

CANADA
DEPARTMENT OF MINES

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THE
PRODUCTION OF CEMENT, LIME, CLAY PRODUCTS, STONE,
AND OTHER STRUCTURAL MATERIALS

IN

CANADA

During the Calendar Year

1913

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**ADVANCE CHAPTER OF THE ANNUAL REPORT ON THE
MINERAL PRODUCTION OF CANADA DURING THE
CALENDAR YEAR, 1913.**

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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., but at the time of closing the statistics several important and comprehensive returns had not been received. 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 1913, according to the record obtained, was \$30,809,752, as compared with a value of \$28,794,869 in 1912, an increase of \$2,014,883, or nearly 7 per cent. The total production in 1911 was valued at \$22,709,611, compared with which the 1912 production showed an increase of \$6,085,258, or 26.8 per cent. The total production in 1910 was valued at \$19,627,592, and in 1909 \$16,533,349.

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 however the exports were larger than the exports in 1912, and the imports showed a falling off of over 10 per cent. 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 1913 valued at \$39,916,642, as compared with a value of \$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 increase in consumption in 1913 was a little less than 2 per cent, as against 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 1913, and in 1912, and the annual production from 1907 to 1911, are shown in tables herewith.

Structural Materials, Calendar Year, 1913.

	Production.	Imports.	Exports.	Con- sumption.
	\$	\$	\$	\$
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		241,018
Stone.....	5,504,639	1,640,849	93,840	7,051,048
	30,809,752	9,724,992	618,102	39,916,642

Structural Materials, Calendar Year, 1912.

	Production.	Imports.	Exports.	Con- sumption.
	\$	\$	\$	\$
Cement, Portland.....	9,106,556	1,969,529	2,436	11,073,649
Clay products.....	10,575,809	6,592,540	18,750	17,149,059
Lime.....	1,844,849	207,481	35,097	2,017,233
Sand-lime brick.....	1,020,386			1,020,386
Sand and gravels.....	1,512,099	445,781	459,952	1,497,928
Slate.....	8,939	200,643		209,532
Stone.....	4,726,171	1,467,143	33,242	6,160,072
	28,794,869	10,883,117	549,477	39,128,509

Production of Structural Materials, 1907-1911.

	1907.	1908.	1909.	1910.	1911.
	\$	\$	\$	\$	\$
Cement.....	3,781,371	3,709,954	5,345,802	6,412,215	7,644,537
Clay products.....	5,772,117	4,500,702	6,450,840	7,629,956	8,359,933
Lime.....	974,595	712,947	1,132,756	1,137,079	1,517,599
Sand-lime brick.....	167,795	152,856	201,650	371,857	442,427
Sand and gravels (exports).....	119,853	161,387	256,166	407,974	408,110
Slate.....	20,056	13,496	19,000	18,492	8,248
Stone.....	2,027,262	2,088,613	3,127,135	3,650,019	4,328,757
Total.....	12,863,049	11,339,955	16,533,349	19,627,592	22,709,011

It will be noted that while there was an increased production of cement, sands and gravels, and stone, there was a falling off in the production of clay products, lime, sand-lime brick and slate. In the case of sands and gravels the increase shown in 1913 is probably chiefly due to the greater completeness of the record covering the past year. The financial stringency experienced during 1913 placed a check upon the development of Canada's structural material resources which has been a feature of the country's growth during the past ten years.

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 fifteen 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 which show an increase in eastern provinces but a very great decrease in all provinces west of the Great Lakes.

CEMENT.

The total quantity of cement made in 1913, according to returns received from the manufacturers, was 8,886,333 barrels of 350 pounds net each (1,555,108 tons) as compared with 7,141,004 barrels (1,249,676 tons) made in 1912, an increase of 1,745,329 barrels (305,432 tons), or 24.4 per cent.

The total quantity of Canadian Portland cement sold in 1913 was 8,658,805 barrels (1,515,291 tons), as compared with 7,132,732 barrels (1,248,228 tons) in 1912, an increase of 1,526,073 barrels (267,063 tons), or 21.4 per cent.

The total consumption of cement in 1913 including Canadian and imported cement was 8,912,898 barrels of 350 pounds net each (1,559,757 tons), as compared with 8,567,145 barrels (1,499,250 tons) in 1912, an increase of 345,753 barrels (60,507 tons) or over 4 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.

Notwithstanding the restriction of building operations during 1913 the consumption of cement shows a small increase of 4 per cent. A very substantial increase in the output of Canadian mills however is shown amounting to over 24 per cent and this increase served to displace imported material, so that in 1913 Canadian cement plants supplied over 97 per cent of the consumption as against 83 per cent of the consumption in 1912.

The industry has been marked during the year by the extension of old, and the completion of new plants, the latter west of the Great Lakes where a cement shortage was experienced during the summer of 1912. The total capacity of completed plants at the end of the year was over 50,000 barrels, as compared with 36,515 barrels at the end of 1912.

The market prices of cement according to quotations published in trade journals, showed practically no variation during the year and little change from the prices during 1912. Prices at Halifax are reported as \$2 per barrel; at Montreal for large lots \$1.35 to \$1.40, bags 40 cents extra; at Toronto in large quantities \$1.50, car lots \$1.55, small city dealers \$1.80 to \$1.85, bags 40 cents extra; at Winnipeg \$2.40 to \$2.50 per barrel in bags.

The average price at cement mills as returned by producers was: for Quebec \$1.16; Ontario \$1.08; Alberta \$2.04, and British Columbia \$1.71 per barrel.

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.	66,210	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	119,303	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

*Quantities sold or used.

The production of cement in 1913 was derived from twenty-seven operating plants, in addition to which sales were made from stock at one plant not producing during the year. The total daily capacity of the operating plants was 50,540 barrels, while three other plants in Ontario, not operated during the year, are equipped for a daily capacity of 2,350 barrels.

The producing plants were distributed as follows: one in Nova Scotia, using blast furnace slag; three in Quebec, using limestone and clay; fourteen in Ontario, of which nine used marl and five 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 1913 was 4,276, and the total wages paid \$3,466,451. In 1912 the average number of men employed was 3,461 and wages paid \$2,623,902.

A comparison of the principal statistics of 1912 and 1913 showing the increase or decrease, as the case may be, is given in the next table:

Comparison of Production, Sales, and Imports of Portland Cement in 1912 and 1913.

	1912.	1913.	Increase.	Per cent	Decrease.	Per cent
Cement sold or used..... Bls.	7,132,732	8,658,805	1,526,073	21.40		
Cement manufactured.... "	7,141,004	8,886,333	1,745,329	24.44		
Stock on hand Jan. 1..... "	894,822	862,067			32,755	3.66
Stock on hand Dec. 31..... "	903,094	1,089,595	186,501	20.65		
Value of cement sold or used. \$	9,106,556	11,019,418	1,912,862	21.01		
Average price per barrel.... "	1.28	1.27			0.01	0.78
Wages paid..... "	2,023,902	3,466,451	842,549	32.11		
Men employed..... No.	3,461	4,276	815	23.55		
Imports of Portland cement. Bls.	1,434,413	254,093			1,180,320	82.8
Value of cement..... \$	1,969,529	409,303			1,560,226	79.1
Average price per barrel... "	1.37	1.61	0.24	17.5		
Total consumption of cement in Canada..... Bls.	8,567,145	8,912,898	345,753	4.04		
No. of completed plants operated.....	24	27	3	12.5		
Total daily capacity of operating plants as on Dec. 31..... Bls.	36,515	50,540	14,025	38.4		

The output exceeded the sales by about 227,000 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 \$1.27 in 1913, as compared with \$1.27 $\frac{3}{4}$ in 1912, and \$1.34 in 1911. The increased production in 1913 was accompanied by an increase of 23.5 per cent in the number of men employed, and an increase of 32 per cent in amount of wages paid.

The imports of cement in 1913 show a falling off of nearly 83 per cent from those of 1912, while the average price of imported cement increased from \$1.37 in 1912 to \$1.61 in 1913.

Of the total cement made in 1913, 1,467,058 barrels were made from marl, and 7,419,275 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 dur-

ing 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, and 16.5 per cent in 1913.

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		513,933	2 01	
1900.....			292,124		562,916	1 91	
1901.....	4	360,160	317,066	58,094	565,615	1 78	
1902.....	8	502,335	594,594	33,446	1,028,618	1 73	3,900
1903.....	9	714,136	627,741	123,386	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

Imports and Exports:—The quantity of cement exported is not recorded but the value in 1913 is reported as only \$1,739 as against a value of exports in 1912 of \$2,436, and \$4,067 in 1911.

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 this year the duty was, on account of the scarcity in western Canada, reduced by one-half from June 12 to October 31, 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 in 1913 however have fallen to 254,093 barrels.

The United States has been the principal source of imports during the past few years and supplied about 68 per cent of the imports in 1913, as compared with 30 per cent from Great Britain. In 1912 about 89 per

cent of the imports were from the United States, and 9 per cent from Great Britain. The imports of cement during 1912 and 1913 by countries, are shown in the next table.

Imports of Cement, 1912 and 1913.

	1912.				1913.			
	Cwt.	Per cent.	Value.	Average value.	Cwt.	Per cent.	Value.	Average value.
			\$	Cts.			\$	Cts.
Great Britain..	457,031	9.1	147,831	32	270,747	30.4	94,844	35
United States..	4,483,353	89.3	1,789,021	40	603,044	67.8	305,165	51
Belgium.....	21,375	0.4	7,175	34	.....	.....	.....	.....
Other countries	3,187	0.1	1,423	45	3,483	0.4	3,307	95
Hong Kong....	55,500	1.1	23,479	42	12,050	1.4	5,087	49
Totals.....	5,020,446	100.0	1,969,529	39	889,324	100.0	409,303	46
Equivalent in barrels of 350 lbs.....	1,434,413	.....	.....	.....	254,093	.....	.....	.....

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	1906.....	\$ 7,551
1892.....	938	1900.....	3,296	1907.....	9,618
1893.....	1,172	1901.....	1,514	1908.....	34,591
1894.....	482	1902.....	2,267	1909.....	113,362
1895.....	937	1903.....	2,851	1910.....	12,914
1896.....	1,328	1904.....	5,494	1911.....	4,067
1897.....	644	1905.....	3,143	1912.....	2,436
1898.....	2,117			1913.....	1,739

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 90	111,521		
1886.....	1,851	6,164	6,028	0 98	120,398		
1887.....	1,419	6,160	8,784	1 43	102,750	1 44	
1888.....	5,787	5,636	7,522	1 33	122,402	1 45	
1889.....	10,668	5,835	7,467	1 28	122,273	1 47	
1890.....	5,443	5,440	9,048	1 66	192,322	1 63	
1891.....	2,890	3,515	6,152	1 75	183,728	1 66	
1892.....	3,394	2,214	2,782	1 26	187,233	1 50	
1893.....	2,909	4,896	8,060	1 65	229,492	1 38	
1894.....	2,618	1,054	985	0 93	224,150	1 25	
1895.....	2,112	5,333	7,001	1 31	196,281	1 24	
1896.....	3,672	5,688	8,948	1 57	204,407	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	6,365	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
1910.....	7,678	588	553	0 94	490,809	158,487	0 32
1911.....	6,275	389	365	0 94	1,283,121	494,081	0 39
1912.....	7,821	901	579	0 64	2,592,025	936,425	0 36
1913.....	10,680				4,958,814	1,955,177	0 39

*Cement not elsewhere specified and manufactures of 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 1913 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.

In 1911 the total consumption of cement was 6,354,831 barrels (1,112,095 tons), made up of 5,692,915 barrels (996,260 tons) of Canadian cement, and 661,916 barrels (115,835 tons) of imported cement, the Canadian cement representing 90 per cent, and the imported cement 10 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

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 1913 in this Province was 2,940,211 barrels valued at \$3,430,023.

Ontario.—Ontario continues as the most important cement producing province in Canada having fourteen mills in operation during 1913 of which six with a total daily capacity of 11,100 barrels are operated by the Canada Cement Company, and eight mills, having a total daily capacity of 6,650 barrels, by independent companies. Five plants are operated on limestone and have a total daily capacity of 9,500 barrels, while nine plants, with an aggregate daily capacity of 8,250 barrels, utilize marl deposits. Three plants, one limestone and two marl, formerly producing cement were idle during 1913. 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 1913, were 3,992,988 barrels valued at \$4,311,183, as compared with 3,044,713 barrels valued at \$3,372,897 in 1912. There was thus an increase in sales of 948,275 barrels or over 31 per cent.

The detailed statistics of production during 1912 and 1913 are shown in the next table.

Cement Production in Ontario, 1912 and 1913.

	1912.	1913.	Increase.	Per cent	Decrease.	Per cent.
Cement sold or used.....Bls.	3,044,713	3,992,988	948,275	31.1		
Cement manufactured... "	2,961,185	4,007,202	1,046,017	35.3		
Stock on hand Jan. 1.... "	563,066	439,010			124,056	22.0
Stock on hand Dec. 31... "	479,538	453,224			26,214	5.5
Value of cement sold.... \$	3,372,897	4,311,183	938,286	27.8		
Wages paid..... "	921,553	1,098,197	176,644	19.2		
Men employed.....No.	1,559	1,539			20	1.3
Total daily capacity of operating plants.....Bls.	19,900	17,750			2,150	10.8

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 1913, 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 now increased to 4,500 barrels. The capacity of the mill at Blairmore operated by the Rocky Mountains Cement Company has been increased to 1,000 barrels.

The new plant at Marlboro, 140 miles west of Edmonton, constructed to utilize the local marl deposits, was completed during the year and operated for a period of four months; the daily capacity of this plant is 1,500 barrels. The total quantity of cement marketed by producers in 1913 was 956,169 barrels valued at \$1,947,933.

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 new plants were completed during the year, making three plants in operation in this Province in 1913. At Tod Inlet the Vancouver Portland Cement Company increased the capacity of its plant to about 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 for a period of seven months, the daily capacity of this plant being about 2,000 barrels. In both cases the limestone, clay and shale are obtained in the vicinity of the works.

The plant at Princeton constructed by the British Columbia Portland Cement Co., Ltd., capacity 500 to 700 barrels per day, did not begin active production until late in the year and was operated for about four weeks only.

The total sales of cement from British Columbia mills in 1913 were 574,258 barrels valued at \$980,560.

The production of cement in Ontario has already been shown separately and the aggregate production in all other provinces during 1912 and 1913 is given in the next table.

Cement Production in Other Provinces, 1912 and 1913.

	1912.	1913:	Increase.	Percent.	Decrease.	Percent.
Cement sold or used.... Bls.	4,088,019	4,665,817	577,798	14.1		
Cement manufactured.... "	4,179,819	4,879,131	699,312	16.7		
Stock on hand Jan. 1.... "	331,756	423,067	91,311	27.5		
Stock on hand Dec. 31.... "	423,556	630,371	212,815	50.2		
Value of cement sold.... \$	5,733,659	6,708,235	964,576	16.8		
Wages paid..... "	1,702,349	2,368,254	665,905	39.1		
Men employed..... No.	1,902	2,737	835	43.9		
Total daily capacity of operating plants..... Bls.	18,115	32,790	14,675	81.0		

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.....	Pointe Aux Trembles, Q.	
International Mill, No. 3.....	Hull, Que.....	
Owen Sound Mill, No. 9.....	Shallow Lake, Ont.....	
Belleville Mill, No. 4.....	Belleville, O. (Point 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 Doric 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.....	Warton, Ont.....	Warton, Ont.
St. Mary's Portland Cement Co., Ltd.....	St. Marys, Ont.....	Toronto, Ont.
The Commercial Cement Co., Ltd.....	Babeck, Man.....	Winnipeg, Man.
The Rocky Mountains Cement Co.....	Blairmore, Alberta.....	Calgary, Alberta.
†The Keystone Portland Cement Co.....	" " " " " "	" " " " " "
The Edmonton Portland Cement Co., Ltd.....	Marlboro, Alberta.....	Edmonton, Alberta.
Vancouver Portland Cement Co.....	Tod Inlet, B.C.....	Victoria, B.C.
British Columbia Portland Cement Co., Ltd...	Princeton, East.....	Vancouver, B.C.
The Associated Cement Co. (Canada), Ltd....	Bamberton.....	Victoria, B.C.

†Mill not yet completed. *Idle.

CLAYS AND CLAY PRODUCTS¹.

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 1913 was \$9,504,314 as compared with a value of \$10,575,869 in 1912, showing a decrease of \$1,071,555 or a little over 10 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 the 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. Other clay products including ornamental brick, firebrick and fireclay, terra cotta fireproofing, pottery, sewerpipe, drain tiles and kaolin showed substantial increases in the quantity and value of products marketed. The average number of men employed and the total wages paid were greater in 1913 than in 1912. The average number of men employed in 1913 was 11,193 as compared with 10,415 in 1912, and 9,131 in

¹Special 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.

1911. The total wages paid in 1913 were \$4,682,801 as against \$4,488,957 in 1912, and \$3,524,058 in 1911.

A significant feature of the clay industry in 1913 was that the falling off in sales was almost entirely confined to the western provinces. There was an increase in the value of the sales of clay products in Nova Scotia, New Brunswick, and in Ontario. In the Province of Quebec the falling off was less than 5 per cent but the decrease in each of the four western provinces was very marked, ranging from 30 to 50 per cent.

Largely because of her preponderance of population and older development, Ontario is by far the largest producer of clay products, having contributed in 1913 nearly 55 per cent of the total values marketed, as compared with 46 per cent in 1912. Quebec contributed 17 per cent in 1913 as against 16 per cent the preceding year; Alberta 9.4 per cent in 1913, as compared with 12.5 per cent in 1912; Manitoba 5 per cent in 1913 as against 10 per cent in 1912, and British Columbia 7 per cent in 1913 as compared with 8 per cent in the previous year.

Of the total value of the production in 1913, building and paving brick, including fire proofing, contributed \$7,928,585 or about 75 per cent, as against \$9,163,666 or 86 per cent of the total in 1912. Sewerpipe and tile production in 1913 were valued at \$1,374,458 or 13 per cent of the total, as against \$1,242,503 or 11.7 per cent of the total in 1912. The total value of the production of pottery in 1913 was reported as \$368,916 of which \$53,533 only, is estimated as attributable to Canadian clays, and the balance to imported clays. The value of the production of fireclay and fire brick from domestic clays was reported as \$142,738. Compared with the previous year the production of building, paving, and fireproofing brick shows a decrease of about 13 per cent, whereas the production of sewerpipe shows an increase of nearly 11 per cent.

The average price of common and building brick for the whole of Canada in 1913 was \$8.85 as compared with \$9.11 in 1912; \$8.37 in 1911, \$8.13 in 1910, and \$7.81 in 1909. The average price of pressed or front brick for the same years was respectively \$12.49, \$12.86, \$12.53, \$11.89, and \$11.01, thus showing a general increase in the cost of building brick until 1912, with a slight falling off in 1913.

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 1913 was \$6,760,752 (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 \$16,212,733 is shown of which about 58.6 per cent was of domestic production.

In 1912 the approximate consumption was valued at \$17,149,659, of which about 62 per cent was of domestic production. In 1911 the con-

sumption was valued at \$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 eight times the Canadian production. The imports of drain tile and sewerpipe were about one-third the Canadian production.

Statistics of production in 1913 and 1912 of the several classes of clay products by provinces are shown in the following tables:—

Production of Clay Products by Provinces, 1913

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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.....	14	379	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. Value.	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 \$315,333 from imported clays.

(b) There was also a production of \$22,925 from imported clays.

Production of Clay Products by Provinces, 1912.

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.			\$	\$
Nova Scotia.....	11	316	98,939	20,095,202	18,722,960	128,508	6 86	220,000	100,000	1,600	16 00
New Brunswick.....	7	148	45,536	6,179,000	5,730,000	52,850	9 22	50,000	50,000	500	10 00
Quebec.....	74	1,917	645,221	181,219,323	161,836,557	1,308,380	8 08	10,386,454	11,500,000	138,500	12 04
Ontario.....	271	4,696	2,060,542	356,964,931	350,461,874	3,045,840	8 69	75,231,791	73,208,310	761,355	10 40
Manitoba.....	21	1,088	405,926	85,556,437	83,681,237	959,854	11 47	3,450,000	3,497,700	52,947	15 13
Saskatchewan.....	14	383	152,654	24,603,771	25,338,771	246,443	9 73	5,950,000	5,200,000	86,500	16 63
Alberta.....	33	1,053	587,223	73,394,693	70,074,568	755,986	10 69	25,798,410	23,685,412	349,926	14 77
British Columbia.....	28	814	492,916	56,569,470	53,345,565	512,514	9 61	8,210,800	7,939,000	218,526	27 53
Totals.....	459	10,415	4,488,957	802,582,827	769,191,532	7,010,375	9 11	129,297,455	125,180,422	1,609,854	12 86

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.....					15,375	1,270		115,000	10,300		272,053
New Brunswick.....									1,560		54,910
Quebec.....					25,000	42,530	500	165,000	390	160	1,680,460
Ontario.....	4,554,500	85,589	352,816	7,168		135,087	43,455	478,156	308,050		4,864,700
Manitoba.....									5,250		1,013,051
Saskatchewan.....											332,943
Alberta.....			10,000	1,000		248,712				560	1,356,184
British Columbia.....	25,000	400	8,540	427	85,210	21,254		126,485	31,752		996,568
Totals.....	4,579,500	85,989	371,356	8,595	(b) 125,585	448,853	(a) 43,955	884,641	357,862	160	10,575,869

(a) There was also a production of \$383,134 from imported clays.

(b) Also a production of \$25,000 from imported clays.

Production of Clay Products, 1910 and 1911.

	1910.			1911.		
	Quantity.	Value.	Per M.	Quantity.	Value.	Per M.
		\$	\$ cts.		\$	\$ cts.
Bricks—						
Common..... No.	627,715,319	5,105,354	8 13	645,550,517	5,420,890	8 37
Pressed..... “	67,895,034	807,204	11 80	87,350,539	1,094,582	12 53
Paving..... “	4,214,917	78,980	18 74	5,220,400	79,444	15 22
Ornamental..... “	703,345	16,092	22 89	605,643	11,281	18 63
Firebrick and fireclay shapes, etc.....		50,215			89,130	
Fireproofing, and architectural terra-cotta, etc.....		176,979			409,585	
Pottery.....		250,924			102,493	
Sewerpipe.....		774,110			812,716	
Tiles, drain.....	24,562,648	370,008			330,812	
Totals.....		7,629,956			8,359,933	

Production of Clay Products by Provinces, 1908-1913.

Province.	1908.	1909	1910.	1911.	1912.	1913.
	\$	\$	\$	\$	\$	\$
Nova Scotia.....	117,833	188,185	204,782	274,249	272,053	332,272
New Brunswick.....	75,513	65,570	56,475	38,000	54,910	62,269
Quebec.....	893,717	1,153,832	1,442,842	1,341,467	1,680,460	1,606,816
Ontario.....	2,476,152	3,425,841	3,667,810	3,916,575	4,864,700	5,220,467
Manitoba.....	265,091	559,008	781,605	834,428	1,018,051	514,858
Saskatchewan.....	87,566	145,516	160,850	226,958	332,943	189,820
Alberta.....	240,384	442,486	753,232	1,052,751	1,356,184	893,408
British Columbia.....	344,446	470,402	562,360	675,505	996,568	684,904
	4,500,702	6,450,840	7,629,956	8,359,933	10,575,869	9,504,314

Annual Value of Production of Clay Products, 1899-1913.

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

Exports and Imports.—The total value of the exports of clay products in 1913 was \$52,333 and included 977,000 building brick valued at \$8,579, manufactures of clay valued at \$27,201 and earthenware valued at \$16,553.

In 1912 the total value of the exports was \$18,750, which included 694,000 building brick valued at \$8,493, manufactures of clay valued at \$256 and earthenware valued at \$10,001.

The imports of clays and clay products reached a total value during the calendar year 1913 of \$6,760,752, or equivalent to about 71 per cent of the domestic production. The total imports in 1912 were valued at \$6,592,540 showing an increase in 1913 of \$168,212 or less than 3 per cent, as against an increase in 1912 over 1911 of nearly 28 per cent in imports. Not only have the imports during the past few years been increasing at a more rapid rate than the home production, but in 1913 there was an increase in imports notwithstanding a decrease in the value of domestic clay products marketed.

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 1913 were valued at \$324,290 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 \$149,337 and of fireclay \$143,399, in both cases an increase over the imports of the previous year. In 1912 the total value of the imports of clays was \$288,394 and included china-clay valued at \$127,402 and fireclay at \$140,500. The imports of these clays have varied considerably from year to year. The present imports of china-clay are the highest recorded but the imports of fireclay in 1908 exceeded the 1913 imports.

The imports classified under brick and tile were valued in 1913 at \$3,121,592 a slightly lower value than the imports in 1912 which were \$3,209,190. A large portion of these imports are made up of firebrick, nearly 40 per cent in 1913. 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 1913 at \$3,314,870 as against \$3,094,956 in 1912, an increase of about 4 per cent. 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 since 1907 is shown in the next table, the figures for the years 1907 to 1909 covering the fiscal year; for the last five years the calendar year is used.

Imports of Clay Products, 1907 to 1913.

Imports.	9 months ending March, 1907.	12 months ending March, 1908.	12 months ending March, 1909.	Calendar year 1909.	Calendar year 1910.	Calendar year 1911.	Calendar year 1912.	Calendar year 1913.
Brick and tile:—	\$	\$	\$	\$	\$	\$	\$	\$
Bath brick.....	1,076	1,834	4,432	1,495	2,290	2,623	1,927	2,690
Building brick.....	88,144	139,105	108,773	195,360	274,482	475,865	763,470	575,269
Paving brick.....	23,256	61,346	101,187	139,366	124,994	164,292	160,663	176,497
Firebrick, of a class or kind not made in Canada.....	*506,801	639,347	350,457	485,994	811,927	814,414	953,621	976,097
Drain tile, not glazed.....	12,106	2,080	2,394	2,785	4,485	5,640	4,018	12,156
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed.....	93,458	125,747	106,399	170,280	175,599	382,929	507,024	465,997
Manufactures of clay, n.o.p.....	45,845	110,097	141,391	254,170	361,996	523,998	818,467	(a)912,886
Total.....	770,686	1,079,556	815,033	1,249,450	1,755,773	2,369,761	3,209,190	3,121,592
Earthenware and chinaware:—								
Brown or coloured earthenware and stoneware, and Rockingham ware.....	9,625	22,847	28,273	36,673	53,413	52,100	62,161	70,632
C. C. or cream coloured ware, decorated, printed or sponged, and all earthenware, n.o.p.....	154,879	239,513	197,623	219,936	202,475	184,291	291,804	264,090
Demijohns, churns, or crocks.....	9,342	17,836	10,571	8,888	6,607	4,933	18,404	32,599
Tableware of china, porcelain, white granite or iron-stoneware..	902,798	1,555,517	1,202,537	1,212,365	1,545,538	1,718,532	2,068,362	2,185,601
China and porcelain ware, n.o.p.....	134,675	109,446	87,798	87,467	95,509	62,025	71,751	43,696
Tiles or blocks of earthenware or stone prepared for mosaic flooring.....	62,547	45,836	43,299	56,974	90,524	123,203	160,082	173,445
Earthenware tiles, n.o.p.....	67,027	116,480	79,854	81,393	125,772	154,351	239,391	296,791
Manufactures of earthenware, n.o.p.....	81,987	83,309	66,932	78,063	163,278	217,051	183,001	248,016
Total.....	1,422,880	2,190,784	1,716,887	1,781,759	2,283,116	2,516,536	3,094,956	3,314,870
Clays:—								
China-clay ground, or unground.....	78,772	97,236	90,922	100,066	142,125	125,768	127,402	149,337
Fireclay, ground or unground.....	85,044	155,873	77,146	86,161	124,293	125,199	140,500	143,399
Pipeclay, ground or unground.....	307	819	887	310	114	1,786	234	385
Clays, all other, n.o.p.....	14,117	14,292	21,280	29,793	25,976	17,494	20,258	31,169
Totals.....	178,240	267,720	190,235	216,330	292,508	270,247	288,394	324,290
Grand total.....	2,371,806	3,538,060	2,722,155	3,247,539	4,331,397	5,156,544	6,592,540	6,760,752
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks and laundry tubs of any material.....	62,547	234,505	157,881	211,837	262,667	285,847	382,920	477,133
Chalk, china or cornwall stone, cliff stone and feldspar, fluorspar, magnesite, ground or unground.....	7,376	72,467	81,675	96,747	121,959	147,640	167,990	164,879

*Includes stove linings, n.e.s.

(z) Includes Building Blocks (9 mos.) \$356,366; Firebrick, N.O.P. (9 mos.) \$216,760; and manufactures of clay N.O.P. \$339,760.

In addition to the imports of clay products there is also shown in the preceding table a considerable annual importation of 'chalk, china or corn-wall 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 1913 was \$164,879; of which \$138,524 was from the United States, \$21,860 from Great Britain, and \$4,495 from other countries. The value of the imports under this item during the calendar year 1912 was \$167,990. 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 1913 being \$477,133 as compared with \$382,920 during the year 1912.

Imported clay products are derived chiefly from Great Britain and the United States, although considerable quantities of earthenware, china, and porcelain 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 86·5 per cent was from the United States and 13·2 per cent from Great Britain; and only \$5,727 worth from other countries. Of the earthenware and chinaware, 59 per cent was imported from Great Britain; 18 per cent from the United States; 11 per cent from Germany; 6 per cent from France, and considerable values also from Japan, 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 1913, Showing Countries of Origin.

66938-5

Imports.	Great Britain.	United States.	Germany.	France.	Austria-Hungary.	Japan.	Other countries.	Total.
Brick and tile:—	\$	\$	\$	\$	\$	\$	\$	\$
Bath brick.....	1,454	196						1,650
Building brick.....	31,812	777,556						809,368
Paving brick.....	63,171	96,005		678				159,854
Fire brick, of a class or kind not made in Canada.....	114,201	882,569		8	250		3,488	1,000,516
Drain tile, not glazed.....	1,199	2,873		381				4,453
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed.....	81,029	432,491						513,520
Manufactures of clay, n.o.p.....	145,403	668,432	270	449	66		137	814,757
Total.....	438,269	2,860,122	270	1,516	316		3,625	3,304,118
Earthenware and chinaware:—								
Brown or coloured earthenware and stoneware, and Rockingham ware.....	22,131	40,112	202		7	22	17	62,491
C. C. or cream coloured ware, decorated printed or sponged, and all earthenware, n.o.p.....	192,367	58,916	21,814	3,475	1,652	10,768	7,646	296,638
Demijohns, churns, or crocks.....	2,454	22,843	12	83			94	25,486
Tableware of china, porcelain, white granite or iron-stoneware..	1,470,349	36,826	303,325	174,431	76,168	89,088	15,976	2,166,163
Chinaware, to be silver mounted, imported by manufacturers of silverware.....	125	232	45					402
China and porcelain ware, n.o.p.....	33,061	17,322	9,344	908	1,792	3,512	987	66,926
Tiles or blocks of earthenware or stone prepared for mosaic flooring.....	29,709	142,713	1,093	3,174		11	108	176,808
Earthenware tiles, n.o.p.....	127,715	147,049	148	1,162			839	276,913
Manufactures of earthenware, n.o.p.....	54,507	118,346	7,898	1,412	813	6,194	4,183	193,353
Total.....	1,932,418	584,359	343,831	184,645	80,432	109,595	29,850	3,265,180
Clays:—								
China-clay, ground or unground.....	95,147	49,980			298			145,425
Fire-clay, ground or unground.....	23,388	134,048	1,283		40			158,759
Pipe-clay, ground or unground.....	98	210						308
Clays, all other, n.o.p.....	478	21,888	512					22,878
Total.....	119,111	206,126	1,795		338			327,370
Grand Total.....	2,489,798	3,650,607	345,946	186,161	81,086	109,595	33,475	6,896,668
Per cent of total.....	36.10	52.93	5.02	2.70	1.18	1.59	0.48	
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks, and laundry tubs of any material.....	128,911	294,057	381					423,349
Chalk, china or Cornwall stone, cliff stone, and feldspar, fluorspar, magnesite, ground or unground.....	35,186	134,276	98	9	164		1,293	170,976

A record of the total annual value of the imports of clay products since 1900 by fiscal years, is shown in the following table. In fourteen years Canada has imported clay products to the value of \$42,293,374. The increase in imports has been most pronounced in the case of brick and tile, the imports of which in 1900 amounted to \$145,914 as compared with \$3,304,118 in the fiscal year 1913, an increase of over twenty-fold. The imports of earthenware and chinaware have more than trebled, and the imports of clays have almost trebled in the same period.

Imports of Clay Products (total value) 1900-13.

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
1909.....	815,033	1,716,887	190,235	2,722,155
1910.....	1,341,310	1,859,302	218,232	3,418,844
1911.....	1,895,201	2,398,416	299,533	4,593,150
1912.....	2,462,181	2,582,966	287,671	5,302,818
1913.....	3,304,118	3,265,180	327,370	6,896,668
	14,298,955	25,132,250	2,862,169	42,293,374

*9 months ending March 1907.

**Includes fireclay classified as "for use in process of manufactures."

The Canadian Customs duties affecting clays and clay products 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 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.

In 1911 the total sales were 732,901,056, valued at \$6,515,472, made up of 645,550,517 common, valued at \$5,420,890, or an average value per thousand of \$8.37; and 87,350,539 pressed brick, valued at \$1,094,582, or an average value per thousand of \$12.53. In addition to the common and pressed brick there was a production of ornamental brick of 605,643, valued at \$11,281, and a production of fireproofing brick and architectural terra-cotta valued at \$409,585.

Production of Clay Building Brick (Common and Pressed) 1912 and 1913.

Province.	1912.				1913.			
	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.....	11	18,822,960	\$ 130,108	1.5	12	22,085,765	\$ 174,024	2.3
New Brunswick..	7	5,780,000	53,350	0.6	8	6,189,152	61,969	0.8
Quebec.....	74	173,336,557	1,446,880	16.8	76	153,696,242	1,250,765	17.0
Ontario.....	271	423,670,184	3,807,195	44.2	271	430,029,531	4,026,029	54.6
Manitoba.....	21	87,178,937	1,012,801	11.7	17	43,660,320	514,358	7.0
Saskatchewan...	14	30,538,771	332,943	3.9	14	18,175,000	189,820	2.6
Alberta.....	33	93,759,980	1,105,912	12.8	30	71,996,343	732,408	9.9
British Columbia	28	61,284,565	731,040	8.5	27	39,396,375	426,733	5.8
Totals.....	459	894,371,954	8,620,229	100.0	455	785,228,728	7,376,106	100.0

Production of Clay Building Brick (Common and Pressed) 1910 and 1911.

Province.	1910.			1911.		
	No. sold.	Value.	Per cent of total value.	No. sold.	Value.	Per cent of total value.
		\$			\$	
Nova Scotia.....	18,730,000	113,436	1.92	23,530,000	141,640	2.17
New Brunswick.....	3,950,000	31,350	0.53	4,400,000	33,000	0.53
Quebec.....	130,273,310	929,492	15.72	122,041,580	1,033,270	15.86
Ontario.....	342,119,078	2,785,361	47.11	369,004,371	3,028,046	46.48
Manitoba.....	75,334,550	746,704	12.63	81,400,000	826,923	12.69
Saskatchewan.....	14,733,340	160,850	2.72	21,071,660	224,758	3.45
Alberta.....	73,639,771	750,982	12.70	71,772,930	779,001	11.96
British Columbia.....	36,316,304	394,473	6.67	39,630,515	443,829	6.81
Totals.....	695,610,353	5,912,648	100.00	732,901,056	6,515,472	100.00

The exports of building brick since 1891 and the imports since 1880 are shown in the two 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 \$8,579 in 1913.

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 1913 the imports 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. The imports during the calendar year 1912 were 81,425,000 brick valued at \$763,470, of which 3,071,000 valued at \$32,731, or an average of \$10.66 per thousand were imported from Great Britain, and 78,350,000 valued at \$730,739, or an average of \$9.33 per thousand from the United States.

It will be noted that in 1913 there was a considerable falling off in the imports of brick, both 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	3,493
1897.....	573	2,679	1905.....	754	5,888	1913.....	977	8,579
1898.....	65	442	1906.....	697	6,541			

Imports of Building Brick.

Fiscal Year.	M.	Value.	Fiscal Year.	M.	Value.	Fiscal Year.	M.	Value.
		\$			\$			\$
1880.....	340	2,067	1891.....	589	9,744	1902.....	4,087	33,802
1881.....	415	4,281	1892.....	621	5,075	1903.....	2,881	28,493
1882.....	3,500	24,572	1893.....	1,489	14,108	1904.....	13,455	117,468
1883.....	1,448	14,234	1894.....	2,220	18,320	1905.....	25,515	168,122
1884.....	3,263	20,258	1895.....	575	4,705	1906.....	21,934	194,897
1885.....	3,108	14,632	1896.....	1,057	23,189	1907 (9 mos.)	8,495	88,144
1886.....	983	5,929	1897.....	2,094	10,336	1908.....	13,790	139,105
1887.....	276	2,440	1898.....	639	6,652	1909.....	10,894	103,773
1888.....	2,483	20,720	1899.....	2,611	21,306	1910.....	30,444	218,175
1889.....	2,590	24,585	1900.....	1,792	19,305	1911.....	32,748	309,553
1890.....	1,933	12,500	1901.....	2,800	20,677	1912.....	51,073	465,997
						1913.....	85,943	809,368

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 1913 according to these returns was \$8.85, as compared with \$9.11 in 1912, and \$8.37 in 1911; and of pressed brick \$12.49 in 1913, as compared with \$12.86 in 1912, and \$12.53 in 1911.

In the Maritime Provinces during 1913 the price of common brick varied from \$7.00 to \$12.00, averaging for Nova Scotia \$7.82, and for New Brunswick \$10.00.

In Quebec the price of common brick varied between \$5 and \$10, averaging \$7.89, while the price of pressed brick averaged \$12.73. The average price of common brick in Ontario was \$8.88, the limits of variation being \$6.00 and \$11.00; while for pressed brick the average was \$11.48 and the variation from \$10.00 to \$17.00.

In all the western provinces common brick ranged from about \$8.00 to \$13.00, averaging \$11.21 in Manitoba, \$9.86 in Saskatchewan, \$9.13 in Alberta, and \$9.49 in British Columbia. Pressed brick ranged from \$11.00 to \$27.00 in individual yards, averaging \$17.28 in Manitoba, \$16.15 in Saskatchewan, \$12.97 in Alberta, and \$25.65 in British Columbia.

The following table shows the average values at the kilns, of common and pressed brick, during 1911, 1912, and 1913, as furnished by the producers.

Average Prices per Thousand of Common and Pressed Brick.

	Common brick.			Pressed brick.		
	1911.	1912.	1913.	1911.	1912.	1913.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	5 88	6 86	7 82	9 52	16 00	16 06
New Brunswick.....	5 55	9 22	10 00	12 00	10 00	12 00
Quebec.....	7 07	8 08	7 89	16 20	12 04	12 73
Ontario.....	7 89	8 69	8 88	10 21	10 40	11 48
Manitoba.....	10 11	11 47	11 21	12 08	15 13	17 28
Saskatchewan.....	9 49	9 73	9 86	15 31	16 63	16 15
Alberta.....	10 10	10 69	9 13	13 81	14 77	12 97
British Columbia.....	9 70	9 61	9 49	24 94	27 53	25 65
Canada.....	8 37	9 11	8 85	12 53	12 86	12 49

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 bricks 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:—There was an increase in the production of brick in both these Provinces in 1913. The total sales in Nova Scotia were 22,085,765 brick valued at \$174,024, as compared with sales of 18,822,960 brick valued at \$130,108 in 1912. The chief sources of production were: Annapolis Royal, Middleton, Pugwash, Elmsdale, Amherst, Mira Gut, River Denys, Pictou, and New Glasgow.

The total sales in New Brunswick were 6,189,152 brick valued at \$61,969 as compared with 5,780,000 brick valued at \$53,350 in 1912, and the principal sources of production were Fredericton, St. John, Chatham, and Moncton.

Quebec:—The total sales of brick in Quebec 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.

The sales in 1912 were 173,336,557 bricks valued at \$1,446,880, comprising 161,836,557 common brick valued at \$1,308,380 or \$8.08 per thousand, and 11,500,000 pressed brick valued at \$138,500 or \$12.04 per thousand.

While brick-making is carried on at many places in the Province the principal plants are located at Laprairie, Sherbrooke, Quebec, and Deschailions.

Ontario:—This Province is credited in 1913 with over 54 per cent of the brick production of Canada, the total sales as reported by 271 firms being 430,029,531 brick valued at \$4,026,029 and including 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 total sales in 1912 were 423,670,184 valued at \$3,807,195, and comprised 350,461,874 common brick, valued at \$3,045,840 or an average of \$8.69 per thousand, and 73,208,310 pressed brick valued at \$761,355 or an average of \$10.40 per thousand.

The city of Toronto and vicinity, including the counties of York and Halton, is the principal brick making section and in 1913 produced about 50 per cent of the Ontario production or about 27 per cent of the total Canadian production of brick.

The district next in importance is the county of Wentworth, comprising the city of Hamilton and vicinity, producing over 11 per cent of the Ontario production. The county of Peel produced over 6 per cent and the Ottawa district, including the counties of Russell and Carleton, a little less than 6 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 1913 and 1912 is shown in the accompanying tables.

Sales 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	163,638	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	67,350	9 28				67,350	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.....	4,993,893	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	3,638,961	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

Sale of Common and Pressed Brick in Ontario by Principal Counties, 1912.

County.	Common.			Pressed.			Total value.	Per cent.
	No.	Value.	Per M	No.	Value.	Per M		
	No.	\$	\$ cts.		\$	\$ cts.	\$	
York.....	159,650,579	1,458,741	9 14	8,813,700	108,855	12 35	1,567,596	41.17
Halton.....				41,507,692	420,967	10 14	420,967	11.06
Wentworth.....	34,661,376	286,268	8 26	12,667,803	129,273	10 20	415,541	10.91
Peel.....	12,123,100	90,538	7 47	9,582,680	95,008	9 91	185,596	4.88
Carleton.....	17,310,000	170,150	9 55				170,150	4.47
Algoma.....	11,900,000	114,875	9 65				114,875	3.02
Russell.....	15,125,000	103,150	6 82				103,150	2.71
Middlesex.....	8,002,000	66,766	8 34				66,766	1.75
Nipissing.....	6,115,800	65,058	10 64				65,058	1.71
Waterloo.....	7,666,778	59,107	7 71				59,107	1.55
Simcoe.....	6,329,000	53,271	8 42				53,271	1.40
Grey.....	6,090,000	47,540	7 81				47,540	1.25
Kent.....	5,442,250	38,524	7 08				38,524	1.02
Lincoln.....	3,209,200	27,345	8 52	598,935	6,915	11 54	34,260	0.90
Renfrew.....	4,110,000	33,615	8 18				33,615	0.88
Peterborough.....	3,700,000	33,300	9 00				33,300	0.87
Essex.....	4,502,587	32,690	7 26				32,690	0.86
Total, 17 counties....	306,437,670	2,680,988	8 75	73,170,810	761,018	10 40	3,442,006	90.41
Total, other counties.	44,024,204	364,852	8 29	37,500	337	9 00	365,189	9.59
Total, Ontario.....	350,461,874	3,045,840	8 69	73,208,310	761,355	10 40	3,807,195	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	490,871	9.227
1910.....	304,983	2,374,287	7.785	44,204	453,596	10.375
1911.....	354,546	2,801,971	7.903	52,764	564,630	10.701
1912.....	385,000	3,178,250	8.255	65,593	634,169	9.667
1913.....	408,808	3,452,352	8.445	81,238	919,741	11.321

In addition to the ordinary clay building brick, there was produced in this Province in 1913 of ornamental brick valued at \$15,423 and fireproofing and terra-cotta valued at \$461,387. In 1912 the production of ornamental brick was valued at \$7,168 and of fireproofing and terra-cotta \$135,087.

Manitoba.—Throughout all of the western provinces there was a large falling off in the demand for brick in 1913. In Manitoba the total sales 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 sales in 1912 were 87,178,937, valued at \$1,012,801 comprising 83,681,237 common brick, valued at \$957,854 or an average of \$11.47 per thousand, and 3,497,700 pressed brick valued at \$52,947 or \$15.13 per thousand. There was thus a falling off in total sales of nearly 50 per cent.

In each of the provinces the number of brick burned was considerably in excess of the number marketed and this excess was more especially evident in the western provinces as shown in the table on page 17. The number of brick made in Manitoba exceeded the number sold by nearly 30,000,000. The principal brick-making plants are located at Winnipeg,

St. Boniface, Lac du Bonnet, Portage la Prairie, Sidney, Gilbert Plains, Virden, Balmoral, Lavenham, and Neepawa.

Saskatchewan.—The total sales of clay building brick in Saskatchewan in 1913 were 18,175,000 valued at \$189,820 which includes 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 total sales in 1912 were 30,538,771 brick valued at \$332,943 which included 25,338,771 common brick valued at \$246,443 or an average of \$9.73 per thousand, and 5,200,000 pressed brick valued at \$86,500, or an average of \$16.63 per thousand. The falling off in value of sales in 1913 was over 43 per cent and the excess in number of brick made during the year over the number sold was 7,744,000.

The principal clay plants are located at Estevan, Prince Albert, Saskatoon, Rosthern, Verigin, and Broadview.

Alberta.—The total sales of clay building brick in 1913 were 71,996,343, 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 total sales in 1912 were 93,759,980 brick valued at \$1,105,912, which comprised 70,074,568 common brick valued at \$775,986 or an average of \$10.69 per thousand, and 23,685,412 pressed brick valued at \$349,926, or an average of \$14.77 per thousand.

The decrease in the value of sales in 1913 was over 33 per cent, and the excess in number of brick made during the year over the number sold was over 18,000,000.

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 1913 of ornamental brick valued at \$738 and fireproofing and terra-cotta valued at \$146,200 as compared with ornamental brick valued at \$1,000 and fireproofing, etc., valued at \$248,712 in 1912.

British Columbia.—The total sales of brick in this Province in 1913 were reported as 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 total sales in 1912 were 61,284,565 valued at \$731,040, comprising 53,345,565 common brick valued at \$512,514 or an average value of \$9.61 per thousand, and 7,939,000 pressed brick valued at \$218,526 or an average of \$27.53 per thousand. The decrease in the value of the sales in 1913 was over 41 per cent, and the excess in the number of brick made during the year over the number sold, was over 10,000,000 brick.

In addition to the building brick there was also a production of fireproofing brick valued at \$42,919 as against a value of \$21,254 in 1912.

The principal centres of manufacture are: Vancouver, New Westminster, Clayburn, Cloverdale, 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 1913 was reported as 4,208,295 valued at \$75,669, or an average value per thousand of \$17.98, as compared with a production of 4,579,500 valued at \$85,989, or an average value of \$18.78 per thousand in 1912.

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 1913, the imports 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. The total imports during the calendar year 1912 were 11,793,000 valued at \$160,663 or an average of \$13.62 per thousand and included 6,709,000 valued at \$95,610 or an average of \$14.25, from the United States, 5,044,000 valued at \$64,375 or an average of \$12.76 per thousand, from Great Britain; and 40,000 valued at \$678 or \$16.95 per thousand, from other countries.

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	1905.....	4,500	54,000	12 00
1898.....				1906.....	3,000	45,000	15 00
1899.....	5,300	42,550	8 03	1907.....	3,618	72,354	20 00
1900.....	2,710	26,950	9 94	1908.....	3,720	59,456	15 98
1901.....	3,689	37,000	10 03	1909.....	3,760	67,408	17 93
1902.....	4,211	42,000	9 97	1910.....	4,215	78,980	18 74
1903.....	3,789	45,288	11 95	1911.....	5,220	79,444	15 22
1904.....	4,436	55,450	12 50	1912.....	4,580	85,989	18 78
				1913.....	4,208	75,669	17 98

*Figures previous to 1907 compiled from Ontario Bureau of Mines.

Imports of Paving Brick.*

Fiscal Year.	M.	Value.	Average per M.	Fiscal Year.	M.	Value.	Average per M.
		\$	\$ cts.			\$	\$ cts.
1895.....	275	5,006	18 20	1904.....	1,986	29,753	14 98
1896.....	918	10,132	11 04	1905.....	3,350	32,578	13 86
1897.....	52	719	13 83	1906.....	4,104	46,008	11 21
1898.....	367	2,337	6 37	1907 (9 mos.).....	2,182	23,256	10 66
1899.....	1,583	23,048	14 94	1908.....	5,340	61,346	11 49
1900.....	2,175	35,644	16 39	1909.....		101,187	†
1901.....	900	10,414	11 57	1910.....		138,763	
1902.....	1,030	16,788	16 30	1911.....	10,336	130,861	12 08
1903.....	1,337	18,811	14 07	1912.....	11,538	165,650	14 36
				1913.....	12,043	159,854	13 27

*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. Similar errors were apparently made in the figures for the fiscal year 1910, and the total number has, therefore, been omitted for these years. 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 fireclay, firebrick, and fireclay products, in 1913, was \$142,738 as compared with a valuation of \$125,585 in 1912, and \$89,130 in 1911. There was in addition in 1913, a production of fireclay products valued at \$22,925 reported as being made from imported clays.

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.

In 1912 the production comprised 6,307 tons of fireclay and refractory clay sold as such valued at \$24,343; firebrick 3,429,594 valued at \$67,192 or an average of \$19.59 per thousand; and other fireclay products valued at \$34,050.

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. The

imports in 1912 were valued at \$953,621 of which \$860,587 was from the United States, \$91,236 from Great Britain, and \$1,798 from other countries. Fireclay was imported during the calendar year 1913 to the value of \$143,399 as compared with a value of \$140,500 in 1912, and \$125,199 in 1911.

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 table:—

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	125,555
1913.....	3,667,276	86,164	23 50	3,345	14,018	4 19	42,556	142,738

Imports of Firebrick and Fireclay, 1900-13.

Fiscal Year.	Fireclay.	Firebrick	Fiscal Year.	Fireclay.	Firebrick.
	\$	\$		\$	\$
1900.....	59,291	39,535	1907*.....	85,044	349,135
1901.....	79,530	32,331	1908.....	155,873	639,347
1902.....	64,541	45,608	1909.....	77,146	350,457
1903.....	94,509	34,522	1910.....	86,151	519,454
1904.....	52,716	38,335	1911.....	129,728	864,465
1905.....	73,837	44,746	1912.....	118,863	860,763
1906.....	131,130	51,892	1913.....	158,759	1,000,516

*9 months ending March.

SEWERPIPE AND DRAIN TILE.

The total value of the sales of sewerpipe in 1913 was \$1,035,906, as compared with a value of \$884,641 in 1912, and \$812,716 in 1911. About 58 per cent of the production in 1913 was made in Ontario.

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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 1913 were valued at \$465,997 of which \$396,641 were imported from the United States, and \$69,356 from Great Britain. The total imports during 1912 were valued at \$507,024 and included \$431,600 from the United States, \$75,394 from Great Britain, and \$30 from other countries.

The total sales of drain tile in Canada in 1913 as reported to this Branch were valued at \$338,552 as compared with sales of \$357,862 in 1912, and \$339,812 in 1911. The greater part of this production is in the Province of Ontario; the sales in this Province in 1913 as reported to this Branch were 19,210,748 valued at \$314,859, as against a value of \$308,050 in 1912, and \$300,029 in 1911.

The Ontario Bureau of Mines reports the total number of drain tile made in that Province during 1913 as 16,935,000 valued at \$292,767 or an average of \$17.28 per thousand, as compared with 16,463,000 valued at \$279,579 or an average of \$16.98 per thousand in 1912.

The imports of unglazed tile are comparatively small, the value during the calendar year 1913 being \$12,156, as compared with \$4,018 in 1912, and \$5,640 in 1911.

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.....	301,065	1911.....	812,716
1894.....	250,325	1903.....	317,970	1912.....	884,641
1895.....	257,045	1904.....	440,804	1913.....	1,035,006
1896.....	153,875	1905.....	382,000		

HOMAS ZIMM
MARSH

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	1906....	17,700,000	252,500
1892....	10,000,000	100,000	1900....	19,544,000	209,738	1907....	15,578,000	250,122
1893....	17,300,000	190,000	1901....	21,592,000	231,374	1908....	24,800,000	338,658
1894....	25,000,000	230,000	1902....	17,510,000	199,000	1909....	27,418,000	363,550
1895....	14,330,000	157,000	1903....	18,200,000	227,000	1910....	21,028,000	318,456
1896....	13,200,000	144,000	1904....	16,000,000	210,000	1911....	21,630,000	349,545
1897....	*	*	1905....	15,000,000	220,000	1912....	16,463,000	279,579
1898....	22,668,000	225,000				1913....	16,935,000	292,767

*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	1897.....	416	33,870
1881.....		37,368	1898.....	157	29,454
1882.....		70,061	1899.....	1,817	32,071
1883.....		70,699	1900.....	1,383	37,766
1884.....	5,585	66,170	1901.....	1,264	54,819
1885.....	2,911	66,678	1902.....	269	55,261
1886.....	1,905	56,048	1903.....	252	57,100
1887.....	2,183	69,020	1904.....	1,637	53,958
1888.....	4,290	96,967	1905.....	1,229	101,166
1889.....	2,346	80,869	1906.....	4,727	131,353
1890.....	3,780	73,654	1907 (9 mos.).....	12,106	93,458
1891.....	673	86,522	1908.....	2,080	125,747
1892.....	473	59,064	1909.....	2,394	106,399
1893.....	110	38,891	1910.....	2,739	196,002
1894.....	53	24,572	1911.....	4,378	174,653
1895.....	695	20,358	1912.....	5,778	405,998
1896.....	339	18,957	1913.....	4,453	513,520

(a) Drain tile, not glazed.

(b) Drain pipes, sewerpipes, 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, jardinières, crocks, jars, churns, etc. A number of potters make 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 1913, according to returns received, was \$368,916 of which it is estimated that the value of \$315,383 is attributable to imported clays: The total value of the production in 1912 was \$427,089 of which a value of \$383,134 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	1905.....	120,000
1889.....	Not available	1898.....	214,675	1906.....	150,000
1890.....	195,242	1899.....	185,000	1907.....	253,809
1891.....	258,844	1900.....	200,000	1908.....	200,541
1892.....	265,811	1901.....	200,000	1909.....	285,285
1893.....	213,186	1902.....	200,000	1910.....	250,924
1894.....	162,144	1903.....	200,000	1911.....	102,493
1895.....	151,588	1904.....	140,000	1912.....	43,955
1896.....	163,427			1913.....	53,533

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 1913 were valued at \$3,314,870, as compared with a value of \$3,094,956 in 1912, and \$2,516,536 in 1911. These imports are subdivided into eight classes, and in 1913 include: 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.

The imports in 1912 comprised: brown or coloured earthenware, etc., \$62,161; C.C. or cream coloured ware, decorated, printed, sponged, etc., \$291,804; demijohns, churns or crocks, \$18,404; tableware of china, porcelain, white granite, etc., \$2,068,362; china and porcelain ware, n.o.p., \$71,751; tiles or blocks of earthenware, or stone prepared for mosaic flooring, \$160,082; earthenware tiles, n.o.p., \$239,391; manufactures of earthenware, n.o.p., \$183,001.

It will be observed that there has been a general increase in almost all classes of earthenware and chinaware imported. 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	1891.....	634,907	1902.....	1,275,093
1881.....	439,029	1892.....	748,810	1903.....	1,406,610
1882.....	646,734	1893.....	709,737	1904.....	1,611,356
1883.....	657,886	1894.....	695,514	1905.....	1,638,214
1884.....	544,586	1895.....	547,935	1906.....	1,692,359
1885.....	511,853	1896.....	575,493	1907 (9 mos.).....	1,422,880
1886.....	599,289	1897.....	595,322	1908.....	2,190,784
1887.....	750,691	1898.....	675,374	1909.....	1,716,887
1888.....	697,082	1899.....	916,727	1910.....	1,859,302
1889.....	697,949	1900.....	959,526	1911.....	2,398,416
1890.....	695,206	1901.....	1,114,677	1912.....	2,582,966
				1913.....	3,265,180

KAOLIN.

About 500 tons of kaolin valued at \$5,000 were shipped in 1913, as compared with 20 tons valued at \$160 in 1912. The production was obtained from the deposits in the township of Amherst, Ottawa county, Quebec, which were 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 Canadian Northern Quebec railway—94 miles northwest of Montreal.

The clay is mined by digging, no drilling or blasting being necessary, trammed 600 feet to the plant, washed free from grit and allowed to settle. After the filter presses have extracted the surplus moisture, it is dried in the open air in stacks. Dry kilns have been built for winter drying. After drying the clay is pulverized and bagged for shipment, chiefly to papermills.

The imports of china-clay ground and unground, into Canada during the twelve months ending December 1913, were 21,164 tons valued at \$149,337 or \$7.06 per ton, as against imports of 18,332 tons valued at \$127,402 or \$6.95 per ton in 1912, and 18,819 tons valued at \$125,768 or an average of \$6.68 in 1911. 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 \$3,314,870 in 1913, 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 1913 being 240,120 gross tons, valued at \$1,625,451.

LIME.

The lime industry in common with other materials of construction, was affected by the financial depression during the latter part of the year, and a falling off in production is shown. According to returns received from the producers, the total production in 1913 was 7,558,484 bushels, this being the amount sold or used (equivalent to about 264,547 tons) valued at \$1,609,398, or an average of 21 cents per bushel, or about \$6.08 per ton.

The production in 1912 was reported as 8,475,839 bushels, (296,654 tons) valued at \$1,844,849, or an average of 22 cents per bushel, or \$6.25 per ton. The decrease in production in 1913 was therefore 117,355 bushels, or slightly over 10 per cent.

Returns were received from 77 active firms in 1913, as compared with 78 firms in 1912. The average number of men employed in 1913 was 1,076, and wages paid \$577,841, as against 1,103 men employed and \$576,217 paid in wages in 1912. 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 1913 varied from a minimum of 18 cents in Ontario, to a maximum of 32 cents in British Columbia. In 1912 the range was from a minimum of 17 cents in Ontario to a maximum of 36 cents in Saskatchewan.

Sales of hydrated lime were reported by two firms only; the Standard Lime Company, Limited, Joliette, Quebec, and the Standard White Lime Company of Guelph, Ontario. The quantity of production is not completely reported but will probably not exceed 5,000 tons. Hydrators are also reported as being installed at Orangeville, Ontario, by the Contractors Supply Company, and at Blubber Bay, B.C., by the Pacific Lime Company, Limited.

A small quantity of lime is annually made in Prince Edward Island. The production is shown separately in 1911, 1912, and 1913, and for the previous years is included in the Nova Scotia figures.

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, 1911.

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*....	3	8	852	20,250	6,765	33	0-44
Nova Scotia.....	1	10	3,964	618,950	123,790	20	8-16
New Brunswick..	5	100	41,378	613,728	132,897	22	8-76
Quebec.....	22	307	139,466	1,428,392	356,453	25	23-49
Ontario.....	31	423	205,618	3,360,265	538,902	16	35-51
Manitoba.....	5	89	44,379	706,888	140,629	20	9-27
Alberta.....	4	33	33,060	434,038	100,407	23	6-61
British Columbia	4	86	53,901	351,014	117,756	34	7-76
Total.....	75	1,056	523,518	7,533,525	1,517,599	20	100-00

*Production in previous years included in Nova Scotia figures.

Lime Production by Provinces, 1909 and 1910.

Province.	1909.				1910.			
	Bushels.	Value.	Average per bushel.	Per cent of total value.	Bushels.	Value.	Average per bushel.	Per cent of total value.
		\$	cts.	%		\$	cts.	%
Nova Scotia.....	57,730	16,729	29	1.5	55,750	13,490	24	1.2
New Brunswick...	697,466	154,151	22	13.6	470,050	105,593	22	9.3
Quebec.....	1,281,827	315,633	25	27.9	1,227,555	299,126	23	26.3
Ontario.....	2,619,553	434,147	17	38.3	2,988,020	476,137	16	41.9
Manitoba.....	423,954	69,670	16	6.2	606,679	100,808	17	8.8
Alberta.....	281,125	67,350	24	5.9	303,214	69,268	23	6.1
British Columbia.	231,269	75,076	32	6.6	196,878	72,657	37	6.4
	5,592,924	1,132,756	20	100.00	5,848,146	1,137,079	19	100.0

Exports and Imports.—The value of the lime exported during the calendar year 1913, was \$29,234, the destination being mainly the United States. In 1912 the exports were valued at \$35,097. The imports of lime during the calendar year 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, and were derived chiefly from the United States. The imports during 1912 were 329,925 barrels (32,992 tons) valued at \$207,481 or an average of 63 cents per barrel, or \$6.29 per ton.

Annual statistics of imports and exports 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	1906.....	57,072
1892.....	121,535	1900.....	80,852	1907.....	55,903
1893.....	86,623	1901.....	99,194	1908.....	43,316
1894.....	83,670	1902.....	116,009	1909.....	48,821
1895.....	71,697	1903.....	131,412	1910.....	44,762
1896.....	70,820	1904.....	73,838	1911.....	39,536
1897.....	53,177	1905.....	85,723	1912.....	35,097
1898.....	49,594			1913.....	29,234

Imports of Lime.

Fiscal Year.	Barrels.	Value.	Average value.	Fiscal Year.	Barrels.	Value.	Average value.
		\$	\$ cts.			\$	\$ cts.
1880.....	6,100	6,013	0 99	1897.....	16,108	10,529	0 65
1881.....	5,796	4,177	0 72	1898.....	12,850	9,002	0 70
1882.....	5,064	5,365	1 06	1899.....	15,720	11,124	0 71
1883.....	7,623	9,224	1 21	1900.....	12,865	11,211	0 87
1884.....	10,804	11,200	1 04	1901.....	19,657	14,534	0 74
1885.....	12,072	11,503	0 95	1902.....	24,602	17,584	0 71
1886.....	11,021	9,347	0 85	1903.....	31,108	22,470	0 72
1887.....	10,835	8,524	0 79	1904.....	54,359	39,639	0 73
1888.....	10,142	7,537	0 74	1905.....	98,676	71,588	0 73
1889.....	13,079	9,363	0 72	1906.....	134,334	93,030	0 70
1890.....	8,149	5,360	0 66	1907 (9 mos.).....	88,919	67,573	0 76
1891.....	6,259	4,273	0 68	1908.....	129,379	99,611	0 77
1892.....	6,132	4,241	0 69	1909.....	153,934	106,263	0 69
1893.....	6,879	4,917	0 71	1910.....	191,537	116,964	0 61
1894.....	6,766	4,907	0 73	1911.....	194,809	143,333	0 74
1895.....	12,008	5,743	0 48	1912.....	230,013	162,593	0 71
1896.....	10,239	7,331	0 72	1913—Duty 20 per cent.....	360,243	225,444	0 62

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 1913, 36 per cent of the total value, and the latter 26 per cent. The western provinces accounted for nearly 22 per cent of the total in 1913, as against 28 per cent in 1912, and 14 per cent in 1908.

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	1905.....	3,100,000	424,700	14
1897.....				1906.....	2,885,000	496,735	17
1898.....	2,620,000	308,000	12	1907.....	2,650,000	418,700	17
1899.....	4,342,500	535,000	12	1908.....	2,442,331	448,596	18
1900.....	3,893,000	544,000	14	1909.....	2,633,500	470,858	18
1901.....	4,100,000	550,000	13	1910.....	2,889,235	474,531	16
1902.....	4,300,000	617,000	14	1911.....	2,469,773	402,340	16
1903.....	3,400,000	520,000	15	1912.....	2,297,525	381,672	17
1904.....	2,600,000	406,800	16	1913.....	2,300,991	390,600	17

According to trade papers, quotations on lime in Toronto, during 1913 were as follows: in the city per 100 lbs. f.o.b cars, 30 cents; at kilns outside the city, f.o.b. cars, 25 cents per 100 lbs.; hydrated lime (imported) at warehouses, \$10 per ton.

The duty on lime is provided under item 711 of the Customs tariff and is 20 per cent under the general tariff, $17\frac{1}{2}$ per cent under the Intermediate tariff, and 15 per cent under the British Preferential tariff.

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 1913 the total sales were reported as 92,586,676 brick, valued at \$906,665, or an average of \$9.79 per M, as against sales in 1912 of 96,448,402 brick, valued at \$1,020,386 or an average of \$10.58 per M.

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

SAND AND GRAVEL.

The record of production of sand and gravel in 1913, while more complete than that obtained for 1912, is still only a partial and very incomplete record.

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, comprising \$243,126 from Quebec; \$563,668 from Ontario; \$101,653 from Manitoba; \$255,453 from Saskatchewan; \$148,704 from Alberta; \$385,946 from British Columbia, and \$13,549 from the Maritime Provinces.

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.

According to the return received, the total value of the production of sand and gravel in 1913 was \$2,258,874, to which the various provinces contributed as follows:—Maritime Provinces, \$101,201; Quebec, \$638,778; Ontario, \$638,771; Manitoba, \$197,719; Saskatchewan, \$236,377; Alberta, \$265,165; and British Columbia, \$180,863.

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 1913 there were exported from Canada 644,633 tons of sand and gravel, valued at \$440,956; while during the same year there were imported 439,673 tons, valued at \$440,343.

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	1903.....	355, 792	124, 006	35
1894.....	324, 656	86, 940	27	1904.....	399, 809	129, 803	32
1895.....	277, 162	118, 359	43	1905.....	306, 935	152, 805	50
1896.....	224, 769	80, 110	36	1906.....	336, 550	139, 712	41
1897.....	152, 963	76, 729	50	1907.....	298, 095	119, 853	40
1898.....	165, 954	90, 498	55	1908.....	298, 954	161, 387	54
1899.....	242, 450	101, 640	42	1909.....	481, 584	256, 166	53
1900.....	197, 558	101, 666	51	1910.....	624, 824	407, 974	65
1901.....	197, 302	117, 465	60	1911.....	573, 494	408, 110	71
1902.....	159, 793	119, 120	75	1912.....	660, 090	459, 952	70
				1913.....	644, 633	440, 956	68

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	1903.....	91,518	95,647	1 05
1894.....	41,573	33,506	0 81	1904.....	110,634	107,547	0 97
1895.....	19,609	24,779	1 26	1905.....	85,339	92,722	1 09
1896.....	18,953	24,604	1 30	1906.....	116,500	173,727	1 49
1897.....	21,308	25,222	1 18	1907 (9 mos.)...	171,700	177,412	1 03
1898.....	32,148	43,287	1 35	1908.....	266,704	223,043	0 84
1899.....	30,288	42,209	1 39	1909.....	132,158	136,011	1 03
1900.....	35,713	41,280	1 16	1910.....	151,982	155,012	1 02
1901.....	35,749	42,891	1 20	1911.....	241,375	246,613	1 02
1902.....	47,381	58,668	1 24	1912.....	263,971	258,438	0 98
				1913.....	542,927	465,263	0 86

SLATE.

There is a small annual production of slate in Canada obtained from the New Rockland quarries, Melbourne township, Richmond county, Quebec, operated by Messrs. Fraser & Davies. During the past two years this firm has also opened up and operated a quarry at Botsford, in Temiscouata county. The production in 1913 is reported as 1,432 squares, valued at \$6,444, as compared with a production in 1912 of 1,894 squares valued at \$8,939.

The quarries in Richmond county have been operated for many years and at one time there was a production valued at upwards of \$100,000 per year.

Statistics of the annual production are shown herewith.

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.....	1,533	8,248
1898.....		40,791	1912.....	1,894	8,939
1899.....		33,406	1913.....	1,432	6,444

*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 have 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 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 total value of the imports during the calendar year 1912 was \$200,643 and included: roofing slate, \$88,911; school writing slate, \$39,858; slate pencils, \$6,978; and other slates and manufactures of, \$65,896. 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, and 1913.

Slate and manufactures of.	Calendar year 1911.	Calendar year 1912.	Calendar year 1913.
	\$	\$	\$
Roofing slate.....	83,075	88,911	97,730
School writing slate.....	35,049	39,858	51,953
Slate pencils.....	6,036	6,978	9,166
Slate of all kinds and manufactures of.....	45,525	65,896	76,625
	169,685	200,643	235,474

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 1913.....	Nil.	Nil.
1892.....	87	2,038			

Imports of Slate.

Fiscal Year.	Value.	Fiscal Year.	Value.	Fiscal Year.	Value.
	\$		\$		\$
1880.....	21,431	1891.....	46,104	1902.....	72,601
1881.....	22,184	1892.....	50,441	1903.....	84,437
1882.....	24,543	1893.....	51,179	1904.....	86,057
1883.....	24,968	1894.....	29,267	1905.....	93,228
1884.....	28,316	1895.....	19,471	1906.....	112,941
1885.....	28,169	1896.....	24,176	1907 (9 mos.).....	95,520
1886.....	27,852	1897.....	21,615	1908.....	131,069
1887.....	27,845	1898.....	24,907	1909.....	124,065
1888.....	23,151	1899.....	33,100	1910.....	136,401
1889.....	41,370	1900.....	53,707	1911.....	147,172
1890.....	22,871	1901.....	72,187	1912.....	173,566
				1913.....	219,834

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 ignaceous 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 1913, according to returns received, was \$5,504,639, as compared with a value of \$4,726,171 in 1912, showing an increased production of \$778,468, or 16.5 per cent.

The number of active firms reporting in 1913 was 218, the total number of men employed 6,131, and the total wages paid \$3,219,465; in 1912 the number of active firms reporting was 192, the number of men employed 5,710, and wages paid \$2,918,116.

Of the total value of the 1913 production, limestone contributed \$3,204,091, or 58.2 per cent; granite, \$1,653,791, or 30 per cent; sandstone, \$396,782, or 7.2 per cent, and marble \$249,975, or 4.6 per cent.

Stone was used for building purposes to the value of \$1,686,806, or 30.7 per cent of the total; monumental and ornamental to the value of \$288,144, or 5.2 per cent; curb, paving and flagstone \$262,955, or 4.8 per cent; rubble \$563,907, or 10.2 per cent; crushed stone \$2,250,533, or 40.9 per cent, and furnace flux 862,744 tons, valued at \$452,294, or 8.2 per cent.

By provinces, Quebec again shows the largest output, having a value of \$2,329,461, or 42.3 per cent of the total; being made up of limestone

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 two reports of this series have already 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."

to the value of \$1,307,428; granite valued at \$790,896, marble \$231,137. Ontario takes second place with a production of \$1,593,168, or 29 per cent of the total, of which limestone is credited with \$1,196,130; granite \$324,062; sandstone \$54,738, and marble \$18,238. British Columbia ranks third in order of importance with a total of \$580,879, including granite \$469,666; sandstone \$71,783; limestone \$38,830, and marble \$600. The production in Manitoba was valued at \$389,904, made up of limestone \$382,984 and granite \$6,920. The Nova Scotia production was valued at \$350,511, comprising: limestone \$258,719; granite, \$29,302; and sandstone, \$62,490. The Alberta production was reported as \$156,984, of which limestone was valued at \$20,000, the balance \$136,984 consisting of sandstone. New Brunswick is credited with \$103,732, made up chiefly of sandstone and granite.

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	.....	.....

Production of Stone by Provinces, 1912.

Province.	Granite.	Lime- stone.	Marble.	Sand- stone.	Total.	%	Labour.	
							No. men em- ployed.	Wages.
Nova Scotia.....	\$ 28,041	\$ 275,944	\$	\$ 20,645	\$ 324,630	6.9	788	\$ 220,501
New Brunswick.....	22,317			68,260	90,577	1.9	210	65,807
Quebec.....	522,114	1,187,751	247,838		1,957,703	41.4	2,216	1,140,715
Ontario.....	174,946	862,052	12,926	59,240	1,109,164	23.5	1,281	614,171
Manitoba.....	1,523	381,572			383,095	8.1	544	274,548
Alberta.....				81,391	81,391	1.7	107	70,276
British Columbia.....	624,178	55,617		99,816	779,611	16.5	564	532,098
Total.....	1,373,119	2,762,936	260,764	329,352	4,726,171	.....	5,710	2,918,116
Per cent.....	29.0	58.5	5.5	7.0	.....	100.00	.....	.....

Value of Stone Sold for Various Purposes in 1913.

Kind.	Building	Ornamental and monumental.	Paving and curb-stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Granite.....	554,505	47,377	243,534	206,442	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

Value of Stone Sold for Various Purposes in 1912.

Kind.	Building.	Ornamental and monumental.	Paving and curb-stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Granite.....	296,715	101,837	227,071	59,824	687,672	.....	1,373,119
Limestone.....	671,383	72,206	13,561	256,798	1,274,577	474,321	2,762,936
Marble.....	237,415	2,641	6,535	.....	14,173	.....	260,764
Sandstone.....	246,644	12,585	21,223	37,249	10,651	.....	329,352
Total.....	1,452,157	190,359	268,390	353,871	1,987,073	474,321	4,726,171

Production of Stone by Provinces and for Purposes Used, 1913.

Province.	Building.	Ornamental and monumental.	Paving and curb-stone.	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

Production of Stone by Provinces and for Purposes Used, 1912.

Province.	Building.	Ornamental and monu- mental.	Paving and curb- stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	24,150	15,911	8,625	.....	.....	275,944	324,630
New Brunswick....	73,759	4,602	8,928	3,288	.....	.....	90,577
Quebec.....	814,380	149,584	97,749	95,170	800,026	794	1,957,703
Ontario.....	185,969	6,848	56,543	107,300	610,561	141,943	1,109,164
Manitoba.....	97,096	.....	.....	119,142	166,834	23	383,095
Alberta.....	52,771	13,414	5,145	10,061	.....	.....	81,391
British Columbia..	204,032	.....	91,400	18,910	409,652	55,617	779,611
Total.....	1,452,157	190,359	268,390	353,871	1,987,073	474,321	4,726,171
Per cent.....	30.7	4.0	5.7	7.5	42.1	10.0	100.0

Exports and Imports:—The exports of stone from Canada in 1913 were valued at \$93,840, as against \$33,242 in 1912, and \$28,335 in 1911. The principal item in the export of stone during the past three years has been building stone unwrought, of which the exports in 1913 were, 191,981 tons, valued at \$82,646. The exports of dressed stone in 1913 including both ornamental and building stone, were valued at \$7,381.

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 1911, 1912, 1913.

	1911.		1912.		1913.	
	Tons.	Value. \$	Tons.	Value. \$	Tons.	Value. \$
Stone—						
Crushed.....					4,814	3,126
Ornamental, granite, marble, etc., unwrought.....	168	1,706	2,339	1,826	1,942	687
Building, freestone, limestone, etc., unwrought.....	83,767	25,103	108,516	28,795	191,981	82,646
Ornamental, granite, marble, etc., dressed.....		980		2,458		7,381
Building, freestone, limestone, etc., dressed.....		456		163		0
		28,335		33,242		93,840

The annual exports of stone since 1890, are shown in the next table:—

Exports of Stone and Marble, Wrought and Unwrought.

Calendar Year.	Wrought.	Unwrought	Calendar Year.	Wrought.	Unwrought
	\$	\$		\$	\$
1890.....	21,725	43,611	1902.....	8,632	124,329
1891.....	13,398	46,162	1903.....	7,684	46,295
1892.....	7,698	47,424	1904.....	4,760	17,802
1893.....	9,102	12,532	1905.....	3,545	13,089
1894.....	22,576	34,130	1906.....	23,097	4,675
1895.....	8,587	51,616	1907.....	4,233	3,087
1896.....	4,934	32,897	1908.....	15,194	36,320
1897.....	9,415	42,034	1909.....	33,598	24,087
1898.....	2,526	65,370	1910.....	5,352	22,219
1899.....	5,092	101,931	1911.....	1,436	26,399
1900.....	5,933	115,711	1912.....	2,621	30,621
1901.....	5,917	157,739	1913.....	7,381	86,459

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 1913, was \$1,640,849, as compared with a value of \$1,467,143 in 1912, showing an increase of \$173,706 or about 12 per cent. 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 manufactures 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.

The total value of the imports of stone during the calendar year 1912 was \$1,467,143, and included: building stone valued at \$568,672; manufactures of granite, \$245,333; paving blocks, \$64,053; marble, \$475,926; and refuse stone, 265,270 tons, valued at \$113,159. Of the total value \$1,240,264 was imported from the United States; \$182,496 from Great Britain; \$18,616, from Italy; and \$25,767, from other countries. 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.

A slight upward revision of the tariff on building stone was put into effect April 7, 1914.

Old and Revised Tariffs on Building Stone.

	Old Tariff.			*New Tariff.		
	A.	B.	C.	A.	B.	C.
Item.						
305. Flagstone, sandstone and all building stone, not hammered, sawn or chiselled, and marble and granite, rough, not hammered or chiselled.	10 p.c.	12½ p.c.	15 p.c.	10 p.c.	12½ p.c.	15 p.c.
306. Marble, sawn or sand rubbed, not polished; granite, sawn; flagstone and all other building stone, sawn or dressed; and paving blocks of stone.				15 p.c.	20 p.c.	20 p.c.
306a. Building stone other than marble or granite, sawn on more than two sides, but not sawn on more than four sides, per hundred pounds.....	15 p.c.	17½ p.c.	20 p.c.	10c.	15c.	15c.
306b. Building stone other than marble or granite, planed, turned, cut or further manufactured than sawn on four sides, per one hundred pounds..				30c.	45c.	45c.
307. Marble and granite, n.o.p., and all manufactures of marble or granite, n.o.p.....	30 p.c.	32½ p.c.	35 p.c.	30 p.c.	32½ p.c.	35 p.c.
308. Manufactures of stone, n.o.p.....	20 p.c.	27½ p.c.	30 p.c.	20 p.c.	27½ p.c.	30 p.c.

A. British Preferential Tariff. *In effect from April 7, 1914.
 B. Intermediate Tariff.
 C. General Tariff.

Total Imports of Stone During the Calendar Years 1912 and 1913.

	1912.		1913.	
	Tons.	Value.	Tons.	Value.
		\$		\$
Building stone, rough ¹		117,037		105,576
Building stone, dressed ²		451,635		464,540
Refuse stone ³	265,270	113,159	356,073	191,307
Granite, sawn only.....		20,706		14,979
Granite, manufactures of.....		180,346		174,155
Paving blocks.....		64,053		£2,321
Manufactures of stone, n.o.p.....		44,281		60,943
Marble and manufactures of:—				
Marble, sawn or sand rubbed, not polished.....		209,900		258,225
Marble, rough, not hammered or chiselled.....		49,626		123,475
Marble, manufactures of, n.o.p.....		216,310		190,328
		1,467,143		1,640,849

¹ Flagstone, granite, rough sandstone, and all building stone not hammered, sawn, or chiselled.

² Flagstone and all other building stone, sawn or 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 1913.

Imports.	Great Britain.		United States		Italy.	Other countries.
	Tons.	Value.	Tons.	Value.	Value.	Value.
		\$		\$	\$	\$
Building stone, rough ¹		4,619		98,802		2,155
Building stone, dressed ²		3,161		460,424		955
Refuse stone.....				100,327		90,980
Granite, sawn only.....		735		14,244		
Granite, manufactures of.....		160,720		13,432		3
Paving blocks.....				52,321		
Manufactures of stone, n.o.p.....		3,753		49,490		7,700
Marble and manufactures of:—						
Marble, sawn or sand rubbed, not polished.....		7,708		207,028	40,335	3,154
Marble, rough, not hammered or chiselled.....		1,510		112,170		14,795
Marble, manufactures of n.o.p.....		3,325		179,202		7,801
		185,531		1,287,440	40,335	127,543

¹ Flagstone, granite, rough sandstone, and all building stone not hammered, sawn, or chiselled.

² Flagstone; all other building stone, sawn or dressed.

Imports of Stone, Fiscal Years 1912 and 1913.

Imports.	1912.		1913.	
	Tons.	Value.	Tons.	Value.
		\$		\$
Building stone, rough ¹	20,185	81,260		123,691
Building stone, dressed ²	51,775	300,378		488,066
Refuse.....	258,731	108,231	249,307	103,947
Granite, sawn only.....	712	5,417		24,636
Granite, manufactures of.....		161,652		185,531
Paving blocks.....		64,737		63,949
Manufactures of stone, n.o.p.....		37,899		51,233
Marble, and manufactures of:—				
Marble, sawn or sand rubbed, not polished.....		175,177		239,678
Marble, rough, not hammered or chiselled.....		56,336		61,009
Marble, manufactures of, n.o.p.....		169,222		210,222
		1,160,359		1,551,967

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.		Manufactures of granite, etc. and refuse stone.	Marble.	Flagstone	Total value.
	Rough.	Dressed.				
	\$	\$	\$	\$	\$	\$
1880.....	32,824	3,146	29,408	63,015	.....	123,393
1881.....	7,823	60,326	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.....	120,456	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	178,638
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	20,102	72,397	130,424	1,231	303,126
1903.....	71,202	16,664	78,629	153,481	Nil	319,976
1904.....	59,864	33,914	141,165	181,511	Nil	416,454
1905.....	49,004	53,813	150,160	145,466	Nil	398,443
1906.....	66,994	65,134	178,435	189,539	Nil	500,152
1907*.....	58,398	78,967	136,779	176,450	Nil	450,594
1908.....	80,950	90,740	192,248	287,587	Nil	651,525
1909.....	63,984	72,961	193,949	200,928	Nil	531,822
1910.....	110,997	184,620	223,462	184,798	Nil	703,877
1911.....	126,386	206,224	271,594	307,428	Nil	911,632
1912.....	81,260	300,378	377,986	400,735	Nil	1,160,359
1913.....	123,691	488,066	429,301	510,909	.....	1,551,967

*9 months ending March 1907.

GRANITE.

The production of granite including trap-rock, syenite, etc., in 1913, according to returns received from 65 active firms reporting, was valued at \$1,653,791 as compared with a production in 1912 by 57 firms, valued at \$1,373,119, showing an increased production in 1913 of \$280,672 or 20.4 per cent.

The largest production is reported from Quebec in 1913, the value being \$790,896, as against \$522,114 in 1912. The value of the production in British Columbia was \$469,666, as against \$624,178 in 1912. Ontario produced granite to the value of \$324,062 in 1913, as compared with \$174,946 in 1912. There was comparatively little change in the production

of the Maritime Provinces. 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 1913 was \$85,803, as against a value of \$82,935 produced in 1912.

Value of Granite Production by Provinces, 1913.

Province.	Building.	Monu- mental or orna- mental.	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	37,431	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.....	40,330	834	7,064	238,893	182,495	469,606
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.

Value of Granite Production by Provinces, 1912.

Province.	Building.	Monu- mental or orna- mental.	Curb, or paving.	Rubble.	Crushed.	Total.
	\$	\$	\$	\$	\$	\$
Nova Scotia.....	3,601	15,815	8,625	.....	.....	28,041
New Brunswick.....	8,862	*4,527	8,928	.....	.....	22,317
Quebec.....	180,036	81,180	79,368	13,912	167,618	522,114
Ontario.....	.....	315	38,750	27,002	108,879	174,946
Manitoba.....	.....	.....	.....	.....	1,523	1,523
British Columbia.....	104,216	.....	91,400	18,910	409,652	624,178
Total.....	296,715	101,837	227,071	59,824	687,672	1,373,119

*"Finished" stone in 1912 was valued at \$82,935.

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

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 1913 was \$3,204,091, as compared with a value of \$2,762,936 in 1912, or an increase of about 16 per cent.

There was an increase in the production of building and paving stone, crushed stone and rubble, and a slight falling off in the production of furnace flux.

The production during 1913 of limestone for building purposes, was valued at \$799,471, as against \$743,679 in 1912. The value of crushed stone in 1913 was \$1,680,834, as against \$1,274,577 in the previous year. Curbstone and paving stone were produced to the value of \$14,073 in 1913, as against \$13,561 in 1912. The value of rubble in 1913 was \$257,419, as against \$256,798 in 1912. The production of furnace flux was 862,774 tons, valued at \$452,294 as compared with 904,528 tons valued at \$474,321 in 1912.

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			382,084
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

Value of Limestone Production by Provinces, 1912.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
					Tons.	\$	
	\$	\$	\$	\$			\$
Nova Scotia.....					538,730	275,944	275,944
Quebec.....	472,192	621,661	11,846	81,258	529	704	1,187,751
Ontario.....	174,391	487,605	1,715	56,398	272,544	141,943	862,052
Manitoba.....	97,096	165,311		119,142	30	23	381,572
British Columbia.....					92,695	55,617	55,617
Total.....	743,679	1,274,577	13,561	256,798	904,528	474,321	2,762,936

Value of Limestone Production by Provinces, 1911.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
					Tons.	\$	
	\$	\$	\$	\$			\$
Nova Scotia.....		2,122		1,577	483,035	241,517	245,216
New Brunswick.....	80				60	30	110
Quebec.....	462,944	597,811	34,986	200,243	659	593	1,296,577
Ontario.....	126,700	332,050	1,916	65,725	295,837	154,070	650,461
Manitoba.....	74,424	134,576		106,782			315,782
British Columbia.....					94,633	56,780	56,780
Total.....	664,143	1,066,559	36,902	374,327	874,224	452,990	2,594,926

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 six years. The total value of the production in 1913 was returned as \$249,975, as compared with \$260,764 in 1912, and \$162,783 in 1911.

Marble quarries were operated during 1913 at Philipsburg and South Stukely, Que., Dungannon and Faraday townships in Ontario, and at Marble Head, B.C.

The value of the Quebec production was \$231,137, as compared with \$247,838 in 1912 and \$135,187 in 1911. Ontario produced marble to the value of \$18,238 as against \$12,926 in 1912, and \$25,996 in 1911. There was a small production only in British Columbia, development work being chiefly in progress.

Annual Production of Marble.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1886.....	501	9,900	1895.....	200	2,000
1887.....	242	6,224	1896.....	224	2,405
1888.....	191	3,100	1897 to 1907 inclusive....	Nil	Nil
1889.....	83	980	1908.....		125,000
1890.....	780	10,776	1909.....		158,441
1891.....	240	1,752	1910.....		158,779
1892.....	340	3,600	1911.....		162,783
1893.....	590	5,100	1912.....		260,764
1894.....	Nil	Nil	1913.....		249,975

The imports of marble during the calendar year 1913 were valued at \$577,028 as compared with \$475,976 in 1912, and \$384,252 in 1911.

The annual imports of marble since 1880 are shown in the general table of imports covering the fiscal years, page 57.

SANDSTONE.

The value of the production of sandstone in 1913 is reported as \$396,782 as compared with a value of \$329,352, reported for 1912. The greater part of the sandstone is quarried for building purposes, though some quantities are used for rubble and paving purposes.

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 of production. There was included in this amount, rough stone valued at \$142,895 and dressed stone valued at \$181,125

Of the 1912 production the value of \$260,229 was credited to building and ornamental stone, and included \$96,877 in rough stone, and \$163,352 in dressed stone.

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, 1912.

Province.	Building and ornamental.	Crushed.	Paving.	Rubble.	Total.
	\$	\$	\$	\$	\$
Nova Scotia.....	20,645				20,645
New Brunswick.....	64,972			3,288	68,260
Ontario.....	8,611	10,651	16,078	23,900	59,240
Alberta.....	66,185		5,145	10,061	81,391
British Columbia.....	99,816				99,816
Total.....	260,229	10,651	21,223	37,249	329,352

Value of Sandstone Production by Provinces, 1911.

Province.	Building and ornamental.	Crushed.	Paving.	Rubble.	Total.
	\$	\$	\$	\$	\$
Nova Scotia.....	21,140	300		2,000	23,440
New Brunswick.....	30,260			5,077	35,337
Quebec.....	450				450
Ontario.....	8,567		24,575	20,890	54,032
Alberta.....	151,787			6,557	158,344
British Columbia.....	179,680				179,680
Total.....	391,784	300	24,575	34,524	451,183