Montcalm.	"	Derry II, 31, etc.
W. L. Parker, Buckingham, Que.	"	" I, 5.
	Ottawa	Portland East 1a.
Richard & Company, L'Ange Gardien, Que.	Montmorency	Petit Pre (Post Office).
Wm. Cleland	Ottawa	Cameron II, 10.
Laurentide Mica Co., Ltd., Pittsburgh, Pa., Box 911.	"	Hull VII, 18, 19, XI, 16b. Templeton IX, 15a, 15b.
The Capital Mica Co., Ltd., Ottawa, Ont.	"	Wakefield II, 23a.
O'Brien & Fowler, Ottawa, Can.	"	Portland East, I, 6, 7; IX, 30, 31. Templeton IV, 1, XII, 4. Villeneuve I, 30, 31; IV, 1.
Brown Bros., Cantley, Que.	"	Hull VI, 20, XII, 11a.
Vavasour Mining Assoc., Ottawa, Can., 22 Metcalfe.	"	" XII, 10.
R. McConnell, Toronto, 32 Adelaide E.	"	" XIV, N½ 10 B.
J. A. Wilson, Cantley, Que.	"	" XVI, 13.
Kellar Bros., Cascades, Que.	"	"
Webster & Company, Ottawa, Can., 174 Stewart.	"	" XV, 25.
Jno. Burns, Buckingham, Que.	"	Portland West X, 2, 4, 5.
Progressive Mining Co., Ltd., Ottawa, Can. 124 Rideau.	"	.....
Wallingford Mica & Mining Co., Perkins, Que.	"	Templeton VIII, 15, 16, 17; XIII, 4, 5.
Wallingford Bros., Ltd., Perkins, Que.	"	Portland East, I, 1.
Watts & Noble, Toronto, Ont., 19 Chestnut Park.	"	" " IX, 4.
Blackburn Bros., Ottawa, Can., 134 Wellington.	"	" " XI, 9, 10.
Jos. Morris, Wilsons Corners, Que.	"	Wakefield, II, 17.
R. J. McGlashan, Wilsons Corners, Que.	"	" VI, 2, 6, 27.
Jos. Tomkiewiez, Poltimore, Que.	"	" VIII, 25.
Wm. Baillie, Aylmer East, Que.	Pontiac	Onslow, VII, 22.
Cross & Wilson, Cascades, Que.	"	Thorne, (P.O. Schwartz).
Geo. Nesbitt, Wakefield, Que.	"	" (P. O. Ladysmith).
Nitz and Schock, Schwartz, Que.	"	" VII, 13, 14.

MINERAL PIGMENTS.

OCHRES.

In 1914 the total production of ochres and iron oxides (used for other purposes than the recovery from them of their metallic contents), was 5,890 tons valued at $51,725, as compared with a production in 1913 of 5,987 tons valued at $41,774, and a production in 1912 of 7,654 tons valued at $32,410.

The 1914 production included 2,140 tons of ochres, valued at $44,225 or an average of $20.67 per ton, used for paint manufacture, and 3,750 tons valued at $7,500 shipped to gas works, while the 1913 production included 2,362 tons valued at $35,430 or an average of $15 per ton, used for paint manufacture, and 3,625 tons valued at $6,344 shipped to gas works.

The ochres used in paint manufacture are calcined, washed, and fine ground at the point of production, while that used for the purification of illuminating gas is shipped in crude form to gas companies.

Statistics of the production since 1886 are shown in the following table:—

Annual Production of Ochres and Iron Oxides.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	350	2,350	1900	1,966	15,398
1887	485	3,733	1901	2,233	16,735
1888	397	7,900	1902	4,955	30,495
1889	794	15,280	1903	6,266	32,760
1890	275	5,125	1904	3,925	24,995
1891	900	17,750	1905	5,105	34,675
1892	390	5,800	1906	6,758	36,125
1893	1,070	17,710	1907	5,828	35,570
1894	611	8,690	1908	4,746	30,440
1895	1,339	14,600	1909	3,940	28,093
1896	2,362	16,045	1910	4,813	33,185
1897	3,905	23,560	1911	3,622	28,333
1898	2,226	17,450	1912	7,654	32,410
1899	3,919	20,000	1913	5,987	41,774
			1914	5,890	51,725

The working of ochre deposits in Canada has been chiefly confined to those deposits found between Champlain and Three Rivers, in the Province of Quebec, a short distance from the shore of the St. Lawrence river. In 1912 there was a small production from a deposit at St. Joseph de Nicolet, Quebec, but it has not since been operated.

In Ontario there have been a few small outputs from an ochre deposit at Campbellville, Halton county, but it has not been operated since 1911.

The only active operators in the ochre industry in 1914 were the following:—

The Canada Paint Company, Limited, Montreal, Que.
The Champlain Oxide Company, Three Rivers, Que.
Thos. H. Argall, Three Rivers, Que.

In previous years production has been reported by:—

Francois Ouellette, St. Joseph de Nicolet, Que.
Ontario Mineral Paint Company, Campbellville, Ont.

The exports of iron oxide, or mineral pigments in 1914 are reported as 1,777 tons, valued at $22,311, as compared with 1,956 tons in 1913 valued at $18,931. Statistics of exports from 1897 follow:—

Exports of Mineral Pigments, Iron Oxides, etc, etc.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1897	512	7,706	1906	139	2,379
1898	283	4,227	1907	191	10,043
1899	308	5,408	1908	125	4,850
1900	651	7,154	1909	658	7,956
1901	401	8,233	1910	1,746	29,839
1902	352	6,182	1911	2,000	27,070
1903	676	12,770	1912	3,016	34,513
1904	416	7,260	1913	1,956	18,931
1905	353	7,704	1914	1,777	22,311

Imports of mineral pigments are entered under two classifications: (1) ochres and ochrey earths, and raw siennas, duty 20 per cent, and (2) oxides, dry fillers, fireproofs, umbers, and burnt siennas, n.e.s., duty 25 per cent. For 1914, imports under the first classification were 1,532 tons valued at $33,197, and under the second 4,023 tons valued at $244,867, or a total of 5,555 tons valued at $278,064. The 1913 imports under the first classification were 1,663 tons valued at $43,119, and under the second 4,387 tons valued at $240,435 or a total of 6,050 tons valued at $283,554.

Statistics of imports appear in the following tables:—

Imports of Ochres and Pigments, 1913 and 1914.

——	Duty.	1913.		1914.	
		Lbs.	$	Lbs.	$
Ochres and ochrey earths and raw siennas	20%	3,325,566	43,119	3,064,776	33,197
Oxides, dry fillers, fireproofs, umbers and burnt siennas n.e.s	25%	8,774,448	240,435	8,045,721	244,867
Total		12,100,014	283,554	11,110,497	278,064

Annual Imports of Ochres and Pigments.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	571,454	6,544	1898	2,126,592	26,307
1881	677,115	8,972	1899	2,444,698	31,092
1882	731,526	8,202	1900	2,474,537	32,017
1883	898,376	10,375	1901	2,092,067	27,267
1884	533,416	6,398	1902	2,530,743	33,909
1885	1,119,177	12,782	1903	3,216,346	42,243
1886	1,100,243	12,267	1904	2,767,580	36,636
1887	1,460,128	17,067	1905	3,122,690	35,887
1888	1,725,460	17,664	1906	4,321,530	57,397
1889	1,342,783	12,994	1907 (9 mos.)	2,926,528	39,675
1890	1,394,811	14,066	1908	3,749,132	39,923
1891	1,528,696	20,550	1909	2,122,781	27,540
1892	1,708,645	22,908	Calendar Year.		
1893	1,968,645	23,134	1910	4,227,660	55,393
1894	1,358,326	18,951	1911	4,397,514	53,092
1895	793,258	12,048	1912	4,998,089	69,621
1896	1,159,494	16,954	1913	12,100,014	283,554
1897	1,504,044	18,504	1914	11,110,497	278,064

MINERAL WATER.

The statistics of production given herewith represent, as usual, as closely as can be secured, the value of mineral water shipped from mineral springs in bottles, barrels, or other containers, and do not include any estimate of the value of mineral water used at springs for drinking or bathing purposes; nor are the natural pure spring waters included, of which a considerable quantity is sold in bottled form.

The value of the production in 1914 was $134,111 as compared with $173,677 in 1913, and $172,465 in 1912.

The imports of mineral and aerated waters during the calendar year 1914 were valued at $199,327, during 1913 at $257,153, and during 1912 at $273,698.

The exports of mineral water during 1914 were valued at $2,367 as compared with exports in 1913 valued at $1,496.

Statistics of production, imports and exports, are given in the following tables:—

Annual Production of Mineral Water.

Calendar Year.	Gals.	Value.	Calendar Year.	Gals.	Value.	Calendar Year.	Gals.	Value.
		$			$			$
1888	124,850	11,456	1897	749,691	141,477	1906	.....	100,000
1889	424,600	37,360	1898	555,000	100,000	1907	.....	136,020
1890	561,165	66,031	1899	.....	100,000	1908	.....	151,953
1891	427,485	54,268	1900	.....	75,000	1909	.....	175,173
1892	640,380	75,348	1901	.....	100,000	1910	.....	199,563
1893	725,096	108,347	1902	.....	100,000	1911	.....	223,758
1894	767,460	110,040	1903	.....	100,000	1912	.....	172,465
1895	739,382	126,048	1904	.....	100,000	1913	.....	173,677
1896	706,372	111,736	1905	.....	100,000	1914	.....	134,111

Annual Imports of Mineral Water.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	41,797	1892	17,913	1904	137,304
1881	55,763	1893	27,909	1905	161,790
1882	57,953	1894	28,130	1906	178,639
1883	49,546	1895	27,879	1907 (9 months)	143,416
1884	48,613	1896	32,674	1908	153,831
1885	55,864	1897	22,142	1909	159,221
1886	47,006	1898	33,314	Calendar Year.	
1887	52,989	1899	38,046	1910	202,306
1888	54,891	1900	30,343	1911	229,367
1889	66,331	1901	40,802	1912	273,698
1890	71,521	1902	91,871	1913	257,153
1891	15,721	1903	108,130	1914	199,327

Annual Exports of Mineral Water.

Calendar Year.	Gallons.	Value.	In bottles. Value.	Total.
		$	$	$
1910	16,136	7,169	.....	7,169
1911	26,495	12,952	.....	12,952
1912	9,690	4,710	.....	4,710
1913	3,640	526	970	1,496
1914	2,287	599	1,768	2,367

The following is a list of the principal producers of mineral water:—

Operator.	Address.	Location of Spring.		Brand of Water.
		County.	P.O.	
Havelock Mineral Springs Company, Ltd.	Moncton, N.B.	Kings, N.B.	Havelock	
Radnor Water Company, Ltd.	Montreal, 500 McGill Bldg.	Champlain, Que.	Radnor Forges	Radnor.
Cypress Roy	St. Germain, Que.	Kamouraska, Que.		St. Germain.
Viauville Mineral Springs	Montreal, Viauville, 1 First Ave.	Laval, Que.		
St. Leon Waters, Limited	Toronto, 1 Toronto St.	Maskinonge, Que.	St. Leon	Mirach.
Bedard, Dion et Cie	Quebec, 22 Bigouette	"	Nancy	St. Leon.
Chas. Gurd & Co., Ltd	Montreal, 76 Bleury	Vercheres, Que.	Varennes	Varennes.
The Abenakis Springs Co., Ltd.	Abenakis Springs, Que.	Yamaska, Que.	Abenakis Springs.	Abenakis.
M. Timmons & Sons	Quebec, Que.			
Saugeen Mineral Water Company.	Southampton, Ont.	Bruce, Ont.	Southampton.	Saugeen.
Thos. L. Boyd	Carlsbad Springs, Ont.	Carleton, Ont.		Carlsbad.
Goderich Mineral Water Co.	Goderich, Ont.	Huron, Ont.		Minisitung.
Dom. Springs Mineral Water.	Pakenham, Ont. R.R. No. 4.	Lanark, Ont.	Pakenham,	Dominion.
Sanitaris Limited	Arnprior, Ont.	"		Sanitaris.
Arthur Belanger	Papineauville, Que.	Prescott, Ont.	N. Plantaganet Tp.	St. George.
Allan's Limited	Montreal, 86 Dorchester W.	"	Caledonia	Caledonia.
Chas. Gurd & Co., Ltd	Montreal, 76 Bleury	"	"	Gurd's Caledonia.
Lyall, Trenholme & Macdonnell	Montreal West	"	"	Beaver.
A. Sabourin	Hawkesbury	"	"	Maple Leaf.
Red Arrow Caledonia Water Co., Ltd.	Montreal, 591 St. Catherine W.	"	Cal. Springs	Magi.
F. Deneault	Bourget, Que.	Russell, Ont.	Bourget	Adanac.
The Can. Mineral Waters, Ltd.	Toronto, 65 Bellwood Ave.	"	"	Brook.
		"	"	Russell. Lithia.
Stanley Mineral Springs Co., Ltd.	Winnipeg, 410 Builders Ex.	Thunder Bay Dist., Ont.	Stanley	Stanley.
St. Davids Mt. Spring Water Co., Ltd.	St. Davids, Ont.	Welland, Ont.	St. Davids	
Halcyon Bottling Co	Halcyon, B.C.	W. Kootenay Dist.	Halcyon	Halcyon Lithia.
M. Grady	St. Leon Hot Springs, B.C.	" "	St. Leon. Hot Springs.	St. Leon.
F. F. Siemens	Rosthern, Sask.	" "	Renata, B.C.	

NATURAL GAS.

The total value of the production of natural gas in 1914 reached the highest figure yet recorded, being slightly in excess of that of the 1913 production.

The 1914 production is reported as about 21,692,504 M cu. ft. valued at $3, 484,727 as compared with 20,477,838 M cu. ft. in 1913, and 15,286,803 M cu. ft. in 1912. Ontario in 1914 produced 14,094,521 M cu. ft., valued at $2,215,808, Alberta 7,172,157 M cu. ft., valued at $1,214,670, and New Brunswick 425,826 M cu. ft., valued at $54,249. The production by provinces in 1913 was as follows: Ontario 12,474,745 M cu. ft., Alberta 7,174,490 M cu. ft., and New Brunswick 828,603 M cu. ft.

The value of the gas, as reported by the producers, varies from 5 cents to 30 cents per thousand feet, but these prices do not represent what the consumer has to pay. In some cases the producer also owns the distribution pipe line and receives the full price paid by the consumer. In other cases the producer may sell to a pipe line company who either sells directly to consumers, or may in turn re-sell to other pipe line companies for retail distribution; in such cases as these the producer receives only a fraction of the amount paid by the consumer, but he is saved the expense of distribution. The statistics given herewith represent, as far as possible, the value received by the producer, or owner, of the gas wells, whether such producer be the owner of the distribution line or not.

The petroleum and natural gas resources of Canada have been the subject of special investigation by the Mines Branch, Ottawa, and the first one of two volumes comprising the results of this investigation has recently been issued.[1]

Statistics of the production of natural gas in 1913 and 1914, and of the value of the annual production since 1892 follow:—

Natural Gas Production, 1914.

Province.	No. men.	Wages.	No. Wells, 1914.				Production.		
			(a)	(b)	(c)	(d)	M cub. ft.	Value.	Average.
								$	cts.
Quebec	.....	.....	2	1	0	0	.....	.....	.....
New Brunswick	5	5,825	23	2	3	0	425,826	54,249	13
Ontario	392	224,492	1,665	120	28	2	14,094,521	2,215,808	15½
Saskatchewan	.....	.....	0	1	1	3	.....	.....	.....
Alberta	164	243,976	64	10	1	4	7,172,157	1,214,670	17
British Columbia	.....	.....	0	0	0	1	.....	.....	.....
Total	561	474,293	1,754	134	33	10	21,692,504	3,484,727	16

(a) Total number of producing wells at end of year.
(b) Number of producing wells drilled during the year.
(c) Number of non-producing wells drilled during the year.
(d) Number of incomplete wells at end of the year.

[1] "Petroleum and Natural Gas Resources of Canada," F. G. Clapp, Mines Branch, Department of Mines, Can., No. 291, Vol. I.

Natural Gas Production, 1913.

Province.	No. men.	Wages.	No. Wells, 1913.				Production.		
			(a)	(b)	(c)	(d)	M cub. ft.	Value.	Average.
								$	cts.
New Brunswick	35	35,000	31	6	6	3	828,603	†174,147	21
Ontario	336	237,600	*1,605	211	49	14	12,474,745	2,055,768	16½
Saskatchewan	.....	.....	1	.....	.....	2	.....	.....	.....
Alberta	176	341,825	49	20	3	3	7,174,490	1,079,466	15
British Columbia	.....	.....	0	0	0	2	.....	.....	.....
Total	547	614,425	*1,686	237	58	24	20,477,838	3,309,381	16

(a) Total number of producing wells at end of year.
(b) Number of producing wells drilled during the year.
(c) Number of non-producing wells drilled during the year.
(d) Number of incomplete wells at the end of the year.
* Includes 40 "shut in."
† This figure subsequently changed from $174,147 to $67,197.

Annual Production of Natural Gas.

Calendar Year.	Value.	Calendar Year.	Value.
	$		$
1892	150,000	1903	202,210
1893	376,233	1904	328,376
1894	313,754	1905	379,561
1895	423,032	1906	583,523
1896	276,301	1907	815,032
1897	325,873	1908	1,012,660
1898	322,123	1909	1,207,029
1899	387,271	1910	1,346,471
1900	417,094	1911	1,907,678
1901	339,476	1912	2,362,700
1902	195,992	1913	3,309,381
		1914	3,484,727

The number of producing wells in Canada at the end of the year was reported as 1,754 of which 134 were completed during the year. Non-producing wells to the number of 33 were drilled during the year, and 10 more under way were not finished on December 31st.

The Maritime Oil Fields, Limited, operating in Albert county, New Brunswick, had 23 wells producing at the end of the year, as contrasted with 31 on December 31, 1913. A number of the wells reported as producers in previous years were being drilled deeper in the hope of securing a larger flow of gas. The Company disposes of all its output to the Moncton Tramways Electricity and Gas Company for distribution in Moncton and Hillsborough.

In Ontario the number of producing wells at the close of the year was 1,665 as contrasted with 1,605 at the end of the previous year. The number of producing wells drilled during the year was 120; the number of non-producing ones was 28, and 2 were unfinished on December 31st.

As in other years almost the whole production of natural gas came from the Welland, the Haldimand-Norfolk, and the Essex-Kent fields. In Lambton county deep drilling for oil resulted in the discovery of gas at about 1,900 feet in depth, some of the wells producing record flows of gas for short intervals. Generally speaking the results of the gas flow from these wells were disappointing. The Fairbanks Estate and the Oil Springs Oil and Gas Company were the principal operators in this field. More detailed information about the drilling operations in Lambton may be found in a report of the Ontario Bureau of Mines[1]. A well with a moderate flow of gas was reported from Delaware, Middlesex county.[2]

During 1913 the Southern Ontario Gas Company was organized with the object of distributing gas from the Kent field to the cities and towns dependent on the Haldimand-Norfolk field, the output of which field has not met the increased demands made upon it. A pipe line 153 miles long was constructed and gas from the Kent county field was distributed as far east as Hamilton in 1914.

To conserve the supply of Ontario natural gas the Ontario Legislature in 1907 passed an Act whereby the exportation of gas is prohibited, except under special license issued by the Lieutenant-Governor-in-Council. This Act was followed in 1908 by further legislation with the same object in view, viz: An "Act to prevent the wasting of natural gas, and to provide for the plugging of all abandoned wells," by which power was conferred on Inspectors appointed under the Act to enforce the stoppage of waste. Even more effective were the provisions of the Supplementary Revenue Act, 1907, by which a tax of 2 cents per thousand cu. ft. is leviable on all natural gas produced in the Province, 90 per cent of which tax is rebated on all gas used within the Province.

Natural gas production in Alberta in 1914 made no advance over 1913, probably because of the general lack of industrial activity. The production was 7,172,157 M cu. ft., valued at $1,214,670 as compared with 7,174,490 M cu. ft. in 1913, valued at $1,079,466. All the production comes from two fields, the Medicine Hat field, a producer since 1891, and the Bow Island field, the production of which was first commercially utilized in 1912. The latter field, by a pipe line 170 miles or more long, supplies Calgary, Lethbridge, McLeod, Granum, Claresholm, Nanton, High River, Okotoks, and other villages and towns in southern Alberta. In the drilling for oil near Calgary, and at other points in the Province, several wells have produced considerable flows of gas.[3] In the Province there were on December 31st, sixty-four producing wells, of which ten had been drilled during the year; four others were not yet completed.

In Saskatchewan a small amount of drilling for gas was done, but with negative results.

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[1] Ontario Bureau of Mines, Toronto, Can., Ann. Report, Vol. XXIII, Part 1, pp. 35, 237.
[2] Mine, Quarry and Derrick, March 31, 1915.
[3] Geol. Survey, Can., Summary Report 1914, p. 51.

On Graham Island, B.C., the British Columbia Oilfields, Ltd., in drilling for oil struck a little gas.

Natural gas rights in Manitoba, Saskatchewan, Alberta, the Northwest Territories, and the Yukon, are the property of the Crown and their disposal is now subject to the regulations approved by Order-in-Council dated the 19th day of January, 1914.

These regulations provide for a rental of 25 cents an acre for the first year, and 50 cents an acre each subsequent year, lease to be for 21 years, renewable on conditions, and no applicant to be allowed to lease the gas rights under an area of more than 1,920 acres.

The full text of the regulations may be secured by applying to the Department of the Interior at Ottawa.

PEAT.

Only one peat bog was operated in 1914, viz: that of the Canadian Peat Company, (Head Office, Kent Bldg., Toronto) at Alfred, Prescott county, Ontario.

The shipments of peat during the year were 685 tons valued at $2,470, as compared with a total of 2,600 tons valued at $10,100 in 1913.

Statistics of the annual production of peat since 1900 are given in the following table:—

Annual Production of Peat.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1900	400	1,200	1907	50	200
1901	220	600	1908	60	180
1902	475	1,663	1909	60	240
1903	1,100	3,300	1910	841	2,604
1904	800	2,400	1911	1,463	3,817
1905	80	260	1912	700	2,900
1906	474	1,422	1913	2,600	10,100
			1914	685	2,470

A number of publications on peat issued by the Mines Branch, Ottawa, are out of print, but copies of the following may be secured on application:—

Report No. 30. Investigation of the Peat Bogs and Peat Fuel Industry of Canada, 1908. Bulletin No. 1, by Erik Nystrom and A. Anrep.

Report No. 90. Reprint of Presidential Address delivered before the American Peat Society at Ottawa, July 25, 1910, by Eugene Haanel, Ph.D.

Report No. 151. Investigation of the Peat Bogs and the Peat Industry of Canada, 1910–1911. Bulletin No. 8, by A. Anrep.

Report No. 154. The Utilization of Peat Fuel for the Production of Power, being a record of experiments conducted at the Fuel Testing Station, Ottawa, 1910–1911. Report on—by B. F. Haanel, B.Sc.

Report No. 266. Investigation of the Peat Bogs and the Peat Industry, 1911–1912. Bulletin No. 9, by A. Anrep, Peat Expert.

Report No. 299. Peat, Lignite and Coal. Their value as Fuels for the Production of Gas and Power in the By-Product Recovery Producer. Report by B. F. Haanel, B.Sc.

PETROLEUM.

During recent years the production of crude petroleum has been regularly showing a decrease, and 1914 proved no exception, since the production was 5·8 per cent less than in 1913. The 1914 production was equivalent to only 27·2 per cent of the production of the banner year in the history of the industry, 1907, when the output was 788,872 barrels.

The 1914 production was 214,805 barrels (of 35 Imperial gallons) valued at $343,124, as compared with a production in 1913 of 228,080 barrels, valued at $406,439; in 1912, of 243,336 barrels, valued at $345,050, and in 1911 of 291,092 barrels, valued at $357,073. The average price per barrel realized in recent years has been as follows: $1·597 in 1914, $1·782 in 1913, $1·418 in 1912, and $1·225 in 1911.

The production of crude petroleum has come almost solely from Ontario, New Brunswick being the only other contributor prior to 1914, when a small production stated as 387 barrels was reported from one of the prospect wells in Alberta. The New Brunswick production has been as follows: 95 barrels in 1909, 1,485 barrels in 1910, 2,461 barrels in 1911, 2,679 barrels in 1912, 2,111 barrels in 1913, and 1,725 barrels in 1914. The 1914 production in Ontario was 212,693 barrels, valued at $338,182. The New Brunswick production was valued at $2,742, and that of Alberta at $2,200.

In Ontario the production of crude oil is steadily but surely declining in spite of attempts being made by drilling to enlarge the areas of producing fields, or to find new ones. In the newer producing fields, as Dutton, Onondaga, and Tilbury, the decline is relatively rapid; in the older fields of Lambton and Bothwell, it is relatively slow.

New Brunswick petroleum production has been confined to Albert county where at present The Maritime Oil-Fields, Limited, are the only operators. The properties of this Company having developed a very considerable flow of gas the operators have recently been concentrating their energies on gas development. The oil production, never large, was smaller in 1914 than any year since 1910. New Brunswick possesses large deposits of bituminous shales richer in oil than the Scottish shales which have been exploited for many years at a profit.

Drilling near Calgary, Alberta, for oil continued briskly during the year, but the Calgary Petroleum Products Company was the only one of the explorers for oil which secured any quantity for sale. Drilling operations in this field were closely watched by the Geological Survey Branch, of the Department of Mines. Mr. Slipper, who had supervision of this work, reports, in part, as follows:—[1]

[1] Geol. Sur. Can. Summary Report, 1914, p. 143.

"The MacDougall Segur Oil Company was the first to begin drilling operations. They 'spudded in' on section 16, township 21, range 3, west of the 5th meridian, in January, 1913. Soon afterward on January 25, well No. 1, of the Calgary Petroleum Products Company, was started near a gas spring on section 6, township 20, range 2, west of the 5th meridian. On October 6, 1913, at a depth of 1,556 feet the Calgary Petroleum Products Company penetrated an oil-bearing sandstone and a small quantity of a very light oil was obtained. This oil was cased off and drilling continued. Besides the oil several gas horizons were passed through. After this discovery other companies which had already been formed began drilling. The Black Diamond No. 1, Southern Alberta, Federal, Western Pacific, and United No. 1, were all drilling in the spring of 1914. On May 14, the Calgary Petroleum Products Company's well No. 1 encountered a second oil-bearing stratum at a depth of 2,718 feet. The second strike brought many other companies into the field and drilling became general over the greater part of the foothills region of southern Alberta. There were 44 drilling outfits which began to operate, but a number of these have ceased work.

"Cable tools, with the California type of standard rig, are in general use in the field. Diamond drills and a rotary type using a fish-tail bit or revolving steel disc cutters are also being operated. A pole-tool outfit was used by one of the companies for a time. Drilling is slow and difficult because most of the wells are boring through strata that are highly inclined and of varying hardness. Hence, crooked and badly caving holes are a continual source of trouble.

"The Calgary Petroleum Products Company's well No. 1, produces a light greenish-yellow oil. The following is the report of an analysis, made by E. Stansfield of the Mines Branch, Department of Mines, on a sample of crude oil from Dingman well No. 1. This report was furnished through the courtesy of Mr. A. W. Dingman, managing director:

"The oil was of a yellow colour, showed fluorescence, and was practically free from any sediment; it possessed a strong unpleasant odour.

"Specific gravity: by hydrometer at 60 degrees F. = 0·756.

Distillation Test.

Degrees.	Per cent. by vol.	Specific gravity.	Colour of distillate.
76—100	14·4	0·702	Yellow.
100—120	28·3	0·729	Orange.
120—140	19·3	0·746	"
140—160	11·3	0·760	Yellow.
160—180	7·0	0·774	Pale yellow.
180—200	4·3		
200—220	3·4		
220—250	2·8	0·791	Almost colourless.
Residue	6·6	0·874	Dark brown.
Loss	2·6		
	100·0		

Distillation began at 76 degrees C.
Specific gravity of the oil calculated from the above test equals 0·752; sulphur 0·10."

"This oil was obtained at a depth of 2,718 feet. The production has not been stated.

"The Moose Mountain well in section 34, township 23, range 5, west of the 5th meridian, obtained a small quantity of a dark green oil, which on analysis gives:—

Gasoline	20 per cent.
Kerosene	50 "
Lubricating oil	24 "
Solids (not analysed)	6 "

"Analysis by E. G. Voss, B.Sc.

"This oil comes from a depth of 1,690 feet. Several other wells in the district report small seepages of oil."

Prospecting for oil was prosecuted in other parts of Alberta, as well as near Calgary, and a review of these operations[1] states that samples of oil were secured from different localities in the northern part of the Province (where 13 oil or gas wells were being drilled[2]), one sample being a thick heavy oil from the "tar-sand" area north of Fort McKay; and in the south, too, in the Sweetgrass area, near the International Boundary some drilling was done, and, from the old Lineham well there, samples of a brown oil of 40° Beaumé gravity were secured.

In British Columbia drilling operations for petroleum were continued on Graham island. A geological investigation of this island was made by Mr. J. D. Mackenzie of the Geological Survey Branch in 1913 and 1914. Mr. Mackenzie, in a summary report on his field work[3] says the chance that petroleum reservoirs may be found by drilling is extremely remote. The grounds for his conclusions are as follows:—

"There are four necessary geological features that an oil field must have in order to become productive. These are:—

1. A supply of liquid oil of sufficiently low viscosity to flow through the pores of cracks in an oil sand at the temperatures obtaining where the oil is found.

2. A container, porous in itself, as in the case of a sandstone, or made so by fracturing or other changes, as in a shale, limestone, chert, or dolomite. This container, irrespective of its real composition, is termed the "oil sand."

3. An impervious capping over the oil sand, imprisoning the oil until it is released by the drill. The capping is usually shale.

4. A rock structure favourable for the accumulation of the oil in reservoirs from which it may be obtained when they are tapped with a drill.

"Without going into the proofs here, it may be said that at no place on Graham island are all four of these conditions found together, and, so far as the writer could determine from a careful study, at no place are con-

[1] The Alberta Oil Fields, E. H. Cunningham Craig. The Can. Mg. Journal, Jan. 1, 1915, p. 26.
[2] See Map of Northern Alberta, No. 284, Mines Branch, Dept. of Mines, accompanying report on Bituminous Sands of Northern Alberta, S. C. Ells, 1915, No. 281.
[3] Geol. Sur., Can., Summary Report, 1914, p. 33.

bitions 1 and 4 fulfilled. For these reasons, then, the possibility that workadle bodies of petroleum may be found on Graham island is regarded as very remote."

Drilling at Port Haney, not far from Vancouver, for oil has given only disappointing results.[1]

The statistics of production of petroleum during recent years are compiled from the records of the Department of Trade and Commerce, as being the most accurate basis available. These figures are secured in connexion with the payment of a bounty of 1½ cent per gallon by the Dominion Government on all crude oil produced from wells, or oil-shales, in Canada, the claim for bounties having to be substantiated as to quantity by the certificate of the receiving stations, tank companies, refiners, or other purchasers, as well as by the supervising officers on bounties.

Statistics of production of crude oil from 1881, in barrels of 35 gallons each, with the total value, and average price per barrel, are given in the following table.

Annual Production of Crude Petroleum.

Year.	Barrels of 35 gallons.	Value.	Average.	Year.	Barrels of 35 gallons.	Value.	Average.
		$	$ cts.			$	$ cts.
1881	368,987	.....	.....	1898	758,391	1,061,747	1·400
1882	389,573	.....	.....	1899	808,570	1,202,020	1·48¾
1883	472,866	.....	.....	1900	710,498	1,151,007	1,620
1884	571,000	.....	.....	1901	622,392	1,008,275	1·620
1885	587,563	.....	.....	1902	530,624	951,190	1·792
1886	584,061	525,655	0·90	1903	486,637	1,048,974	2·155
1887	713,728	556,708	0·78	1904	503,474	935,895	1,858
1888	695,203	713,695	1·02⅝	1905	634,095	856,028	1·350
1889	704,690	653,600	0·92¾	1906	569,753	761,760	1·337
1890	795,030	902,734	1·18	1907	788,872	1,057,088	1·340
1891	755,298	1,010,211	1·33¾	1908	527,987	747,102	1·415
1892	779,753	984,438	1·26¼	1909	420,755	559,604	1·330
1893	798,406	874,255	1·09½	1910	315,895	388,550	1·230
1894	829,104	835,322	1·00¾	1911	291,092	357,073	1·225
1895	726,138	1,086,738	1·49⅝	1912	243,336	345,050	1·418
1896	726,822	1,155,647	1·59	1913	228,080	406,439	1·782
1897	709,857	1,011,546	1·42½	1914	214,805	343,124	1·597

The following table gives statistics of the bounties paid to date by the Dominion Government on production of crude oil in Canada, from wells or oil shales, the bounty being 1½ cent per gallon.

Record of Bounty Paid by Dominion Government on Production of Crude Petroleum.

Calendar Year.	Bounty Paid.	Calendar Year.	Bounty Paid.
	$		$
1905	332,900	1910	165,845
1906	299,120	1911	152,823
1907	414,158	1912	127,751
1908	277,193	1913	119,742
1909	220,897	1914	112,569

[1] "Drilling for Oil at Port Haney." Report of Minister of Mines, British Columbia, 1914, p. 392.

The production of crude oil in the Province of Ontario, by districts, since 1910, is shown in the following table. The record has been furnished by the Supervisor of Petroleum Bounties at Petrolia, and agrees very closely, although not identically, with the statistics of the Department of Trade and Commerce used in compiling the record of production for the whole of Canada.

Production of Crude Petroleum in Ontario by Districts.

Field.	1910.	1911.	1912.	1913.	1914.
	Bls.	Bls.	Bls.	Bls.	Bls.
Lambton	205,456	184,450	150,272	155,747	154,186
Tilbury and Romney	63,058	48,707	44,727	26,824	18,530
Bothwell	36,998	35,244	34,486	34,348	33,961
Leamington	141	.....	.....	.....	.....
Dutton	7,752	6,732	4,335	4,610	2,190
Onondaga (Brant county)	1,005	13,501	7,115	4,172	2,437
Belle River	.....	.....	.....	464	1,191
Total	314,410	288,634	240,935	226,165	212,495

Inspection of Petroleum.

At present there are five oil refineries in Canada: one at Sarnia, Ontario, and one at Ioco, British Columbia (near Vancouver), both owned by the Imperial Oil Company, of Sarnia, Ontario; one at Petrolia, Ontario, owned by the Canadian Oil Company of Toronto, Canada; one at Wallaceburg, Ontario, owned by the Empire Refining Company; and one at Toronto owned by the British American Oil Company. At each of these refineries considerable quantities of imported crude oil are handled. Domestic crude oil is refined chiefly by the Imperial Oil Company and occasionally by some of the other refineries.

All refined illuminating oils and naphtha manufactured and shipped from Canadian refineries are inspected by the Department of Inland Revenue. The total quantity inspected for the fiscal year ending March 31, 1915, was 46,382,785·09 gallons as compared with 33,602,017·27 gallons the previous year. There are four inspection districts known respectively as the London, Toronto, Winsdor, and Vancouver districts, the first mentioned covering the refineries at Sarnia and Petrolia, Ontario, the second the Toronto refinery, the third the Wallaceburg refinery, and the fourth the recently opened refinery of the Imperial Oil Company at Ioco on Burrard Inlet, near Vancouver, British Columbia.

The following tables, showing the quantities of refined illuminating oils and naphtha inspected in the several districts, are quoted from the annual report of the Department of Inland Revenue.

Return of Inspected Petroleum and Naphtha Shipped from Refineries During the Fiscal Year Ending March 31, 1915.

Divisions.	Petroleum.	Naphtha.	Total.
	Gals.	Gals.	Gals.
London, Ont.	28,937,088·18	12,317,387·61	41,254,475·79
Toronto, Ont.	2,008,089·00	2,932,217·00	4,940,306·00
Windsor, Ont.	3,591·90	15,775·40	19,367·30
Vancouver, B.C.	168,636·00	Nil.	168,636·00
	31,117,405·08	15,265,380·01	46,382,785·09

Comparative Statement of Inspected Petroleum and Naphtha Shipped from Canadian Refineries During the Fiscal Years Ending March 31, 1910-1915.

Fiscal Year.	Petroleum.	Naphtha.	Total.
1910	19,100,424·16	4,113,149·46	*23,213,573·62
1911	21,017,628·45	6,517,655·41	*27,535,283·86
1912	20,886,072·43	5,577,591·62	*26,463,664·05
1913	22,485,437·34	6,880,761·85	*29,366,199·19
1914	22,986,328·66	10,615,688·61	*33,602,017·27
1915	31,117,405·08	15,265,380·01	46,382,785·09

* All from Ontario Refineries.

EXPORTS OF PETROLEUM.

The exports of crude oil from Canada are comparatively small, the available statistics being shown in the next table following. During 1914 the exports, as published by the Customs Department, included, crude oil 3,996 gallons valued at $362, refined oils 3,922 gallons valued at $826, naphtha and gasoline 43,023 gallons valued at $11,607, or a total of 50,941 gallons valued at $12,795. There was also an export of 455,867 gallons valued at $104,179 of "other oils n.e.s." which probably included products of petroleum.

Exports of Crude and Refined Petroleum.

Calendar Year.	Crude oil.		Refined oil.		Total.	
	Gals.	Value.	Gals.	Value.	Gals.	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
1897			342	49	342	49
1898	96	4	12,735	3,001	12,831	3,005
1899			3,425	859	3,425	859
1900	40	2	8,559	2,394	8,599	2,396
1901	14,168	691	375	66	14,543	757
1902	400	40	626	146	1,026	186
1903	350	15	1,013	190	1,363	205
1904	4,207	213	2,126	470	6,333	683
1905	35	2	7,228	2,078	7,263	2,080
1906	900	141	8,938	1,401	9,838	1,542
1907	1,125	102	3,132	575	4,257	677
1908			296	71	296	71
1909			7,768	934	7,768	934
1910			2,818	462	2,818	462
1911			24,448	4,500	24,448	4,500
1912	18,500	3,964	62,736	10,408	81,236	14,372
1913	3,650	379	*42,148	7,472	45,798	7,851
1914	3,996	362	*46,945	12,433	50,941	12,795

*Includes naphtha and gasoline.

IMPORTS OF PETROLEUM.

The imports of petroleum and petroleum products into Canada have been rapidly increasing, while the domestic production has been decreasing. The imports during the calendar year 1914 totalled 244,487,973 gallons of petroleum, crude and refined, valued at $11,072,362, while in 1913 they were 222,779,028 gallons, valued at $13,238,429. The simultaneous occurrence of a large increase in total quantity and a substantial decrease in total value is explained by the fact that there was a thirty-three-million gallon increase in imports of crude fuel and gas oils, with an increase of only about $500,000 over the value of similar imports in the previous year, while in all varieties of refined petroleum there was a decrease in quantity of about 19 per cent.

Imports of paraffin wax and paraffin wax candles in 1914 totalled 1,594,236 pounds, valued at $102,401, as compared with imports in 1913 of 1,628,837 pounds, valued at $109,897.

The oil imports included: crude oil 195,207,210 gallons, valued at $5,750,971, (items (a) and (b) in table below); refined and illuminating oils 12,833,065 gallons valued at $970,481, (items (c) and (d) in table below); gasoline 24,396,401 gallons valued at $2,747,360; lubricating oils 5,767,676 gallons valued at $940,143, (items (e) and (g) in table below); and other oils, products of petroleum, 6,283,621 gallons, valued at $663,407. On comparison with 1913 imports it is seen that imports of crude oil showed an increase of 20·4 per cent, imports of refined illuminating oils a decrease of 33·7 per cent, imports of gasoline a decrease of 17·3 per cent, imports of lubricating oils a decrease of 15·0 per cent, and imports of other oils, products of petroleum, an increase of 25·4 per cent.

In British Columbia, particularly, the use of crude oil for fuel is increasing rapidly, the imports of crude oil into that Province for the past few years having been as follows: For the fiscal year ending March 31, 1913, 80,234,743 gallons valued at $1,443,789; for the fiscal year ending March 31, 1914, 110,585,434 gallons, valued at $2,282,299, and for the fiscal year ending March 31, 1915, 110,641,693 gallons, valued at $2,174,634.

Details of imports of petroleum and petroleum products during the calendar years 1913 and 1914 are given in the following table:—

Imports of Petroleum and Petroleum Products During the Calendar Years 1913 and 1914.

Products.	1913.		1914.	
	Gals.	Value.	Gals.	Value.
		$		$
(a) Petroleum crude, fuel and gas oils (0·8235 specific gravity or heavier)	162,023,842	5,246,526	195,152,861	5,746,107
(b) Crude petroleum, gas oils (other than benzene, naphtha and gasoline)	38,084	4,309	54,349	4,864
(c) Coal and kerosene, distilled, purified, or refined	19,225,528	1,327,647	12,670,085	905,124
(d) Illuminating oils composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon	168,099	66,793	162,980	65,357
(e) Lubricating oils composed wholly or in part of petroleum, costing less than 25 cents per gallon	5,620,697	779,789	4,775,154	629,311
(f) Products of petroleum, n.o.p.	5,008,844	597,227	6,283,621	663,407
(g) Lubricating oils, n.o.p.	1,168,754	393,197	992,522	310,832
(h) Gasoline	29,525,180	4,822,941	24,396,401	2,747,360
Total	222,779,028	13,238,429	244,487,973	11,072,362
Paraffin wax	.....	72,351	.....	57,527
Paraffin wax candles	.....	37,546	.....	44,874
Total	.....	13,348,326	.....	11,174,763

The total annual imports of petroleum and petroleum products are shown in the three tables following. The first table gives imports of petroleum, crude and refined; the second imports of paraffin wax; and the third imports of paraffin wax candles.

Imports of Crude and Refined Petroleum.

Fiscal Year.	Gals.	Value.	Fiscal Year.	Gals.	Value.
		$			$
1880	687,641	131,359	1898	9,074,311	724,519
1881	1,437,475	262,168	1899	10,394,208	763,303
1882	3,007,702	398,031	1900	9,633,647	864,833
1883	3,086,316	358,546	1901	11,082,822	982,640
1884	3,160,282	380,082	1902	13,220,005	1,107,207
1885	3,767,441	415,195	1903	18,799,312	1,643,371
1886	3,819,146	421,836	1904	24,521,115	2,152,623
1887	4,290,003	467,003	1905	35,296,332	2,151,514
1888	4,523,056	408,025	1906	32,624,410	1,908,177
1889	4,650,274	484,462	1907 (9 mos.)	23,645,861	1,480,261
1890	5,075,650	515,852	1908	40,213,542	2,577,059
1891	5,071,386	498,330	1909	51,700,476	3,219,243
1892	5,649,145	475,732	Calendar Year.		
1893	6,002,141	446,389	1910	84,629,334	4,826,763
1894	6,597,108	439,988	1911	116,892,689	6,009,730
1895	7,577,674	525,372	1912	186,787,484	11,858,533
1896	8,005,891	735,913	1913	222,779,028	13,238,429
1897	8,415,302	697,169	1914	244,487,973	11,072,362

Imports of Paraffin Wax.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1883	43,716	5,166	1900	47,400	3,529
1884	39,010	6,079	1901	118,848	9,639
1885	59,967	8,123	1902	225,885	12,750
1886	62,035	7,953	1903	592,642	28,674
1887	61,132	6,796	1904	418,967	18,440
1888	53,862	4,930	1905	81,992	7,795
1889	63,229	5,250	1906	112,612	9,721
1890	239,229	15,844	1907 (9 mos.)	55,021	5,922
1891	753,854	50,275	1908	62,308	8,041
1892	733,873	48,776	1909	129,631	12,795
1893	452,916	38,935	Calendar Year.		
1894	208,099	15,704	1910	1,192,616	58,673
1895	163,817	11,579	1911	1,688,216	75,661
1896	150,287	10,042	1912	1,901,586	85,491
1897	138,703	7,945	1913	1,291,615	72,351
1898	103,570	5,987	1914	1,218,969	57,527
1899	92,242	4,025			

Imports of Paraffin Wax Candles.

Fiscal Year.	Lbs.	Value.	Fiscal Year.	Lbs.	Value.
		$			$
1880	10,445	2,269	1898	60,802	4,427
1881	7,494	1,683	1899	62,331	5,856
1882	5,818	1,428	1900	27,663	3,671
1883	7,149	1,734	1901	44,562	3,588
1884	8,755	2,229	1902	51,120	5,752
1885	9,247	2,449	1903	83,377	9,025
1886	12,242	2,587	1904	83,471	9,078
1887	21,364	3,611	1905	137,353	15,293
1888	22,054	2,829	1906	148,808	15,804
1889	8,038	1,337	1907 (9 mos.)	38,900	5,088
1890	7,233	1,186	1908	156,934	20,035
1891	10,598	2,116	1909	110,848	14,806
1892	9,259	1,952	Calendar Year.		
1893	8,351	1,735	1910	169,619	21,433
1894	10,818	1,685	1911	271,571	30,763
1895	19,448	2,541	1912	242,420	34,029
1896	25,787	4,072	1913	337,222	37,546
1897	25,114	2,929	1914	375,267	44,874

PETROLEUM REGULATIONS

The regulations under which petroleum and natural gas rights on Dominion lands may be secured were revised in January, 1914. The full text of the regulations, which are briefly outlined herewith, may be obtained from the Mining Lands and Yukon Branch of the Department of the Interior. They are entitled "Regulations for the disposal of petroleum and natural gas rights, the property of the Crown in Manitoba, Saskatchewan, Alberta, the Northwest Territories, the Yukon Territory, the Railway Belt in the Province of British Columbia, and within the tract containing three and one-half ($3\frac{1}{2}$) million acres of land acquired by the Dominion Government, and referred to in sub-section 6 of section 3 of the Dominion Lands Act." Approved by Order-in-Council dated the 19th day of January, 1914.

These regulations provide for the leasing of petroleum and natural gas rights under an area of not more than 1,920 acres to one applicant for a period of twenty-one (21) years, subject to a rental of twenty-five (25) cents an acre for the first year, and fifty (50) cents an acre for each subsequent year.

The lessee is required to have upon the lands leased, within one year of the date of the lease, such machinery as the Minister may consider necessary for the carrying on of prospecting operations, and is required to begin boring operations within fifteen months of the date of the lease, which shall be continued with reasonable diligence, with a view to the discovery of oil or natural gas.

The lessee is required to prevent the injurious access of water to the oil-bearing formation, and should gas be discovered, must take all reasonable and proper precautions to prevent the waste of natural gas.

Provision is made in the regulations that on or after January 1, 1930, a royalty may be charged on the petroleum products from locations leased under these regulations, and that at any time a royalty may be levied on the natural gas products of the leasehold.

Any company acquiring, by assignment or otherwise, a lease shall at all times be and remain a British company registered in Great Britain or Canada.

PHOSPHATE.

The small production of phosphate or apatite, which has been obtained in Canada since 1896, has been produced almost altogether as a by-product in connexion with the mining of mica. Shipments during 1914 totalled 954 tons valued at $7,275 as compared with 385 tons valued at $3,643 in 1913. The output during 1914 was derived from the Little Rapids Mine, Portland East, and the Blackburn Mine in West Templeton, Que., and a mine in North Burgess, Lanark county, Ontario, and was marketed in Buckingham, Que., Smiths Falls, Ont., and N. Paterson, N. J.

Phosphate is used at Buckingham, Que., in the manufacture of fertilizers, phosphorus, and ferro-phosphorus, and the main supply is now imported from Florida.

For a number of years previous to 1892, there was a considerable production of apatite from the district north of Buckingham, the annual output varying from 20,000 tons to 30,000 tons. The introduction of the cheaply-mined phosphates of the southern states, however, resulted in the collapse of the Canadian industry, though it was claimed at the time of closing down that there was no diminution in the available supply of mineral.

Statistics of production and exports are shown in tables following:—

Annual Production of Phosphate.

Calendar Year.	Tons.	Value.	Average value per ton.	Calendar Year.	Tons.	Value.	Average value per ton.
		$	$ cts.			$	$ cts.
1886	20,495	304,338	14 85	1900	1,415	7,105	5 02
1887	23,690	319,815	13 50	1901	1,033	6,280	6 07
1888	22,485	242,285	10 77	1902	856	4,953	5 79
1889	30,988	316,662	10 21	1903	1,329	8,214	6 18
1890	31,753	361,045	11 37	1904	817	4,590	5 62
1891	23,588	241,603	10 24	1905	1,300	8,425	6 48
1892	11,932	157,424	13 20	1906	850	6,375	7 50
1893	8,198	70,942	8 65	1907	824	6,018	7 30
1894	6,861	41,166	6 00	1908	1,596	14,794	9 26
1895	1,822	9,565	5 25	1909	998	8,054	8 07
1896	570	3,420	6 00	1910	1,478	12,578	8 51
1897	908	3,984	4 39	1911	621	5,206	8 38
1898	733	3,665	5 00	1912	164	1,640	10 00
1899	3,000	18,000	6 00	1913	385	3,643	9 46
				1914	954	7,275	7 63

Exports of phosphate in 1914 are reported by the Department of Customs as 247 tons valued at $677.

The imports of phosphate rock (fertilizer) during 1914 were valued at $20,220; acid phosphate (not medicinal) 1,874,486 pounds valued at $97,862; and phosphorus 20,994 pounds valued at $6,760.

The imports of phosphate rock (fertilizer) for 1913 were valued at $16,070; acid phosphate (not medicinal) 1,987,775 pounds valued at $89,543; and phosphorus, 17,600 pounds, valued at $5,856.

Phosphorus is manufactured at Buckingham by the Electric Reduction Company. The exports of phosphorus during the twelve months ending December 31, 1914 were 610,350 pounds, valued at $92,303 as compared with 534,340 pounds, valued at $73,395 in 1913; 543,620 pounds, valued at $66,806 in 1912; and 524,370 pounds, valued at $76,608 in 1911.

Exports of Phosphate.

Calendar Year.	Ontario.		Quebec.		Total.	
	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	20,440	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
1897	70	450	165	400	235	850
1898	21	240	702	8,000	723	8,240
1899	215	1,850	93	1,725	308	3,575
1900	.....	.....	.....	.....	Nil.	Nil.
1901	.....	.....	.....	.....	6	120
1902	.....	.....	.....	.....	70	1,880
1903	.....	.....	.....	.....	1	20
1904	.....	.....	.....	.....	191	5,348
1905	.....	.....	.....	.....	40	1,253
1906	.....	.....	.....	.....	.....	.....
1907	.....	.....	.....	.....	.....	.....
1908	.....	.....	.....	.....	1	30
1909	.....	.....	.....	.....	895	15,735
1910	.....	.....	.....	.....	.....	.....
1911	.....	.....	.....	.....	3	100
1912	.....	.....	.....	.....	.....	.....
1913	.....	.....	.....	.....	.....	.....
1914	.....	.....	.....	.....	247	677

* These values do not compare with those in Table of Annual Production; the spot value is adopted for the production, while the exports are valued upon quite a different basis.

Exports of Phosphorus.

Calendar Year.	Pounds.	Value.
		$
1911	524,370	76,608
1912	543,620	66,806
1913	534,340	73,395
1914	610,350	92,303

Imports of Acid Phosphate and Phosphorus.

Calendar Year.	Phosphate rock (fertilizer)	Acid phosphate.		Phosphorus.	
		Lbs.	Value.	Lbs.	Value.
	$		$		$
1910	72,950	1,379,173	55,999	6,752	2,065
1911	46,217	1,334,643	60,882	14,818	4,384
1912	24,586	1,379,173	55,999	13,807	4,012
1913	16,070	1,987,775	89,543	17,600	5,856
1914	20,220	1,874,486	97,862	20,994	6,760

PYRITES.

Pyrites ores are mined in the Province of Quebec at the Eustis mine, Eustis, the Weedon mine, the Stratford prospect in Stratford township, and the Ives mine at Eastman. The shipping mines in Ontario were those at Sulphide and Queensboro in Hastings county, the Helen mine and Goudreau properties in Michipicoten, Algoma dist., and Northpines, Vermilion lake, Kenora dist.

The total shipments in 1914 were 228,314 tons, valued at $744,508 and included 117,698 tons valued at $470,792 from Quebec and 110,616 tons valued at $273,716 from Ontario mines.

The total shipments in 1913 were 158,566 tons, valued at $521,181 which included 87,314 tons, valued at $349,256 from Quebec and 71,252 tons, valued at $171,925 from Ontario. The pyrites ores of the Eastern Townships of Quebec are cupriferous, the copper content of the shipping ores averaging about 2·75 per cent; they also carry small quantities of gold and silver.

The exports of pyrites from Canada in 1914 as reported by the Customs Department were 89,999 tons valued at $377,985, as compared with 46,066 tons valued at $211,640 exported in 1913 and 5,938 tons valued at $11,935 exported in 1912. Direct returns from operators, however, appear to indicate larger exports than is shown by this record and it is possible that some of the ore may be exported as "copper ore" and not as pyrites.

The imports of brimstone and crude sulphur during the calendar year 1914 were 41,954 tons, valued at $870,868, as against 30,433 tons, valued at $633,114, in 1913, and 38,647 tons valued at $806,690 in 1912.

No record is available of the quantity of sulphuric acid manufactured in Canadian plants. The imports of sulphuric acid during the calendar year 1914, according to Customs returns, were 332,274 pounds, valued at $7,149, as compared with imports in 1913 of 145,074 pounds, valued at $4,054 and 4,971,446 pounds, valued at $35,325 in 1912.

Statistics of production and exports of pyrites, of imports of brimstone and crude sulphur, and of imports of sulphuric acid, are shown in the following tables:—

Annual Production of Pyrites.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons	Value.
		$			$
1886	42,906	193,077	1900	40,031	155,164
1887	38,043	171,194	1901	35,261	130,544
1888	63,479	285,656	1902	35,616	138,939
1889	72,225	307,292	1903	33,982	127,713
1890	49,227	123,067	1904	37,180	134,033
1891	67,731	203,193	1905	33,339	125,486
1892	59,770	179,310	1906	42,743	169,990
1893	58,542	175,626	1907	46,243	212,491
1894	40,527	121,581	1908	47,336	224,824
1895	34,198	102,594	1909	64,644	222,812
1896	33,715	101,155	1910	53,870	187,064
1897	38,910	116,730	1911	82,666	365,820
1898	32,218	128,872	1912	81,526	314,081
1899	27,687	110,748	1913	158,566	521,181
			1914	228,314	744,508

Imports:—Brimstone* and Crude Sulphur.

Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.
		$.			$
1880	1,775,489	27,401	1898	38,026,798	373,786
1881	2,118,720	36,956	1899	24,517,026	265,799
1882	2,375,821	40,329	1900	21,128,656	215,433
1883	2,336,085	36,737	1901	23,856,651	270,608
1884	2,195,735	37,463	1902	24,640,735	325,307
1885	2,248,986	35,043	1903	24,412,737	259,123
1886	2,922,043	43,651	1904	19,364,730	204,663
1887	3,103,644	38,750	1905	23,435,140	242,251
1888	2,048,812	25,318	1906	43,047,672	436,156
1889	2,427,510	34,006	1907 (9 mos.)	25,854,615	277,439
1890	4,440,799	44,276	1908	51,806,739	517,249
1891	3,601,748	46,351	1909	44,049,172	426,569
1892	4,769,759	67,095	Calendar Year.		
1893	6,381,203	77,216	1910	45,669,739	474,619
1894	5,845,463	61,558	1911	43,862,954	446,491
1895	4,900,225	56,965	1912	77,294,039	806,690
1896	6,934,190	63,973	1913	60,865,975	633,114
1897	8,672,751	87,719	1914	83,907,805	870,868

* Brimstone, crude or in roll or flour, or sulphur in roll or flour.

Exports of Pyrites.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1894	8,532	33,205	1904	18,279	49,911
1895	7,705	38,298	1905	19,755	55,767
1896	15,002	33,837	1906	26,050	65,349
1897	15,096	30,812	1907	25,056	80,139
1898	9,804	26,387	1908	17,283	96,600
1899	15,599	34,084	1909	35,798	156,644
1900	17,620	41,182	1910	30,434	110,071
1901	24,971	57,263	1911	32,102	120,585
1902	18,584	50,178	1912	5,938	11,935
1903	21,067	59,604	1913	46,066	211,640
			1914	89,999	377,985

Imports of Sulphuric Acid.

Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.
		$			$
1885	774,764	10,791	1901	448,608	5,272
1886	507,927	7,930	1902	420,731	4,626
1887	678,603	8,468	1903	102,314	2,332
1888	2,494,648	35,415	1904	113,407	2,563
1889	181,652	2,606	1905	920,804	8,227
1890	211,871	2,927	1906	822,585	8,558
1891	177,627	2,466	1907	733,151	6,901
1892	222,628	2,837	1908	650,095	7,582
1893	172,422	2,367	1909	241,388	3,298
1894	107,520	1,648	Calendar Year.		
1895	174,605	2,481	1910	2,474,802	21,702
1896	114,137	1,430	1911	1,031,803	9,281
1897	977,446	8,033	1912	4,971,446	35,325
1898	665,344	5,536	1913	145,074	4,054
1899	165,637	2,427	1914	332,274	7,149
1900	740,858	7,066			

The following is a list of companies operating pyrites mines, in Canada:—

The Eustis Mining Company, Eustis, Que.

The Weedon Mining Company, Limited, Weedon, Que.

The Nichols Chemical Company of Canada, Limited, Sulphide, Ont., and 25 Broad St., New York.

The Canadian Sulphur Ore Co., Ltd., Queensboro, Ont.

The Northern Pyrites Company, Northpines, Ont., and 25 Broad St., New York.

Algoma Steel Corporation, Limited, Sault Ste. Marie, Ont.

The Madoc Mining Co., Goudreau, Ont., and 25 Broad St., New York.

QUARTZ.

Considerable quantities of quartz are used by the smelters of nickel copper ores. It is also used in the manufacture of ferro-silicon, and ground quartz is used for the manufacture of sanitary and enamelled ware.

The total shipments in 1914 are reported as 54,148 tons, valued at $84,583, as compared with shipments of 78,261 tons, valued at $169,842, in 1913, and 100,242 tons, valued at $195,216, in 1912.

Imports of silex, or crystallized quartz in 1914 were 870 tons, valued at $15,502, and the imports of flint during the same year were 3,835 tons, valued at $47,931.

In 1913 the imports of silex were 690 tons, valued at $13,811, and the imports of flint were 6,708 tons, valued at $60,718.

Statistics of the annual production of quartz, so far as these have been obtained, are shown in the next table:—

Annual Production of Quartz.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1890	200	1,000	1906	48,376	65,765
1891–2	.....	.....	1907	56,585	124,148
1893	100	500	1908	44,741	52,830
1894–5–6	10	50	1909	56,924	71,285
1897	.....	.....	1910	88,205	91,951
1898	284	570	1911	60,526	83,865
1899	600	1,260	1912	100,242	195,216
1900–1905	.....	.....	1913	78,261	169,842
			1914	54,148	84,583

Imports of Silex:—Crystallized Quartz.

Fiscal Year.	Cwt.	Value.	Fiscal Year.	Cwt.	Value.
		$			$
1880	5,252	2,290	1898	3,104	2,773
1881	3,251	1,659	1899	3,951	2,595
1882	3,283	1,678	1900	4,021	2,876
1883	3,543	2,058	1901	3,562	2,106
1884	3,259	1,709	1902	4,388	3,858
1885	3,527	1,443	1903	3,514	2,762
1886	2,520	1,313	1904	5,547	4,409
1887	14,533	5,073	1905	8,931	4,475
1888	4,808	2,385	1906	7,465	8,347
1889	5,130	1,211	1907 (9 mos.)	11,964	12,969
1890	1,768	2,617	1908	24,938	19,166
1891	3,674	1,929	1909	6,206	6,909
1892	1,429	1,244	Calendar Year.		
1893	2,447	1,301	1910	12,577	11,996
1894	2,451	1,521	1911	7,877	7,518
1895	2,882	1,881	1912	12,571	10,680
1896	3,289	2,174	1913	13,797	13,811
1897	2,564	3,415	1914 Duty free	17,407	15,502

SALT.

The production of salt in Canada has for a number of years been obtained from salt fields in southwestern Ontario, although there was at one time a very small production in New Brunswick and Manitoba.

The total sales of salt in 1914 were 107,038 tons, valued at $493,648, exclusive of packages, as compared with sales of 100,791 tons, valued at $491,280 in 1913 showing a continued increase in production.

The average number of men employed during the year was reported as 253 and the amount of wages paid $178,277. The value of the packages used during the year was $278,879 and stock of salt in manufacturers' hands at the close of the year was reported as 4,519 tons.

Detailed statistics of the production during the past six years, showing the total sales of salt, the value of the sales, exclusive of packages, the value of the packages used, stock in manufacturers' hands at the end of each year, number of men employed, wages paid, and the total annual production since 1886 are given in the following tables.

Detailed Statistics of Production of Salt, 1909-1914.

	1909.	1910.	1911.	1912.	1913.	1914.
Sales of salt.....Tons	84,037	84,092	91,582	95,053	100,791	107,038
Value of salt (exclusive of packages)..... $	415,219	409,624	443,004	459,582	491,280	493,648
Value of packages..... $	175,612	173,446	198,789	224,696	262,479	278,879
Stock in manufacturers' hands at end of year.....Tons	2,671	2,474	1,422	3,256	4,066	4,519
Men employed..... No.	185	208	225	231	251	253
Wages paid..... $	96,116	112,909	123,040	155,648	178,386	178,277

Annual Production of Salt.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886.....	62,359	227,195	1900.....	62,055	279,458
1887.....	60,173	166,394	1901.....	59,428	262,328
1888.....	59,070	185,460	1902.....	64,456	292,581
1889.....	32,832	129,547	1903.....	62,452	297,517
1890.....	43,754	198,857	1904.....	69,477	321,778
1891.....	45,021	161,179	1905.....	67,340	320,858
1892.....	45,486	162,041	1906.....	76,720	329,130
1893.....	62,324	195,926	1907.....	72,697	342,315
1894.....	57,199	170,687	1908.....	79,975	378,798
1895.....	52,376	160,455	1909.....	84,037	415,219
1896.....	43,960	169,693	1910.....	84,092	409,624
1897.....	51,348	225,730	1911.....	91,582	443,004
1898.....	57,142	248,639	1912.....	95,053	459,582
1899.....	59,339	254,390	1913.....	100,791	491,280
			1914.....	107,038	493,648

The salt deposits of Canada and the salt industry have been made the subject of a special Report[1] published by the Mines Branch. In respect to Ontario, which is at present the centre of the salt industry in Canada, this Report states:—

"The salt obtained in this province is recovered by the evaporation of brine which has leached out rock salt from beds which occur in the Salina formation in the southwestern part of the Province bordering on Lake Huron, the St. Clair river, lake St. Clair, and the Detroit river. It is impossible, with our present knowledge, to determine definite boundaries of the salt basin; but, as far as it now stands proved, the area underlain by salt, in Ontario, lies west of a line joining the towns of Inverhuron, Teeswater, Brussels, Seaforth, London, and St. Thomas, and north of a line through Thamesville, Dresden, Lake St. Clair, Elmstead, and Amherstburg. The area enclosed within this boundary in Canada is about 3,000 square miles.

"The salt beds are known to vary in thickness. In some wells they occur in thin beds interstratified with dolomite and shale; the total combined thickness of all these beds varying from 100 to 200 feet. In other localities, as in the case of the beds at Windsor, the salt beds are of great thickness, one bed alone having a thickness of 200 feet. The average depth at which the salt is found is in excess of over 1,000 feet, there being a gradual increase in depth of the beds as one goes farther south.

"The production from a few wells has hitherto been sufficient to supply the domestic demand, and little exploration has been carried on by which the area underlain by salt can be definitely outlined. There has, however, been a great deal of exploratory work in connexion with the development of petroleum and natural gas fields. Where these boreholes extend below the salt horizon, they give evidence of either the presence, or the absence of salt.

"From the records available, it would appear that within the area mentioned, and outlined on the accompanying map, the salt beds are practically continuous; there are, however, some limited areas within these boundaries where—according to the records of drill holes that have penetrated below the Salina—there are no salt beds.

"The southeast boundary of the salt area is at present unknown as no drill records are obtainable from the district along the north shore of Lake Erie between St. Thomas and Chatham. Records from a hole at Orford, Kent county, show 171 feet of salt, at 1,510 feet below the collar of the hole; while another from Glencoe shows 104 feet of salt, at 1,290 feet below the surface. These records lead one to believe that possibly the beds are dipping to the southeast and may be found by deeper drilling in the vicinity of Lake Erie.

"The southwestern boundary merely marks the dividing line between the area beneath which salt beds are encountered, and the area where brines

[1] "The Salt Deposits of Canada and the Salt Industry," by L. Heber Cole, B.Sc., Mines Branch, Department of Mines, 1915, No. 325.

of a more or less density were found, although no rock salt was obtained.

"The salt beds are supposed to extend under the Detroit river, Lake St. Clair, St. Clair river, and the southern part of Lake Huron, since rock salt has been found in the Salina formation in the State of Michigan, on the opposite side of the International Boundary."

As at present carried on in western Ontario, the salt industry consists essentially in the production of table, dairy and coarse salt, and a small quantity of land salt. The brine is obtained by forcing water down boreholes sunk to the rock salt bed, through a casing inside of which is a pipe of smaller diameter. A powerful pump forces water down the outer tube; this dissolves the salt, eventually forming large cavities at the bottom of the well, which offer a great surface of salt to the action of the water. The water forced downwards is charged to saturation in the salt cavity, and, as the rock is not fissured or porous, this brine is forced upwards through the inner tube. After a process of purification and settling, this brine is evaporated either in vacuum pans or in large open air vats, and after passing through mechanical dryers or over drying floors, the salt is ready for the market.

In 1911 the Canadian Salt Company, at their Sandwich plant, commenced the manufacture of caustic soda by the electrolytic method, the liberated chlorine being utilized for the manufacture of bleaching powder. The following description of this plant is taken from Mr. Cole's Report.[1]

"The brine is pumped directly into settling tanks, and from there it is carried to six concrete tanks, in which it is treated by soda ash in order to eliminate the lime which is present in small quantities. The soda ash is dissolved in hot water before adding to the brine. The purified brine is then treated in electrolytic cells, where the sodium chloride is decomposed into chlorine gas and metallic sodium. The metallic sodium at once reacts with the water, forming caustic soda. There are 256 of these cells, arranged in 8 rows, with 32 in each row. These cells employ direct current at 220 volts.

"The weak solution of caustic soda thus produced in these cells is concentrated in two vacuum pan evaporators, operated double effect. The solution is taken from these to storage tanks—after being through separators—to eliminate the salt. The final concentration is carried on in the finishing pots, and the pure caustic soda is run from the final pot into iron drums (700 lbs. capacity), and allowed to solidify. The finishing pots have a capacity of 18 tons each. They are made of cast iron, 10 feet in diameter, and 6 feet deep. The setting is built of fire brick.

"The chlorine gas, previously referred to as being generated in the cells, is piped to the bleaching chamber building, where it is allowed to circulate through eight bleaching chambers.

[1] "The Salt Deposits of Canada and the Salt Industry," by L. Heber Cole, B.Sc., Mines Branch, Dept. of Mines, 1915, No. 325, p. 43.

"These chambers are 20 ft. wide and 100 ft. long, and are lined on sides and roof with chemical lead. On the bottom are laid 2″ cooling pipes, firmly secured by a covering of cement, over which is laid a layer of asphalt. This arrangement thoroughly protects the pipes from the gas. On top of the asphalt is laid a layer of hydrated lime 3″ thick. The chlorine gas circulating through the chambers reacts with this lime, forming bleaching powder, which, when ready, is drawn off through openings in the bottom of each chamber. The shipping floor is situated beneath the chambers. The bleaching powder is packed in drums of 700 pounds capacity.

"The cooling pipes are connected with an ammonia refrigerating plant.

"The percentage of bleach in the chloride of lime produced at this plant will vary from 37 per cent to 39 per cent, i.e.: this bleach contains from 37 per cent to 39 per cent chlorine that is available for bleaching purposes.

"The whole product from this plant finds a ready market in Canada."

The annual imports of caustic soda and chloride of lime since 1910 are shown in the accompanying table.

Imports of Caustic Soda and Chloride of Lime.

	Caustic Soda.		Chloride of Lime.	
	Pounds.	Value.	Pounds.	Value.
1910	13,974,444	$267,338	10,386,519	$116,923
1911	13,812,053	259,982	11,725,167	118,501
1912	14,544,545	278,579	12,183,765	113,346
1913	15,983,298	291,008	12,761,153	115,614
1914	18,436,827	314,278	15,147,645	138,619

EXPORTS AND IMPORTS.

Comparatively small quantities of salt are now exported from Canada, the exports in 1914 being 952,700 pounds, valued at $5,229, as compared with exports of 460,900 pounds, valued at $3,047 in 1913.

The imports of salt on the other hand are quite considerable, and in total value greatly exceed the domestic production.

For the calendar year 1914 the imports of salt subject to duty included: salt in bulk 26,065 tons, valued at $82,149, and salt in bags, barrels, or other packages 7,828 tons, valued at $68,959. Salt imported from the United Kingdom or any British possession, or imported for the use of sea or gulf fisheries, duty free, was imported to the extent of 108,753 tons, valued at $389,773, giving total imports of 142,646 tons, valued at $540,881.

The total consumption of salt, domestic and imported, was in 1914 approximately 249,208 tons, valued at $1,029,300, as compared with a consumption in 1913 of 245,007 tons, valued at $1,053,516.

The statistics of exports and imports of salt since 1880, are shown in tables following:—

Exports of Salt.

Calendar Year.	Bushels.	Value.	Calendar Year.	Bushels.	Value.
		$			$
1880	467,641	46,211	1898	5,202	1,252
1881	343,208	44,627	1899	11,205	2,773
1882	181,758	18,350	1900	37,653	8,997
1883	199,733	19,492	1901	39,224	6,510
1884	167,029	15,291	1902	9,331	3,798
1885	246,794	18,756			
1886	224,943	16,886		Lbs.	
1887	154,045	11,526	1903	1,915,648	5,927
1888	15,251	3,987	1904	1,006,036	4,186
1889	8,557	2,390	1905	1,447,728	6,112
1890	6,605	1,166	1906	618,707	3,437
1891	5,290	1,277	1907	2,222,542	7,709
1892	2,000	504	1908	529,229	3,840
1893	4,940	1,267	1909	276,765	2,488
1894	4,639	1,120	1910	275,200	2,618
1895	4,865	959	1911	454,600	5,055
1896	3,842	899	1912	289,150	3,723
1897	5,383	1,193	1913	460,900	3,047
			1914	952,700	5,229

Imports:—Salt Paying Duty.

Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.
		$			$
1880	726,640	3,916	1898	11,068,785	32,792
1881	2,588,465	6,355	1899	11,781,453	32,839
1882	3,679,415	12,318	1900	11,028,337	30,180
1883	12,136,968	36,223	1901	11,625,688	34,087
1884	12,770,950	38,949	1902	13,892,849	39,605
1885	10,397,761	31,726	1903	14,554,693	41,785
1886	12,266,021	39,181	1904	29,779,183	73,826
1887	10,413,258	35,670	1905	18,473,868	58,056
1888	10,509,799	32,136	1906	21,366,064	59,805
1889	11,190,088	38,968	1907 (9 mos.)	21,834,435	58,553
1890	15,135,109	57,549	1908	31,019,400	79,341
1891	15,140,827	59,311	1909	31,653,900	83,660
1892	18,648,191	65,963	Calendar Year.		
1893	21,377,339	79,838	1910	40,347,500	97,326
1894	15,867,825	53,336	1911	46,351,900	109,793
1895	8,498,404	29,881	1912	60,134,500	133,869
1896	7,665,257	24,550	1913	63,015,000	147,775
1897	11,911,766	33,470	1914	67,786,600	151,108

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
		$		$
Salt, fine, in bulk, n.e.s. (a)	45,574,800	73,115	52,131,100	82,149
Salt, n.e.s., in bags, barrels or other packages (b)	17,440,200	74,660	15,655,500	68,959
Total	63,015,000	147,775	76,786,600	151,108

(a) Duty 5c per 100 lbs. (b) Duty 7½ c per 100 lbs.

Imports:—Salt Not Paying Duty.*

Fiscal Year.	Pounds.	Value.	Fiscal Year.	Pounds.	Value.
		$			$
1880	212,714,747	400,167	1898	202,634,927	293,410
1881	231,640,610	488,278	1899	183,046,365	267,520
1882	166,183,962	311,489	1900	193,554,550	295,253
1883	246,747,113	386,144	1901	216,271,603	339,887
1884	225,390,121	321,243	1902	238,648,737	385,629
1885	171,571,209	255,719	1903	232,708,675	361,185
1886	180,205,949	255,359	1904	198,634,047	338,082
1887	203,042,332	285,455	1905	196,907,500	340,954
1888	184,166,986	220,975	1906	203,080,000	352,214
1889	180,847,800	253,009	1907 (9 mos.)	139,459,900	240,841
1890	158,490,075	252,291	1908	200,944,800	350,878
1891	195,491,410	321,239	1909	232,237,700	376,961
1892	201,831,217	314,995	Calendar Year.		
1893	191,595,530	281,462	1910	217,587,000	364,735
1894	196,668,730	328,300	1911	202,347,100	326,325
1895	201,691,248	332,711	1912	219,278,900	352,081
1896	205,005,100	338,888	1913	225,877,200	417,508
1897	215,844,484	312,117	1914	217,505,500	389,773

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

Consumption of Salt in Canada in 1913 and 1914.

	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
		$		$
Canadian salt production	201,582,000	491,280	214,076,000	493,648
Less exports	460,900	3,047	952,700	5,229
	201,121,100	488,233	213,123,300	488,419
Imports of salt paying duty	63,015,000	147,775	67,786,600	151,108
Imports of salt free of duty	225,877,200	417,508	217,505,500	389,773
	490,013,300	1,053,516	498,415,400	1,029,300

The following is a list of operators:—

Operator.	Address.	Location.	No. of Wells.	Depth.
				Ft.
†New Brunswick Salt Works	Plumweseep, N.B.	Plumweseep		
The Canadian Salt Co., Ltd.	Windsor, Ont.	Windsor	6	1,200 to 1,700
		Sandwich	2	1,200 & 1,700
The Western Salt Co., Ltd.	Courtwright	Courtwright	1	1,800
		Mooretown	1	1,700
Stapleton Salt Works	Clinton, Ont, Box 29	Stapleton	1	1,300
North American Chem. Co.	" "	Goderich	1	1,200
*Jas. H. Kittermaster	Sarnia, Ont., 175 Christie S.	Mooretown	1	
The Dominion Salt Co., Ltd.	Sarnia, Ont.	Sarnia	3	1,700 & 2,100
*The Sarnia Salt Works Co., Ltd.	Windsor, Ont., 36 Elliott	"		
The Elarton Salt Works Co., Ltd.	Hyde Park Corner	Warwick	1	1,397
Parkhill Salt Co.	Parkhill, Ont.	Parkhill		
Exeter Salt Works Co., Ltd.	Exeter, Ont.	Exeter	1	1,225
*Hensall Salt Works	Hensall, Ont.			
Western Can. Flour Mills Co., Ltd.	Goderich, Ont.	Goderich	1	1,100
*Goderich Salt Works (P. McEwan Est.)	"	"	1	1,050
Ontario Peoples Salt & Soda Co., Ltd.	Kincardine, Ont.	Kincardine	1	981
Gray, Young & Sparling Co., Ltd.	Wingham, Ont.	Wingham	1	1,116
*Prairie Lime & Salt Co., Ltd.	Edmonton, 949 Fraser Ave	Mafeking, Man.		
B. C. Salt Works, Ltd.	Prince Rupert, B.C.	Kwinitsa	1	300

*Not in operation.
†Development work in progress.

TALC.

Talc is being mined in the Province of Ontario only, two mines being operated during 1914 in the county of Hastings, at Madoc and Eldorado, respectively.

The total quantity of shipments by the operators of the mines in 1914 were 10,808 tons, valued at $40,418, as compared with 12,250 tons, valued at $45,980, in 1913.

The operators are:—

Messrs. Cross & Wellington, Madoc, operating the Henderson mine on lot 14, concession XIV, Huntingdon township.

Eldorite Limited, Eldorado, operating a mine and small mill near Eldorado, lot 20, concession V, Madoc township.

The Henderson mine has been operated for some years, the greater part of the output being sold to Geo. H. Gillespie & Co., who operate a grinding mill at Madoc, the balance being exported to the United States.

In 1914, 1,269 tons were shipped crude to the United States, the balance being sent to Canadian grinding mills. In 1913, 2,750 tons were shipped crude to the United States. The crude talc is valued at about $2 per ton at the mine, and the ground or refined talc at an average of about $8 per ton.

The imports of talc during the calendar year 1914, according to Customs Department returns, were 584 tons, valued at $8,983 or an average value per ton of $15.38, as against imports of 402 tons, valued at $10,706, or an average value per ton of $26.63 in 1913.

Annual Production of Soapstone and Talc.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	50	400	1900	1,420	6,365
1887	100	800	1901	259	842
1888	140	280	1902	689	1,804
1889	195	1,170	1903	990	2,739
1890	917	1,239	1904	840	1,875
1891	Nil.	Nil.	1905	500	1,800
1892	1,374	6,240	1906	1,234	3,030
1893	717	1,920	1907	1,534	4,602
1894	916	1,640	1908	1,016	3,048
1895	475	2,138	1909	4,350	10,300
1896	410	1,230	1910	7,112	22,308
1897	157	350	1911	7,300	22,100
1898	405	1,000	1912	8,270	23,132
1899	450	1,960	1913	12,250	45,980
			1914	10,808	40,418

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

INTRODUCTORY.

The subjects included under this heading comprise, in the order treated: cement; clay products of various kinds, such as brick, sewerpipe and tile, pottery, etc.; lime; sand-lime brick; sands and gravels; slate; and stone for building and other purposes, including granite, marble, limestone, sandstone, etc. Previous to 1912 no attempt had been made to collect a record of the production of sands and gravels in Canada, and the only statistics available were those of exports and imports. In 1912 however a beginning was made in the collection of these statistics; but owing to the incompleteness of the available lists of producers and the failure of many to answer correspondence, only a very partial record was obtained. In 1913 the scope of the collection was extended to cover sands and gravels used by railways for ballasting, etc. The statistics of stone production do not include the stone used in making cement or lime, but are as complete as possible for all other established stone quarries; nevertheless there is undoubtedly a large production of stone for foundation work, road-making, and railway construction of which no record is available.

The total value of the production of these structural products in 1914, according to the record obtained, was $26,009,227 as compared with a value of $30,809,752 in 1913, a decrease of $4,800,525 or over 15·5 per cent.

For several years previous to 1913 the aggregate imports of structural material had been increasing at a more rapid rate than the domestic production. In 1913 and 1914, however, the exports continued to increase, while the imports fell off very materially, the decrease being 10 per cent in 1913 and 33 per cent in 1914.

The apparent total consumption of products of this class based upon the statistics of production in conjunction with the records of exports and imports was in 1914 valued at $31,596,404 as compared with $39,916,642 in 1913, and $39,128,509 in 1912.

The approximate consumption in 1911 was slightly less than $30,000,000 and about $25,250,000 in 1910, and $20,350,000 in 1909. The decrease in consumption in 1914 was nearly 21 per cent as against increases of nearly 2 per cent in 1913, 30 per cent in 1912, 18 per cent in 1911, and 24 per cent in 1910.

A summary of the production, imports, exports, and consumption of structural materials and clay products in 1914, and in 1913, and the annual production from 1908 to 1912, are shown in tables herewith.

Structural Materials, Calendar Year, 1914.

—	Production.	Imports.	Exports.	Consumption.
	$	$	$	$
Cement, Portland	9,187,924	159,691	2,223	9,345,392
Clay products	6,871,957	4,467,140	48,073	11,291,024
Lime	1,360,628	211,123	16,927	1,554,824
Sand-lime brick	609,515	.....	.....	609,515
Sand and gravels	2,505,310	224,759	802,358	1,927,711
Slate	4,837	213,256	.....	218,093
Stone	5,469,056	1,252,869	72,080	6,649,845
	26,009,227	6,528,838	941,661	31,596,404

Structural Materials, Calendar Year, 1913.

—	Production.	Imports.	Exports.	Consumption.
	$	$	$	$
Cement, Portland	11,019,418	409,303	1,739	11,426,982
Clay products	9,504,314	6,760,752	52,333	16,212,733
Lime	1,609,398	238,271	29,234	1,818,435
Sand-lime brick	906,665	.....	.....	906,665
Sand and gravels	2,258,874	440,343	440,956	2,258,261
Slate	6,444	235,474	.....	241,918
Stone	5,504,639	1,640,849	93,840	7,051,648
	30,809,752	9,724,992	618,102	39,916,642

Production of Structural Materials, 1908-1912.

—	1908.	1909.	1910.	1911.	1912.
	$	$	$	$	$
Cement	3,709,954	5,345,802	6,412,215	7,644,537	9,106,556
Clay products	4,500,702	6,450,840	7,629,956	8,359,933	10,575,869
Lime	712,947	1,132,756	1,137,079	1,517,599	1,844,849
Sand-lime brick	152,856	201,650	371,857	442,427	1,020,386
Sand and gravels (exports)	161,387	256,166	407,974	408,110	1,512,099
Slate	13,496	19,000	18,492	8,248	8,939
Stone	2,088,613	3,127,135	3,650,019	4,328,757	4,726,171
Total	11,339,955	16,533,349	19,627,592	22,709,611	28,794,869

It will be noted that there was a falling off in the production of all products except sand and gravel, the increase in which, as in 1913, is probably chiefly due to the greater completeness of the record covering the past year. The financial stringency, the effects of which had already begun to be experienced in 1913, together with the conditions arising out of the war, caused a great falling off in building activities of all kinds, resulting in the decreased production shown.

According to apparently reliable records, the total value of the building permits in twenty-five eastern cities in Canada increased from a little over $26,000,000 in 1908 to over $78,000,000 in 1912, and nearly $90,000,000 in 1913. The aggregate value of building permits in 15 western cities increased from about $18,000,000 in 1908 to nearly $117,000,000 in 1912, but fell off in 1913 to $72,000,000. Thus, while structural activity increased more rapidly in western Canada, this section was the first to feel the effects of the set back. This would appear to be confirmed by the statistics of production of clay products in 1913, which showed an increase in eastern provinces but a very great decrease in all provinces west of the Great Lakes.

The total value of building permits in 40 cities in Canada during 1913, according to the above record, was thus about $160,000,000.

Statistics of the value of building permits issued in 1913 and 1914, as published in the Labour Gazette of April 1913, show the total value of permits in 86 localities in 1913 as about $171,000,000, and as about $107,000,000 in 1914, or a falling off of over 37 per cent during the past year. The same record shows building permits in 50 eastern cities in 1914 valued at $70,000,000, as against $97,000,000 in 1913, and permits in 36 western localities in 1914 valued at $36,000,000, as against $74,000,000 in 1913, a falling off of nearly 30 per cent in eastern Canada, as against over 50 per cent in western Canada.

CEMENT.

The total quantity of cement made in 1914, according to returns received from the manufacturers, was 8,727,269 barrels of 350 pounds net each (1,527,272 tons), as compared with 8,886,333 barrels made in 1913, a decrease of 159,064 barrels (27,836 tons), or nearly 2 per cent.

The total quantity of Canadian Portland cement sold in 1914 was 7,172,480 barrels (1,255,184 tons), as compared with 8,658,805 barrels (1,515,291 tons) in 1913, a decrease of 1,486,325 barrels (260,107 tons), or 17·2 per cent.

The total consumption of cement in 1914 including Canadian and imported cement was 7,270,502 barrels of 350 pounds net each (1,272,338 tons), as compared with 8,912,898 barrels (1,559,757 tons) in 1913, a decrease of 1,642,396 barrels (287,419 tons), or over 18 per cent.

The production of cement in Canada during the past few years, though all classed as Portland, has included an output of Puzzolan cement, made from blast furnace slag at Sydney, N.S., and a small production of "natural Portland," made at Babcock, Manitoba, 75 miles southwest of Winnipeg, on the Canadian Northern railway.

The production of cement in 1914 was derived from 24 operating plants, but of these three were in commission for a few days only, and of the others, seven were in operation less than five months. Five plants were idle throughout the year. The total daily capacity of 29 completed plants was 51,415 barrels, while of these the five plants idle throughout the year had a total daily capacity of 3,600 barrels.

The completed plants were distributed as follows: one in Nova Scotia, using blast furnace slag; three in Quebec, using limestone and clay; sixteen in Ontario, of which ten used marl and six limestone; two rock plants in Manitoba, one of which makes a "natural Portland"; four in Alberta including one marl plant and three limestone plants; and three rock plants in British Columbia.

The average number of men employed in Canadian cement plants during 1914 was 2,977 and the total wages paid $2,271,006. In 1913 the average number of men employed was 4,276 and wages paid $3,466,451.

Statistics of the total annual sales of natural rock and Portland cement since 1887 are shown in the following table:—

Annual Production* of Cement.

Calendar Year.	Natural rock cement.			Portland cement.			Totals.	
	Barrels.	Value.	Average value.	Barrels.	Value.	Average value.	Barrels.	Value.
		$	$ cts.		$	$ cts.		$
1887	.....	.....	.....	.....	.....	.....	69,843	81,909
1888	.....	.....	.....	.....	.....	.....	50,668	35,593
1889	90,474	69,790	0 77	Nil.	Nil.	.....	90,474	69,790
1890	87,521	74,822	0 85	14,695	17,583	1 20	102,216	92,405
1891	90,846	103,479	1 14	2,633	5,082	1 93	93,479	108,561
1892	88,187	94,912	1 08	29,221	52,751	1 81	117,408	147,663
1893	126,673	130,167	1 03	31,924	63,848	2 00	158,597	194,015
1894	72,965	74,842	1 03	35,177	69,795	1 98	108,142	144,637
1895	66,219	60,795	0 92	62,075	112,880	1 82	128,294	173,675
1896	70,705	60,500	0 86	78,385	141,151	1 80	149,090	201,651
1897	85,450	65,893	0 77	119,763	209,380	1 75	205,213	275,273
1898	87,125	73,412	0 84	163,084	324,168	1 99	250,209	397,580
1899	147,387	119,308	0 81	255,366	513,983	2 01	396,753	633,291
1900	125,428	99,994	0 80	292,124	562,916	1 93	417,552	662,910
1901	133,328	94,415	0 71	317,066	565,615	1 78	450,394	660,030
1902	127,931	98,932	0 77	594,594	1,028,618	1 73	722,525	1,127,550
1903	92,252	74,655	0 81	627,741	1,150,592	1 83	719,993	1,225,247
1904	56,814	50,247	0 88	910,358	1,287,992	1 41	967,172	1,338,239
1905	14,184	10,274	0 72	1,346,548	1,913,740	1 42	1,360,732	1,924,014
1906	8,610	6,052	0 70	2,119,764	3,164,807	1 49	2,128,374	3,170,859
1907	5,775	4,043	0 70	2,436,903	3,777,328	1 55	2,441,868	3,781,371
1908	1,044	815	0 78	2,665,289	3,709,139	1 39	2,666,333	3,709,954
1909	0	0	.....	4,067,709	5,345,802	1 31	4,067,709	5,345,802
1910	0	0	.....	4,753,975	6,412,215	1 35	4,753,975	6,412,215
1911	0	0	.....	5,692,915	7,644,537	1 34	5,692,915	7,644,537
1912	0	0	.....	7,132,732	9,106,556	1 28	7,132,732	9,106,556
1913	0	0	.....	8,658,805	11,019,418	1 27	8,658,805	11,019,418
1914	0	0	.....	7,172,480	9,187,924	1 28	7,172,480	9,187,924

* Quantities sold or used.

A comparison of the principal statistics of 1913 and 1914 showing the increase or decrease, as the case may be, is given in the next table:—

It will be noted that the output exceeded the sales by about 1,554,000 barrels and consequently stocks were increased during the year by about this amount. The average price per barrel at the mill for all plants was $1.28 in 1914 as compared with $1.27 in 1913, $1.27¾ in 1912, and $1.34 in 1911. The average price at the mill in the several provinces was: Quebec $1.17 in 1914 and $1.16 in 1913; Ontario $1.10 in 1914 and $1.08 in 1913; Manitoba $1.83 in 1914; Alberta $1.89 in 1914 and $2.04 in 1913, and British Columbia $1.67 in 1914, as against $1.71 in 1913.

The imports of cement in 1914 again show a falling off amounting to nearly 62 per cent from those of 1913, while the average price of imported cement decreased from $1.61 in 1913 to $1.50 in 1914.

Comparison of Production, Sales, and Imports of Portland Cement in 1913 and 1914.

	1913.	1914.	Increase.	Per cent.	Decrease.	Per cent.
Cement sold or used.....Bls.	8,658,805	7,172,480	.....	.....	1,486,325	17·2
Cement manufactured..... "	8,886,333	8,727,269	.....	.....	159,064	1·8
Stock on hand Jan. 1..... "	862,067	1,073,328	211,261	24·5	.....	.....
Stock on hand Dec. 31..... "	1,089,595	2,628,117	1,538,522	141·2	.....	.....
Value of cement sold or used.... $	11,019,418	9,187,924	.....	.....	1,831,494	16·6
Average price per barrel..... "	1·27	1·28	0·01	0·8	.....	.....
Wages paid..... "	3,466,451	2,271,006	.....	.....	1,195,445	34·5
Men employed..... No.	4,276	2,977	.....	.....	1,299	30·4
Imports of Portland cement.....Bls.	254,093	98,022	.....	.....	156,071	61·4
Value of cement..... $	409,303	147,158	.....	.....	262,145	64·0
Average price per barrel..... "	1·61	1·50	.....	.....	11 cents	6·83
Total consumption of cement in Canada.....Bls.	8,912,898	7,270,502	.....	.....	1,642,396	18·4

Of the total cement made in 1914, 641,869 barrels were made from marl, and 8,085,400 barrels from limestone and slag. In 1913, 1,491,131 barrels were made from marl and 7,395,202 barrels from limestone and slag. In 1912, 1,420,155 barrels were made from marl, and 5,720,849 barrels from limestone and slag; while in 1911, 1,626,857 barrels were made from marl and 4,050,682 barrels were made from limestone and slag. With the exception of the new plant at Marlboro, Alberta, practically all of the newer plants erected during the past few years have been limestone plants. The proportion of cement made from marl in 1908 was about 45 per cent of the total output as compared with 28 per cent in 1911, 20 per cent in 1912, 16·8 per cent in 1913, and 7·3 per cent in 1914.

Statistics of the annual production of Portland cement since 1897, showing the quantity made, quantity sold, stocks on hand at the end of the year, value of sales, etc., are shown in the next table.

Annual Production of Portland Cement.

Year.	Number of operating plants.	Quantity made.	Quantity sold.	On hand Dec. 31.	Value of sales.	Average per barrel.	Daily capacity.
		Barrels.	Barrels.	Barrels.	$	$ cts.	Barrels.
1897.....	.....	.....	119,763	.....	209,380	1 75	.....
1898.....	.....	.....	163,084	.....	324,168	1 99	.....
1899.....	.....	.....	225,366	.....	513,983	2 01	.....
1900.....	.....	.....	292,124	.....	562,916	1 91	.....
1901.....	4	360,160	317,066	58,094	565,615	1 78	.....
1902.....	8	562,335	594,594	33,446	1,028,618	1 73	3,900
1903.....	9	714,136	627,741	128,386	1,150,592	1 83	4,850
1904.....	10	908,990	910,358	112,051	1,287,992	1 41	.....
1905.....	13	1,541,568	1,346,548	306,466	1,913,740	1 42	8,000
1906.....	15	2,152,562	2,119,764	302,356	3,164,807	1 49	10,500
1907.....	17	2,491,513	2,436,093	354,435	3,777,328	1 55	14,400
1908.....	23	3,495,961	2,665,289	1,214,021	3,709,139	1 39	27,500
1909.....	22	4,146,708	4,067,709	1,777,238	5,345,802	1 31	23,050
1910.....	22	4,396,282	4,753,975	832,038	6,412,215	1 35	25,835
1911.....	24	5,677,539	5,692,915	903,589	7,644,537	1 34	28,810
1912.....	24	7,141,004	7,132,732	903,094	9,106,556	1 28	36,515
1913.....	27	8,886,333	8,658,805	1,089,595	11,019,418	1 27	50,540
1914.....	24	8,727,269	7,172,480	2,628,117	9,187,924	1 28	51,415

Imports and Exports:—The quantity of cement exported is not recorded but the value in 1914 is reported as $2,223 as against a value of exports in 1913 of $1,739 and $2,436 in 1912.

The imports of cement previous to 1901 were larger than the Canadian production, but gave way steadily to the increasing domestic output until 1909, during which year the imports amounted to 142,194 barrels, or about 3 per cent of the Canadian consumption. From 1910 to 1912 inclusive there was a steady increase in the importation of cement, the imports in 1912 being 1,434,413 barrels. During four and a half months of that year the duty was, on account of the scarcity in western Canada, reduced by one-half, and on May 31, 1913, a permanent reduction was made in the general tariff from 12½ cents to 10 cents per hundred pounds. The imports, however, have fallen to 254,093 barrels in 1913 and 98,022 barrels in 1914.

The United States has been the principal source of imports during the past few years and supplied about 71 per cent of the imports in 1914, as compared with 27 per cent from Great Britain. In 1913 about 68 per cent of the imports were from the United States, and 30 per cent from Great Britain. The imports of cement during 1913 and 1914 by countries, are shown in the next table.

Imports of Cement, 1913 and 1914.

	1913.				1914.			
	Cwt.	Per cent.	Value.	Average value.	Cwt.	Per cent.	Value.	Average value.
			$	Cts.			$	Cts.
Great Britain.....	270,747	30·4	94,844	35	93,709	27·3	35,517	38
United States....	603,044	67·8	305,165	51	241,910	70·5	108,487	45
Belgium.....	.....	.....	.....	.....	7,457	2·2	3,154	43
Other countries...	3,483	0·4	3,307	95	.....	.....	.....	.....
Hong Kong.....	12,050	1·4	5,987	49	.....	.....	.....	.....
Totals.....	889,324	100·0	409,303	46	343,076	100·0	147,158	43
Equivalent in barrels of 350 lbs..	254,093				98,022			

A permanent revision of the cement duties was made in the early part of 1913, and from May 13, 1913, the cement duties have been as follows:—

	British Preferential tariff.	Intermediate tariff.	General tariff.
Cement, Portland, and hydraulic or water lime, in barrels, bags, or casks, the weight of the package to be included in the weight for duty per hundred pounds.....	7 cents.....	10 cents.....	10 cents.....
Bags in which cement or lime mentioned in the next preceding item is imported.....	15 per cent....	20 per cent....	20 per cent....

This is equivalent to a duty under the general and intermediate tariffs of 35 cents per barrel on cement, and 8 cents on the bags, or a total of 43 cents per barrel.

Statistics of the exports of cement since 1891 and of imports since 1880 are given in the next two tables.

Exports of Cement.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1891	2,881	1899	2,733	1907	9,618
1892	938	1900	3,296	1908	34,591
1893	1,172	1901	1,514	1909	113,362
1894	482	1902	2,267	1910	12,914
1895	937	1903	2,851	1911	4,067
1896	1,328	1904	5,494	1912	2,436
1897	644	1905	3,143	1913	1,739
1898	2,117	1906	7,551	1914	2,223

Imports of Cement.

Fiscal Year.	Cement and Mfrs. of, N.E.S.*	Hydraulic cement.†			Portland cement.		
		Quantity.	Value.	Average value.	Quantity.	Value.	Average value.
	$	Barrels.	$	$ cts.	Barrels.	$	$ cts.
1880	28	10,034	10,306	1 03	.....	55,774	.....
1881	298	7,812	7,821	1 00	.....	45,646	.....
1882	86	11,945	13,410	1 12	.....	66,579	.....
1883	548	11,659	13,755	1 18	.....	102,537	.....
1884	1,236	8,606	9,514	1 11	.....	102,857	.....
1885	1,315	5,613	5,396	0 96	.....	111,521	.....
1886	1,851	6,164	6,028	0 98	.....	120,398	.....
1887	1,419	6,160	8,784	1 43	102,750	148,054	1 44
1888	5,787	5,636	7,522	1 33	122,402	177,158	1 45
1889	10,668	5,835	7,467	1 28	122,273	179,406	1 47
1890	5,443	5,440	9,048	1 66	192,322	313,572	1 63
1891	2,890	3,515	6,152	1 75	183,728	304,648	1 66
1892	3,394	2,214	2,782	1 26	187,233	281,553	1 50
1893	2,909	4,896	8,060	1 65	229,492	316,179	1 38
1894	2,618	1,054	985	0 93	224,150	280,841	1 25
1895	2,112	5,333	7,001	1 31	196,281	242,813	1 24
1896	3,672	5,688	8,948	1 57	204,407	242,409	1 19
1897	4,318	2,494	3,937	1 58	210,871	252,587	1 20
		Cwt.			Cwt.		
1898	3,263	16,033	7,097	0 44	1,073,058	355,264	0 33
1899	8,929	1,678	694	0 41	1,300,424	467,994	0 36
1900	10,452	10,418	4,711	0 45	1,301,361	498,607	0 38
1901	4,890	17,784	6,865	0 39	1,612,432	654,595	0 41
1902	12,234	29,585	17,755	0 60	1,971,616	833,657	0 42
1903	16,281	13,690	6,333	0 46	2,316,853	868,131	0 37
1904	14,305	12,088	5,391	0 45	2,476,388	995,017	0 40
1905	18,489	16,961	10,690	0 63	4,228,394	1,234,649	0 29
1906	27,858	10,794	4,034	0 37	2,848,582	963,839	0 34
1907	16,201	1,192	685	0 57	1,551,493	523,120	0 34
1908	12,418	18,860	6,710	0 36	2,427,381	852,041	0 35
1909	5,733	438	466	1 06	1,460,850	475,676	0 33
Calendar Year.							
1910	7,718	365	349	0 96	1,222,586	468,046	0 38
1911	7,430	26,655	6,107	0 23	2,316,707	834,879	0 36
1912	9,698	†	.....	.....	5,020,446	1,969,529	0 39
1913	17,729	†	.....	.....	889,324	409,303	0 46
1914	12,533	†	.....	.....	343,076	147,158	0 43

*Cement not elsewhere specified and manufactures of cement.
†From 1912 included in Portland cement.

Consumption of Cement:—The consumption of cement is represented practically by the domestic production together with the imports, the exports being so comparatively small as to be negligible. The total con-

sumption of cement in Canada in 1914 was 7,270,502 barrels (1,272,338 tons), made up of 7,172,480 barrels (1,255,184 tons) of Canadian cement, and 98,022 barrels (17,154 tons) of imported cement, the Canadian cement representing 98·7 per cent and the imported cement 1·3 per cent of the total.

In 1913 the total consumption of cement was 8,912,898 barrels (1,559,757 tons) made up of 8,658,805 barrels (1,515,291 tons) of Canadian cement, and 254,093 barrels (44,466 tons) of imported cement, the Canadian cement representing 97·1 per cent and the imported cement 2·9 per cent of the total.

In 1912 the total consumption of cement was 8,567,145 barrels (1,499,250 tons) made up of 7,132,732 barrels (1,248,228 tons) of Canadian cement, and 1,434,413 barrels (251,022 tons) of imported cement, the Canadian cement representing 83·3 per cent, and the imported cement 16·7 per cent of the total.

Annual Consumption of Portland Cement.

Calendar Year.	Canadian.		Imported.		Total.
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.
1901	317,066	36	555,900	64	872,966
1902	594,594	52	544,954	48	1,139,548
1903	627,741	45	773,678	55	1,401,419
1904	910,358	54	784,630	46	1,694,988
1905	1,346,548	59	918,701	41	2,265,249
1906	2,119,764	76	665,845	24	2,785,609
1907	2,436,093	78	672,630	22	3,108,723
1908	2,665,289	85	469,049	15	3,134,338
1909	4,067,709	97	142,194	3	4,209,903
1910	4,753,975	93	349,310	7	5,103,285
1911	5,692,915	90	661,916	10	6,354,831
1912	7,132,732	83·3	1,434,413	16·7	8,567,145
1913	8,658,805	97·1	254,093	2·9	8,912,898
1914	7,172,480	98·7	98,022	1·3	7,270,502

Nova Scotia:—There is but one cement plant in Nova Scotia located at Sydney and operated by the Sydney Cement Company, Limited. Puzzolan cement is made from blast furnace slag and lime.

Quebec:—This Province has three completed cement mills all operated by the Canada Cement Company, Limited; two situated near Montreal at Longue Pointe and Pointe aux Trembles, and the third in Hull. The Montreal mills have now a combined capacity of 13,800 barrels per day and the Hull mill 2,800 barrels per day. The total quantity of cement sold or used by producers during 1914 in this Province was 2,846,061 barrels valued at $3,331,601.

Ontario:—Ontario continues as the most important cement producing province in Canada having sixteen completed plants with a total daily capacity of 18,700 barrels at the end of 1914 of which twelve were operated during the year, three of these for a few days only. Of the twelve plants operated five used limestone and seven marl. The four idle mills included one lime-

stone and three marl plants. The names of the operating companies and location of plants are shown in an accompanying list of producers.

The total sales of cement in Ontario during 1914 were 2,775,142 barrels valued at $3,062,129, as compared with 3,992,988 barrels valued at $4,311,183 in 1913. There was thus a decrease in sales of 1,217,846 barrels or about 31 per cent.

The detailed statistics of production during 1913 and 1914 are shown in the next table.

Cement Production in Ontario, 1913 and 1914.

——	1913.	1914.	Increase.	Per cent.	Decrease.	Per cent.
Cement sold or used.....Bls.	3,992,988	2,775,142	.....	.....	1,217,846	30·5
Cement manufactured..... "	4,007,202	3,183,053	.....	.....	824,149	20·6
Stock on hand Jan. 1..... "	439,010	439,113	103	.....	.....	.....
Stock on hand Dec. 31..... "	453,224	847,024	393,800	86·9	.....	.....
Value of cement sold..... $	4,311,183	3,062,129	.....	.....	1,249,054	28·9
Wages paid..... "	1,098,197	721,287	.....	.....	376,910	34·3
Men employed.....No.	1,539	1,088	.....	.....	451	29·3
Total daily capacity of operating plants.....Bls.	17,750	.....	.....	.....	.....	.....

Manitoba:—The Commercial Cement Company of Winnipeg is operating a natural Portland cement plant at Babcock, 75 miles southwest of Winnipeg on the Canadian Northern railway. The capacity of the plant is reported as about 175 barrels per day. The Canada Cement Company completed and placed in operation its new plant near Winnipeg. This plant which was originally constructed as a clinker grinding mill was completed by the addition of a burning department. During 1913 all the cement produced at this plant was ground from clinker shipped from the Company's mill at Belleville, Ont. In the month of December, however, a commencement was made in the manufacture of clinker from raw materials obtained in the Province of Manitoba. The mill has a daily capacity of 3,500 barrels. Limestone is obtained from a property in township 28, range 10, west of the first meridian, and about 130 miles north of Winnipeg, on the Oak Point branch of the Canadian Northern railway.

Alberta:—Four cement plants were operated in this Province during 1914, located respectively at Exshaw, Calgary, Blairmore, and Marlboro, the first three being limestone plants and the last mentioned using marl. The mills at Exshaw and Calgary are operated by the Canada Cement Company and have a daily capacity of 4,500 barrels. The capacity of the mill at Blairmore, operated by the Rocky Mountains Cement Company is reported as having a daily capacity of 800 barrels. The new plant at Marlboro, 140 miles west of Edmonton, constructed to utilize the local marl deposits, has a daily capacity of 1,500 barrels. The total quantity of cement marketed by producers in 1914 was 641,395 barrels valued at $1,212,342.

In addition to the completed plants, two others are in course of construction, one at Blairmore by the Keystone Portland Cement Company, and one at Dauntless, near Medicine Hat, by the Canada Cement Company; the latter plant is being planned for a capacity of 1,000,000 barrels per annum.

British Columbia:—Two plants were in operation in this Province in 1913. At Tod Inlet the Vancouver Portland Cement Company's mill has a capacity of from 2,500 to 3,000 barrels per day. The Associated Cement Company (Canada) Ltd., successors to the Portland Cement Construction Company, Ltd., operated the new plant at Bamberton, also on Tod Inlet during five months, the daily capacity of this plant being about 2,000 barrels. In both cases the limestone, clay and shale are obtained in the vicintity of the works.

The plant at Princeton constructed by the British Columbia Portland Cement Co., Ltd., capacity 500 to 700 barrels per day, was idle throughout 1914.

The total sales of cement from British Columbia mills in 1914 were 499,151 barrels valued at $833,606.

The production of cement in Ontario has already been shown separately and the aggregate production in all other provinces during 1913 and 1914 is given in the next table.

Cement Production in Other Provinces, 1913 and 1914.

——	1913.	1914.	Increase.	Per cent.	Decrease.	Per cent.
Cement sold or used.....Bls.	4,665,817	4,397,338	.....	.....	268,479	5·75
Cement manufactured..... "	4,879,131	5,544,216	665,085	13·6	.....	.....
Stock on hand Jan. 1..... "	423,067	634,215	211,148	49·9	.....	.....
Stock on hand Dec. 31..... "	636,371	1,781,093	1,144,722	179·9	.....	.....
Value of cement sold..... $	6,708,235	6,125,795	.....	.....	582,440	8·7
Wages paid..... "	2,368,254	1,549,719	.....	.....	818,535	34·6
Men employed.....No.	2,737	1,889	.....	.....	848	31·0
Total daily capacity of operating plants.....Bls.	32,790	32,115	.....	.....	675	2·1

Following is a list of cement manufacturing companies:—

Name.	Location of Plant.	Head Office.
Sydney Cement Company, Ltd	Sydney, N.S.	Sydney, N.S.
Canada Cement Company, Ltd:—		Montreal, Que.
Montreal Mill No. 1	Longue Pointe, Que.	
Montreal Mill No. 2	Pt. aux Trembles, Que.	
International Mill, No. 3	Hull, Que.	
Owen Sound Mill, No. 9	Shallow Lake, Ont.	
Belleville Mill, No. 4	Belleville, O. (Pt. Ann)	
Lehigh Mill, No. 5	"	
Lakefield Mill, No. 7	Lakefield, Ont.	
Marlbank Mill, No. 6	Marlbank, Ont.	
Port Colborne Mill, No. 8	Port Colborne, Ont.	
Alberta Mill, No. 10	Calgary, Alberta.	
†Dauntless Mill	Dauntless, Alberta.	
Exshaw Mill, No. 12	Exshaw, Alberta.	
Winnipeg Mill, No. 13	Winnipeg, Man.	
The Union Portland Cement Co., Ltd	Owen Sound, Ont.	Owen Sound, Ont.
*The Imperial Cement Co., Ltd	" "	"
Hanover Portland Cement Co., Ltd	Hanover, Ont.	Hanover, Ont.
The Ontario Portland Cement Co., Ltd	Blue Lake, Ont.	Brantford, Ont.
The National Portland Cement Co., Ltd	Durham, Ont.	Durham, Ont.
Kirkfield Portland Cement Co., Ltd	Raven Lake, Ont.	Toronto, Ont.
*Superior Portland Cement Co., Ltd	Orangeville, Ont.	Orangeville, Ont.
*The Maple Leaf Portland Cement Co., Ltd	Atwood, Ont.	Listowel, Ont.
*The Crown Portland Cement Co., Ltd	Wiarton, Ont.	Toronto, Ont.
St. Marys Portland Cement Co., Ltd.	St. Marys, Ont.	" "
The Commercial Cement Co., Ltd	Babcock, Man.	Winnipeg, Man.
The Rocky Mountains Cement Co.	Blairmore, Alberta.	Calgary, Alberta.
†The Keystone Portland Cement Co.	" "	" "
The Edmonton Portland Cement Co., Ltd.	Marlboro, "	Edmonton, Alberta
Vancouver Portland Cement Co.	Tod Inlet, B.C.	Victoria, B.C.
*British Columbia Portland Cement Co., Ltd	Princeton, East, B.C.	Vancouver, B.C.
The Associated Cement Co. (Canada) Ltd	Bamberton, B.C.	Victoria, B.C.

† Mill not yet completed. *Idle.

CLAYS AND CLAY PRODUCTS.[1]

For a number of years a small quantity of fireclay has been produced and sold as such, and during the past two years there has been a small production of kaolin or china-clay from a deposit in the Province of Quebec. With these exceptions, practically all of the clay production in Canada is manufactured by the producer, and this report, therefore, treats almost altogether of the manufactured product.

The clay products made in Canada comprise brick of various kinds, including common and pressed, ornamental and fancy building brick, paving brick, firebrick, porous fireproofing brick and blocks, sewerpipe and drain tile, pottery and sanitary ware, the last two products chiefly from imported clays.

The total value of the clay products sold or marketed in 1914 was $6,871,957, as compared with a value of $9,504,314, in 1913, showing a decrease of $2,632,357, or nearly 28 per cent. During the five years preceding 1913 the annual production of clay products increased very rapidly having more than doubled in that period. In 1913, however, the financial stringency affected building operations to such an extent as to greatly reduce the demand for building brick. There was actually a considerable increase in the quantity of common and pressed building brick manufactured during that year, but a large falling off in sales, so that large stocks of brick must have remained in manufacturers' hands at the close of the year. In 1914 there was a large falling off both in quantities of brick made and in quantities sold, and the stocks of common and pressed brick on hand at the end of the year were reported as 242,206,000, or about 44 per cent of the number sold during the year. There was an increase in the value of the sales of ornamental brick, sewerpipe, tiles, and also of kaolin, but a falling off in all other products including paving brick, firebrick, terra-cotta, fireproofing, and pottery. The average number of

[1] Special investigations of the clay resources of Canada have been undertaken by the Department of Mines for a number of years and several special reports have been published thereon. The first work was undertaken by J. Walter Wells in 1905, under the direction of Dr. Haanel. In 1909, Dr. Heinrich Ries, Professor of Economic Geology in Cornell University, was engaged by the Geological Survey to carry on a general investigation of Canadian clays. Mr. Joseph Keele of the Geological Survey was associated with Dr. Ries in the work which has been continued during the past five years.

The following reports have been published dealing with clays.

Mines Branch, Department of Mines:—

"Clays and Shales of Manitoba: Their Industrial Value," Report on. By J. Walter Wells, 1905. (Out of print).

Geological Survey Branch, Department of Mines:—

"The Clay and Shale Deposits of Nova Scotia and Portions of New Brunswick." By H. Ries and J. Keele, 1911.

"Preliminary Report on the Clay and Shale Deposits of the Western Provinces." By H. Ries and J. Keele, 1912.

"The Clay and Shale Deposits of the Western Provinces, Part II." By H. Ries and J. Keele, 1913.

"Clay and Shale Deposits of New Brunswick." By J. Keele, 1914.

"Clay and Shale Deposits of the Western Provinces, Part III." By Heinrich Ries, 1914.

"Preliminary Report on the Clay and Shale Deposits of the Province of Quebec." By J. Keele, 1915 Memoir No. 64.

"Clay and Shale Deposits of the Western Provinces, Part IV." By H. Ries, 1915. Memoir No. 65.

"Clay and Shale Deposits of the Western Provinces, Part V. By J. Keele, 1915, Memoir No. 66.

men employed in 1914 was 8,339, as compared with 11,193 in 1913, and 10,415 in 1912. The total wages paid in 1914 were $3,201,380, as against $4,682,801 in 1913, and $4,488,957 in 1912.

Of the total value of the production in 1914, building and paving brick, including fireproofing, contributed $5,258,179, or about 76·5 per cent, as against $7,928,585 or 75 per cent of the total in 1913.

Sewerpipe and tile production in 1914 were valued at $1,470,839, or 21 per cent of the total, as against $1,374,458, or 13 per cent of the total in 1913. The total value of the production of pottery in 1914 was reported as $312,846 of which $35,371 only, is estimated as attributable to Canadian clays, and the balance to imported clays.

The value of the production of fireclays and fire brick from domestic clays was reported as $107,568. Compared with the previous year the production of building, paving and fireproofing brick shows a further decrease of about 33·7 per cent, whereas the production of sewerpipe shows an increase of nearly 7 per cent.

The average price of common and building brick for the whole of Canada in 1914 was $7.99 per M, as compared with $8.85 in 1913; $9.11 in 1912; $8.37 in 1911; and $8.13 in 1910. The average prices of pressed or front brick for the same years were respectively $11.91; $12.49; $12.86; $12.53; and $11.89, thus showing a general increase in the cost of building brick until 1912, falling off again in 1913 and 1914.

Ontario is by far the largest producer of clay products, having contributed in 1914 nearly 58 per cent of the total values marketed, as compared with 55 per cent in 1913.

Quebec contributed 18·5 per cent in 1914, as against 17 per cent the preceding year; Alberta 6·7 per cent in 1914, as compared with 9·4 per cent in 1913; Manitoba 4·6 per cent in 1914, as against 5 per cent in 1913, and British Columbia 6 per cent in 1914 as compared with 7 per cent in the previous year.

There was a falling off in the total sales of clay products in every province except New Brunswick in which a small increase was shown. As in the previous year, the falling off was most pronounced in the western provinces. The total decrease in the eastern provinces, including Ontario, amounted to 22·7 per cent, while in the western provinces, including Manitoba, it was 43 per cent.

The following tables of production and of imports of clay products furnish comparisons of particular interest. In the first place an estimate of the value of consumption of clay products is furnished. The total value of the imports in 1914 was $4,467,140 (not including certain items probably in part covering clay products) and after deducting a small export, a total approximate consumption of clay products valued at $11,291,024 is shown of which about 61 per cent was of domestic production.

In 1913 the approximate consumption was valued at $16,212,733 of which 58·6 per cent was of domestic production.

In 1912 the consumption was valued at $17,149,659; in 1911, $13,516,477; in 1910, $11,958,591; and in 1909, $9,696,324. In 1909 about 70 per cent of the consumption was of domestic production.

In the case of building brick the imports are small, compared with the home production, amounting to not much more than 5 per cent of the latter. The imports of paving brick are more than double and those of firebrick about seven times the Canadian production. The imports of drain tile and sewerpipe were about one-fourth the Canadian production.

Statistics of production in 1913 and 1914 of the several classes of clay products by provinces are shown in the following tables:—

Production of Clay Products by Provinces, 1914.

Province.	No. of active firms reporting.	No. of men employed.	Wages.	Common brick.				Pressed brick.			
				No. manufactured.	No. sold.	Value of sales.	Per M.	No. manufactured.	No. sold.	Value of sales.	Per M.
			$			$	$ cts.			$	$ cts.
Nova Scotia	11	337	109,174	14,579,936	12,574,546	97,510	7 75	148,280	98,200	1,502	15 32
New Brunswick	8	107	26,977	5,584,000	6,033,528	64,042	10 61	200,000	100,000	2,250	22 50
Quebec	45	1,371	524,189	132,711,357	118,278,889	874,961	7 40	10,568,446	8,540,060	135,900	15 91
Ontario	282	4,727	1,946,581	300,721,629	249,896,642	1,963,921	7 86	90,003,675	72,153,067	777,199	10 77
Manitoba	13	464	119,838	21,072,050	26,777,950	289,060	10 79	1,603,000	2,258,000	28,428	12 59
Saskatchewan	14	370	72,152	11,485,600	6,865,000	61,669	8 98	2,235,000	1,850,000	32,030	17 31
Alberta	26	507	211,592	20,298,000	23,190,257	183,696	7 92	6,918,100	6,979,500	94,358	13 52
British Columbia	20	456	190,877	19,385,000	13,896,950	119,002	8 56	1,539,000	1,655,951	43,889	26 50
Totals	419	8,339	3,201,380	525,837,572	457,513,762	3,653,861	7 99	113,215,501	93,634,858	1,115,556	11 91

Province.	Paving brick.		Ornamental.		Firebrick and fireclay shapes. Value.	Fireproofing and terra-cotta, etc. Value.	Pottery. Value.	Sewerpipe Value.	Tiles, drain. Value.	Kaolin. Value.	Total value. Clay products.
	No. sold.	Value.	No. sold.	Value.							
		$		$	$	$	$	$	$	$	$
Nova Scotia	.....	.....	.....	.....	13,204	484	.....	149,420	4,084	.....	266,204
New Brunswick	.....	.....	.....	.....	.....	.....	.....	.....	210	.....	66,502
Quebec	.....	.....	160,960	4,824	15,978	45,753	2,395	176,629	1,260	10,000	1,267,700
Ontario	2,566,000	47,534	1,121,236	15,504	.....	205,204	32,976	593,606	343,662	.....	3,979,606
Manitoba	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	317,488
Saskatchewan	.....	.....	.....	.....	4,650	.....	.....	.....	.....	.....	98,349
Alberta	7,000	245	272,300	3,264	.....	96,025	.....	83,036	1,575	.....	462,199
British Columbia	134,000	1,848	.....	.....	73,736	58,077	.....	101,808	15,549	.....	413,909
Totals	2,707,000	49,627	1,554,496	23,592	(b) 107,568	405,543	(a) 35,371	1,104,499	366,340	10,000	6,871,957

(a) There was also a production of $277,475 in 1914.
(b) There was also a production of $30,264 in 1914.

Production of Clay Products by Provinces, 1913.

Province.	No. of active firms reporting.	No. of men employed.	Wages.	Common brick.				Pressed brick.			
				No. manufactured.	No. sold.	Value of sales.	Per M.	No. manufactured.	No. sold.	Value of sales.	Per M.
			$			$	$ cts.			$	$ cts.
Nova Scotia	12	395	123,554	25,052,866	21,923,573	171,418	7 82	175,186	162,192	2,606	16 06
New Brunswick	8	173	34,540	7,158,240	6,139,152	61,369	10 00	50,000	50,000	600	12 00
Quebec	76	2,055	721,435	180,063,371	145,972,957	1,152,444	7 89	10,338,313	7,723,285	98,321	12 73
Ontario	271	5,260	2,393,357	401,055,851	349,846,487	3,105,256	8 88	89,494,500	80,183,044	920,773	11 48
Manitoba	17	1,134	283,143	67,078,850	39,559,320	443,498	11 21	6,031,079	4,101,000	70,860	17 28
Saskatchewan	13	479	116,312	23,169,000	16,475,000	162,370	9 86	2,750,000	1,700,000	27,450	16 15
Alberta	30	991	592,709	65,091,783	52,378,283	477,998	9 13	25,016,515	19,618,060	254,410	12 97
British Columbia	27	806	417,751	43,919,240	36,131,903	343,020	9 49	5,728,907	3,264,472	83,713	25 65
Totals	455	11,193	4,682,801	812,589,201	668,426,675	5,917,373	8 85	139,584,500	116,802,053	1,458,733	12 49

Province.	Paving brick.		Ornamental.		Firebrick and fireclay shapes. Value.	Fireproofing and terra-cotta, etc. Value.	Pottery. Value.	Sewerpipe. Value.	Tiles, drain.	Kaolin. Value.	Total value. Clay products.
	No. sold.	Value.	No. sold.	Value.							
		$		$	$	$	$	$	$	$	$
Nova Scotia	.....	.....	.....	.....	17,173	.....	.....	138,209	2,866	.....	332,272
New Brunswick	.....	.....	.....	.....	.....	.....	.....	.....	300	.....	62,269
Quebec	.....	.....	195,000	4,875	29,528	122,000	1,800	184,248	8,600	5,000	1,606,816
Ontario	3,995,180	69,840	635,855	9,810	.....	150,268	48,864	600,797	314,859	.....	5,220,467
Manitoba	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	514,358
Saskatchewan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	189,820
Alberta	100,000	3,000	44,500	738	.....	146,200	2,869	7,219	974	.....	893,408
British Columbia	113,115	2,829	.....	.....	96,037	42,919	.....	105,433	10,953	.....	684,904
Totals	4,208,295	75,669	875,355	15,423	(b)142,738	461,387	(a)53,533	1,035,906	338,552	5,000	9,504,314

(a) There was also a production of $315,383 from imported clays.
(b) There was also a production of $22,925 from imported clays.

Production of Clay Products, 1911, and 1912.

	1911.			1912.		
	Quantity.	Value.	Per M.	Quantity.	Value.	Per M.
		$	$ cts.		$	$ cts.
Bricks—						
Common.....No.	645,550,517	5,420,890	8 37	769,191,532	7,010,375	9 11
Pressed..... "	87,350,539	1,094,582	12 53	125,180,422	1,609,854	12 86
Paving..... "	5,220,400	79,444	15 22	4,579,500	85,989	18 78
Ornamental..... "	605,643	11,281	18 63	371,356	8,595	23 15
Firebrick and fireclay shapes, etc.....	.....	89,130	.....	.....	125,585	.....
Fireproofing, and architectural terra-cotta, etc.....	.....	409,585	.....	.....	448,853	.....
Pottery.....	.....	102,493	.....	.....	43,955	.....
Sewerpipe.....	.....	812,716	.....	.....	884,641	.....
Tiles, drain.....	.....	339,812	.....	.....	357,862	.....
Totals.....	.....	8,359,933	.....	.....	10,575,709	.....

Production of Clay Products by Provinces, 1909-1914.

Province.	1909.	1910.	1911.	1912.	1913.	1914.
	$	$	$	$	$	$
Nova Scotia.....	188,185	204,782	274,249	272,053	332,272	266,204
New Brunswick.....	65,570	56,475	38,000	54,910	62,269	66,502
Quebec.....	1,153,832	1,442,842	1,341,467	1,680,460	1,606,816	1,267,700
Ontario.....	3,425,841	3,667,810	3,916,575	4,864,700	5,220,467	3,979,606
Manitoba.....	559,008	781,605	834,428	1,018,051	514,358	317,488
Saskatchewan.....	145,516	160,850	226,958	332,943	189,820	98,349
Alberta.....	442,486	753,232	1,052,751	1,356,184	893,408	462,199
British Columbia.....	470,402	562,360	675,505	996,568	684,904	413,909
	6,450,840	7,629,956	8,359,933	10,575,869	9,504,314	6,871,957

Annual Value of Production of Clay Products, 1899-1914.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1899.....	2,988,099	1904.....	3,841,560	1909.....	6,450,840
1900.....	3,195,105	1905.....	4,709,842	1910.....	7,629,956
1901.....	3,382,706	1906.....	5,072,635	1911.....	8,359,933
1902.....	3,625,489	1907.....	5,772,117	1912.....	10,575,869
1903.....	4,034,289	1908.....	4,500,702	1913.....	9,504,314
				1914.....	6,871,957

Exports and Imports:—The total value of the exports of clay products in 1914 was $48,073, and included 1,486,000 building brick valued at $11,871, manufactures of clay valued at $26,866, and earthenware valued at $9,336.

In 1913 the total value of the exports was $52,333, which included 977,000 building brick valued at $8,579, manufactures of clay valued at $27,201, and earthenware valued at $16,553.

Exports of Clay Products.

Calendar Year.	Building brick.		Manufactures.	Earthenware.	Total.
	M.	Value.			
		$	$	$	$
1910	390	2,762	9,061	9,240	21,063
1911	394	3,977	2,071	6,101	12,149
1912	694	8,493	256	10,001	18,750
1913	977	8,579	27,201	16,553	52,333
1914	1,486	11,871	26,866	9,336	48,073

The imports of clays and clay products reached a total value, during the calendar year 1914, of $4,467,140, or equivalent to about 66 per cent of the domestic production. The total imports in 1913 were valued at $6,760,752 or about 71 per cent of the domestic production. The decrease in value of imports in 1914 was $2,293,612, or nearly 34 per cent.

Clay imports are classified by the Department of Customs under three main subdivisions, including: brick and tile; earthenware and chinaware; and clays. The imports of clays in 1914 were valued at $288,128 and included chiefly china-clay and fireclay with a small quantity of pipeclay and other clays not classified. The value of china-clay imported was $150,881 and of fireclay $90,233, the former an increase, the latter a decrease from the imports of the previous year. In 1913 the total value of the imports of clays was $324,290 and included china-clay valued at $149,337 and fireclay at $143,399. The imports of these clays have varied considerably from year to year and the present imports of china-clay are the highest record, while the imports of fireclay were the lowest since 1909.

The imports classified under brick and tile were valued in 1914 at $1,986,790 as compared with a value of $3,121,592 in 1913. A large portion of these imports are made up of firebrick, nearly 35 per cent in 1914. There is also a considerable import of building and paving brick, of sewerpipe and drain tile, and of building blocks, and manufactures of clay not specified.

The imports of earthenware and chinaware, of which the most important class is tableware, were valued in 1914 at $2,192,222, as against $3,314,870 in 1913. These imports are chiefly of a class of goods not manufactured in Canada and for which the raw materials are not as yet obtainable from Canadian sources.

The detailed record of imports during the calendar years 1909 to 1914 is shown in the next table.

Imports of Clay Products, Calendar Years 1909 to 1914.

Imports.	1909.	1910.	1911.	1912.	1913.	1914.
	$	$	$	$	$	$
Brick and tile:—						
Bath brick	1,495	2,290	2,623	1,927	2,690	1,894
Building brick	195,360	274,482	475,865	763,470	575,269	353,353
Paving brick	139,366	124,994	164,292	160,663	176,497	145,063
Firebrick, of a class or kind not made in Canada	485,994	811,927	814,414	953,621	976,097	535,712
Drain tile, not glazed	2,785	4,485	5,640	4,018	12,156	2,941
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed	170,280	175,599	382,929	507,024	465,997	338,533
Manufactures of clay, n.o.p.	254,170	361,996	523,998	818,467	(a)912,886	(b)609,294
Total	1,249,450	1,755,773	2,369,761	3,209,190	3,121,592	1,986,790
Earthenware and chinaware:—						
Brown or coloured earthenware and stoneware, and Rockingham ware	36,673	53,413	52,100	62,161	70,632	71,083
C. C. or cream coloured ware, decorated, printed or sponged, and all earthenware, n.o.p.	219,936	202,475	184,291	291,804	264,090	163,431
Demijohns, churns, or crocks	8,888	6,607	4,933	18,404	32,599	25,935
Tableware of china, porcelain, white granite or iron-stoneware	1,212,365	1,545,538	1,718,582	2,068,362	2,185,601	1,437,175
China and porcelain ware, n.o.p.	87,467	95,509	62,025	71,751	43,696	30,006
Tiles or blocks of earthenware or stone prepared for mosaic flooring	56,974	90,524	123,203	160,082	173,445	104,285
Earthenware tiles, n.o.p.	81,393	125,772	154,351	239,391	296,791	186,161
Manufactures of earthenware, n.o.p.	78,063	163,278	217,051	183,001	248,016	174,146
Total	1,781,759	2,283,116	2,516,536	3,094,956	3,314,870	2,192,222
Clays:—						
China-clay ground, or unground	100,066	142,125	125,768	127,402	149,337	150,881
Fireclay, ground or unground	86,161	124,293	125,199	140,500	143,399	90,233
Pipeclay, ground or unground	310	114	1,786	234	385	829
Clays, all other, n.o.p.	29,793	25,976	17,494	20,258	31,169	46,185
Totals	216,330	292,508	270,247	288,394	324,290	288,128
Grand total	3,247,539	4,331,397	5,156,544	6,592,540	6,760,752	4,467,140
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks and laundry tubs of any material	211,837	262,667	285,847	382,920	477,133	359,288
Chalk, china or cornwall stone, cliff stone and feldspar, fluorspar, magnesite, ground or unground	96,747	121,959	147,640	167,990	164,879	113,211

(a) Includes Building Blocks (9 mos.) $356,366; Firebrick, n.o.p. (9 mos.) $216,760; and manufactures of clay, n.o.p., $339,760.
(b) Includes Building Blocks (12 mos.) $276,817; Firebrick, n.o.p. (12 mos.) $154,421; and manufactures of clay, n.o.p., $178,056.

In addition to the imports of clay products there is also shown in the preceding table a considerable annual importation of 'chalk, china or cornwall stone, cliff stone and feldspar, fluorspar, magnesite ground or unground,' much of which is no doubt used in connexion with the manufacture of clay products. The value of these imports during the calendar year 1914 was $113,211; of which $104,212 was from the United States, $5,396 from Great Britain, and $3,603 from other countries. The value of the imports under this item during the calendar year 1913 was $164,879. There is also shown an annual importation of 'baths, bath-tubs, basins, closets, lavatories, urinals, sinks, and laundry tubs of any material,' the value of such imports during 1914 being $359,288, as compared with $477,133 during the year 1913.

Imported clay products are derived chiefly from Great Britain and the United States, although considerable quantities of earthenware, china and poreclain ware, white granite or iron-stoneware, etc., are brought from Germany, France, Austria-Hungary, and Japan. The imports during the fiscal year, showing the country of origin, are shown in the next table. Of the brick and tile imported 84 per cent was from the United States and 15·6 per cent from Great Britain; and only $11,079 worth from other countries. Of the earthenware and chinaware, 60 per cent was imported from Great Britain; 18 per cent from the United States; 10 per cent from Germany; 6 per cent from France; 3 per cent from Japan, and considerable values also from Austria-Hungary, and other countries. The crude clays were imported principally from Great Britain and the United States.

Imports of Clay Products During the Twelve Months Ending March 1914, Showing Countries of Origin.

Imports.	Great Britain.	United States.	Germany.	France.	Austria-Hungary.	Japan.	Other countries.	Total.
Brick and tile:—	$	$	$	$	$	$	$	$
Bath brick	2,598	226	.....	.....	.....	.....	.....	2,824
Building brick	28,067	499,596	.....	.....	.....	.....	.....	527,663
Building blocks	50,930	375,796	.....	194	.....	.....	.....	426,920
Paving brick	73,146	98,471	.....	.....	.....	.....	.....	171,617
Fire brick, of a class or kind not made in Canada	130,179	743,860	2,106	2,947	.....	.....	1,626	850,718
Fire brick, n.o.p.	82,094	176,286	.....	965	.....	.....	98	259,443
Drain tile, not glazed	3,186	6,937	.....	1,053	.....	.....	.....	11,176
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed	54,696	399,830	.. ..	.. ..	.....	.....	.....	454,526
Manufactures of clay, n.o.p.	34,646	206,539	1,502	312	242	.....	34	243,275
Total	459,542	2,477,541	3,608	5,471	242	.....	1,758	2,948,162
Earthenware and chinaware:—								
Brown or coloured earthenware and stoneware, and Rockingham ware	21,501	51,585	364	169	634	42	195	74,490
C. C. or cream coloured ware, decorated, printed or sponged, and all earthenware, n.o.p.	174,499	46,444	23,333	2,646	2,318	11,214	4,065	264,519
Demijohns, churns, or crocks	2,127	27,993	30	8	57	.....	.....	30,215
Tableware of china, porcelain, white granite or iron-stoneware	1,425,593	40,871	258,702	180,199	71,060	82,712	11,868	2,071,005
Chinaware, to be silver mounted, imported by manufacturers of silverware	1,217	357	.....	15	.....	.....	.....	1,589
China and porcelain ware, n.o.p.	15,949	11,592	7,184	1,142	449	2,956	888	40,160
Tiles or blocks of earthenware or stone prepared for mosaic flooring	31,196	125,409	637	2,410	.....	.....	226	159,878
Earthenware tiles, n.o.p.	145,012	124,464	318	814	149	.....	455	271,212
Manufactures of earthenware, n.o.p.	56,505	142,597	9,394	2,184	283	5,507	1,767	218,237
Total	1,873,599	571,312	299,962	189,587	74,950	102,431	19,464	3,131,305
Clays:—								
China-clay, ground or unground	66,211	96,251	.....	.....	.....	.....	.....	162,462
Fireclay, ground or unground	24,136	100,676	622	.....	.....	.....	223	125,657
Pipeclay, ground or unground	252	237	.....	.....	.....	.....	60	549
Clays, all other, n.o.p.	1,589	29,721	7	.....	.....	.....	.....	31,317
Total	92,188	226,885	629	.....	.....	.....	283	319,985
Grand total	2,425,329	3,275,738	304,199	195,058	75,192	102,431	21,505	6,399,452
Per cent of total	37·90	51·19	4·75	3·05	1·17	1·60	0·34	100·00
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks, and laundry tubs of any material	163,089	288,714	37	815	.....	.....	93	452,748
Chalk, china or cornwall stone, cliff stone, and feldspar, fluorspar, magnesite, ground or unground	21,322	149,963	1,337	326	80	.....	2,982	176,010

A record of the total annual value of the imports of clay products since 1900 is shown in the following table.

Imports of Clay Products (total value) 1900-14.

Fiscal Year.	Brick and tile.**	Earthenware and chinaware.	Clays.	Totals.
	$	$	$	$
1900	145,914	959,526	122,965	1,228,405
1901	133,343	1,114,677	141,251	1,389,271
1902	172,281	1,275,093	140,521	1,587,895
1903	157,783	1,406,610	176,416	1,740,809
1904	259,421	1,611,356	144,706	2,015,483
1905	761,756	1,636,214	176,805	2,574,775
1906	1,000,372	1,692,359	220,504	2,913,235
1907*	770,686	1,422,880	178,240	2,371,806
1908	1,079,556	2,190,784	267,720	3,538,060
Calendar Year.				
1909	1,249,450	1,781,759	216,330	3,247,539
1910	1,755,773	2,283,116	292,508	4,331,397
1911	2,369,761	2,516,536	270,247	5,156,544
1912	3,209,190	3,094,956	288,394	6,592,540
1913	3,121,592	3,314,870	324,290	6,760,752
1914	1,986,790	2,192,222	288,128	4,467,140

* 9 months ending March, 1907.
** Includes fireclay classified as "for use in process of manufactures."

The Canadian Customs duties affecting clays and clay products, in force during 1914, are shown as follows:—

Canadian Customs Duties on Clay Products.

(From the Customs Tariff, 1907, revised 1910).

Item.	British Preferential tariff.	Intermediate tariff.	General tariff.
281 Firebrick of a class or kind not made in Canada	Free.	Free.	Free.
282 Building brick, paving brick, and mfgs. of clay or cement (n.o.p.)	12½ %	20 %	22½ %
283 Drain tiles not glazed	15 "	17½ "	20 "
284 Drain pipes, sewerpipes, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks glazed or unglazed, earthenware tiles (n.o.p.)	25 "	32½ "	35 "
285 Tiles or blocks of earthenware or of stone prepared for mosaic flooring	20 "	27½ "	30 "
286 Earthenware and stoneware, viz., demijohns, churns, or crocks	20 "	27½ "	30 "
287 Tableware of china, porcelain, white granite or ironstone	15 "	27½ "	27½ "
288 Earthenware and stoneware, brown or coloured and Rockingham ware "C.C." or cream coloured ware, decorated, printed or sponged, and all earthenware (n.o.p.)	20 "	27½ "	30 "
289 Closets, urinals, basins, lavatories, baths, bath-tubs, sinks, and laundry tubs of earthenware, stone, cement or clay or of other material	20 "	30 "	35 "
295 Clays, including china-clays, fireclay and pipe-clay, not further manufactured than ground; ganister and sand; gravels; earths, crude only	Free.	Free.	Free

CLAY BUILDING BRICK.

The total sales from Canadian plants of clay building brick including the common and pressed brick, but excluding ornamental, paving, firebrick, and fireproofing brick, are shown by provinces, for the past four years, in the following tables:—

In 1914 the total sales were 551,148,620, valued at $4,769,417, made up of 457,513,762 common, valued at $3,653,861, or an average value per thousand of $7·99; and 93,634,858 pressed brick, valued at $1,115,556, or an average value per thousand of $11.91. In addition to the common and pressed brick there was a production of ornamental brick of 1,554,496, valued at $23,592, and a production of fireproofing brick and architectural terra-cotta valued at $405,543.

In 1913 the total sales were 785,228,728 brick, valued at $7,376,106, made up of 668,426,675 common, valued at $5,917,373 or an average value per thousand of $8·85; and 116,802,053 pressed brick, valued at $1,458,733 or an average value per thousand of $12.49. In addition to the common and pressed brick there were sales of ornamental brick of 875,355 valued at $15,423, and of fireproofing brick and architectural terra-cotta valued at $461,387.

In 1912 the total sales were 894,371,954, valued at $8,620,229, made up of 769,191,532 common, valued at $7,010,375, or an average value per thousand of $9.11; and 125,180,422 pressed brick, valued at $1,609,854,or an average value per thousand of $12.86. In addition to the common and pressed brick, there was a production of ornamental brick of 371,356 valued at $8,595, and a production of fireproofing brick and architectural terra-cotta valued at $448,853.

Production of Clay Building Brick (Common and Pressed) 1913 and 1914.

Province.	1913.				1914.			
	No. of active firms reporting.	No. sold.	Value.	Per cent of total value.	No. of active firms reporting.	No. sold.	Value.	Per cent of total value.
			$				$	
Nova Scotia.....	12	22,085,765	174,024	2·3	11	12,672,826	99,012	2·1
New Brunswick..	8	6,189,152	61,969	0·8	8	6,133,528	66,292	1·4
Quebec.....	76	153,696,242	1,250,765	17·0	45	126,818,949	1,010,861	21·2
Ontario.....	271	430,029,531	4,026,029	54·6	282	322,049,709	2,741,120	57·5
Manitoba.....	17	43,660,320	514,358	7·0	13	29,035,950	317,488	6·7
Saskatchewan....	14	18,175,000	189,820	2·6	14	8,715,000	93,699	1·9
Alberta.....	30	71,996,343	732,408	9·9	26	30,169,757	278,054	5·8
British Columbia.	27	39,396,375	426,733	5·8	20	15,552,901	162,891	3·4
Totals.....	455	785,228,728	7,376,106	100·0	419	551,148,620	4,769,417	100·0

Production of Clay Building Brick (Common and Pressed) 1911 and 1912.

Province.	1911.			1912.		
	No. sold.	Value.	Per cent of total value.	No. sold.	Value.	Per cent of total value.
		$			$	
Nova Scotia	23,530,000	141,640	2·17	18,822,960	130,108	1·5
New Brunswick	4,400,000	38,000	0·58	5,780,000	53,350	0·6
Quebec	122,041,580	1,033,270	15·86	173,336,557	1,446,880	16·8
Ontario	369,004,371	3,028,046	46·48	423,670,184	3,807,195	44·2
Manitoba	81,400,000	826,928	12·69	87,178,937	1,012,801	11·7
Saskatchewan	21,071,660	224,758	3·45	30,538,771	332,943	3·9
Alberta	71,772,930	779,001	11·96	93,759,980	1,105,912	12·8
British Columbia	39,680,515	443,829	6·81	61,284,565	731,040	8·5
Totals	732,901,056	6,515,472	100·00	894,371,954	8,620,229	100·0

Very large stocks of brick were reported as being in manufacturers' hands at the close of 1914, the total number being 242,206,000 brick or equivalent to about 44 per cent of the year's sales.

The record of stocks on hand by provinces is shown in the following table:—

Common and Pressed Brick held in Stock by Manufacturers, December 31, 1914.

Province.	Common brick.	Pressed brick.	Total.
	No.	No.	No.
Nova Scotia	4,690,000	50,000	4,740,000
New Brunswick	2,830,000	100,000	2,930,000
Quebec	42,494,000	2,851,000	45,345,000
Ontario	107,325,000	23,369,000	130,694,000
Manitoba	20,140,000	760,000	21,000,000
Saskatchewan	7,503,000	1,140,000	8,643,000
Alberta	10,483,000	8,549,000	19,032,000
British Columbia	8,264,000	1,558,000	9,822,000
Total	203,729,000	38,377,000	242,206,000

The exports of building brick since 1891 and the imports since 1880 are shown in the following tables. The exports have never been large, averaging for a number of years about $6,000 per annum. The exports fell off somewhat from 1909 to 1911, but increased again to a value of $11,871 in 1914.

The annual imports for a number of years previous to 1903 averaged only about $20,000 in value; during the past ten years, however, the imports have rapidly increased from $100,000 to over $760,000 in 1912. During

the calendar year 1914 the imports were 30,022,000 brick, valued at $353,353, of which 1,794,000 valued at $20,505, or an average of $11.43 per thousand, were imported from Great Britain, and 28,228,000 valued at $332,848 or an average of $11.79 per thousand, from the United States. The imports during the year 1913 were 56,846,000 brick valued at $575,269, of which 2,427,000, valued at $28,645, or an average of $11.80 per thousand, were imported from Great Britain, and 54,419,000 valued at $546,624, or an average of $10.04 per thousand, from the United States. In both 1913 and 1914 there was a considerable falling off in the imports of brick from Great Britain and the United States, and an increase in the average price of the brick imported.

Exports of Building Brick.

Calendar Year.	M.	Value.	Calendar Year.	M.	Value.	Calendar Year.	M.	Value.
		$			$			$
1891	246	1,163	1899	172	1,351	1907	802	6,193
1892	1,963	12,192	1900	546	4,528	1908	2,344	9,047
1893	6,073	44,110	1901	646	5,189	1909	365	2,255
1894	1,095	7,405	1902	2,110	12,786	1910	390	2,762
1895	1,655	8,665	1903	891	5,699	1911	394	3,977
1896	983	5,678	1904	696	5,357	1912	694	8,493
1897	573	2,679	1905	754	5,888	1913	977	8,579
1898	65	442	1906	697	6,541	1914	1,486	11,871

Imports of Building Brick.

Fiscal Year.	M.	Value.	Fiscal Year.	M.	Value.	Fiscal Year.	M.	Value.
		$			$			$
1880	340	2,067	1892	621	5,075	1904	13,455	117,468
1881	415	4,281	1893	1,489	14,108	1905	25,515	168,122
1882	3,500	24,572	1894	2,220	18,320	1906	21,934	194,897
1883	1,448	14,234	1895	575	4,705	1907 (9 mos.)	8,495	88,144
1884	3,263	20,258	1896	1,057	23,189	1908	13,790	139,105
1885	3,108	14,632	1897	2,094	10,336	1909	10,894	103,773
1886	983	5,929	1898	639	6,652	Calendar Year.		
1887	276	2,440	1899	2,611	21,306	1910	29,049	274,482
1888	2,483	20,720	1900	1,792	19,305	1911	51,102	475,865
1889	2,590	24,585	1901	2,800	20,677	1912	81,425	763,470
1890	1,933	12,500	1902	4,087	33,802	1913	56,846	575,269
1891	589	9,744	1903	2,881	28,493	1914	30,022	353,353

Prices:—The price of brick varies greatly with the quality, locality, market or demand. The values as given in the table of production are those at the yard or kiln and do not include costs of delivery. They do not, therefore, represent the price to the consumer. The average price of common brick at the kiln in 1914 according to these returns was $7.99, as compared with $8.85 in 1913 and $9.11 in 1912; and of pressed brick $11.91 in 1914, as compared with $12.49 in 1913, and $12.86 in 1912.

In the Maritime Provinces during 1914 the price of common brick varied from $7.50 to $11.00, averaging for Nova Scotia $7.75 and for New Brunswick $10.61.

In Quebec the price of common brick varied between $5 and $8.50, averaging $7.40 while the price of pressed brick averaged $15.91. The average price of common brick in Ontario was $7.86, the limits of variation being $6.00 and $10.50; while for pressed brick the average was $10.77 and the variation from $10.00 to $15.00.

In all the western provinces common brick ranged from about $8.00 to $11.50, averaging $10.79 in Manitoba, $8.98 in Saskatchewan, $7.92 in Alberta, and $8.56 in British Columbia. Pressed brick ranged from $11.00 to $27.00 in individual yards, averaging $12.59 in Manitoba, $17.31 in Saskatchewan, $13.52 in Alberta, and $26.50 in British Columbia.

The following table shows the average values at the kilns, of common and pressed brick, during 1912, 1913, and 1914, as furnished by the producers.

Average Prices per Thousand of Common and Pressed Brick.

	Common brick.			Pressed brick.		
	1912.	1913.	1914.	1912.	1913.	1914.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Nova Scotia	6 86	7 82	7 75	16 00	16 06	15 32
New Brunswick	9 22	10 00	10 61	10 00	12 00	22 50
Quebec	8 08	7 89	7 40	12 04	12 73	15 91
Ontario	8 69	8 88	7 86	10 40	11 48	10 77
Manitoba	11 47	11 21	10 79	15 13	17 28	12 59
Saskatchewan	9 73	9 86	8 98	16 63	16 15	17 31
Alberta	10 69	9 13	7 92	14 77	12 97	13 52
British Columbia	9 61	9 49	8 56	27 53	25 65	26 50
Canada	9 11	8 85	7 99	12 86	12 49	11 91

According to trade journals, the following retail prices were quoted during the year:—

Toronto:—Grey stock brick were quoted uniformly throughout the year at $11.50 per M and red stock brick at $12; Don Valley No. 1 dry pressed and buff brick $17 at the yard; Port Credit brick, f.o.b. Port Credit, wire cut, $10 per M, and pressed brick $12 to $15 according to grade.

Winnipeg:—Kiln run brick were quoted throughout the year at $13, sewer and chimney brick at $14, and veneer brick at $15. Pressed brick were quoted at from $25 to $50.

Production of Brick by Provinces.

Nova Scotia and New Brunswick:—The total sales in Nova Scotia were 12,672,826 brick, valued at $99,012, as compared with sales of 22,085,765 brick, valued at $174,024 in 1913. The chief sources of production were: Annapolis Royal, Pugwash, Elmsdale, Amherst, Orangedale, and New Glasgow.

The total sales in New Brunswick were 6,133,528 brick, valued at $66,292, as compared with 6,189,152 brick, valued at $61,969 in 1913; and the principal sources of production were Fredericton, St. John, Chatham, and Lewisville.

Quebec:—The total sales of brick in Quebec in 1914 were 126,818,949, valued at $1,010,861, comprising 118,278,889 common brick, valued at $874,961, or $7.40 per thousand, and 8,540,060 pressed brick, valued at $135,900, or $15.91 per thousand.

The sales in 1913 were 153,696,242, valued at $1,250,765, comprising 145,972,957 common brick, valued at $1,152,444, or $7.89 per thousand, and 7,723,285 pressed brick, valued at $98,321, or $12.73 per thousand.

While brick-making is carried on at many places in the Province, the principal plants are located at Montreal, Laprairie, Sherbrooke, Quebec, and Deschaillons.

Ontario:—This Province is credited in 1914 with over 57 per cent of the brick production of Canada, the total sales as reported by 282 firms being 322,049,709 brick, valued at $2,741,120, and including 249,896,642 common brick, valued at $1,963,921 or an average of $7.86 per thousand, and 72,153,067 pressed brick, valued at $777,199 or an average of $10.77 per thousand.

The total sales in 1913 were 430,029,531 brick, valued at $4,026,029, and comprised 349,846,487 common brick, valued at $3,105,256, or an average of $8.88 per thousand, and 80,183,044 pressed brick, valued at $920,773, or an average of $11.48 per thousand.

The city of Toronto and vicinity, including the counties of York, Peel, and Halton, is the principal brick-making section, and in 1914 produced about 63 per cent of the Ontario production, or about 36 per cent of the total Canadian production of brick. The county of Wentworth, comprising the city of Hamilton and vicinity, produced nearly 6 per cent of the Ontario production. The Ottawa district, including the counties of Russell and Carleton, produced about 7 per cent.

The greater part of the pressed brick reported as such was made in Toronto and Hamilton districts.

The production by principal counties in 1914 and 1913 is shown in the accompanying tables.

Sale of Common and Pressed Brick in Ontario by Principal Counties, 1914.

County.	Common.			Pressed.			Total value.	Per cent
	No.	Value.	Per M.	No.	Value.	Per M.		
		$	$ cts.		$	$ cts.	$	
York	100,565,314	807,673	8 03	4,979,600	72,192	14 50	879,865	32·10
Peel	39,981,156	278,242	6 96	14,566,450	152,435	10 47	430,677	15·71
Halton	.....	.....	.....	40,404,037	424,627	10 51	424,627	15·49
Wentworth	18,846,955	117,896	6 26	4,329,240	39,059	9 02	156,955	5·73
Carleton	10,027,000	95,908	9 56	.....	.....	.....	95,908	3·50
Russell	11,574	79,295	6 85	1,355,079	15,702	11 59	94,997	3·47
Thunder Bay District	5,049,176	46,696	9 25	2,395,873	31,056	12 96	77,752	2·84
Middlesex	6,678,511	56,743	8 50	1,750,000	19,800	11 31	76,543	2·79
Kent	6,498,600	51,074	7 86	.....	.....	.....	51,074	1·86
Waterloo	5,340,321	37,719	7 06	.....	.....	.....	37,719	1·38
Lincoln	2,522,325	22,956	9 10	734,788	8,450	11 50	31,406	1·14
Peterboro	3,000,000	30,000	10 00	.....	.....	.....	30,000	1·09
Simcoe	3,150,000	26,313	8 35	.....	.....	.....	26,313	0·96
Renfrew	2,503,775	22,595	9 02	.....	.....	.....	22,595	0·82
Essex	2,688,000	18,863	7 02	.....	.....	.....	18,863	0·69
Nipissing	2,050,000	18,850	9 20	.....	.....	.....	18,850	0·69
Grey	2,094,283	16,748	8 00	.....	.....	.....	16,748	0·61
Total, 17 counties	222,569,416	1,727,571	7 76	70,515,067	763,321	10 82	2,490,892	90·87
Total, other counties,	27,327,226	236,350	8 65	1,638,000	13,878	8 47	250,228	9·13
Total, Ontario	249,896,642	1,963,921	7 86	72,153,067	777,199	10 77	2,741,120	100·00

Sale of Common and Pressed Brick in Ontario by Principal Counties, 1913.

County.	Common.			Pressed.			Total value.	Per cent.
	No.	Value.	Per M.	No.	Value.	Per M.		
		$	$ cts.		$	$ cts.	$	
York	155,311,199	1,376,191	8 86	5,641,285	84,619	15 00	1,460,810	36·28
Halton	.....	.....	.....	48,703,150	553,926	11 37	553,926	13·76
Wentworth	37,414,652	320,400	8 56	12,633,406	127,528	10 09	447,928	11·13
Peel	20,206,400	163,688	8 10	9,861,341	109,097	11 06	272,785	6·78
Algoma	15,105,673	149,058	9 87	1,294,878	21,015	16 23	170,073	4·22
Carleton	13,765,000	138,740	10 08	.....	.....	.....	138,740	3·45
Russell	11,653,000	80,849	6 94	848,000	10,176	12 00	91,025	2·26
Kent	9,762,500	76,943	7 88	.....	.....	.....	76,943	1·91
Grey	8,860,556	69,573	7 85	.....	.....	.....	69,573	1·73
Waterloo	7,255,672	67,330	9 28	.....	.....	.....	67,330	1·67
Middlesex	6,802,197	64,042	9 42	.....	.....	.....	64,042	1·59
Nipissing	6,273,000	64,030	10 21	.....	.....	.....	64,030	1·59
Lincoln	4,998,893	45,882	9 18	1,200,984	14,412	12 00	60,294	1·50
Simcoe	4,846,000	40,600	8 38	.....	.....	.....	40,600	1·01
Renfrew	4,226,000	38,134	9 02	.....	.....	.....	38,134	0·95
Essex	4,649,775	37,515	8 07	.....	.....	.....	37,515	0·93
Brant	2,993,200	35,213	11 77	.....	.....	.....	35,213	0·87
Total, 17 counties	314,123,717	2,768,188	8 81	80,183,044	920,773	11 48	3,688,961	91·63
Total, other counties	35,722,770	337,068	9 44	.....	.....	.....	337,068	8·37
Total, Ontario	349,846,487	3,105,256	8 88	80,183,044	920,773	11 48	4,026,029	100·00

The annual production of common and pressed brick as ascertained by the Ontario Bureau of Mines, is shown in the following table. The figures differ only slightly from those reported directly to the Mines Branch.

Building Brick Made in Ontario Since 1898.

	Common brick.			Pressed brick.		
	M.	Value.	Average per M.	M.	Value.	Average per M.
		$	$ cts.		$	$ cts.
1898	170,000	914,000	5·376	8,970	100,344	11·187
1899	233,898	1,313,750	5·617	10,808	105,000	9·715
1900	240,430	1,379,590	5·738	11,562	114,419	9·896
1901	259,265	1,530,460	5·903	12,846	104,394	8·127
1902	220,500	1,411,000	6·399	19,755	144,171	7·298
1903	230,000	1,561,700	6·790	23,703	218,550	9·220
1904	200,000	1,430,000	7·150	26,857	226,750	8·443
1905	250,000	1,937,500	7·750	26,000	234,000	9·000
1906	300,000	2,157,000	7·190	39,860	337,795	8·475
1907	273,882	2,109,978	7·704	69,763	648,683	9·298
1908	222,361	1,575,875	7·087	56,167	485,819	8·649
1909	246,308	1,916,147	7·779	53,167	490,571	9·227
1910	304,988	2,374,287	7·785	44,204	458,596	10·375
1911	354,546	2,801,971	7·903	52,764	564,630	10·701
1912	385,000	3,178,250	8·255	65,598	634,169	9·667
1913	408,808	3,452,352	8·445	81,238	919,741	11·321
1914*	294,400	2,336,207	7·935	60,620	646,604	10·67

* Preliminary.

In addition to the ordinary clay building brick, there was produced in this Province in 1914, ornamental brick valued at $15,504, and fireproofing and terra-cotta valued at $205,204. In 1913 the production of ornamental brick was valued at $9,810 and of fireproofing and terra-cotta $150,268.

Manitoba:—Throughout all of the western provinces there was again a large falling off in the demand for brick. In Manitoba the total sales were 29,035,950, valued at $317,488, comprising 26,777,950 common brick, valued at $289,060, or an average of $10.79 per thousand, and 2,258,000 pressed brick, valued at $28,428, or $12.59 per thousand. The sales in 1913 were 43,660,320, valued at $514,358, comprising 39,559,320 common brick, valued at $443,498, or an average of $11.21 per thousand, and 4,101,000 pressed brick, valued at $70,860 or $17.28 per thousand.

The principal brick-making plants operated were at Winnipeg, St. Boniface, Lac du Bonnet, Portage la Prairie, Sidney, Gilbert Plains, Balmoral, and Neepawa.

Saskatchewan:—The total sales of clay building brick in Saskatchewan in 1914 were 8,715,000 valued at $93,699 which includes 6,865,000 common brick, valued at $61,669 or an average of $8.98 per thousand, and 1,850,000 pressed brick, valued at $32,030 or an average of $17.31 per thousand. The total sales in 1913 were 18,175,000, valued at $189,820, which included 16,475,000 common brick, valued at $162,370, or an average of $9.86 per thousand, and 1,700,000 pressed brick, valued at $27,450, or an average of

$16.15 per thousand. The falling off in sales was over 50 per cent and stocks on hand at the end of the year were almost equal to the year's sales.

The principal clay plants are located at Estevan, Prince Albert, Bruno, Weyburn, Saskatoon, Rosthern, Verigin, and Broadview.

Alberta:—The total sales of clay building brick in 1914 were 30,169,757, valued at $278,054, comprising 23,190,257 common brick, valued at $183,696 or an average of $7.92 per thousand, and 6,979,500 pressed brick, valued at $94,358 or an average of $13.52 per thousand.

The total sales in 1913 were 71,996,343 brick, valued at $732,408, comprising 52,378,283 common brick, valued at $477,998 or an average of $9.13 per thousand, and 19,618,060 pressed brick, valued at $254,410 or an average of $12.97 per thousand. The decrease in the value of sales in 1914 was over 58 per cent, and stocks on hand at the end of the year were equivalent to nearly 65 per cent of the year's sales.

The principal centres of production are: Edmonton, Cochrane, Calgary, Medicine Hat, Redcliff, Lethbridge, Red Deer, Sandstone, Brickburn, and Innisfail.

There was also a production during 1914 of ornamental brick, valued at $3,264, and fireproofing and terra-cotta, valued at $96,025, as compared with ornamental brick valued at $738, and fireproofing, etc., valued at $146,200 in 1913.

British Columbia:—The total sales of brick in this Province in 1914 were reported as 15,552,901, valued at $162,891 which included 13,896,950 common brick, valued at $119,002 or an average of $8.56 per thousand, and 1,655,951 pressed brick, valued at $43,889 or an average of $26.50 per thousand.

The total sales in 1913 were 39,396,375, valued at $426,733 which included 36,131,903 common brick, valued at $343,020 or an average of $9.49 per thousand, and 3,264,472 pressed brick, valued at $83,713 or an average of $25.65 per thousand. The decrease in the value of the sales in 1914 was over 61 per cent and the stocks on hand at the end of the year amounted to more than 60 per cent of the year's sales.

In addition to the building brick there was also a production of fireproofing brick valued at $58,077, as against a value of $42,919 in 1913.

The principal centres of manufacture are: Vancouver, New Westminster, Clayburn, Port Haney and vicinity, Gabriola Island, Victoria, Sydney and Kelowna.

CLAY PAVING BRICK.

The total production of paving brick and paving blocks in Canada in 1914 was reported as 2,707,000, valued at $49,627, or an average value per thousand of $18.33, as compared with a production of 4,208,295, valued at $75,669, or an average value of $17.98 per thousand in 1913.

This paving brick is made chiefly at West Toronto, Ontario, from shale obtained from the banks of the Humber river, although during the past two years there has also been a small production reported from Edmonton, Alberta, and Clayburn, British Columbia.

The annual production has for a number of years varied from 3,000,000 to over 5,000,000 per season, and the Ontario output finds a market chiefly in Toronto.

Statistics of production since 1887 are shown in the next table.

The imports of paving brick during the past five years have considerably exceeded the domestic production. During the calendar year 1914 the imports were 9,069,000, valued at $145,063 or an average value per thousand of $16.00, and included 6,395,000, valued at $103,900 or an average of $16.25 from the United States, and 2,674,000, valued at $41,163 or an average of $15.21 from Great Britain. The total imports during the calendar year 1913 were 13,035,000, valued at $176,497, or an average value per thousand of $13.54, and included 7,779,000, valued at $103,572, or an average of $13.31 from the United States, and 5,256,000 valued at $72,925 or an average of $13.87 from Great Britain.

Annual Production of Paving Brick*.

Year.	M.	Value.	Average per M.	Year.	M.	Value.	Average per M.
		$	$ cts.			$	$ cts.
1897	4,568	45,670	10 00	1906	3,000	45,000	15 00
1898	.....	.....	.....	1907	3,618	72,354	20 00
1899	5,300	42,550	8 03	1908	3,720	59,456	15 98
1900	2,710	26,950	9 94	1909	3,760	67,408	17 93
1901	3,689	37,000	10 03	1910	4,215	78,980	18 74
1902	4,211	42,000	9 97	1911	5,220	79,444	15 22
1903	3,789	45,288	11 95	1912	4,580	85,989	18 78
1904	4,436	55,450	12 50	1913	4,208	75,669	17 98
1905	4,500	54,000	12 00	1914	2,707	49,627	18 33

* Figures previous to 1907 compiled from Ontario Bureau of Mines.

Imports of Paving Brick.*

Year.	M.	Value.	Average per M.	Year.	M.	Value.	Average per M.
Fiscal Year.		$	$ cts.	Fiscal Year.		$	$ cts.
1895	275	5,006	18 20	1906	4,104	46,008	11 21
1896	918	10,132	11 04	1907 (9 mos.)	2,182	23,256	10 66
1897	52	719	13 83	1908	5,340	61,346	11 49
1898	367	2,337	6 37	1909	.....	101,187	†
1899	1,583	23,648	14 94	Calendar Year.			
1900	2,175	35,644	16 39	1910	10,503	124,994	11 90
1901	900	10,414	11 57	1911	11,450	164,292	14 34
1902	1,030	16,788	16 30	1912	11,793	160,663	13 62
1903	1,337	18,811	14 07	1913	13,035	176,497	13 54
1904	1,986	29,753	14 98	1914	9,069	145,063	16 00
1905	3,350	32,578	13 86				

*Duty 20 per cent.

† The imports during July, 1908, under the general tariff, are reported as 6,581 M, value $7,317, an apparent error. There appears also to be an error in the entries for August and September of the same year, and the total number has, therefore, been omitted. The actual value of the imported brick varies from $10 to $12 per M.

FIRECLAY AND FIRECLAY PRODUCTS.

There are a number of clays from different localities in Canada that have been used in the manufacture of refractory brick or firebrick, and for furnace linings, etc., which have been usually termed "fireclays". These include clays found with the coal measures at Westville, Nova Scotia, and at Comox, Vancouver island, also clays found south of Moosejaw, Sask., at Clayburn, near the city of Vancouver, B.C., and at Kilgard, B.C. Stove linings and other refractory clay products are made at several places in Ontario and Quebec from imported clays.

The total value of the sales of fireclays, firebrick, and fireclay products in 1914 was $107,568, as compared with a valuation of $142,738 in 1913, and $125,585 in 1912. There was in addition, in 1914, a production of fireclay products valued at $30,264 reported as being made from imported clays.

The production in 1914 included fireclay or refractory clay, sold as such to the extent of 2,171 tons valued at $12,875; firebrick 2,815,690, valued at $72,299, or an average of $25.67 per thousand; and other fireclay products valued at $22,394.

The production in 1913 included fireclay or refractory clay sold as such to the extent of 3,345 tons valued at $14,018; firebrick 3,667,276, valued at $86,164 or an average of $23.50 per thousand; and other fireclay products valued at $42,556.

The imports of firebrick during the calendar year 1914 were valued at $690,133 of which $592,650 was from the United States, $93,837 from Great Britain, and $3,646 from other countries.

The imports of firebrick during the calendar year 1913 were valued at $1,192,857 of which $952,667 were imported from the United States, $230,500 from Great Britain, and $9,690 from other countries.

Fireclay was imported, during the calendar year 1914, to the value of $90,233 as compared with a value of $143,399 in 1913, and $140,500 in 1912.

Statistics of the annual production since 1907 of firebrick, refractory clay or fireclay, sold as such, and of fireclay products; and statistics of the imports of firebrick and fireclay are shown in the following tables:—

Production of Fireclay and Fireclay Products.

Year.	Firebrick.			Fireclay.			Other fireclay products.	Total value.
	No. sold.	Value.	Per M.	Tons.	Value.	Per Ton.	Value.	
		$	$ cts.		$	$ cts.	$	$
1907	4,323,179	113,322	26 21	.....	.....	.....	18,000	131,322
1908	2,415,871	70,429	29 16	1,984	8,121	4 09	31,752	110,302
1909	1,059,270	32,742	30 92	4,405	12,390	2 81	33,000	78,132
1910	1,375,400	21,352	21 34	1,425	5,863	4 11	15,000	50,215
1911	2,367,937	44,122	18 63	7,532	24,128	3 20	20,880	89,130
1912	3,429,594	67,192	19 59	6,307	24,343	3 86	34,050	125,585
1913	3,667,276	86,164	23 50	3,345	14,018	4 19	42,556	142,738
1914	2,815,690	72,299	25 67	2,171	12,875	5 93	22,394	107,568

Imports of Firebrick and Fireclay.

Fiscal Year.	Fireclay.	Firebrick.	Fiscal Year.	Fireclay.	Firebrick.
	$	$		$	$
1900	59,291	39,535	1908	155,873	639,347
1901	79,530	32,831	1909	77,146	350,457
1902	64,541	45,608	Calendar Year.		
1903	94,509	34,522	1910	124,293	811,927
1904	52,716	38,335	1911	125,199	814,414
1905	73,837	44,746	1912	140,500	953,621
1906	131,130	51,892	1913	143,399	1,192,857
1907*	85,044	349,185	1914	90,233	690,133

*9 months ending March.

SEWERPIPE AND DRAIN TILE.

The total value of the sales of sewerpipe in 1914 was $1,104,499 as compared with a value of $1,035,906 in 1913 and $884,641 in 1912. About 54 per cent of the production in 1914 was made in Ontario.

Following is a list of firms reporting production of sewerpipe in 1913:—

Standard Clay Products, Limited, St. Johns, Que., and New Glasgow, N. S.

Ontario Sewerpipe Company, Mimico, Ont.

Dominion Sewerpipe Company, Swansea, Ont.

Hamilton & Toronto Sewerpipe Company, Hamilton, Ont.

Alberta Clay Products Company, Medicine Hat, Alberta.

Kilgard Fireclay Company, Kilgard, B.C.

The Clayburn Company, Limited, Clayburn, B.C.

British Columbia Pottery Company, Victoria, B.C.

The imports of drain pipe and sewerpipe during 1914 were valued at $338,533 of which $305,546 were imported from the United States; $32,866 from Great Britain; and $121 from other countries. The total imports during 1913 were valued at $465,997 of which $396,641 were imported from the United States, and $69,356 from Great Britain.

The total sales of drain tile in Canada in 1914 as reported to this Branch were valued at $366,340, as compared with sales of $338,552 in 1913 and $357,862 in 1912. The greater part of this production is in the Province of Ontario; the sales in this Province in 1914 as reported to this Branch were 18,592,254, valued at $343,662, as against a value of $314,859 in 1913, and $308,050 in 1912.

The Ontario Bureau of Mines reports the total number of drain tile made in that Province during 1914 as 14,710,000, valued at $277,530 or an average of $18.87 per thousand, as compared with 16,935,000, valued at $292,767 or an average of $17.28 per thousand in 1913.

The imports of unglazed tile are comparatively small, the value during the calendar year 1914 being $2,941, as compared with $12,156 in 1913 and $4,018 in 1912.

Statistics of the annual production of sewerpipe and of the imports of drain tile and sewerpipe, are shown in the next three tables:—

Production of Sewerpipe.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1888	266,320	1897	164,250	1906	350,045
1889	Not available	1898	181,717	1907	667,100
1890	348,000	1899	161,546	1908	514,362
1891	227,300	1900	231,525	1909	645,722
1892	367,660	1901	248,115	1910	774,110
1893	350,000	1902	301,965	1911	812,716
1894	250,325	1903	317,970	1912	884,641
1895	257,045	1904	440,894	1913	1,035,906
1896	153,875	1905	382,000	1914	1,104,499

Production of Drain Tile in Ontario.

(As ascertained by the Ontario Bureau of Mines.)

Year.	No.	Value.	Year.	No.	Value.	Year.	No.	Value.
		$			$			$
1891	7,500,000	90,000	1899	21,027,400	240,246	1907	15,578,000	250,122
1892	10,000,000	100,000	1900	19,544,000	209,738	1908	24,800,000	338,658
1893	17,300,000	190,000	1901	21,592,000	231,374	1909	27,418,000	363,550
1894	25,000,000	280,000	1902	17,510,000	199,000	1910	21,028,000	318,456
1895	14,330,000	157,000	1903	18,200,000	227,000	1911	21,630,000	349,545
1896	13,200,000	144,000	1904	16,000,000	210,000	1912	16,463,000	279,579
1897	*	*	1905	15,000,000	220,000	1913	16,935,000	292,767
1898	22,668,000	225,000	1906	17,700,000	252,500	1914	14,710,000	277,530

* Not stated.

Imports of Drain Tile and Sewerpipe.

Fiscal Year.	Drain tile (a).	Sewerpipe (b).	Fiscal Year.	Drain tile (a).	Sewerpipe (b).
	$	$		$	$
1880	.....	33,796	1898	157	29,454
1881	.....	37,368	1899	1,817	32,071
1882	.....	70,061	1900	1,383	37,766
1883	.....	70,699	1901	1,264	54,819
1884	5,585	66,170	1902	269	55,261
1885	2,911	66,678	1903	252	57,100
1886	1,905	56,048	1904	1,637	53,958
1887	2,183	69,020	1905	1,229	101,166
1888	4,290	96,967	1906	4,727	131,353
1889	2,346	80,869	1907 (9 mos.)	12,106	93,458
1890	3,780	73,654	1908	2,080	125,747
1891	673	86,522	1909	2,394	106,399
1892	473	59,064	Calendar Year.		
1893	110	38,891	1910	4,485	175,599
1894	53	24,572	1911	5,640	382,929
1895	695	20,358	1912	4,018	507,024
1896	339	18,957	1913	12,156	465,997
1897	416	33,870	1914	2,941	338,533

(a) Drain tile, not glazed.
(b) Drain pipes, sewer pipes, and earthenware fittings therefor, chimney linings, or vents, chimney tops and inverted blocks, glazed or unglazed.

POTTERY AND EARTHENWARE.

The pottery made from Canadian clays has been, hitherto, chiefly of the common grades, such as flowerpots, jardinieres, crocks, jars, churns, etc. A number of potters made a higher grade product of stoneware, but the majority of these use imported clays. Sanitaryware is made at St. Johns, Que., and other points; but the raw material, including clays and feldspar, is nearly all imported.

The total value of the production of pottery and clay sanitaryware in 1914, according to returns received, was $312,846 of which it is estimated that the value of $277,475 is attributable to imported clays. The total value of the production in 1913 was $368,916 of which a value of $315,383 was credited to imported clays.

Annual statistics of production are shown herewith:—

Annual Production of Pottery.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1888	27,750	1897	129,629	1906	150,000
1889	Not available.	1898	214,675	1907	253,809
1890	195,242	1899	185,000	1908	200,541
1891	258,844	1900	200,000	1909	285,285
1892	265,811	1901	200,000	1910	250,924
1893	213,186	1902	200,000	1911	102,493
1894	162,144	1903	200,000	1912	43,955
1895	151,588	1904	140,000	1913	53,533
1896	163,427	1905	120,000	1914	35,371

Details of the imports of earthenware and chinaware, showing the values imported and the countries of origin, have already been shown in the general table of imports.

The imports in 1914 were valued at $2,192,222, as compared with a value of $3,314,870 in 1913, and $3,094,956 in 1912. These imports are subdivided into eight classes, and in 1914 included: brown or coloured earthenware, etc., $71,083; C. C. or cream-coloured ware, decorated, printed, sponged, etc., $163,431; demijohns, churns or crocks $25,935; tableware of china, porcelain, white granite, etc., $1,437,175; china and porcelain ware, n.o.p., $30,006; tiles or blocks of earthenware or stone prepared for mosaic flooring, $104,285; earthenware tiles, n.o.p., $186,161; manufactures of earthenware, n.o.p., $174,146.

The imports of 1913 comprised: brown or coloured earthenware, etc., $70,632; C. C. or cream-coloured ware, decorated, printed, or sponged, etc., $264,090; demijohns, churns or crocks, $32,599; tableware of china, porcelain, white granite, etc., $2,185,601; china and porcelain ware, n.o.p., $43,696; tiles or blocks of earthenware or stone prepared for mosaic flooring, $173,445; earthenware tiles, n.o.p., $296,791; manufactures of earthenware, n.o.p., $248,016.

It will be observed that there has been a general decrease in almost all classes of earthenware and chinaware imported in 1914. Great Britain is the principal source of the imports of this class of products, but quite large supplies are also obtained from the United States, Germany, France, Austria-Hungary, Japan, Belgium, and other countries.

Imports of Earthenware and Chinaware.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	$		$		$
1880	322,333	1892	748,810	1904	1,611,356
1881	439,029	1893	709,737	1905	1,636,214
1882	646,734	1894	695,514	1906	1,692,359
1883	657,886	1895	547,935	1907 (9 mos.)	1,422,880
1884	544,586	1896	575,493	1908	2,190,784
1885	511,853	1897	595,822	1909	1,716,887
1886	599,269	1898	675,874	Calendar Year.	
1887	750,691	1899	916,727	1910	2,283,116
1888	697,082	1900	959,526	1911	2,516,536
1889	697,949	1901	1,114,677	1912	3,094,956
1890	695,206	1902	1,275,093	1913	3,314,870
1891	634,907	1903	1,406,610	1914	2,192,222

KAOLIN.

About 1,000 tons of kaolin valued at $10,000 were shipped in 1914, as compared with 500 tons valued at $5,000 in 1913, and 20 tons valued at $160 in 1912. The production was obtained from the deposits in the township of Amherst, Ottawa county, Quebec, which have been opened up by the Canadian China Clay Company of Montreal.

The plant for refining the clay is situated 2 miles from St. Remi d'Amherst, and 7 miles from Huberdeau, the terminus of the Montefort Branch of the Canadian Northern Quebec railway—94 miles northwest of Montreal.

The imports of china-clay ground and unground, into Canada during the twelve months ending December 1914, were 20,437 tons, valued at $150,881, or $7.38 per ton, as against imports of 21,164 tons, valued at $149,337 or $7.06 per ton in 1913, and 18,332 tons valued at $127,402 or $6.95 per ton in 1912. These figures indicate to some extent at least the present actual demand for this product.

The imports of earthenware and chinaware were, however, valued at $2,192,222 in 1914, and were comprised chiefly of tableware of china, porcelain, etc., showing the possibilities for the development of industries utilizing china-clays.

Kaolin or china-clay is also in considerable demand in the United States, the imports into that country in 1914 being 288,858 gross tons, valued at $1,908,407, and in 1913, 240,120 gross tons, valued at $1,625,451.

The St. Remi d'Amherst kaolin deposits have been described by Mr. Keele in Geological Survey Memoir No. 64[1] from which the following extracts have been taken:—

> The crude material, therefore, is a mixture of fine-grained white clay and angular fragments of quartz, mostly under one-fourth of an inch in size. A small quantity of tourmaline is also present. In some parts of the vein the material is almost free from quartz, but for the most part quartz forms over 50 per cent of the deposit.
>
> The lumps of crude kaolin coming from the mine are broken up in a blunger, an iron tank filled with water, in which a vertical shaft, furnished with horizontal arms, revolves. The quartz settles to the bottom of the tank, while the clay is carried off through an overflow pipe and led into a series of troughs, where the finest particles of sand are deposited. After flowing slowly through the troughs, the clay-water finally falls into settling tanks. The clay gradually sinks to the bottom of the tanks and the clear liquid is pumped out. By means of this washing process the deposits yield from 30 to 40 per cent of fine-grained clay. A chemical analysis made from a sample of the washed clay by G. E. F. Lundell, gave the following results:—

Silica	46·13
Alumina	39·45
Iron oxide	0·72
Lime	None.
Magnesia	None.
Potash	0·20
Soda	0·09
Loss on ignition	13·81
	100·40

[1] Preliminary Report on the Clay and Shale Deposits of the Province of Quebec, by J. Keele, Memoir 64, Geological Survey, Dept. of Mines, 1915, p. 2.

The analysis shows the material to be of high purity. The physical tests are as follows. The washed kaolin requires 45 per cent of water for tempering. It has a fair amount of plasticity, but like all kaolin, it works rather short and crumbly. The shrinkage on drying is 7 per cent.

Cone.	Fire shrinkage. %	Absorption. %
010	3·0	34·3
06	3·6	34·3
1	4·5	32·0
5	9·3	20·0
9	11·3	17·0
34	Softens.	

This material has greater plasticity and higher shrinkages than most of the standard brands of washed kaolin or china-clay. The samples for testing were taken from near the surface, but at deeper levels, it is possible that the kaolin will not be so plastic and not shrink so much on drying and burning.

The Canadian China Clay Company which operates this mine is disposing of the washed product in Montreal, where it is used as a paper filler. On account of its fineness of grain and pure white colour, it is very suitable for this purpose.

Washed kaolin is one of the ingredients used in all whiteware pottery bodies, such as tableware, china, porcelain, wall tile, sanitary pottery, electrical porcelain, etc. Potters generally call it china-clay. It is the most valuable of all the clays.

PROSPECTING FOR KAOLIN.

Considerable prospecting has been done for kaolin in the vicinity of St. Remi, but so far no other workable deposit has been uncovered.

The whole country has been heavily glaciated, and much of the residual clays which may have existed in pre-glacial time have been removed by erosion. A sheet of glacial drift materials, principally boulder clay, covers the slopes of the hills and the valley bottoms. The kaolin was first discovered by a farmer when sinking a well. He went through 15 feet of boulder clay, and found the white clay deposit beneath. There are probably other deposits in the region, as the Grenville rocks occur at intervals as far west as the Ottawa river and beyond. The general prevalence of the drift covering renders prospecting a tedious and difficult operation, and kaolin being a soft deposit, is never exposed to the surface, unless a stream has cut down to it through the overburden.

LIME.

The lime industry in common with other materials of construction was affected by the financial depression during the latter part of the year 1913 and throughout 1914, and a falling off in production is shown. According to returns received from the producers, the total production in 1914 was 7,028,582 bushels, this being the amount sold or used (equivalent to about 246,000 tons) valued at $1,360,628, or an average of 19 cents per bushel, or about $5.53 per ton.

The production in 1913 was reported as 7,558,484 bushels, (264,547 tons) valued at $1,609,398, or an average of 21 cents per bushel, or $6.08 per ton. The decrease in production in 1914 was therefore 529,902 bushels, or slightly over 7 per cent.

Returns were received from 85 active firms in 1914, as compared with 77 firms in 1913. The average number of men employed in 1914 was 1,015, and wages paid $518,331, as against 1,076 men employed and $577,841 paid in wages in 1913. Statistics in respect to labour and wages in lime production, however, should be used with some discrimination, as many firms producing lime are also engaged in the quarrying of stone for purposes other than lime-burning, and are unable to make separate reports as to labour employed. This is particularly evident in the record from Nova Scotia and New Brunswick, since, for the first mentioned, the record includes only the labour employed at the kilns, while, for the latter, quarry costs are also included.

The average price per bushel of lime sold in 1914 varied from a minimum of 16½ cents in Ontario, to a maximum of 37 cents in British Columbia. In 1913, the range was from a minimum of 18 cents in Ontario to a maximum of 32 cents in British Columbia.

Production of hydrated lime was reported by four firms, viz: The Standard Lime Co. Ltd., Joliette, Que., The Standard White Lime Co. of Guelph, Ont., The Contractors Supply Co. Ltd., Orangeville, Ont., and the Guelph Ontario Reformatory.

Lime Production by Provinces, 1914.

Province.	No. of active firms reporting.	Men employed.	Wages paid.	Sales.			
				Bushels.	Value.	Average per bushel.	Per cent. of total value.
			$		$	cts.	%
P. E. Island	1	2	61	1,693	542	32	0·04
Nova Scotia	1	15	6,900	516,029	103,206	20	7·59
New Brunswick	5	89	47,224	391,739	102,980	26·3	7·57
Quebec	18	258	137,640	1,767,935	389,064	22	28·59
Ontario	43	429	224,937	3,393,078	556,850	16·4	40·92
Manitoba	7	123	47,331	526,167	92,898	17·7	6·83
Alberta	6	58	25,963	280,252	58,321	20·8	4·29
British Columbia	4	41	28,275	151,689	56,767	37·4	4·17
Total	85	1,015	518,331	7,028,582	1,360,628	19·3	100·00

Lime Production by Provinces, 1913.

Province.	No. of active firms reporting.	Men employed.	Wages paid.	Sales.			
				Bushels.	Value.	Average per bushel.	Per cent. of total value.
			$		$	cts.	%
P. E. Island	1	2	130	3,762	1,129	30	10·65
Nova Scotia	1	10	5,199	851,050	170,210	20	
New Brunswick	5	93	50,180	392,985	98,841	25	6·14
Quebec	17	321	162,422	1,616,446	418,008	26	25·97
Ontario	39	410	239,143	3,254,482	573,209	18	35·62
Manitoba	5	42	21,640	576,938	107,281	19	6·66
Saskatchewan	1	8	3,000	35,000	10,000	29	0·62
Alberta	6	70	50,127	465,250	115,355	25	7·17
British Columbia	2	120	46,000	362,571	115,365	32	7·17
Total	77	1,076	577,841	7,558,484	1,609,398	21	100·00

Lime Production by Provinces, 1912.

Province.	No. of active firms reporting.	Men employed.	Wages paid.	Sales.			
				Bushels.	Value.	Average per bushel.	Per cent. of total value.
			$		$	cts.	%
P. E. Island	4	10	844	24,971	8,191	33	0·44
Nova Scotia	1	8	5,510	684,625	136,930	20	7·42
New Brunswick	5	96	53,536	616,835	133,742	22	7·25
Quebec	21	334	157,909	1,729,614	474,595	27	25·73
Ontario	32	470	242,196	3,376,193	573,269	17	31·07
Manitoba	5	10	2,656	818,237	168,257	21	9·12
Saskatchewan	1	6	450	4,000	1,440	36	0·08
Alberta	4	76	52,272	704,035	166,520	24	9·03
British Columbia	5	93	60,844	517,329	181,905	35	9·86
Total	78	1,103	576,217	8,475,839	1,844,849	22	100·00

Lime Production by Provinces, 1910 and 1911.

Province.	1910.				1911.			
	Bushels.	Value.	Average per bushel.	Per cent of total value.	Bushels.	Value.	Average per bushel.	Per cent of total value.
		$	cts.	%		$	cts.	%
Nova Scotia	55,750	13,490	24	1·2	639,200	130,555	53	8·60
New Brunswick	470,050	105,593	22	9·3	613,728	132,897	22	8·76
Quebec	1,227,555	299,126	23	26·3	1,428,392	356,453	25	23·49
Ontario	2,988,020	476,137	16	41·9	3,360,265	538,902	16	35·51
Manitoba	606,679	100,808	17	8·8	706,888	140,629	20	9·27
Alberta	303,214	69,268	23	6·1	434,038	100·407	23	6·61
British Columbia	196,878	72,657	37	6·4	351,014	117,756	34	7·76
	5,848,146	1,137,079	19	100·0	7,533,525	1,517,599	20	100·00

Exports and Imports:—The value of the lime exported during the calendar year 1914 was $16,927, the destination being mainly the United States. In 1913, the exports were valued at $29,234. The imports of lime during the calendar year 1914, were 340,828 barrels, (34,083 tons) valued at $211,123, or an average of 62 cents per barrel, or $6.16 per ton, and were derived chiefly from the United States. The imports during 1913 were 386,693 barrels (38,669 tons) valued at $238,271 or an average of 62 cents per barrel, or $6.16 per ton.

Annual statistics of exports and imports are given in the next two tables:—

Exports of Lime.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	$		$		$
1891	119,853	1899	73,565	1907	55,903
1892	121,535	1900	80,852	1908	43,316
1893	86,623	1901	99,194	1909	48,821
1894	83,670	1902	116,009	1910	44,762
1895	71,697	1903	131,412	1911	39,536
1896	70,820	1904	73,838	1912	35,097
1897	53,177	1905	85,723	1913	29,234
1898	49,594	1906	57,072	1914	16,927

Imports of Lime.

Year	Barrels.	Value.	Average value.	Year.	Barrels.	Value.	Average value.
Fiscal Year.		$	$ cts.	Fiscal Year.		$	$ cts.
1880	6,100	6,013	0 99	1898	12,850	9,002	0 70
1881	5,796	4,177	0 72	1899	15,720	11,124	0 71
1882	5,064	5,365	1 06	1900	12,865	11,211	0 87
1883	7,623	9,224	1 21	1901	19,657	14,534	0 74
1884	10,804	11,200	1 04	1902	24,602	17,584	0 71
1885	12,072	11,503	0 95	1903	31,108	22,470	0 72
1886	11,021	9,347	0 85	1904	54,359	39,639	0 73
1887	10,835	8,524	0 79	1905	98,676	71,588	0 73
1888	10,142	7,537	0 74	1906	134,334	93,630	0 70
1889	13,079	9,363	0 72	1907 (9 mos.)	88,919	67,573	0 76
1890	8,149	5,360	0 66	1908	129,379	99,611	0 77
1891	6,259	4,273	0 68	1909	153,934	106,263	0 69
1892	6,132	4,241	0 69	Calendar Year.			
1893	6,879	4,917	0 71	1910	212,502	138,847	0 65
1894	6,766	4,907	0 73	1911	228,538	161,985	0 71
1895	12,008	5,743	0 48	1912	329,925	207,481	0 63
1896	10,239	7,331	0 72	1913	386,693	238,271	0 62
1897	16,108	10,529	0 65	1914*	340,828	211,123	0 62

*Duty 20 per cent.

It will be observed that the Provinces of Ontario and Quebec, being the chief centres of population in Canada, are the largest producers of lime, the former producing in 1914, 41 per cent of the total value, and the latter 29 per cent. The western provinces accounted for about 15 per cent of the total in 1914, as against 22 per cent in 1913 and 28 per cent in 1912.

Statistics of the annual production of lime in Ontario, as published by the Ontario Bureau of Mines since 1896, are shown in the next table. For the years previous to 1910 these returns are slightly higher than those obtained by the Mines Branch.

Annual Production of Lime in Ontario.

(As ascertained by the Ontario Bureau of Mines.)

Calendar Year.	Bushels.	Value.	Cents per bushel.	Calendar Year.	Bushels.	Value.	Cents per bushel.
		$				$	
1896	1,800,000	222,000	12	1906	2,885,000	496,785	17
1897				1907	2,650,000	418,700	17
1898	2,620,000	308,000	12	1908	2,442,331	448,596	18
1899	4,342,500	535,000	12	1909	2,633,500	470,858	18
1900	3,893,000	544,000	14	1910	2,889,235	474,531	16
1901	4,100,000	550,000	13	1911	2,469,773	402,340	16
1902	4,300,000	617,000	14	1912	2,297,525	381,672	17
1903	3,400,000	520,000	15	1913	2,300,991	390,600	17
1904	2,600,000	406,800	16	1914*	2,075,228	333,363	16
1905	3,100,000	424,700	14				

* Preliminary.

SAND-LIME BRICK.

The manufacture of sand-lime brick in Canada, is a comparatively new industry, and the first returns of production were obtained for the year 1907, when there was a production by ten firms amounting to 16,492,971 brick, valued at $167,795.

In 1914, the total sales were reported as 70,650,030 brick, valued at $609,515, or an average of $8.63 per thousand, as against sales in 1913 of 92,586,676 brick, valued at $906,665, or an average of $9.79 per thousand.

Stocks of brick on hand at the end of the year were reported as 16,796,000 brick.

Annual statistics of production since 1907 are shown below:—

Annual Production of Sand-Lime Brick.

Calendar Year.	No. of firms reporting.	Number sold.	Value	Per M
			$	$ cts.
1907	10	16,492,971	167,795	10 17
1908	9	17,288,260	152,856	8 84
1909	9	27,052,864	201,650	7 45
1910	13	44,593,541	371,857	8 34
1911	16	51,535,243	442,427	8 58
1912	20	96,448,402	1,020,386	10 58
1913	22	92,586,676	906,665	9 79
1914	21	70,650,030	609,515	8 63

SAND AND GRAVEL.

Previous to 1912, no attempt had been made by this Department to obtain statistics of the production of building sand or of gravel in Canada. In 1912, however, a beginning was made, the returns received showing a production of sand and gravel, valued at $1,512,099.

For the year 1913 the collection was extended to include a record of the production of sand and gravel for railroad ballasting, but, at the time of closing the statistics, several important returns had not been received. However, the total value of the production as reported was $2,258,874.

The total value of the production in 1914 as reported was $2,505,310, but it is probable that the record is more complete than for the previous years which doubtless accounts in large measure for the fact that an increase in production is shown.

The production by provinces during the past three years was as follows:—

Annual Production of Sand and Gravel.

Province.	1912.	1913.	1914.
	$	$	$
P. E. Island, Nova Scotia, New Brunswick	13,549	101,201	100,016
Quebec	243,126	638,778	370,713
Ontario	363,668	638,771	833,635
Manitoba	101,653	197,719	314,081
Saskatchewan	255,453	236,377	222,019
Alberta	148,704	265,165	273,115
British Columbia	385,946	180,863	391,731

Statistics of the exports and imports of sand and gravel, are published in the annual reports of the Department of Customs, and the following tables are compiled from this record since 1893.

During 1914, there were exported from Canada 952,370 tons of sand and gravel, valued at $802,358; while during the same year there were imported 273,812 tons, valued at $224,759.

Annual Exports of Sand and Gravel.

Calendar Year.	Tons.	Value.	Average value.	Calendar Year.	Tons.	Value.	Average value.
		$	Cents.			$	Cents.
1893	329,116	121,795	37	1904	399,809	129,803	32
1894	324,656	86,940	27	1905	306,935	152,805	50
1895	277,162	118,359	43	1906	336,550	139,712	41
1896	224,769	80,110	36	1907	298,095	119,853	40
1897	152,963	76,729	50	1908	298,954	161,387	54
1898	165,954	90,498	55	1909	481,584	256,166	53
1899	242,450	101,640	42	1910	624,824	407,974	65
1900	197,558	101,666	51	1911	573,494	408,110	71
1901	197,302	117,465	60	1912	660,090	459,952	70
1902	159,793	119,120	75	1913	644,633	440,956	68
1903	355,792	124,006	35	1914	952,370	802,358	84

Annual Imports of Sand and Gravel.

Fiscal Year.	Tons.	Value.	Average value.	Fiscal Year.	Tons.	Value.	Average value.
		$	$ cts.			$	$ cts.
1893	26,065	31,739	1 22	1904	110,634	107,547	0 97
1894	41,573	33,506	0 81	1905	85,339	92,722	1 09
1895	19,609	24,779	1 26	1906	116,500	173,727	1 49
1896	18,953	24,604	1 30	1907 (9 mos.)	171,700	177,412	1 03
1897	21,308	25,222	1 18	1908	266,704	223,043	0 84
1898	32,148	43,287	1 35	1909	132,158	136,011	1 03
1899	30,288	42,209	1 39	Calendar Year.			
1900	35,713	41,280	1 16	1910	195,796	196,766	1 00
1901	35,749	42,891	1 20	1911	241,375	246,613	1 02
1902	47,381	58,668	1 24	1912	532,721	445,781	0 84
1903	91,518	95,647	1 05	1913	439,673	440,343	1 00
				1914	273,812	224,759	0 82

SLATE.

There is a small annual production of slate in Canada obtained from the New Rockland quarries, Melbourne township, Richmond county, and from quarries at Botsford in Temiscouata county, both operated by Messrs. Fraser and Davies.

The production in 1914 was 1,075 squares valued at $4,837 as compared with a production in 1913 of 1,432 squares, valued at $6,444.

Annual Production of Slate.

Calendar Year.	Quantity*	Value.	Calendar Year.	Quantity*	Value.
	Tons.	$		Squares.	$
1886	5,345	64,675	1900	.....	12,100
1887	7,357	89,000	1901	.....	9,980
1888	5,314	90,689	1902	.....	19,200
1889	6,935	119,160	1903	5,510	22,040
1890	6,368	100,250	1904	5,277	23,247
1891	5,000	65,000	1905	.....	21,568
1892	5,180	69,070	1906	.....	24,446
1893	7,112	90,825	1907	4,335	20,056
1894	.....	75,550	1908	2,950	13,496
1895	.....	58,900	1909	4,000	19,000
1896	.....	53,370	1910	3,959	18,492
1897	.....	42,800	1911	1,833	8,248
1898	.....	40,791	1912	1,894	8,939
1899	.....	33,406	1913	1,432	6,444
			1914	1,075	4,837

* From 1903, in squares; previously, in tons.

No exports of slate have been reported since 1896 with the exception of the years 1908 and 1909.

The imports of slate during the past eight years ranged from $100,000 to over $200,000 per annum.

The total value of the imports during the calendar year, 1914, was $213,256, and included: roofing slate, $91,977; school writing slate, $54,723; slate pencils, $6,514; mantels, $598; and other slates and manufactures of, $59,444. The total value of the imports during the calendar year 1913 was $235,474, comprising: roofing slate, $97,730; school writing slate, $51,953; slate pencils, $9,166; and other slates and manufactures of, $76,625. The imports of roofing slate, school writing slate, and manufactures of slate n.o.p., are chiefly from the United States. Some roofing slate is also imported from Great Britain, while slate pencils come chiefly from Germany and the United States.

Statistics of imports and exports are shown in the following tables:—

Imports of Slate During the Years 1911, 1912, 1913, and 1914.

Slate and manufactures of.	Calendar year 1911.	Calendar year 1912.	Calendar year 1913.	Calendar year 1914.
	$	$	$	$
Roofing slate	83,075	88,911	97,730	91,977
School writing slate	35,049	39,858	51,953	54,723
Slate pencils	6,036	6,978	9,166	6,514
Slate of all kinds and manufactures of	45,525	65,896	76,625	59,444
Mantels	.....	.....	.....	598
	169,685	200,643	235,474	213,256

Exports of Slate.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
1884	539	6,845	1893	178	3,168
1885	346	5,274	1894	187	3,610
1886	34	495	1895	36	574
1887	27	373	1896	301	8,913
1888	22	475	1897 to 1907	Nil	Nil.
1889	26	3,303	1908	.....	2,539
1890	12	153	1909	134	612
1891	15	195	1910 to 1914	Nil.	Nil.
1892	87	2,038			

Imports of Slate.

	Value.		Value.		Value.
Fiscal Year.	$	Fiscal Year.	$	Fiscal Year.	$
1880	21,431	1892	50,441	1904	86,057
1881	22,184	1893	51,179	1905	93,228
1882	24,543	1894	29,267	1906	112,941
1883	24,968	1895	19,471	1907 (9 mos.)	95,520
1884	28,816	1896	24,176	1908	131,069
1885	28,169	1897	21,615	1909	124,065
1886	27,852	1898	24,907	Calendar Year.	
1887	27,845	1899	33,100	1910	142,285
1888	23,151	1900	53,707	1911	169,685
1889	41,370	1901	72,187	1912	200,643
1890	22,871	1902	72,601	1913	235,474
1891	46,104	1903	84,437	1914	213,256

STONE.[1]

Statistics of stone production given herewith include the sales of all classes of stone used for building, monumental, and ornamental purposes, stone for paving purposes, curbstone, and flagstone, rubble, rip-rap, and crushed stone, limestone, for furnace flux, sugar factories, etc., but stone used for burning lime or the manufacture of cement is not included.

The kinds of stone quarried have been classed as granite (including trap rock, syenite, and other igneous rocks), limestone, sandstone, and marble.

The records are practically confined to quarry operations and the production of sawn or polished stone when these operations are carried on by the quarry operators. In addition to this production of stone by regular operators, there is no doubt a large stone production by individuals, such as farmers, and others, for house or barn foundations, concrete work, etc., of which it would be impracticable to obtain any satisfactory record. Much stone is also used in railway construction work and in road building, of which the record is probably very incomplete.

It is impossible, except in a few cases, to show the quantity of stone production, so that the value only of the shipment can be given.

The total value of the production of stone in 1914, according to returns received, was $5,469,056, as compared with a value of $5,504,639 in 1913, showing a slight decrease amounting to $35,583, or less than one per cent.

The number of active firms reporting in 1914 was 219, the total number of men employed 5,929, and the total wages paid $2,871,817; in 1913, the number of active firms reporting was 218, the number of men employed 6,131, and wages paid $3,219,465.

Of the total value of the 1914 production, limestone contributed $2,672,781, or 48·9 per cent; granite $2,176,602, or 39·8 per cent; sandstone $487,140, or 8·9 per cent, and marble $132,533, or 2·4 per cent.

Stone was used for building purposes to the value of $1,632,763, or 29·8 per cent of the total; monumental and ornamental to the value of $201,348, or 3·7 per cent; curb, paving and flagstone $217,578, or 4 per cent; rubble $1,236,157, or 22·6 per cent; crushed stone $1,951,337 or 35·7 per cent; and furnace flux 427,966 tons, valued at $229,873, or 4·2 per cent.

[1] A special investigation has been undertaken by the Mines Branch on the building and ornamental stones of Canada, by Prof. W. A. Parks, of Toronto University, and three reports of this series have been completed, as follows:—
No. 100. "The Building Stones of Canada, Vol. I. "Building and Ornamental Stones of Ontario."
No. 203. "Building Stones of Canada, Vol. II." "Building and Ornamental Stones of the Maritime Provinces."
No. 279. "Building Stones of Canada, Vol. III." "Building and Ornamental Stones of the Province of Quebec."

By provinces, Quebec again shows the largest output, having a value of $2,286,078, or 41·8 per cent of the total; being made up of limestone to the value of $1,326,943; granite valued at $842,845; marble $98,890. Ontario takes second place with a production of $1,253,849, or 23 per cent of the total, of which limestone is credited with $853,906; granite $309,720; sandstone $59,923; and marble $30,300. British Columbia ranks third in order of importance with a total of $1,024,683, including granite $918,131; sandstone $51,774; limestone $51,435; and marble $3,343. The production in Manitoba was valued at $361,912, made up of limestone $346,258 and granite $15,654. The Nova Scotia production was valued at $221,090, comprising: limestone $94,239; granite $65,727; and sandstone $61,124. The Alberta production was reported as $60,272, all sandstone. New Brunswick is credited with $261,172 made up chiefly of sandstone and granite.

Production of Stone by Provinces, 1914.

Province.	Granite.	Lime-stone.	Marble.	Sand-stone.	Total.	%	Labour.	
							No. men em-ployed.	Wages.
	$	$	$	$	$			$
Nova Scotia	65,727	94,239	.....	61,124	221,090	4·1	441	120,944
New Brunswick	24,525	.....	.....	236,647	261,172	4·8	277	156,619
Quebec	842,845	1,326,943	98,890	17,400	2,286,078	41·8	2,400	1,145,873
Ontario	309,720	853,906	30,300	59,923	1,253,849	22·9	1,575	645,728
Manitoba	15,654	346,258	.....	.....	361,912	6·6	373	190,241
Alberta	.....	.....	.....	60,272	60,272	1·1	78	46,943
British Columbia	918,131	51,435	3,343	51,774	1,024,683	18·7	785	565,469
Total	2,176,602	2,672,781	132,533	487,140	5,469,056	.....	5,929	2,871,817
Per cent	39·8	48·9	2·4	8·9	.....	100·0	.....	.....

Production of Stone by Provinces, 1913.

Province.	Granite.	Lime-stone.	Marble.	Sand-stone.	Total.	%	Labour.	
							No. men em-ployed.	Wages.
	$	$	$	$	$			$
Nova Scotia	29,302	258,719	.....	62,490	350,511	6·3	733	200,598
New Brunswick	32,945	.....	.....	70,787	103,732	1·9	285	104,828
Quebec	790,896	1,307,428	231,137	.....	2,329,461	42·3	2,208	1,316,306
Ontario	324,062	1,196,130	18,238	54,738	1,593,168	29·0	1,621	812,137
Manitoba	6,920	382,984	.....	.....	389,904	7·0	558	280,224
Alberta	.....	20,000	.....	136,984	156,984	2·9	116	113,468
British Columbia	469,666	38,830	600	71,783	580,879	10·6	610	391,904
Total	1,653,791	3,204,091	249,975	396,782	5,504,639	.....	6,131	3,219,465
Per cent	30·0	58·2	4·6	7·2	.....	100·00	.....	.....

Value of Stone for Various Purposes in 1914.

Kind.	Building.	Ornamental and monumental.	Paving and curbstone.	Rubble.	Crushed.	Furnace flux.	Total.
	$	$	$	$	$	$	$
Granite	496,261	93,948	138,443	793,736	654,214	.....	2,176,602
Limestone	876,544	13,504	55,420	241,698	1,255,742	229,873	2,672,781
Marble	33,643	93,386	.....	2,614	2,890	.....	132,533
Sandstone	226,315	510	23,715	198,109	38,491	.....	487,140
Total	1,632,763	201,348	217,578	1,236,157	1,951,337	229,873	5,469,056

Value of Stone Sold for Various Purposes in 1913.

Kind.	Building.	Ornamental and monumental.	Paving and curbstone.	Rubble.	Crushed.	Furnace flux.	Total.
	$	$	$	$	$	$	$
Granite	554,505	47,377	243,534	266,442	541,933	.....	1,653,791
Limestone	790,795	8,676	14,073	257,419	1,680,834	452,294	3,204,091
Marble	18,838	230,739	398	.....	.....	.....	249,975
Sandstone	322,668	1,352	4,950	40,046	27,766	.....	396,782
Total	1,686,806	288,144	262,955	563,907	2,250,533	452,294	5,504,639

Production of Stone by Provinces and for Purposes Used, 1914.

Province.	Building.	Ornamental and monumental.	Paving and curbstone.	Rubble.	Crushed.	Furnace flux.	Total.
	$	$	$	$	$	$	$
Nova Scotia	78,504	20,964	2,649	22,083	2,651	94,239	221,090
New Brunswick	52,287	13,983	10,702	184,200	.....	.....	261,172
Quebec	916,978	154,012	97,895	112,655	994,637	9,901	2,286,078
Ontario	153,871	12,089	100,332	180,272	859,085	74,298	1,253,849
Manitoba	230,160	.....	.....	.....	16,654	.....	361,912
Alberta	59,572	.....	.....	700	.....	.....	60,272
British Columbia	151,391	300	6,000	736,247	79,310	51,435	1,024,683
Total	1,632,763	201,348	217,578	1,236,157	1,951,337	229,873	5,469,056
Per cent	29·8	3·7	4·0	22·6	35·7	4·2	100·0

Production of Stone by Provinces and for Purposes Used, 1913.

Province.	Building.	Ornamental and monumental.	Paving and curbstone.	Rubble.	Crushed.	Furnace flux.	Total.
	$	$	$	$	$	$	$
Nova Scotia	67,576	8,822	7,244	5,502	12,900	248,467	350,511
New Brunswick	68,647	126	10,843	21,403	2,713	.....	103,732
Quebec	900,478	270,304	97,884	60,784	999,046	965	2,329,461
Ontario	241,928	7,222	139,920	119,487	920,579	164,032	1,593,168
Manitoba	162,384	450	.....	94,270	132,800	.....	389,904
Alberta	133,030	386	.....	23,568	.....	.....	156,984
British Columbia	112,763	834	7,064	238,893	182,495	38,830	580,879
Total	1,686,806	288,144	262,955	563,907	2,250,533	452,294	5,504,639
Per cent	30·7	5·2	4·8	10·2	40·9	8·2	100·0

Exports and Imports:—The exports of stone from Canada in 1914 were valued at $72,080 as against $93,840 in 1913 and $33,242 in 1912. The principal item in the export of stone during the past three years has been building stone unwrought, of which the exports in 1914 were 63,009 tons, valued at $46,198. The exports of dressed stone in 1914 including both ornamental and building stone, were valued at $2,122.

The exports of the several classes of stone during the past three years, as shown by the Customs' record, were as follows:—

Exports of Stone During the Calendar Years 1912, 1913, 1914.

	1912.		1913.		1914.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		$		$		$
Stone—						
Crushed	.....	.....	4,814	3,126	25,130	18,153
Ornamental, granite, marble, etc., unwrought	2,339	1,826	1,942	687	231	5,607
Building, freestone, limestone, etc., unwrought	108,516	28,795	191,981	82,646	63,009	46,198
Ornamental, granite, marble, etc., dressed	.....	2,458	.....	7,381	.....	1,752
Building, freestone, limestone, etc., dressed	.....	163	.....	0	.....	370
	.....	33,242	.....	93,840	.....	72,080

Exports of Stone and Marble, Wrought and Unwrought.

Calendar Year.	Wrought.	Unwrought	Calendar Year.	Wrought.	Unwrought.
	$	$		$	$
1890	21,725	43,611	1903	7,684	46,295
1891	13,398	46,162	1904	4,760	17,802
1892	7,698	47,424	1905	3,545	13,089
1893	9,102	12,532	1906	23,097	4,675
1894	22,576	34,130	1907	4,233	3,087
1895	8,587	51,616	1908	15,194	36,820
1896	4,934	32,897	1909	33,598	24,087
1897	9,415	42,034	1910	5,352	22,219
1898	2,526	65,370	1911	1,436	26,899
1899	5,092	101,931	1912	2,621	30,621
1900	5,933	115,711	1913	7,381	86,459
1901	5,917	157,739	1914	2,122	69,958
1902	8,632	124,829			

The imports of stone are classified as: building stone of all kinds, except marble; manufactures of granite and other stone; and marble and its manufactures. The total value of the imports during the calendar year 1914, was $1,252,869, as compared with a value of $1,640,849 in 1913, showing a decrease of $387,980, or about 23 per cent.

The imports during 1914 comprised: building stone, (rough) valued at $72,147, building stone (dressed) $252,563; granite and manufactures of granite $235,587; paving blocks $4,428; marble and manufactures of, $465,563; and refuse stone 416,816 tons, valued at $222,581.

The total value of the imports from the United States in 1914 was $909,618; Great Britain, $202,055; Italy, $37,610; and from other countries, $103,586.

Of the total imports in 1913, $570,116 in value was classed as building stone, and included $105,576 worth of rough stone, and $464,540 worth of dressed stone. The imports of sawn granite, manufactures of granite, and manufacture of stone n.o.p. were valued at $250,077; paving blocks $52,321; marble and manufactures of, $577,028. There was also an importation of refuse stone amounting to 356,073 tons, valued at $191,307.

The total value of the imports from the United States in 1913 was $1,287,440; Great Britain, $185,531; from Italy, $40,335; and from other countries, $127,543. During both years the imports were derived chiefly from the United States and Great Britain, the United States supplying building stone, paving blocks, and marble principally; and Great Britain, mainly manufactures of granite. Marble is obtained also in some quantity from Italy and other countries.

Total Imports of Stone During the Calendar Years 1913 and 1914.

Imports.	1913.		1914.	
	Tons.	Value.	Tons.	Value.
		$		$
Building stone, rough[1]	.....	105,576	.....	72,147
Building stone, dressed[2]	.....	464,540	.....	252,563
Refuse stone[3]	356,073	191,307	416,816	222,581
Granite, sawn only	.....	14,979	.....	5,346
Granite, manufactures of	.....	174,155	.....	196,622
Paving blocks	.....	52,321	.....	4,428
Manufactures of stone, n.o.p.	.....	60,943	.....	33,619
Marble and manufactures of:—				
Marble, sawn or sand rubbed, not polished	.....	258,225	.....	204,863
Marble, rough, not hammered or chiselled	.....	128,475	.....	115,339
Marble, manufactures of, n.o.p.	.....	190,328	.....	145,361
	.....	1,640,849	.....	1,252,869

[1] Flagstone, granite, rough sandstone, and all building stone not hammered, sawn, or chiselled.
[2] Flagstone and all other building stone, sawn or dressed, or partially dressed.
[3] Stone refuse not sawn, hammered, or chiselled, not fit for flagstone, building stone, or paving.

Imports of Stone, Showing Country of Origin, Calendar Year 1914.

Imports.	Great Britain.		United States.		Italy.	Other countries
	Tons.	Value.	Tons.	Value.	Value.	Value.
		$		$	$	$
Building stone, rough[1]	.....	718	.....	71,429	.....	.....
Building stone, dressed[2]	.....	1,189	.....	251,374	.....	.....
Refuse stone	.....	.....	300,072	146,860	.....	75,725
Granite, sawn only	.....	851	.....	4,495	.....	.....
Granite, manufactures of	.....	178,946	.....	14,580	.....	3,096
Paving blocks	.....	.....	.....	4,428	.....	.....
Manufactures of stone, n.o.p.	.....	6,645	.....	23,700	.....	3,274
Marble and manufactures of:—						
Marble, sawn or sand rubbed, not polished	.....	1,142	.....	174,977	28,095	649
Marble, rough, not hammered or chiselled	.....	.....	.....	100,783	9,515	5,041
Marble, manufactures of n.o.p.	.....	12,564	.....	116,992	.....	15,805
Total	.....	202,055	.....	909,618	37,610	103,586
	.....	16·1%	.....	72·6%	3·0%	8·3%

[1] Flagstone, granite, rough sandstone, and all building stone not hammered, sawn, or chiselled.
[2] Flagstone; all other building stone, sawn, or dressed.

Annual Imports of Stone.

Fiscal Year.	Building stone. Rough.	Building stone. Dressed.	Manufactures of granite, etc., Paving blocks.	Marble.	Flagstone.	Total value.
	$	$	$	$	$	$
1880	32,824	3,146	29,408	63,015	.....	128,393
1881	7,823	50,326	36,877	85,977	241	181,244
1882	32,848	775	37,267	109,505	848	181,243
1883	33,429	1,632	45,636	128,520	99	209,316
1884	46,232	4,856	45,290	108,771	1,158	206,307
1885	28,433	2,058	39,867	102,835	1,756	174,949
1886	36,776	4,899	41,984	117,752	9,443	210,854
1887	47,819	6,549	41,829	104,250	10,966	211,413
1888	84,263	2,110	47,487	94,681	21,077	249,618
1889	89,723	10,591	61,341	118,421	15,451	295,527
1890	126,456	5,699	84,396	99,353	48,995	364,899
1891	151,119	19,771	61,051	107,661	36,348	372,950
1892	85,169	10,381	39,479	106,268	15,048	256,345
1893	47,609	8,901	49,323	96,177	8,500	210,510
1894	48,097	4,811	49,510	94,657	2,429	199,504
1895	37,732	6,550	51,050	83,422	84	178,838
1896	42,737	11,393	51,499	90,065	Nil.	195,694
1897	27,442	11,272	34,026	77,150	227	150,117
1898	25,322	3,173	41,240	95,894	1,540	167,129
1899	43,494	4,546	60,148	104,879	Nil.	210,067
1900	63,376	1,157	57,039	94,017	63	215,652
1901	45,039	1,039	66,639	96,159	116	208,992
1902	69,972	29,102	72,397	130,424	1,231	303,126
1903	71,202	16,664	78,629	153,481	....**	319,976
1904	59,864	33,914	141,165	181,511	.....	416,454
1905	49,004	53,813	150,160	145,466	.....	398,443
1906	66,994	65,134	178,435	189,589	.....	500,152
1907*	58,398	78,967	136,779	176,450	.....	450,594
1908	80,950	90,740	192,248	287,587	Refuse	651,525
1909	63,984	72,961	193,949	200,928	stone.	531,822
Calendar Year.						
1910	125,531	186,064	266,313	267,215	.....	845,123
1911	85,084	307,784	272,512	384,252	91,214	1,140,846
1912	117,037	451,635	309,386	475,926	113,159	1,467,143
1913	105,576	464,540	302,398	577,028	191,307	1,640,849
1914	72,147	252,563	240,015	465,563	222,581	1,252,869

* 9 months ending March 1907. ** Included in building stone since 1903.

GRANITE.

The production of granite including trap-rock, syenite, etc., in 1914, according to returns received from 69 active firms reporting, was valued at $2,176,602, as compared with a production in 1913, by 65 firms, valued at $1,653,791, showing an increased production in 1914 of $522,811 or 31·6 per cent.

The largest production is reported from British Columbia in 1914, the value being $918,131 as against $469,666 in 1913. The value of the production in Quebec was $842,845 as against $790,896 in 1913. Ontario produced granite to the value of $309,720 in 1914, as compared with $324,062 in 1913. There was comparatively little change in production in New Brunswick, but an increase of over 100 per cent in the Nova Scotia production. Much of the rough stone quarried in New Brunswick, as well as stone imported from Redbeach, Maine, and Mt. Johnson, Que., is worked

up into finished ornamental and monumental stone in mills at St. George, N.B. The value of the finished stone produced at St. George in 1914 was $90,840, as against a value of $85,803 produced in 1913.

Value of Granite Production by Provinces, 1914.

Province.	Building.	Monumental or ornamental.	Curb, or paving.	Rubble.	Crushed.	Total.
	$	$	$	$	$	$
Nova Scotia	26,324	20,614	2,649	13,940	2,200	65,727
New Brunswick	.....	*13,823	10,702	.....	.....	24,525
Quebec	370,403	57,626	45,052	12,809	356,955	842,845
Ontario	3,260	1,585	74,040	30,740	200,095	309,720
Manitoba	.....	.....	.....	.....	15,654	15,654
British Columbia	96,274	300	6,000	736,247	79,310	918,131
Total	496,261	93,948	138,443	793,736	654,214	2,176,602

* "Finished" stone in 1914 was valued at $90,840.

Value of Granite Production by Provinces, 1913.

Province.	Building.	Monumental or ornamental.	Curb, or paving.	Rubble.	Crushed.	Total.
	$	$	$	$	$	$
Nova Scotia	11,176	7,982	7,244	.....	2,900	29,302
New Brunswick	22,102	(a)	10,843	.....	.....	32,945
Quebec	454,105	37,481	83,838	27,549	187,923	790,896
Ontario	26,742	1,080	134,545	.....	161,695	324,062
Manitoba	.....	.....	.....	.....	6,920	6,920
British Columbia	40,380	834	7,064	238,893	182,495	469,666
Total	554,505	47,377	243,534	266,442	541,933	1,653,791

(a) The production of rough granite for ornamental or monumental purposes is included under building stone. Finished stone was produced at St. George to the value of $85,803.

Annual Production of Granite.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	6,062	63,309	1900	.....	80,000
1887	21,217	142,506	1901	.....	155,000
1888	21,352	147,305	1902	.....	210,000
1889	10,197	79,624	1903	.....	200,000
1890	13,307	65,985	1904	.....	150,000
1891	13,637	70,056	1905	.....	226,305
1892	24,302	89,326	1906	.....	278,419
1893	22,521	94,393	1907	15,136	194,712
1894	16,392	109,936	1908	.....	282,320
1895	19,238	84,838	1909	.....	454,824
1896	18,717	106,709	1910	.....	739,516
1897	19,345	61,934	1911	.....	1,119,865
1898	23,897	81,073	1912	.....	1,373,119
1899	13,418	90,542	1913	.....	1,653,791
			1914	.....	2,176,602

LIMESTONE.

The statistics given herewith do not include the value of the stone burned into lime by the quarry operators, nor that of the stone used in the manufacture of cement, a record of lime and cement production being separately given. With this exception, the total value of limestone produced in Canada in 1914 was $2,672,781, as compared with the value of $3,204,091 in 1913, or a decrease of about 17 per cent.

There was an increase in the production of building and paving stone, and a falling off in the production of furnace flux, crushed stone and rubble.

The production during 1914 of limestone for building purposes, was valued at $890,048, as against $799,471 in 1913. The value of crushed stone in 1914 was $1,255,742, as against $1,680,834 in the previous year. Curbstone and paving stone were produced to the value of $55,420 in 1914, as against $14,073 in 1913. The value of rubble in 1914 was $241,698, as against $257,419 in 1913. The production of furnace flux was 427,966 tons, valued at $229,873, as compared with 862,774 tons valued at $452,294 in 1913.

Value of Limestone Production by Provinces, 1914.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
	$	$	$	$	Tons.	$	$
Nova Scotia	.....	.....	.....	.....	176,817	94,239	94,239
Quebec	549,575	617,392	52,843	97,232	13,467	9,901	1,326,943
Ontario	120,313	563,363	2,577	93,355	116,468	74,298	853,906
Manitoba	220,160	74,987	.....	51,111	.....	.....	346,258
British Columbia	.....	.....	.....	.....	121,214	51,435	51,435
Total	890.048	1,255,742	55,420	241.698	427,966	229,873	2,672,781

Value of Limestone Production by Provinces, 1913.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
	$	$	$	$	Tons.	$	$
Nova Scotia	.....	10,000	.....	252	489,516	248,467	258,719
Quebec	448,457	811,123	13,648	33,235	643	965	1,307,428
Ontario	188,180	733,831	425	109,662	281,246	164,032	1,196,130
Manitoba	162,834	125,880	.....	94,270	.....	.....	382,984
Alberta	.....	.....	.....	20,000	.....	.....	20,000
British Columbia	.....	.....	.....	.....	91,369	38,830	38,830
Total	799,471	1,680,834	14,073	257,419	862,774	452,294	3,204,091

Production of Limestone by Provinces 1909-1912.

Province.	1909.	1910.	1911.	1912.
	$	$	$	$
Nova Scotia	161,922	192,919	245,216	275,944
New Brunswick	30	315	110	.....
Quebec	972,253	962,429	1,296,577	1,187,751
Ontario	639,674	722,763	680,461	862,052
Manitoba	328,554	328,029	315,782	381,572
British Columbia	37,258	43,121	56,780	55,617
Total	2,139,681	2,249,576	2,594,926	2,762,936

MARBLE.

From 1886 to 1896 there was a small production of marble, aggregating, however, only $45,837 in value for the eleven years. During the next eleven years—1897 to 1907—there is no record of any production. But the opening up of the quarries at Philipsburg and South Stukely, Que., together with the development of quarries in Ontario and British Columbia, has resulted in a considerable production of marble during the past seven years. The total value of the production in 1914 was returned as $132,533, as compared with $249,975 in 1913, and $260,764 in 1912.

Marble quarries were operated during 1914 at Philipsburg and South Stukely, Que., Dungannon and Faraday townships in Ontario, and at Marble Head, B. C. A new quarry was also being opened up in Texada Island, British Columbia.

Annual Production of Marble.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		$			$
1886	501	9,900	1896	224	2,405
1887	242	6,224	1897 to 1907 inclusive.	Nil.	Nil.
1888	191	3,100	1908	.....	125,000
1889	83	980	1909	.....	158,441
1890	780	10,776	1910	.....	158,779
1891	240	1,752	1911	.....	162,783
1892	340	3,600	1912	.....	260,764
1893	590	5,100	1913	.....	249,975
1894	Nil.	Nil.	1914	.....	132,533
1895	200	2,000			

The imports of marble during the calendar year 1914 were valued at $465,563 as compared with $577,028 in 1913, and $475,926 in 1912.

The annual imports of marble since 1880 are shown in the general table of imports, page 357.

SANDSTONE.

The value of the production of sandstone in 1914 is reported as $487,140, as compared with a value of $396,782 reported for 1913. The greater part of the sandstone is quarried for building purposes, though large quantities were used for rubble and paving purposes during 1914.

Of the production in 1914, building and ornamental stone was sold to the value of $226,825, or 47 per cent of the total value of production. There was included in this amount, rough stone valued at $108,606 and dressed stone valued at $118,219.

Of the production in 1913, building and ornamental stone was sold to the value of $324,020, or 82 per cent of the total value, there being included in this amount, rough stone valued at $142,895 and dressed stone valued at $181,125.

Value of Sandstone Production by Provinces, 1914.

Province.	Building and ornamental.	Crushed.	Paving.	Rubble.	Total.
	$	$	$	$	$
Nova Scotia	52,530	451	.....	8,143	61,124
New Brunswick	52,447	.....	.....	184,200	236,647
Quebec	.....	17,400	.....	.....	17,400
Ontario	10,502	20,640	23,715	5,066	59,923
Alberta	59,572	.....	.....	700	60,272
British Columbia	51,774	.....	.....	.....	51,774
Total	226,825	38,491	23,715	198,109	487,140

Value of Sandstone Production by Provinces, 1913.

Province.	Building and ornamental.	Crushed.	Paving.	Rubble.	Total.
	$	$	$	$	$
Nova Scotia	57,240	.....	.....	5,250	62,490
New Brunswick	46,671	2,713	.....	21,403	70,787
Ontario	14,910	25,053	4,950	9,825	54,738
Alberta	133,416	.....	.....	3,568	136,984
British Columbia	71,783	.....	.....	.....	71,783
Total	324,020	27,766	4,950	40,046	396,782

Value of Sandstone Production by Provinces 1909-1912.

Province.	1909.	1910.	1911.	1912.
	$	$	$	$
Nova Scotia	21,850	16,425	23,440	20,645
New Brunswick	30,609	51,793	35,337	68,260
Quebec	.....	.....	450	.....
Ontario	62,824	62,247	54,032	59,240
Alberta	90,383	240,858	158,344	81,391
British Columbia	168,513	130,825	179,580	99,816
Total	374,179	502,148	451,183	329,352

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