

CANADA

DEPARTMENT OF MINES

MINES BRANCH

HON. ROBERT ROGERS, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER;
EUGENE HAANEL, PH.D., DIRECTOR.

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

IN

CANADA

During the Calendar Year

1911

JOHN McLEISH, B.A.

Chief of the Division of Mineral Resources and Statistics.

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ADVANCE CHAPTER OF THE ANNUAL REPORT ON THE MINERAL PRODUCTION OF CANADA DURING THE CALENDAR YEAR 1911.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

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. In the case of sands and gravels no complete record of production throughout Canada has been obtained, but statistics of exports are published. 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 1911 according to the record obtained was \$22,709,611, as compared with a value of \$19,627,592 in 1910, an increase of \$3,082,019, or 15.7 per cent. The total production in 1909 was valued at \$16,533,349, as compared with which the 1910 production showed an increase of \$3,094,243, or 18.7 per cent.

The Canadian consumption of products of this class is apparently increasing at an even more rapid rate than the production. The consumption based upon the above figures of production in conjunction with the record of exports and imports was in 1911 only a little less than \$30,000,000, as against about \$25,250,000 in 1910 and \$20,350,000 in 1909, the increase in 1911 being 18 per cent and in 1910, 24 per cent.

The large increase in production and consumption of structural materials is only a natural accompaniment of the great national development taking place in Canada. The normal growth of population supplemented by the large immigration now constantly in progress has resulted in a great wave of construction in the building up of cities, the construction of railways, highways, and public works of all kinds.

The building permits issued in a number of the principal cities and towns are but one proof of this growth.

Building permits in thirty-four cities in 1911 aggregated nearly \$32,000,000 in value, as against \$29,000,000 in 1910, an increase of over 28 per cent, and the year 1910 shows a similar increase over 1909 in permits issued of nearly 46 per cent.

A summary of the production of structural materials and clay products since 1907 is shown below:—

	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	1,617,599
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	16,583,349	19,627,592	22,709,611

The increase in the value of cement sales in 1911 over 1910 was 19 per cent; clay products show an increased production of 9.6 per cent; stone an increase of 18.6 per cent; lime an increase of nearly 29 per cent; sand-lime brick an increase of 15.6 per cent. The production of slate is at no time large, but shows a falling off in 1911.

The export of products of this class is comparatively small, being valued at only \$484,047 in 1911, of which over 90 per cent was made up of sand and gravel. The imports, on the other hand, aggregated \$7,710,552 in value, and included Portland cement, \$834,876; clay products, \$5,156,544; lime, \$161,985; sand and gravel, \$246,613; slate, \$169,685; and stone, \$1,140,846.

CEMENT.

The production of cement in Canada during the past few years, though all classed as Portland, has included an output of Puzzolan cement, made from blast furnace slag at Sydney, N.S., and a small production of 'natural Portland,' made at Babcock, Manitoba, 75 miles southwest of Winnipeg, on the Canadian Northern railway.

The total quantity of cement made in Canada during 1911, as per reports received from the manufacturers, was 5,677,539 barrels of 350 pounds net each (993,569 tons), as compared with 4,396,282 barrels (769,349 tons) made in 1910—an increase of 1,281,257 barrels, or over 29 per cent.

The total quantity of Canadian Portland cement sold in 1911 was 5,692,915 barrels (996,260 tons), as compared with 4,753,975 barrels (831,946 tons) in 1910—an increase of 938,940 barrels, or nearly 20 per cent.

The total consumption of Portland cement in 1911, including Canadian and imported cement, was 6,354,831 barrels of 350 pounds net (1,112,095 tons) as compared with 5,103,285 barrels (893,075 tons) in 1910—or an increase of 1,251,546 barrels, or nearly 25 per cent.

The cement industry has been rapidly growing in importance, and its output is now exceeded in value amongst non-metallic products by coal and clay products only.

An average of 3,010 men were employed in 1911, the total wages paid being reported as \$2,103,838.

The increase in annual production since 1905 has been nearly four-fold. The production per capita in 1911 was about 278 pounds, as against only 79 pounds in 1905. The approximate consumption per capita has increased during the same period from 115 pounds to 310 pounds.

A similar rapid increase in both production and consumption has taken place in the United States, where the annual production now exceeds 75,000,000 barrels.

The production per capita in the United States was in 1910 about 332 pounds, as against 204 pounds in 1905.

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.	Barrels.	Value.	Barrels.	Value.
		\$		\$		\$
1887					69,843	81,909
1888					50,668	35,593
1889	90,474	69,790	Nil.	Nil.	90,474	69,790
1890	87,521	74,322	11,695	17,583	102,216	92,405
1891	90,846	103,479	2,633	5,082	93,479	108,561
1892	88,187	94,912	29,221	52,751	117,408	147,663
1893	126,673	130,167	31,924	63,848	158,597	194,015
1894	72,965	74,842	35,177	69,795	108,142	144,637
1895	66,219	60,795	62,075	112,880	128,294	173,675
1896	70,705	60,500	78,385	141,151	149,090	201,651
1897	85,450	65,893	119,763	209,386	205,213	275,273
1898	87,125	73,412	163,084	324,168	250,209	397,580
1899	147,387	119,308	255,366	513,983	396,753	633,291
1900	125,428	99,994	292,124	562,916	417,552	662,910
1901	133,323	94,415	317,066	565,615	450,394	660,030
1902	127,931	98,932	594,594	1,028,618	722,525	1,127,550
1903	92,252	74,655	627,741	1,150,592	719,993	1,225,247
1904	56,314	50,247	910,358	1,287,992	967,172	1,338,239
1905	14,184	10,274	1,316,548	1,913,740	1,360,732	1,924,014
1906	8,610	6,052	2,119,764	3,164,807	2,128,374	3,170,859
1907	5,775	4,043	2,436,903	3,777,323	2,441,868	3,781,371
1908	1,044	815	2,665,289	3,709,139	2,666,333	3,709,954
1909	0	0	4,067,709	5,345,802	4,067,709	5,345,802
1910	0	0	4,753,975	6,412,215	4,753,975	6,412,215
1911	0	0	5,692,915	7,644,537	5,692,915	7,644,537

* Quantities sold or shipped.

The production of cement in 1911 was derived from twenty-four operating plants, having a total daily capacity of 28,810 barrels, the operating plants being distributed as follows: one in Nova Scotia using blast furnace slag; one in Manitoba making a natural Portland cement; one in British Columbia; three in Alberta; three in Quebec using limestone and clay; and fifteen in Ontario, of which twelve use marl and three limestone.

A comparison of the principal statistics for 1910 and 1911, showing the increases or decreases, as the case may be, is given in the next table.

Comparison of Production, Sales, and Imports of Portland Cement in 1910 and 1911.

	1910.	1911.	Increase.	%	De-crease.	%
Cement sold..... Bls.	4,753,975	5,692,915	938,940	19.8		
Cement manufactured,	4,396,232	5,677,539	1,281,257	29.1		
Stock on hand Jan. 1..... "	1,189,731	918,965			270,766	22.8
Stock on hand Dec. 31..... "	832,038	903,589	71,551	8.6		
Value of cement sold..... \$	6,412,215	7,644,537	1,232,322	19.2		
Average price per barrel..... "	1.35	1.34			0.01	0.9
Wages paid..... "	1,409,715	2,103,838	694,123	49.2		
Men employed..... No.	2,220	3,010	790	35.6		
Imports of Portland cement... Bls.	349,310	661,916	312,606	89.5		
Value of cement..... \$	468,046	834,579	366,533	78.4		
Average price per barrel..... "	1.34	1.26			0.08	5.9
Total consumption of cement in Canada..... Bls.	5,103,285	6,354,831	1,251,546	24.5		
No. of completed plants operated....	22	24	2	9.1		
Total daily capacity of operating plants as on Dec. 31..... Bls.	25,835	28,810	2,975	11.5		

The large increase in output and sales of cement has already been referred to. It will be observed that the stocks on hand December 31, 1911, were approximately 900,000 barrels. The average price per barrel at the mill for all plants practically remains unchanged, being \$1.34 in 1911. There was a considerable increase in the number of men employed and the total wages paid. The imports of Portland cement in 1911 show a very decided increase, nearly 90 per cent, over those of 1910. The average price per barrel of 350 pounds of imported cement shows, however, a falling off of nearly 6 per cent, being \$1.26 in 1911, as compared with \$1.34 in 1910.

The increase in the number of operating plants and in total daily capacity is not due to the building of new plants, but rather to the resumption of

operations at the Exshaw plant in Alberta, and the Point Ann plant of the Canada Cement Company at Belleville, Ontario, neither of which was operated during 1910.

Of the total quantity of cement made in 1911, 1,626,857 barrels were made from marl and 4,050,682 barrels from limestone and slag. In 1910, there were 1,214,479 barrels made from marl and 3,181,803 barrels from limestone and slag, and in 1909, 810,706 barrels were made from marl and 3,336,002 barrels from limestone and slag. Practically all of the newer plants erected during the past few years have been limestone plants. The proportion of cement made from marl in 1908 was about 45 per cent of the total output, as compared with about 28 per cent in 1911.

Statistics of the annual production of Portland cement since 1897, showing the quantity made, the 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.....			255,366		513,983	2 01	.....
1900.....			292,124		562,916	1 91	.....
1901.....	4	360,160	317,066	58,094	565,615	1 78	.....
1902.....	8	562,335	594,594	33,446	1,028,618	1 73	3,900
1903.....	9	714,136	627,741	128,386	1,150,592	1 83	4,850
1904.....	10	908,990	910,358	112,051	1,287,992	1 41	.....
1905.....	13	1,541,568	1,346,548	306,466	1,913,740	1 42	8,000
1906.....	15	2,152,562	2,119,764	302,356	3,164,807	1 49	10,500
1907.....	17	2,491,513	2,436,093	354,435	3,777,328	1 55	14,400
1908.....	23	3,495,961	2,665,289	1,214,021	3,709,139	1 39	27,500
1909.....	22	4,146,708	4,067,709	1,777,238	5,345,802	1 31	23,050
1910.....	22	4,396,282	4,753,975	832,038	6,412,215	1 35	25,335
1911.....	24	5,677,539	5,692,915	903,589	7,644,537	1 34	23,810

Imports and Exports.—There has been very little cement exported from Canada during past years. The quantity is not shown in the export records of the Customs Department, but the value of the exports during 1911 was only \$4,067, as against a value of \$12,914 in 1910, and \$113,362 in 1909.

The imports of cement previous to 1901 were larger than 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 total Canadian consumption. During the past two years there has been an increase in the importation of cement—the imports for 1911 being 661,916 barrels, as compared with 349,310 barrels in 1910. A duty of 12½ cents per 100 pounds general tariff is levied on cement, and 20 per cent on the value of bags

containing the product. The British Preferential and Intermediate tariffs are reduced in proportion. The following items in the Customs tariff of 1907 cover the duty on cement:—

	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.....	8 cents.	11 cents.	12½ cents.
Bags in which cement or lime mentioned in the next preceding item is imported.....	15 per cent....	20 per cent....	20 per cent.

The duty on cement alone is equivalent to 43½ cents per barrel of 350 pounds net, and as bags are valued at 10 cents each, there is a further additional duty of 8 cents per barrel, making a total of 51½ cents. As the weight of the bag is included in taking the weight for duty, the general rate will be practically 52 cents per barrel.

The United States was the principal source of imports during the past two years, supplying about 66 per cent of the imports in 1911, as compared with about 29 per cent from Great Britain.

The imports of cement during 1910 and 1911, by countries, are shown in the next table:—

Imports of Cement.

	1910.			1911.		
	Cwt.	%	Value.	Cwt.	%	Value.
			\$			\$
Great Britain.....	433,578	35·5	130,951	666,771	28·8	210,839
United States.....	591,403	48·4	253,463	1,544,612	66·7	575,768
Belgium.....	66,595	5·4	20,618	9,389	0·4	2,618
Other countries.....	131,010	10·7	63,014	18,727	0·8	7,962
Hong Kong.....	(a).....			77,208	3·3	38,292
Totals.....	1,222,586	100·0	468,046	2,316,707	100·0	834,879
Equivalent in barrels of 350 lbs..	349,310			661,916		

(a) In 1910 included "in other countries."

Statistics of the exports of cement since 1891 and of the 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	1898.....	2,117	1905.....	3,143
1892.....	938	1899.....	2,733	1906.....	7,551
1893.....	1,172	1900.....	3,296	1907.....	9,618
1894.....	482	1901.....	1,514	1908.....	34,591
1895.....	937	1902.....	2,267	1909.....	113,362
1896.....	1,328	1903.....	2,851	1910.....	12,914
1897.....	644	1904.....	5,494	1911.....	4,067

Imports of Cement into Canada.

Fiscal Year.	Cement and Mfrs. of, N. E. S. *	Hydraulic cement.		Portland cement.	
		Barrels.	Value.	Barrels.	Value.
			\$		\$
1880.....	28	10,034	10,306	55,774	
1881.....	298	7,812	7,821	45,646	
1882.....	86	11,945	13,410	66,579	
1883.....	548	11,659	13,755	102,537	
1884.....	1,236	8,606	9,514	102,857	
1885.....	1,315	5,613	5,396	111,521	
1886.....	1,851	6,164	6,028	120,398	
1887.....	1,419	6,160	3,784	102,750	
1888.....	5,787	5,636	7,622	122,402	
1889.....	10,668	5,835	7,467	122,273	
1890.....	5,443	5,440	9,048	192,322	
1891.....	2,890	3,515	6,152	183,728	
1892.....	3,394	2,214	2,782	187,233	
1893.....	2,909	4,896	3,060	229,492	
1894.....	2,618	1,054	985	224,150	
1895.....	2,112	5,333	7,001	196,281	
1896.....	3,672	5,688	3,948	204,407	
1897.....	4,318	2,494	3,937	210,871	
		Cwt.	Cwt.		
1898.....	3,263	16,033	7,097	1,073,058	
1899.....	8,929	1,673	694	1,300,424	
1900.....	10,452	10,418	4,711	1,301,361	
1901.....	4,890	17,784	6,365	1,612,432	
1902.....	12,234	29,585	17,755	1,971,616	
1903.....	16,281	13,690	6,333	2,316,853	
1904.....	14,305	12,088	5,391	2,476,388	
1905.....	18,489	16,961	10,690	4,228,394	
1906.....	27,858	10,794	4,034	2,848,532	
1907.....	16,201	1,192	685	1,651,493	
1908.....	12,418	18,360	6,710	2,427,381	
1909.....	5,733	438	466	1,460,350	
1910.....	7,673	588	553	490,809	
1911.....	6,275	389	365	1,283,121	

* 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 consumption of Portland cement in Canada in 1911 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.

In 1910 the total consumption of cement was 5,103,285 barrels (893,075 tons), of which 93 per cent was of domestic production and 7 per cent imported. In 1901 the total consumption was 872,966 barrels (152,769 tons), of which only 36 per cent was made in Canada and 64 per cent imported. The following is an estimate of the annual consumption of Portland cement in Canada during the past eleven years:—

Annual Consumption of Portland Cement.

Calendar Year.	Canadian.		Imported.		Total. Barrels.
	Barrels.	%	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.....	4,763,975	93	349,310	7	5,103,285
1911.....	5,692,915	90	661,916	10	6,354,831

Nova Scotia.—There is only one cement plant in Nova Scotia located at Sydney and operated by the Sydney Cement Company, Limited. Puzzolan cement is made from a mixture of blast furnace slag and lime. The capacity of the mill is about 500 barrels per day of twenty-four hours.

Quebec.—This Province has three cement mills all operated by the Canada Cement Company, Limited: two situated near Montreal at Longue Pointe and Point aux Trembles, and the third at Hull. The Montreal mills have a combined capacity of 5,300 barrels per day, and the Hull mill, 2,000 barrels. The quantity of cement sold or used during 1911 was 1,614,730 barrels, valued at \$1,963,439.

Ontario.—Ontario is the most important cement producing province, having 15 mills, of which 6, with a total daily capacity of 9,200 barrels, are operated by the Canada Cement Company, and 9 mills, having a total daily capacity of 6,550 barrels, by independent companies. Four plants are operated on limestone and

have a daily capacity of 6,800 barrels, while 11 plants with an aggregate daily capacity of 8,950 barrels are utilizing marl deposits.

The names of the operating companies and location of plants are shown in the list of cement producers following.

The total sales of cement in Ontario during 1911 were 3,090,786 barrels, valued at \$3,741,039, as compared with 2,504,650 barrels, valued at \$3,150,479, sold in 1910.

The detailed statistics of production during 1910 and 1911 are shown in the next table.

Cement Production in Ontario, 1910 and 1911.

	1910.	1911.	Increase.	%	Decrease.	%
Cement sold Bls.	2,504,650	3,090,786	586,136	23.4		
Cement manufactured "	2,496,200	2,973,958	477,758	19.1		
Stock on hand Jan. 1 "	600,971	682,593	81,627	13.6		
Stock on hand Dec. 31 "	592,521	565,770			26,751	4.5
Value of cement sold \$	3,150,479	3,741,039	590,560	18.7		
Wages paid "	743,213	945,971	202,758	27.3		
Men employed No.	1,306	1,464	158	12.1		
Total daily capacity of operating plants Bls.	15,300	15,750	450	29.4		

Manitoba.—There is as yet only one cement plant in this Province, located at Babcock, 75 miles southwest of Winnipeg on the Canadian Northern railway.

This plant is operated by the Commercial Cement Company of Winnipeg, and a natural Portland cement is manufactured. The capacity of the plant is about 216 barrels a day. The Canada Cement Company is also constructing near Winnipeg a grinding plant, in which it is proposed for the present to grind clinker produced in the Company's plants in Ontario.

Alberta.—Alberta has three cement plants, located at Exshaw, Calgary, and Blairmore, respectively. All three plants are operated on limestone and shale. The first two, operated by the Canada Cement Company, have an aggregate daily capacity of 2,800 barrels. The Rocky Mountain Cement Company is doubling the capacity of its Blairmore plant, which in 1911 was 500 barrels per day; while the Keystone Portland Cement Company is erecting a mill at the same place.

British Columbia.—The Tod Inlet plant of the Vancouver Portland Cement Company, Limited, near Victoria, B.C., with a capacity of 2,250 barrels per day, is as yet the only operating plant in British Columbia. Limestone and clay are obtained from the Company's property adjoining the works.

At Princeton, B.C., the British Columbia Portland Cement Company, Limited, is constructing a plant with capacity of from 500 to 700 barrels per day.

The Portland Cement Construction Company of London, England, has also commenced the erection of a new cement plant at Tod Inlet.

The production of cement in Ontario has already been shown separately, and the aggregate production in all other provinces during 1910 and 1911 is given in the next table:—

Cement Production in other Provinces, 1910 and 1911.

		1910.	1911]	Increase.	%	Decrease.	%
Cement sold.....	Bls.	2,249,325	2,602,129	352,804	15.7		
Cement manufactured....	"	1,900,082	2,703,581	803,499	42.3		
Stock on hand Jan. 1.....	"	588,760	236,367			352,393	59.9
Stock on hand Dec. 31....	"	239,517	337,819	98,302	41.0		
Value of cement sold.....	\$	3,261,736	3,903,498	641,762	19.7		
Wages paid.....	"	666,502	1,157,867	491,365	73.7		
Men employed.....	No.	914	1,546	632	69.1		
Total daily capacity of operating plants.....	Bls.	10,535	13,060	2,525	23.9		

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.....	Hull, Que.....	
Owen Sound Mill.....	Shallow Lake, Ont.....	
Belleville Mill.....	Belleville, O. (Point Am)	
Leligh Mill.....	"	
Lakefield Mill.....	Lakefield, Ont.....	
Marbank Mill.....	Marbank, Ont.....	
Port Colborne Mill.....	Port Colborne, Ont.....	
Alberta Mill.....	Calgary, Alta.....	
Exshaw Mill.....	Exshaw, Alta.....	
Grey & Bruce Portland Cement Co. (assigned.)	Owen Sound, Ont.....	Owen Sound, Ont.
The Sun Portland Cement Co., Ltd.....	"	"
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.
The Commercial Cement Co., Ltd.....	Babcock, Man.....	Winnipeg, Man.
The Rocky Mountain Cement Co.....	Blairmore, Alta.....	Calgary, Alta.
Vancouver Portland Cement Co.....	Tod Inlet, B.C.....	Victoria, B.C.

The following companies are engaged in the construction of or contemplating the erection of mills:—

Ben Allan Portland Cement Co.....		Owen Sound, Ont.
Lake Medal Portland Cement Co.....		Hamilton, Ont.
The Brant Portland Cement Co.....		Brantford, Ont.
Canada Cement Co. (Quebec Mill).....	Neuville, Que.....	Montreal, Que.
The Edmonton Portland Cement Co.....		Edmonton, Alta.
The Keystone Portland Cement Co.....	Blairmore, Alta.....	Calgary, Alta.
British Columbia Portland Cement Co.....		Princeton, B.C.
The Portland Cement Construction Co.....	Tod Inlet, B.C.....	

CLAY PRODUCTS.

The actual production and sale of clay as such in Canada is as yet very small and practically limited to a small quantity of fireclay sold by a few operators. With this exception, 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 production of clay products has been rapidly increasing, the value of the output having almost doubled in three years. The total value of the production in 1911 was \$8,359,933, as compared with a value of \$7,629,956 in 1910, showing an increase of \$729,977, or over 9.5 per cent.

While the increase in gross output was not as large as that shown in 1910, the industry apparently made very satisfactory progress during the year. Demand in most districts exceeded supply and higher prices generally were realized. For the year 1911 about 419 active firms reported, as against 438 active firms reporting for 1910. A larger number of men were, however, employed in 1911, an average of 9,131 being engaged, as compared with 8,656 in 1910; while the wages paid were \$3,524,058 in 1911, as against \$3,308,609 in 1910.

Considered by provinces, Ontario in 1911 had the largest output, being credited with 47 per cent of the total value. Quebec was second with 16 per cent, Alberta third with 12½ per cent, Manitoba fourth with 10 per cent, followed by British Columbia with 8 per cent.

In 1907, Ontario contributed 54 per cent of the production of clay products, while the western provinces contributed only 21 per cent, as against over 33 per cent in 1911.

Of the total value of production in 1911, building and paving brick, including fireproofing, contributed \$6,915,792, or nearly 84 per cent; sewerpipe and tile production were valued at \$1,152,528, or about 14 per cent of the total. The total value of the production of pottery was reported as \$439,264, of which \$102,493 is estimated as being attributable to Canadian clays and the balance to imported clays; the value of production of fireclay and firebrick was \$89,130. Compared with the previous year, the production of building, paving, and fireproofing brick shows an increase of nearly 12 per cent, while the production of sewerpipe and drain tile increased less than one per cent.

The average price of common building brick for the whole of Canada in 1911 was \$8.37, as compared with \$8.13 in 1910 and \$7.81 in 1909. The average

price of pressed or front brick for the same years was, respectively, \$12.53, \$11.89, and \$11.01, thus showing the general increase in cost of building brick.

A comparison of statistics of imports of clay products shown in the table following, with those of production, is worth special attention. It will be noted in the first place that the total value of the imports in 1911 was at least \$5,156,544 (certain items probably covering clay products not being included), showing a total approximate consumption of clay products valued at \$13,416,537, of which only 62 per cent was of domestic production.

In 1909 the approximate consumption was valued at \$9,172,995, of which about 70 per cent was of domestic production.

In the case of building brick, the imports while increasing rapidly are still small compared with the home production; it is different, however, with paving brick and firebrick. The imports of paving brick in 1911 were over twice, and the imports of firebrick nearly ten times the Canadian output.

While the production of sewerpipe and drain tile remained nearly stationary, the imports of these products more than doubled in 1911, and amounted in value to about one-third the domestic production.

Statistics of the production in 1911 of the several classes of clay products by provinces are shown in the next table, and of the total production for a number of years past in subsequent tables following:—

Production of Clay Products by Provinces, 1911.

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	13	336	97,513	22,300,000	22,680,000	133,540	5·88	850,000	850,000	8,100	9·52
New Brunswick	6	126	24,091	4,811,470	4,300,000	36,800	5·55	100,000	100,000	1,200	12·00
Quebec	60	1,402	417,882	129,256,700	110,701,580	849,654	7·67	14,577,000	11,840,000	183,616	16·20
Ontario	262	4,366	1,727,478	385,221,526	318,670,621	2,513,965	7·89	51,990,204	50,333,750	514,081	10·21
Manitoba	18	1,210	435,228	83,362,000	79,600,000	805,178	10·11	1,800,000	1,800,000	21,750	12·08
Saskatchewan	13	303	105,507	17,824,260	16,819,960	159,634	9·49	4,726,700	4,251,700	65,124	15·31
Alberta	28	782	324,868	58,064,710	56,943,955	574,243	10·10	14,752,734	14,828,975	204,758	13·81
British Columbia	19	606	388,491	37,816,308	35,834,401	347,876	9·70	5,373,647	3,846,114	95,953	24·94
Totals	419	9,131	3,524,058	688,656,974	645,550,517	5,420,890	8·37	94,170,285	87,350,539	1,094,582	12·53

Province.	Paving brick.		Ornamental.		Firebrick and fireclay shapes, Value.	Fireproofing and terra-cotta, etc., Value.	Pottery, Value.	Sewerpipe, Value.	Tiles, drain, Value.	Total value, Clay products.
	No. sold.	Value.	No. sold.	Value.						
		\$		\$	\$	\$	\$	\$	\$	\$
Nova Scotia					15,207	11,256	1,800	98,946	5,400	274,249
New Brunswick										38,000
Quebec			192,000	3,840	13,000	76,199	59,400	150,303	455	1,341,467
Ontario	5,220,400	79,444	413,643	7,441		51,080	41,293	409,242	300,029	3,916,575
Manitoba									7,500	834,428
Saskatchewan					2,200					226,958
Alberta						270,750			3,000	1,052,751
British Columbia					53,723	300		154,225	23,428	675,505
Totals	5,220,400	79,444	605,643	11,281	89,130	409,585	*102,493	812,716	339,812	8,359,933

* There was also a production of \$336,771 from imported clays.

Production of Clay Products, 1909 and 1910.

	1909.			1910.		
	Quantity.	Value.	Per M.	Quantity.	Value.	Per M.
		\$	\$ cts.		\$	\$ cts.
Bricks—						
Common No.	539,228,708	4,212,424	7 81	627,715,319	5,105,354	8 13
Pressed "	57,264,656	630,677	11 01	67,895,034	807,294	11 89
Paving "	3,759,803	67,408	17 93	4,214,917	78,980	18 74
Ornamental		8,866		703,345	16,092	22 89
Firebrick and fireclay shapes, etc.		78,132			50,215	
Fireproofing, and architectural terra-cotta, etc.		113,886			176,979	
Pottery		285,285			250,924	
Sewerpipe		645,722			774,110	
Tiles, drain	27,571,097	408,440	14 81	24,562,648	370,008	
Totals		6,450,840			7,629,956	

Production of Clay Products by Provinces, 1906-1911.

Province.	1906.	1907.	1908.	1909.	1910.	1911.
	\$	\$	\$	\$	\$	\$
Nova Scotia	160,506	125,560	117,839	188,185	204,782	274,249
New Brunswick	49,220	57,377	75,513	65,570	56,475	38,000
Quebec	769,458	1,214,108	893,717	1,153,832	1,442,842	1,341,467
Ontario	3,136,870	3,123,372	2,476,152	3,425,841	3,667,810	3,916,575
Manitoba	517,065	466,432	265,091	559,608	781,605	834,428
Saskatchewan	136,022	125,459	87,566	145,516	160,850	226,958
Alberta	180,217	353,672	240,384	442,486	753,232	1,052,751
British Columbia	123,277	306,137	344,446	470,402	562,360	675,505
	5,072,635	5,772,117	4,500,702	6,450,840	7,629,956	8,359,933

Annual Value of Production of Clay Products, 1899-1911.

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		
1903	4,034,289	1908	4,500,702		

Exports and Imports.—The only export of clay products recorded is that of building brick, of which the exports in 1911 were 394,000, valued at \$3,977, as compared with 390,000, valued at \$2,762, in 1910, and 365,000, valued at \$2,255, in 1909.

The imports of clay products and of clay are, on the other hand, as already pointed out, quite considerable, and amounted in total value during the calendar year 1911 to \$5,156,544, equivalent to about 62 per cent of the domestic production. The total imports in 1910 were valued at \$4,331,397, showing an increase in 1911 of \$825,147, or 19 per cent, as against an increase in 1910 over 1909 of 33 per cent. In both years the imports have increased at a higher rate than the domestic production. Clay imports are classified by the Department of Customs under three main subdivisions: clays, brick and tile, and earthenware and chinaware. The imports of clays in 1911 were valued at \$270,247, and included chiefly china-clay and fireclay with a small quantity of pipeclay, and other clays not classified. The value of china-clay imports was \$125,768, and of fireclay, \$125,199. The imports of these clays have varied considerably from year to year, and do not show the same general increase as do the imports of manufactured clays. A reference to the next table will show the changes since 1905. The imports classified under brick and tile were valued in 1911 at \$2,369,761, of which about 34 per cent was firebrick, other important items being building brick, sewerpipe, and paving brick. There was also an importation under this class of manufactures of clay not specifically designated, valued at \$523,998. The imports of these 'unclassified' brick and tile have increased steadily year by year, the value of such imports in 1905 having been only \$20,804. The total imports of brick and tile in 1910 were valued at \$1,755,773, showing an increase in 1911 of about 35 per cent. The imports of earthenware and chinaware, of which the most important class is tableware, were valued in 1911 at \$2,516,536, as against \$2,283,116, an increase of about 10 per cent.

The detailed record of imports since 1905 is shown in the next table, the figures for the years 1905 to 1909 covering the fiscal year, and for the last three years the calendar year is used.

Imports of Clay Products, 1905 to 1911.

Imports.	12 months ending June, 1905.	12 months ending June, 1906.	12 months ending March, 1907.	12 months ending March, 1908.	12 months ending March, 1909.	Calendar year 1909.	Calendar year 1910.	Calendar year 1911.
	\$	\$	\$	\$	\$	\$	\$	\$
Brick and tile:—								
Bath brick.....	916	1,466	1,076	1,834	4,432	1,495	2,290	2,623
Building brick.....	168,122	194,897	88,144	139,105	108,773	195,360	274,482	475,865
Paving brick.....	32,578	46,008	23,256	61,346	101,187	139,366	124,994	164,292
Firebrick, of a class or kind not made in Canada.....	*436,941	*591,854	*506,801	639,347	350,457	485,994	811,927	814,414
Drain tile, not glazed.....	1,229	4,727	12,106	2,080	2,394	2,785	4,485	5,640
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed.....	101,166	131,353	93,458	125,747	106,399	170,280	175,599	382,929
Manufactures of clay, N.O.P.....	20,804	30,067	45,845	110,097	141,391	254,170	361,996	523,998
Total.....	761,756	1,000,372	770,686	1,079,556	815,033	1,249,450	1,755,773	2,369,761
Earthenware and chinaware:—								
Brown or coloured earthenware and stoneware, and Rockingham ware.....	15,464	8,363	9,625	22,847	28,273	36,673	53,413	52,100
C. C. or cream coloured ware, decorated, printed or sponged, and all earthenware, N.O.P.....	169,102	191,552	154,879	239,513	197,623	219,936	202,475	184,291
Demijohns, churns, or crocks.....	8,158	10,508	9,342	17,836	10,571	8,888	6,607	4,933
Tableware of china, porcelain, white granite or iron- stoneware.....	1,033,171	1,004,024	902,798	1,555,517	1,202,537	1,212,365	1,545,538	1,718,582
China and porcelain ware, N.O.P.....	199,960	214,013	134,675	109,446	87,798	87,467	95,509	62,025
Tiles or blocks of earthenware or stone prepared for mosaic flooring.....			62,547	45,836	43,299	56,974	90,524	123,203
Earthenware tiles, N.O.P.....	65,181	78,247	67,027	116,480	79,854	81,393	125,772	154,351
Manufacture of earthenware, N.O.P.....	71,609	117,824	81,987	83,309	66,932	78,063	163,278	217,051
Total.....	1,562,645	1,624,531	1,422,880	2,190,784	1,716,887	1,781,759	2,283,116	2,516,536

Clays:—								
China-clay, ground or unground.....	94,501	65,909	78,772	97,236	90,922	100,066	142,125	125,768
Fireclay, ground or unground.....	73,837	131,130	85,044	155,873	77,146	86,161	124,293	125,199
Pipeclay, ground or unground.....	1,189	1,333	307	319	887	310	114	1,786
Clays, all other, N.O.P.....	7,278	22,132	14,117	14,292	21,280	29,793	25,976	17,494
Total.....	176,805	220,504	178,240	267,720	190,235	216,330	292,508	270,247
Grand total.....	2,501,206	2,845,407	2,371,806	3,538,060	3,722,155	3,247,539	4,331,397	5,156,544
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks and laundry tubs of any material.....	73,569	67,828	62,547	234,505	157,881	211,837	262,667	235,847
Chalk, china or cornwall stone, cliff stone and feldspar, fluorspar, magnesite, ground or unground.....	5,276	9,053	7,376	72,467	81,675	96,747	121,959	147,640

* Includes stove linings, N. E. S.

In addition to the imports shown in the above table, there is also a considerable annual importation of 'chalk, china or cornwall stone, cliff stone and feldspar, fluorspar, magnesite ground or unground,' much of which is no doubt used in connexion with the manufacture of clay products. The value of these imports during the calendar year 1911 was \$147,640: of which \$90,119 was from the United States, \$54,548 from Great Britain, and \$2,973 from other countries. The value of the imports under this item during the calendar year 1910 was \$121,959. There is also an annual importation of 'baths, bath tubs, basins, closets, lavatories, urinals, sinks, and laundry tubs of any material,' the value of such imports during 1911 being \$285,847, as compared with \$262,667 during the year 1910.

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 ironstoneware, 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, 76.7 per cent was from the United States and 23.2 per cent from Great Britain; and only \$578 worth from other countries. Of the earthenware and chinaware, 62 per cent was imported from Great Britain; 15 per cent from the United States; 9 per cent from Germany; 7 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, 1911, showing Countries of Origin.

Imports.	Great Britain.	United States.	Germany.	France.	Austria-Hungary.	Japan.	Other countries.	Total.
	\$	\$	\$	\$	\$	\$	\$	\$
Brick and tile:—								
Bath brick.....	2,250	17						2,267
Building brick.....	30,837	278,716						309,553
Paving brick.....	94,885	35,976						130,861
Firebrick, of a class or kind not made in Canada.....	73,128	791,202					135	864,465
Drain tile, not glazed.....	305	4,073						4,378
Drain pipe, sewerpipe, and earthenware fittings therefor, chimney linings or vents, chimney tops and inverted blocks, glazed or unglazed.....	23,179	151,283	191					174,653
Manufactures of clay, N.O.P.....	216,950	191,822	194	29	17		12	409,024
Total.....	441,534	1,453,089	385	29	17		147	1,895,201
Earthenware and chinaware:—								
Brown or coloured earthenware and stoneware, and Rockingham ware.....	13,747	39,728	718	90		123		54,406
C. C. or cream coloured ware, decorated, printed or sponged, and all earthenware, N. O. P.....	112,956	46,260	12,892	2,186	2,438	12,949	1,829	191,510
Demijohns, churns, or crocks.....	1,622	5,615						7,237
Tableware of china, porcelain, white granite or ironstone-ware.....	1,133,279	29,893	174,405	157,325	47,446	69,525	28,162	1,640,085
China and porcelain ware, N.O.P.....	44,866	18,330	15,869	2,330	4,893	3,975	4,312	94,575
Tiles or blocks of earthenware or stone prepared for mosaic flooring.....	24,216	66,057	13	3,448			150	93,884
Earthenware tiles, N.O.P.....	85,489	50,032	236	566			162	136,485
Manufacture of earthenware, N.O.P.....	60,143	95,983	15,539	2,606	1,026	3,399	1,588	180,284
Total.....	1,476,318	351,898	219,672	168,551	55,803	89,971	36,203	2,398,416

Imports of Clay Products during the twelve months ending March, 1911, showing Countries of Origin—*Continued.*

Imports.	Great Britain.	United States.	Germany.	France.	Austria-Hungary.	Japan.	Other Countries.	Total.
	\$	\$	\$	\$	\$	\$	\$	\$
Clays:—								
China-clay, ground or unground.	110,432	34,472						144,904
Fireclay, ground or unground.	25,218	103,811					699	129,728
Pipeclay, ground or unground.	100	156						256
Clays, all other, N.O.P.	486	23,660	499					24,645
Total	136,236	162,099	499				699	299,533
Grand total	2,054,088	1,967,086	220,556	168,580	55,820	89,971	37,049	4,598,150
Per cent of total.	44.72	42.83	4.80	3.67	1.21	1.96	0.81	100.00
Baths, bath-tubs, basins, closets, lavatories, urinals, sinks, and laundry tubs of any material.	65,332	195,218	160		11		13	260,734
Chalk, china or cornwall stone, cliff stone, and feldspar, fluorspar, magnesite, ground or unground.	27,550	89,846	856	332	152		1,945	120,681

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 twelve years Canada has imported clay products to the value of \$30,093,888. 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 \$1,895,201 in 1911. The imports of earthenware and chinaware have a little more than doubled in the same time.

Imports of Clay Products (total value) 1900-11.

Fiscal Year.	Brick and tile.	Earthenware and chinaware.	Clays.	Total.
	\$	\$	\$	\$
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
	8,532,656	19,284,104	2,277,128	30,093,888

* 9 months ending March 1907.

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

In view of the large import of clay products into Canada, it may be of interest to quote herewith the Customs duties affecting these goods.

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 production of clay building brick, including the common and pressed varieties, but excluding ornamental, paving, fire-brick, and fireproofing brick, is shown by provinces for the past two years in the following tables.

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.

In 1910 the production was 627,715,319 common brick, valued at \$5,105,354, or an average value per thousand of \$8.13; and 67,895,034 pressed brick, valued at \$807,294, or an average value per thousand of \$11.89; the total of the two classes being 695,610,353, valued at \$5,912,648. The production of ornamental brick in 1910 was 703,345, valued at \$16,092; and of fireproofing and architectural terra-cotta, \$176,979.

The increase in production of fireproofing has been particularly marked, and is due to the establishment of new plants, including the National Fire Proofing Company of Canada at Hamilton, Ont., and the Alberta Clay Products Company, Limited, of Medicine Hat, Alta.

The demand for brick has been very strong, particularly throughout the west, where numbers of plants are being increased in capacity and many new plants either contemplated or in course of construction.

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

Province.	1910.				1911.			
	No. of active firms re- porting.	No. sold.	Value.	Per cent of total value.	No. of active firms re- porting.	No. sold.	Value.	Per cent of total value.
			\$				\$	
Nova Scotia.....	15	18,730,000	113,436	1.92	13	23,530,000	141,640	2.17
New Brunswick.....	4	3,950,000	31,350	0.53	6	4,400,000	38,000	0.58
Quebec.....	62	130,278,310	929,492	15.72	60	122,041,580	1,033,270	15.86
Ontario.....	235	342,119,078	2,785,361	47.11	262	369,074,371	3,028,046	46.48
Manitoba.....	22	75,834,550	746,704	12.63	18	81,400,000	826,928	12.69
Saskatchewan.....	11	14,733,340	160,850	2.72	13	21,071,660	224,758	3.45
Alberta.....	29	73,639,771	750,982	12.70	28	71,772,930	779,001	11.96
British Columbia....	19	36,316,304	394,473	6.67	19	39,680,515	443,329	6.81
Totals.....	397	695,610,353	5,912,648	100	419	732,901,056	6,515,472	100.00

Production of Clay Building Brick (Common and Pressed) 1908 and 1909.

Province.	1903.			1909.		
	No. sold.	Value.	Per cent of total value.	No. sold.	Value.	Per cent of total value.
		\$			\$	
Nova Scotia.....	9,125,000	56,064	1.79	18,875,000	114,795	2.37
New Brunswick.....	6,594,011	54,573	1.74	6,170,000	44,330	0.91
Quebec.....	90,667,177	601,874	19.24	101,471,567	690,918	14.27
Ontario.....	221,600,575	1,664,184	53.19	322,524,414	2,557,068	52.80
Manitoba.....	26,818,000	254,591	8.14	59,110,000	544,548	11.24
Saskatchewan.....	8,262,996	87,566	2.80	14,416,770	144,816	2.98
Alberta.....	25,521,911	240,336	7.68	45,479,855	441,606	9.12
British Columbia.....	18,152,362	169,546	5.42	28,445,758	305,520	6.31
Totals.....	406,742,632	3,128,734	100.00	596,493,364	4,843,101	100.00

The exports and imports of building brick since 1891 and 1880, respectively, are shown in the two following tables. The exports have never been large, averaging for a number of years past about \$6,000 in value per annum, but falling in 1910 and 1911 to \$2,762 and \$3,977, respectively. The annual imports for a number of years previous to 1903 averaged only about \$20,000 in value. During the past eight years, however, the imports have rapidly increased from \$100,000 to nearly \$500,000 per annum. During the calendar year 1911 the imports were 51,102,000 brick, valued at \$475,865: of which 6,404,000, valued at \$72,675, or an average of \$11.35 per thousand, were imported from Great Britain; and 44,698,000, valued at \$403,190, or an average of \$9.02 per thousand, from the United States. The imports during the calendar year 1910 were 29,049,000 brick, valued at \$274,482: of which 1,993,000, valued at \$26,447, or an average of \$13.27 per thousand, were imported from Great Britain; and 27,056,000, valued at \$248,035, or an average of \$9.45 per thousand, from the United States.

Exports of Building Brick.

Calendar Year.	M.	Value.	Calendar Year.	M.	Value.	Calendar Year.	M.	Value.
		\$			\$			\$
1891.....	246	1,163	1898.....	65	442	1905.....	754	5,888
1892.....	1,963	12,192	1899.....	172	1,351	1906.....	697	6,541
1893.....	6,073	44,110	1900.....	546	4,528	1907.....	802	6,193
1894.....	1,095	7,405	1901.....	646	5,189	1908.....	2,344	9,047
1895.....	1,655	8,665	1902.....	2,110	12,786	1909.....	365	2,255
1896.....	983	5,673	1903.....	891	5,699	1910.....	390	2,762
1897.....	573	2,679	1904.....	696	5,357	1911.....	394	3,977

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	38,802
1881.....	415	4,281	1892.....	621	5,075	1903.....	2,381	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.....	30,414	213,175
1889.....	2,590	24,585	1900.....	1,792	19,305	1911.....	32,748	300,553
1890.....	1,933	12,500	1901.....	2,800	20,677			

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 1911 according to these returns was \$8.37, as compared with \$8.13 in 1910, and \$7.81 in 1909; and of pressed brick \$12.53, as compared with \$11.89 in 1910 and \$11.01 in 1909.

In the Maritime Provinces, during 1911, the price of common brick varied from \$5 to \$9, averaging for Nova Scotia \$5.88, and for New Brunswick \$5.55.

In Quebec the price of common brick varied between \$4.50 and \$11, averaging \$7.67; while the price of pressed brick averaged \$16.20, with only one firm reporting production. The average price of common brick in Ontario was \$7.89, the limits of variation being \$5 and \$11; while for pressed brick the average was \$10.21 and the variation from \$8 to \$12.

In the western provinces the averages for common brick were fairly uniform—\$9.49 to \$10.11. In individual yards the prices varied from \$8 to \$12. Pressed brick in the west averaged \$12.08 per thousand in Manitoba; \$15.31 in Saskatchewan; \$13.81 in Alberta; and \$24.94 in British Columbia. With the exception of Saskatchewan, the average prices for pressed brick in the western provinces were all lower than in 1910.

The following table shows the average values at the kilns of common and pressed brick during 1909, 1910, and 1911, as furnished by the producers:—

Average Prices per Thousand of Common and Pressed Brick.

	Common brick.			Pressed brick.		
	1909.	1910.	1911.	1909.	1910.	1911.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	5 69	5 77	5 88	12 36	12 27	9 52
New Brunswick.....	7 14	7 33	5 55	12 00	12 00	12 00
Quebec.....	6 38	6 63	7 67	14 00	15 00	16 20
Ontario.....	7 71	7 88	7 89	9 46	9 74	10 21
Manitoba.....	9 14	9 81	10 11	12 00	16 27	12 08
Saskatchewan.....	9 66	9 63	9 49	14 00	14 97	15 31
Alberta.....	9 21	9 63	10 10	13 03	19 01	13 81
British Columbia.....	9 73	9 77	9 70	31 05	33 56	24 94
Canada.....	7 81	8 13	8 37	11 01	11 89	12 53

Nova Scotia and New Brunswick.—An increase is shown in the brick production of both these Provinces in 1911, the total production in Nova Scotia being 23,530 thousand, valued at \$141,640; and in New Brunswick, 4,400 thousand, valued at \$38,000. In addition to brick there was a production in Nova Scotia of fireproofing, terra-cotta, tile, etc., valued at \$11,256, and a production of pottery valued at \$1,800. The principal brick plants are located at Pugwash, Elmsdale, New Glasgow, Middleton, and Annapolis in Nova Scotia, and at Fredericton, St. John, and Chatham, New Brunswick.

Quebec.—The total production of brick in Quebec in 1911 is reported by sixty operative firms as 122,042 thousand, valued at \$1,033,270, comprising 110,702 thousand common brick, valued at \$849,654, or \$7.67 per thousand, and 11,340 thousand pressed brick, valued at \$183,616, or \$16.20 per thousand. The production by sixty-two active firms in 1910 was 130,287 thousand brick, valued at \$929,492.

The production of brick is widely scattered throughout the Province, but the principal brickmaking plants are located at Laprairie, Sherbrooke, and St. Jean Deschaillons.

Ontario.—This Province has for a number of years produced over 50 per cent of the clay building brick production in Canada, though the percentage in 1910 and 1911 has fallen to a little over 46. The city of Toronto and vicinity, including the counties of York and Halton, is the principal brick-making section, and in 1911 produced about 59 per cent of the Ontario production, or about 28 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 7½ per cent of the Ontario production. The Ottawa district, including the counties of Russell and Carleton, produced over 6½ per cent. Other important districts are Algoma and Nipissing, which cover a wide area, and the counties of Waterloo, Middlesex, Grey, Simcoe, Essex, and Kent. These thirteen counties contributed over 86 per cent of the Ontario production. The greater part of the pressed brick reported as such was made in the Toronto and Hamilton districts.

Production of Common and Pressed Brick by Principal Counties, 1911.

County.	Common.			Pressed.			Total value.	Per cent.
	No.	Value.	Per M.	No.	Value.	Per M.		
		\$	\$ c.		\$	\$ c.	\$	%
York.....	163,102,300	1,353,096	8 30	14,146,000	162,865	11 51	1,515,961	50·06
Halton.....	200,000	1,600	8 00	26,948,400	259,659	9 64	261,259	8·63
Wentworth.....	26,754,286	168,479	6 30	6,612,314	63,706	9 63	232,185	7·67
Carleton.....	11,975,000	109,369	9 13				109,369	3·61
Russell.....	15,850,500	96,353	6 08				96,353	3·18
Algoma.....	9,096,000	74,189	8 16				74,189	2·45
Waterloo.....	8,120,365	60,913	7 50				60,913	2·01
Nipissing.....	6,100,000	57,500	9 43				57,500	1·90
Middlesex.....	6,849,530	52,502	7 66				52,502	1·73
Grey.....	6,099,490	48,952	8 03				48,952	1·62
Simcoe.....	4,993,000	38,940	7 80				38,940	1·23
Essex.....	5,255,200	35,497	6 75	120,000	1,200	10 00	36,697	1·21
Kent.....	4,997,500	33,453	6 69				33,453	1·10
Total, 13 counties...	269,395,171	2,130,843	7 91	47,826,714	487,430	10 19	2,618,273	86·46
Total, other counties	49,275,450	383,122	7 77	2,507,036	26,651	10 63	409,773	13·54
Total, Ontario.....	318,670,621	2,513,965	7 89	50,333,750	514,081	10 21	3,028,046	100·00

The annual production of common and pressed brick in this Province since 1898, 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	114,394	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	213,550	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	643,683	9.298
1908	222,361	1,575,875	7.087	56,167	485,819	8.649
1909	246,308	1,916,147	7.779	53,167	490,571	9.227
1910	304,988	2,374,287	7.785	44,204	453,596	10.375
*1911	316,000	2,480,177	7.845	51,844	562,345	10.847

* Preliminary.

In addition to the ordinary building brick, there was produced in this Province in 1911, ornamental brick valued at \$7,441, and fireproofing and terracotta valued at \$51,080.

Manitoba.—The production of building brick in Manitoba in 1911 was 81,400 thousand, valued at \$826,928, comprising 79,600 thousand common brick, valued at \$805,173, or an average of \$10.11 per thousand; and 1,800 thousand pressed brick, valued at \$21,750, or \$12.08 per thousand. The total production in 1910 was 75,835 thousand, valued at \$746,704, showing an increase of over 10 per cent in the value of the production.

The principal brickmaking plants are located at Winnipeg, Morris, Lac du Bonnet, Portage La Prairie, Sidney, Brandon, Brookdale, Gilbert Plains, and Virden.

Saskatchewan.—Returns from thirteen operating firms show a production in 1911 of 21,072 thousand brick, valued at \$224,753, as compared with 14,733 thousand brick, valued at \$160,850, produced by eleven firms during 1910.

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

Alberta.—The production in 1911 reported by twenty-eight firms was 71,773 thousand, valued at \$779,001, as against 73,640 thousand, valued at \$750,932, reported by twenty-nine firms in 1910. The 1911 production included 56,944 thousand common brick, valued at \$574,243, or an average of \$10.10 per thousand, and 14,829 thousand pressed brick, valued at \$204,758, or an average of \$13.81 per thousand.

In addition to building brick, there was a production in this Province during 1911 of fireproofing valued at \$270,750.

The principal centres of production are Edmonton, Cochrane, Calgary, Medicine Hat, Lethbridge, and Red Deer.

Throughout the three prairie provinces the demand for brick was particularly heavy, and the prices of common ranged from \$8 to \$12 per thousand, while pressed brick sold at from \$14 to \$20 per thousand.

British Columbia.—The production during 1911 by nineteen active firms was 39,681 thousand brick, valued at \$443,829, and included 35,835 thousand common brick, valued at \$347,876, or an average of \$9.70 per thousand; and 3,846 thousand pressed brick, valued at \$95,953, or an average of \$24.94 per thousand. The total production by the same number of firms in 1910 was 36,316 thousand brick, valued at \$394,473. Vancouver, New Westminster, Port Haney and vicinity, Anvil Island, Victoria, and Sidney are the principal centres for the production of common brick, while pressed brick are made in considerable quantities at Clayburn and Anvil Island.

Paving Brick.—The total production of paving brick and paving blocks in Canada in 1911 was reported as 5,220,400, valued at \$79,444, as compared with a production of 4,215,000, valued at \$78,980 in 1910.

This paving brick is made at West Toronto, Ont., from shale obtained from the banks of the Humber river. The annual production has for a number of years varied from 3,000,000 to over 5,000,000 per season, and the output finds a market chiefly in Toronto. Statistics of production are available since 1897 and are shown in the next table; the average price per thousand has varied from \$8 to \$20.

The imports of paving brick have during the past three years exceeded the domestic production. During the calendar year 1911 the imports were 11,450 thousand, valued at \$164,292, or \$14.34 per thousand, and included 4,988 thousand, valued at \$73,201, or \$15.68 per thousand, from the United States, and 6,462 thousand, valued at \$86,091, or \$13.32 per thousand, from Great Britain. The imports during the calendar year 1910 were 10,503 thousand, valued at \$124,994.

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	1904.....	4,436	55,450	12 50
1898.....				1905.....	4,500	54,000	12 00
1899.....	5,309	42,550	8 03	1906.....	3,000	45,000	15 00
1900.....	2,710	26,950	9 94	1907.....	3,618	72,354	20 00
1901.....	3,689	37,000	10 03	1908.....	3,720	59,456	15 98
1902.....	4,211	42,000	9 97	1909.....	3,760	67,408	17 93
1903.....	3,789	45,288	11 95	1910.....	4,215	78,980	18 74
				1911.....	5,220	79,444	15 22

* 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	1903.....	1,337	18,811	14 07
1896.....	918	10,132	11 04	1904.....	1,986	29,753	14 98
1897.....	52	719	13 83	1905.....	3,350	32,578	13 86
1898.....	367	2,337	6 37	1906.....	4,104	46,008	11 21
1899.....	1,533	23,648	14 94	1907 (9 mos)....	2,182	23,256	10 66
1900.....	2,175	35,644	16 39	1908.....	5,340	61,346	11 49
1901.....	900	10,414	11 57	1909.....		101,187	†
1902.....	1,030	16,788	16 30	1910.....		138,763	
				1911.....	10,836	130,861	12 08

* 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 July, 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 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, Saskatchewan, and at Clayburn, near the city of Vancouver, British Columbia. Stove lining and other refractory clay products are made at several places in Ontario and Quebec from imported fireclays.

The total value of the sales of fireclay, firebrick, and fireclay products in 1911 was \$89,130, as compared with a valuation of \$50,215 in 1910, and \$78,132 in 1909.

The production in 1911 comprised 2,367,937 firebrick, valued at \$44,122, or an average of \$18.63 per thousand; fireclay or refractory clay sold was 7,532 tons, valued at \$24,128, and other fireclay products valued at \$20,880.

The imports of firebrick during the calendar year 1911 were valued at \$814,414, of which \$659,602 worth was imported from the United States, and \$154,020 from Great Britain. The imports of firebrick in 1910 were valued at \$811,927, and included \$734,908 from the United States and \$76,902 from Great Britain. Fireclay was imported during the calendar year 1911 to the value of \$125,199, as compared with a value of \$124,293 in 1910, and \$86,161 in 1909.

Statistics of the annual production since 1907 of firebrick, refractory clay or fireclay sold as such, and of fireclay products and statistics of the imports of firebrick and fireclay are shown in the following tables:—

Production of Fireclay and Fireclay Products.

Year.	Firebrick.			Fireclay.			Other fireclay products.	Total value.
	No. sold.	Value.	Per M.	Tons.	Value.	Per Ton.	Value.	
		\$	\$ cts.		\$	\$ cts.	\$	\$
1907.....	4,323,179	113,322	26 21				18,000	131,322
1908.....	2,415,871	70,429	29 16	1,984	8,121	4 09	31,752	110,302
1909.....	1,059,270	32,742	30 92	4,405	12,390	2 81	33,000	78,132
1910.....	1,375,400	29,352	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	20,850	89,130

Imports of Firebrick and Fireclay, 1900-11.

Fiscal Year.	Fireclay.	Firebrick.	Fiscal Year.	Fireclay.	Firebrick.
	\$	\$		\$	\$
1900.....	59,291	39,535	1906.....	131,130	51,892
1901.....	79,530	32,831	1907*.....	85,044	349,185
1902.....	64,541	45,608	1908.....	155,873	639,347
1903.....	94,509	34,522	1909.....	77,146	350,457
1904.....	52,716	33,335	1910.....	86,151	519,454
1905.....	73,837	44,746	1911.....	129,728	864,465

* 9 months ending March.

Sewerpipe and Drain Tile.—The total value of the sales of sewerpipe in 1911 was \$812,716, as compared with a value of \$774,110 in 1910, and a value of \$645,722 in 1909. Nearly 50 per cent of the production in 1911 was made in Ontario.

Following is a list of firms reporting production of sewerpipe in 1911:—

- Standard Drain Pipe Co., St. Johns, Que., and New Glasgow, N.S.
- Ontario Sewerpipe Company, Toronto, Ont.
- Dominion Sewer Pipe Company, Toronto, Ont.
- Hamilton and Toronto Sewer Pipe Co., Ltd., Hamilton, Ont.
- Clayburn Company Ltd., Clayburn, B.C.
- B.C. Pottery Company, Victoria, B.C.

The imports of drain pipe and sewerpipe during the calendar year 1911 were valued at \$382,929, of which \$338,644 worth was imported from the United States, \$44,278 from Great Britain, and \$7 from other countries.

The production of drain tile as reported to this Branch was not as large in 1911 as in 1910 or 1909. The total sales in 1911 were valued at \$339,812, as against \$370,008 in 1910, and \$408,440 in 1909.

The Ontario Bureau of Mines reports the total number made in that Province during 1911 as 21,461,000, valued at \$343,956, or an average of \$16.03 per thousand, as compared with 21,028,000, valued at \$318,456, or an average of \$15.14 per thousand, in 1910. The sales in Ontario in 1911 as reported to the Mines Branch were valued at \$300,029, as against a value of \$334,402 in 1910.

The imports of unglazed tile are comparatively small, the value during the calendar year 1911 being \$5,640 only, as compared with \$4,485 in 1910, and \$2,785 in 1909.

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, etc.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	\$		\$		\$
1888	266,320	1896	153,875	1904	440,894
1889	Not available.	1897	164,250	1905	382,000
1890	348,000	1898	181,717	1906	350,045
1891	227,300	1899	161,546	1907	667,100
1892	367,660	1900	231,525	1908	514,362
1893	350,000	1901	243,115	1909	645,722
1894	250,325	1902	301,965	1910	774,110
1895	257,045	1903	317,970	1911	812,716

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	1898...	22,668,000	225,000	1905...	15,000,000	220,000
1892...	10,000,000	100,000	1899...	21,027,400	240,246	1906...	17,700,000	252,500
1893...	17,300,000	190,000	1900...	19,544,000	209,738	1907...	15,578,000	250,122
1894...	25,000,000	280,000	1901...	21,592,000	231,374	1908...	24,800,000	338,658
1895...	14,330,000	157,000	1902...	17,510,000	199,000	1909...	27,418,000	363,550
1896...	13,200,000	144,000	1903...	18,200,000	227,000	1910...	21,028,000	318,456
1897...	*	*	1904...	16,000,000	210,000	1911...	21,461,000	343,956

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

(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 1911, according to returns received, was \$439,264, of which it is estimated that a value of \$336,771 is attributable to imported clays. The value of the production reported in 1910 was \$250,924, and in 1909, \$285,285. Annual statistics of production are shown herewith.

Annual Production of Pottery.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	\$		\$		\$
1888.....	27,750	1896.....	163,427	1904.....	140,000
1889.....	Not available.	1897.....	129,629	1905.....	120,000
1890.....	195,242	1898.....	214,675	1906.....	150,000
1891.....	253,844	1899.....	185,000	1907.....	253,809
1892.....	265,811	1900.....	200,000	1908.....	200,541
1893.....	213,186	1901.....	200,000	1909.....	285,285
1894.....	162,144	1902.....	200,000	1910.....	250,924
1895.....	151,588	1903.....	200,000	1911.....	102,493

Details of the imports of earthenware and chinaware, showing the values imported and the countries of origin, have already been given in the general table of imports, pages 21 and 22.

The total imports in 1911 were valued at \$2,516,536, as compared with a value of \$2,283,116 in 1910. These imports are subdivided into eight classes and in 1911 include: brown or coloured earthenware, etc., \$52,100; C.C. or cream coloured ware, decorated, printed, or sponged, etc., \$184,291; demijohns, churns, or crocks, \$4,933; tableware of china, porcelain, white granite, etc., \$1,718,582; china and porcelain ware, N.O.P., \$62,025; tiles or blocks of earthenware or stone prepared for mosaic flooring, \$123,203; earthenware tiles, N.O.P., \$154,351; manufactures of earthenware, N.O.P., \$217,051.

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.....	430,029	1892.....	748,810	1903.....	1,406,610
1882.....	646,734	1893.....	709,737	1904.....	1,611,356
1883.....	657,836	1894.....	695,514	1905.....	1,636,214
1884.....	544,586	1895.....	547,935	1906.....	1,692,359
1885.....	511,853	1896.....	575,493	1907 (9 mos.)....	1,422,880
1886.....	599,269	1897.....	595,822	1908.....	2,100,784
1887.....	750,691	1898.....	675,874	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		

Kaolin.—Although there has as yet been no actual commercial production of china-clay or kaolin in Canada, the development of kaolin deposits in the township of Amherst, Ottawa county, and the construction of a washing or refining plant at St. Remi d'Amherst, are worthy of note.

The present operators are the Canadian China Clay Co., incorporated at Ottawa, February 3, 1912, with a capital of \$250,000; head office, 151 St. James street, Montreal. The property is located on parts of lots 4, 5, 6, 7, and 8 of range VI south, township of Amherst, county of Ottawa, Quebec.

Mr. John C. Broderick, St. Remi d'Amherst, is mine manager, and Mr. Jas. G. Ross, B.Sc., consulting engineer.

The plant¹ for refining the clay is situated 2 miles from St. Remi d'Amherst and 7 miles from Huberdeau station, the terminus of the Canadian Northern Quebec railway, 94 miles northwest of Montreal.

Development work was begun by the present operators in June, 1911, and the washing plant completed in April of 1912.

¹A short description of the plant and property was published in the Canadian Mining Journal, July 1, 1912.

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 are being built for drying in the winter and wet seasons. After drying it will be pulverized and bagged for shipment. It is expected that an immediate market will be found in the demand of the Canadian paper mills.

The imports of china-clay, ground and unground, into Canada during the twelve months ending December 31, 1911, were valued at \$125,768, as against a value of \$142,125 in 1910, and \$100,066 in 1909, thus indicating to some extent at least the present actual demand for this product. The imports of earthenware and chinaware, however, valued at \$2,516,536 in 1911, and composed chiefly of tableware of china, porcelain, etc., show the possibilities in 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 1910 being valued at \$1,593,472.

The kaolin deposits of Amherst were first brought to the attention of the Department in 1894, when samples were submitted to the Geological Survey Museum by Mr. R. Lanigan, of Calumet, Que. In 1896, samples were sent to porcelain works at Trenton, N.J., and were very favourably reported upon, but no serious attempt to develop the property was made until the past season.

LIME.

The production of lime in Canada in 1911, according to returns received from the producers, was 7,533,525 bushels, this being the amount sold or used (equivalent to about 263,673 tons), and valued at \$1,517,599, or an average of 20 cents per bushel, or \$5.75 per ton.

The production in 1910 was reported as 5,848,146 bushels (204,685 tons), valued at \$1,137,079, an average of 19 cents per bushel, thus showing an increased production in 1911 of 1,685,579 bushels, or 22 per cent.

Returns were received from seventy-five active firms in 1911, as compared with seventy firms in 1910. The average number of men employed was 1,056, and wages paid, \$523,518, during the past year, as against 976 men employed and \$466,876 paid in wages in 1910. Statistics of labour and wages should be used with discrimination, however, as many firms producing lime are also engaged in quarrying stone for purposes other than lime making, and are unable to make separate reports as to labour employed. This is particularly evident in the record for Nova Scotia and New Brunswick, since for the first mentioned the record includes only the labour employed at the kilns, while for the latter the quarry costs are also included.

The average price per bushel varied from a minimum of 16 cents in Ontario to a maximum of 34 cents in British Columbia.

Hydrated lime was produced by three firms only, the sales being 5,023 tons.

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

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.
			\$		\$	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	33,960	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, 1910.

Province.	No. of active firms reporting.	Men employed.	Wages paid.	SALES.			
				Bushels.	Value.	Average per bushel.	Per cent of total.
			\$		\$	cts.	%
Nova Scotia.....	4	45	10,504	55,750	13,490	24	1.2
New Brunswick....	6	109	42,524	470,050	105,593	22	9.3
Quebec.....	17	223	107,275	1,227,555	299,126	23	26.3
Ontario.....	31	410	180,557	2,988,020	476,137	16	41.9
Manitoba.....	5	95	48,707	606,679	100,808	17	8.8
Alberta.....	3	29	21,700	303,214	69,268	23	6.1
British Columbia....	4	65	55,608	196,878	72,657	37	6.4
Total.....	70	976	466,876	5,848,146	1,137,079	19	100.0

Lime Production by Provinces, 1908 and 1909.

Province.	1908.				1909.			
	Bushels.	Value.	Average per bushel.	Per cent.	Bushels.	Value.	Average per bushel.	Per cent.
		\$	cts.	%		\$	cts.	%
Nova Scotia.	51,068	16,102	32	2·3	57,730	16,729	29	1·5
New Brunswick..	155,748	34,262	22	4·8	697,466	154,151	22	13·6
Quebec	357,700	201,357	23	28·2	1,281,827	315,633	25	27·9
Ontario	2,087,731	358,507	17	50·3	2,619,553	434,147	17	38·3
Manitoba	138,786	24,192	17	3·4	423,954	69,670	16	6·2
Alberta	135,000	34,500	26	4·8	231,125	67,350	24	5·9
British Columbia.	176,435	44,027	25	6·2	231,269	75,076	32	6·6
	3,601,468	712,947	20	100·0	5,592,924	1,132,756	20	100·0

Exports and Imports.—The value of the lime exported during the calendar year 1911 was \$39,536, the destination of shipments being mainly the United States. The quantity is not reported, but at the average price of lime in Canada (20 cents a bushel) the quantity would be about 692 tons.

The imports of lime during the same period were 228,538 barrels (22,853 tons), valued at \$161,985: an average of 70 cents per barrel, or \$7.08 per ton, and were derived chiefly from the United States.

Annual statistics of exports and imports are given in the next two tables:—

Exports of Lime.

Calendar Year.	Value.	Calendar Year.	Value.	Calendar Year.	Value.
	\$		\$		\$
1891.....	119,853	1898.....	49,594	1905.....	85,723
1892.....	121,535	1899.....	73,565	1906.....	57,072
1893.....	86,623	1900.....	80,852	1907.....	55,903
1894.....	83,670	1901.....	99,194	1908.....	43,316
1895.....	71,657	1902.....	116,009	1909.....	48,821
1896.....	70,820	1903.....	131,412	1910.....	44,762
1897.....	53,177	1904.....	73,835	1911.....	39,536

Imports of Lime.

Fiscal Year.	Barrels.	Value.	Fiscal Year.	Barrels.	Value.
		\$			\$
1880.....	6,100	6,013	1896.....	10,239	7,331
1881.....	5,796	4,177	1897.....	16,108	10,529
1882.....	5,064	5,365	1898.....	12,850	9,002
1883.....	7,623	9,224	1899.....	15,720	11,124
1884.....	10,804	11,200	1900.....	12,865	11,211
1885.....	12,072	11,503	1901.....	19,657	14,534
1886.....	11,021	9,347	1902.....	24,602	17,584
1887.....	10,835	8,524	1903.....	31,108	22,470
1888.....	10,142	7,537	1904.....	54,359	39,639
1889.....	13,079	9,363	1905.....	98,676	71,588
1890.....	3,149	5,360	1906.....	134,334	93,630
1891.....	6,259	4,273	1907 (9 mos.).....	88,919	67,573
1892.....	6,132	4,241	1908.....	129,379	99,611
1893.....	6,879	4,917	1909.....	153,934	106,263
1894.....	6,766	4,907	1910.....	191,537	116,964
1895.....	12,008	5,743	1911 Duty 20 per cent.....	194,809	143,338

In reviewing the production of lime by provinces it will be observed that the Provinces of Ontario and Quebec, being the chief centres of population, are the largest producers, the former contributing in 1911 over 35 per cent of the total quantity, and the latter 23 per cent; the production west of the great lakes has, however, been rapidly increasing, these provinces accounting for nearly 24 per cent of the total in 1911, as against 14 per cent in 1908.

Statistics of the annual production of lime in Ontario as published by the Ontario Bureau of Mines are available since 1896, and 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	1904.....	2,600,000	406,800	16
1897.....				1905.....	3,100,000	424,700	14
1898.....	2,620,000	308,000	12	1906.....	2,885,000	496,785	17
1899.....	4,342,500	535,000	12	1907.....	2,650,000	418,700	17
1900.....	3,893,000	544,000	14	1908.....	2,442,331	448,596	18
1901.....	4,100,000	550,000	13	1909.....	2,633,500	470,858	18
1902.....	4,300,000	617,000	14	1910.....	2,889,235	474,531	16
1903.....	3,400,000	520,000	15	*1911.....	2,335,985	394,551	17

* Provisional.

SAND-LIME BRICK.

The manufacture of sand-lime or silica brick, although of comparatively recent origin in Canada, has developed with considerable rapidity during the past five years, for which statistics have been collected.

Returns received from sixteen producing firms showed total sales in 1911 of 51,535,243 brick, valued at \$442,427, or an average of \$8.58 per thousand, as compared with a production of 44,593,541 brick, valued at \$371,857, or an average of \$8.34 per thousand, by thirteen firms in 1910.

The total sales by nine firms in 1909 were 27,052,864 brick, valued at \$201,650, or an average of \$7.45 per thousand.

The number of men employed in 1911 was 337, and wages paid, \$166,902.

The number of completed plants at the end of 1911 was seventeen, of which eight were in Ontario, four in Manitoba, two in Saskatchewan, one in Alberta, and two in British Columbia. Two additional plants were under construction.

Annual statistics of production since 1907 are shown below:—

Annual Production of Sand-Lime Brick.

Calendar Year.	Number sold.	Value.	Per M.
		\$	\$ cts.
1907.....	16,492,971	167,795	10 17
1908.....	17,288,260	152,856	8 84
1909.....	27,052,864	201,650	7 45
1910.....	44,593,541	371,857	8 34
1911.....	51,535,243	442,427	8 58

The following is a list of manufacturers of sand-lime brick reporting to the Department:—

Completed plants—

The Schultz Bros. Co., Ltd., Brantford, Ont.

The Jno. Mann Brick Co., Ltd., Brantford, Ont.

The Silicate Brick Co. of Ottawa, Ltd., Ottawa, Ont.

The Peterboro Sandstone Brick Co., Ltd., Peterborough, Ont.

Toronto Brick Co., Ltd., 64 Wellington St. W., Toronto, Ont.

Canada Sand Lime Pressed Brick Co., 1161 Dundas St., Toronto, Ont.

Harbour Brick Co., Ltd., 50 Front St. E., Toronto, Ont.

The Port Arthur Sand Lime Brick Co., Port Arthur, Ont.

The Brandon Sandstone Co., Ltd., Brandon, Man.

Manitoba Pressed Brick Co., Ltd., 215 McIntyre Block, Winnipeg, Man.

Winnipeg Sandstone Brick Co., 410 Builders' Exchange, Winnipeg, Man.

The Alsip Sandstone Brick Co., Ltd., 502 Builders' Exchange, Winnipeg, Man.

Moosejaw Pressed Brick Co., Moosejaw, Sask.

Interocean Pressed Brick Co., Regina, Sask.

Calgary Silicate Pressed Brick Co., Calgary, Alta.

Vancouver Pressed Brick and Stone Co., Ltd., 145 Front St. W., Vancouver, B.C.

Victoria-Vancouver Lime and Brick Co., Victoria, B.C.

Plants under construction—

The Wilcox Lake Brick Co., 79 Adelaide St. E., Toronto, Ont.

The British Columbia Pressed Brick Co., Vancouver, B.C.

SAND AND GRAVEL.

No attempt has yet been made by this Department to obtain complete statistics of the production of building sand or gravel, but the record of exports and imports as collected by the Department of Customs has been published from year to year and is shown in tables below.

The business of obtaining and supplying sand and gravel is, however, becoming well organized in many districts. In the Province of Quebec, coarse river sand is being taken from the beds of certain streams under mining license from the Quebec Government, the sand being shipped to Montreal and other large centres, where it finds a ready market for building purposes. The Superintendent of Mines of Quebec reports a production from such sources in 1911 valued at \$62,000. This will, of course, be only a small fraction of the value of such material produced in that Province during the year.

The Provincial Mineralogist for British Columbia states that near Vancouver and Victoria, companies have been formed for supplying washed sand and gravel properly screened to size, some of these companies having installed a system of mining the gravel by hydraulic streams and carrying the product to the screens by the water used. The value of the sand and gravel produced for use in these two cities amounted during the past year to over \$360,000.

Annual Exports of Sand and Gravel.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1893.....	329,116	121,795	1903.....	355,792	124,006
1894.....	324,656	86,940	1904.....	399,809	129,808
1895.....	277,162	118,359	1905.....	306,935	152,805
1896.....	224,769	80,110	1906.....	336,550	139,712
1897.....	152,963	76,729	1907.....	298,095	119,853
1898.....	165,954	90,498	1908.....	298,954	161,387
1899.....	242,450	101,640	1909.....	481,584	256,166
1900.....	197,558	101,666	1910.....	624,824	407,974
1901.....	197,302	117,465	1911.....	573,494	408,110
1902.....	159,793	119,120			

Annual Imports of Sand and Gravel.

Fiscal Year.	Tons.	Value.	Fiscal Year.	Tons.	Value.
		\$			\$
1893.....	26,065	31,739	1903.....	91,518	95,647
1894.....	41,573	53,506	1904.....	110,634	107,547
1895.....	19,609	24,779	1905.....	85,339	92,722
1896.....	18,953	24,604	1906.....	116,500	173,727
1897.....	21,308	25,222	1907 (9 mos.).....	171,700	177,412
1898.....	32,148	43,287	1908.....	266,704	223,043
1899.....	30,288	42,209	1909.....	132,158	136,011
1900.....	35,713	41,280	1910.....	151,982	155,012
1901.....	35,749	42,891	1911.....	241,375	246,613
1902.....	47,381	58,068			

SLATE.

The production of slate in 1911 is reported as 1,833 squares, valued at \$8,248, which is a little less than one-half the production of 1910, which was 3,959 squares, valued at \$18,492.

The output was as usual obtained from the New Rockland quarries, in Melbourne township, Richmond county, Quebec, operated under lease by Messrs. Frazer and Davies. The same firm also opened up a quarry during the year at Botsford, Temiscouata county.

In the Province of Ontario some development work was undertaken on a slate property near New Liskeard, in Hudson township, lot 10, concession V, this property being owned by the Canada Slate Co., Ltd., of New Liskeard. No shipments were made.

Statistics of annual production are shown herewith:—

Annual Production of Slate.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1886.....	5,345	64,675	1899.....		33,406
1887.....	7,357	89,000	1900.....		12,100
1888.....	5,314	90,639	1901.....		9,980
1889.....	6,935	119,160	1902.....		19,200
1890.....	6,368	100,250	1903.....	5,510	22,040
1891.....	5,000	65,000	1904.....	5,277	23,247
1892.....	5,180	69,070	1905.....		21,568
1893.....	7,112	90,825	1906.....		24,446
1894.....		75,550	1907.....	4,335	20,056
1895.....		58,900	1908.....	2,950	13,496
1896.....		53,370	1909.....	4,006	19,000
1897.....		42,800	1910.....	3,959	18,492
1898.....		40,791	1911.....	1,833	8,248

No exports of slate have been reported since 1909.

The imports of slate have ranged in value during the past six years from \$100,000 to \$170,000 per annum. The total value of the imports during the calendar year 1911 was \$169,685, comprising: roofing slate, \$83,075; school writing slate, \$35,049; slate pencils, \$6,036; other slates and manufactures of slate, \$45,525. The total value of the imports during the calendar year 1910 was \$142,285. 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 1909, 1910, and 1911.

Slate and manufactures of.	Calendar Year 1909.	Calendar Year 1910.	Calendar Year 1911.
	\$	\$	\$
Roofing slate.....	71,914	67,063	83,075
School writing slate.....	34,085	31,397	35,049
Slate pencils	6,154	6,948	6,036
Slate of all kinds and manufactures of.....	23,068	36,877	45,525
	135,221	142,285	169,685

Exports of Slate.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1884.....	530	6,845	1893.....	178	3,168
1885.....	346	5,274	1894.....	187	3,610
1886.....	34	495	1895.....	30	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.....	Nil.	Nil.
1892.....	57	2,036	1911.....	Nil.	Nil.

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.....	28,816	1895.....	19,471	1906.....	112,941
1885.....	28,169	1896.....	24,176	1907 (9 mons.)...	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		

STONE.

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, limestone, sandstone, and marble.

The records are practically confined to quarry operations or 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 probably also used in railway construction work and in road building, of which no record has yet been obtained.

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 1911, according to returns received, was \$4,328,757, as compared with a value of \$3,650,019 in 1910, showing an increased production of \$678,738, or 18.6 per cent.

The number of active firms reporting in 1911 was 191, the total number of men employed 5,437, and the total wages paid, \$2,500,005. In 1910 the number of active firms reporting was 166, the number of men employed 5,105, and wages paid, \$2,225,791.

Of the total value of the 1911 production, limestone contributed \$2,594,926, or nearly 60 per cent; granite, \$1,119,865, or nearly 26 per cent; sandstone, \$451,183, or 10.4 per cent; and marble, \$162,783, or 3.8 per cent.

Stone was used for building purposes to the value of \$1,368,693, or 31.6 per cent of the total; monumental and ornamental stone, a value of \$303,050, or 7 per cent; curb, paving, and flagstone, \$233,723, or 5.4 per cent; rubble, \$460,803, or 10.6 per cent; crushed stone, \$1,509,498, or 34.9 per cent; and furnace flux, 874,224 tons, valued at \$452,990, or 10.5 per cent.

By provinces, Quebec again shows the largest output, having a value of \$1,894,892, or 43.8 per cent of the total, being made up of limestone to the value of \$1,296,577, granite valued at \$462,678, marble, \$135,187, and sandstone, \$450. Ontario takes second place with a production of \$892,305, or 20.6 per cent of the total, of which limestone is credited with \$680,461; granite, \$131,816; sandstone, \$54,032, and marble, \$25,996. British Columbia ranked third in order of importance, with a total of \$698,811, including granite, \$460,851;

sandstone, \$179,580; limestone, \$56,780, and marble, \$1,600. The production in Manitoba was valued at \$318,050, made up of limestone, \$315,782, and granite, \$2,268. The Nova Scotia production was valued at \$292,914, comprising limestone, \$245,216; granite, \$24,258, and sandstone, \$23,440. The Alberta production was reported as \$158,344, all sandstone. New Brunswick is credited with \$73,441, made up chiefly of sandstone and granite.

Production of Stone by Provinces, 1911.

Province.	Granite.	Lime- stone.	Marble.	Sand- stone.	Total.	%
	\$	\$	\$	\$	\$	
Nova Scotia.....	24,258	245,216	.....	23,440	292,914	6·8
New Brunswick.....	37,994	110	.....	35,337	73,441	1·7
Quebec.....	462,678	1,296,577	135,187	450	1,894,892	43·8
Ontario.....	131,816	680,461	23,996	54,037	892,305	20·6
Manitoba.....	2,268	315,782	.....	.....	318,050	7·3
Alberta.....	.....	.....	.....	158,344	158,344	3·7
British Columbia.....	460,851	56,780	1,600	179,580	698,811	16·1
Total.....	1,119,865	2,594,926	162,783	451,183	4,328,757	.....
Per cent.....	25·9	59·9	3·8	10·4	.....	100·0

Production of Stone by Provinces, 1910.

Province.	Granite.	Lime- stone.	Marble.	Sand- stone.	Total.	%
	\$	\$	\$	\$	\$	
Nova Scotia.....	18,291	192,919	.....	16,425	227,635	6·2
New Brunswick.....	6,880	315	.....	51,793	58,988	1·6
Quebec.....	356,257	962,429	151,000	.....	1,469,686	40·3
Ontario.....	109,778	722,763	4,100	62,247	898,788	24·6
Manitoba.....	3,643	328,029	.....	.....	331,672	9·1
Alberta.....	.....	.....	.....	240,858	240,858	6·6
British Columbia.....	244,767	48,121	3,679	130,825	422,392	11·6
Total.....	739,516	2,249,576	158,779	502,148	3,650,019	.....
Per cent.....	20·3	61·7	4·3	13·7	.....	100·0

Value of Stone Sold for Various Purposes in 1911.

Kind.	Building.	Ornamental and monu- mental.	Paving and curb- stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Granite.....	324,011	129,017	172,246	51,982	442,639	.....	1,119,865
Limestone.....	625,402	38,746	36,902	374,327	1,066,559	452,990	2,594,926
Marble.....	27,596	135,187	.....	.....	.....	.....	162,783
Sandstone.....	391,684	100	24,575	34,524	300	.....	451,183
Total.....	1,368,693	353,050	233,723	460,803	1,509,498	452,990	4,328,757

Value of Stone Sold for Various Purposes in 1910.

Kind.	Building.	Ornamental and monumental.	Paving and curb-stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Granite	268,197	74,576	79,501	46,639	270,603	.....	739,516
Limestone	623,149	72,580	125,637	295,168	701,556	431,486	2,249,576
Marble	158,700	.....	.....	15	.....	64	158,779
Sandstone	453,955	265	34,530	10,178	3,220	.....	502,148
Total	1,504,001	147,421	239,668	352,000	975,379	431,550	3,650,019

Production of Stone by Provinces and for Purposes used, 1911.

Province.	Building.	Ornamental and monumental.	Paving and curb-stone.	Rubble.	Crushed.	Furnace flux:	Total.
	\$	\$	\$	\$	\$	\$	\$
Nova Scotia	26,710	17,148	1,400	3,717	2,422	241,517	292,914
New Brunswick	45,348	22,986	.....	5,077	.....	30	73,441
Quebec	599,758	242,269	151,242	200,243	700,787	593	1,894,892
Ontario	168,012	8,647	54,091	98,615	408,870	154,070	892,305
Manitoba	74,424	.....	.....	106,782	136,844	.....	318,050
Alberta	151,787	.....	.....	6,557	.....	.....	158,344
British Columbia	302,654	12,000	26,990	39,812	260,575	56,780	698,811
Total	1,368,693	303,050	233,723	460,803	1,509,498	452,990	4,328,757
Per cent	31.6	7.0	5.4	10.6	34.9	10.5	100.0

Production of Stone by Provinces and for Purposes used, 1910.

Province.	Building.	Ornamental and monumental.	Paving and curb-stone.	Rubble.	Crushed.	Furnace flux.	Total.
	\$	\$	\$	\$	\$	\$	\$
Nova Scotia	18,610	11,156	4,600	.....	350	192,919	227,635
New Brunswick	49,047	6,880	.....	2,761	200	100	58,988
Quebec	707,890	116,456	165,730	143,930	329,627	6,053	1,469,686
Ontario	83,602	9,929	65,588	135,550	414,826	189,293	898,788
Manitoba	215,378	.....	.....	53,302	62,992	.....	331,672
Alberta	234,487	.....	.....	6,371	.....	.....	240,858
British Columbia	194,987	3,000	3,750	10,086	167,384	43,185	422,392
Total	1,504,001	147,421	239,668	352,000	975,379	431,550	3,650,019
Per cent	41.2	4.0	6.6	9.7	26.7	11.8	100.0

Exports and Imports.—The exports of stone from Canada in 1911 were valued at \$28,335, as against \$27,571 in 1910 and \$57,685 in 1909. The principal item in the 1911 export was building stone, unwrought, of which the exports were 83,767 tons, valued at \$25,103. The exports of dressed stone in 1911, including both ornamental and building stone, were valued at \$1,436 only.

The exports of several classes of stone during the past three years, as shown by the Customs record, was as follows:—

Exports of Stone during the Calendar Years 1909, 1910, 1911.

	1909.		1910.		1911.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
		\$		\$		\$
Stone—						
Ornamental, granite, marble, etc., unwrought.....	1,027	8,606	446	3,352	168	1,796
Building, freestone, limestone, etc., unwrought.....	26,672	15,481	63,407	18,867	83,767	25,103
Ornamental, granite, marble, etc., dressed.....		33,097		5,272		980
Building, freestone, limestone, etc., dressed.....		501		80		456
		57,685		27,571		28,335

The annual exports since 1890 are shown in the following table:—

Exports of Stone and Marble, Wrought and Unwrought.

Calendar Year.	Wrought.	Unwrought.	Calendar Year.	Wrought.	Unwrought.
	\$	\$		\$	\$
1890.....	21,725	43,611	1901.....	5,917	157,739
1891.....	13,398	46,162	1902.....	8,632	124,820
1892.....	7,698	47,424	1903.....	7,684	46,295
1893.....	9,102	12,532	1904.....	4,760	17,802
1894.....	22,576	34,130	1905.....	3,545	13,089
1895.....	8,587	51,616	1906.....	23,097	4,675
1896.....	4,934	32,897	1907.....	4,233	3,087
1897.....	9,415	42,034	1908.....	15,194	36,820
1898.....	2,526	65,370	1909.....	32,598	24,087
1899.....	5,092	101,931	1910.....	5,352	22,219
1900.....	5,933	115,711	1911.....	1,436	26,899

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 1911 was \$1,140,846, as compared with a value of \$845,123 in 1910; showing an increase of \$295,723, or about 35 per cent. Of the total imports in 1911, \$392,868 in value was classed as building stone, and included 21,356 tons of rough stone,

valued at about \$3.98 per ton, and 52,908 tons of dressed stone, valued at about \$5.82 per ton. The imports of sawn granite, manufactures of granite, and manufactures of stone N.O.P., were valued at \$207,836; paving blocks, \$64,676; marble and manufactures of, \$384,252. There was also an importation of refuse stone of 226,122 tons, valued at \$91,214.

During 1910 the imports of building stone were \$311,595; manufactured granite, \$192,213; paving blocks, \$74,100, and marble, \$267,215. The imports during both years 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 in some quantity also from Italy and other countries. The total value of the imports from the United States in 1911 was \$946,624; from Great Britain, \$175,169; from Italy, \$6,334, and from other countries, \$12,719.

The value of the imports from the United States in 1910 was \$640,084; from Great Britain, \$160,664; from Italy, \$31,314, and from other countries, \$13,061.

Total Imports of Stone during the Calendar Years 1910 and 1911.

Imports.	1910.		1911.	
	Tons.	Value.	Tons.	Value.
		\$		\$
Building stone, rough (1).....	27,658	125,531	21,356	85,084
" " dressed (2).....	33,996	186,064	52,908	307,784
Refuse stone (3).....			226,122	91,214
Granite, sawn only.....	789	3,287	539	4,231
" manufactures of.....		154,798		164,229
Paving blocks.....		74,100		64,676
Manufactures of stone, N.O.P.....		34,128		39,376
Marble and manufactures of:—				
Marble, sawn or sand rubbed, not polished.....		154,153		186,174
" rough, not hammered or chiselled.....		18,368		46,839
" manufactures of, N.O.P.....		94,694		151,239
.....		845,123		1,140,846

(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 1911.

Imports.	Great Britain.		United States.		Italy.	Other countries.
	Tons.	Value.	Tons.	Value.	Value.	Value.
		\$		\$	\$	\$
Building stone, rough (1).....	196	1,764	20,496	81,157	.....	2,163
" " dressed (2).....	109	419	52,659	306,694	.....	671
Refuse ".....	.....	.....	226,122	91,214	.....	.....
Granite, sawn only.....	118	911	421	3,320	.....	.....
" manufactures of.....	.....	156,101	.....	8,128	.....	.....
Paving blocks.....	.....	43	.....	64,633	.....	.....
Manufactures of stone, N.O.P.....	.....	4,297	.....	32,257	.....	2,822
Marble and manufactures of:—						
Marble, sawn or sand rubbed, not polished.....	.....	3,825	.....	174,618	6,334	1,397
Marble, rough, not hammered or chiselled.....	.....	.....	.....	45,589	.....	1,250
Marble, manufactures of, N.O.P.....	.....	7,809	.....	139,014	.....	4,416
.....	.....	175,169	.....	946,624	6,334	12,719

- (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 1910 and 1911.

Imports.	1910.		1911.	
	Tons.	Value.	Tons.	Value.
		\$		\$
Building stone, rough (1).....	23,928	110,997	28,001	126,386
" " dressed (2).....	36,884	184,620	36,578	206,224
Granite, sawn only.....	280	2,146	773	3,213
" manufactures of.....	.....	130,697	.....	159,377
Paving blocks.....	.....	58,247	.....	74,143
Manufactures of stone, N.O.P.....	.....	32,372	.....	34,861
Marble and manufactures of:—				
Marble, sawn or sand rubbed, not polished.....	.....	128,897	.....	174,001
" rough, not hammered or chiselled.....	.....	1,398	.....	25,606
" manufactures of, N.O.P.....	.....	54,503	.....	107,821
.....	.....	703,877	.....	911,632

- (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.	Marble.	Flagstone.	Total value.
	Rough.	Dressed.				
	\$	\$	\$	\$	\$	\$
1880.....	32,824	3,146	29,408	63,015	.....	128,393
1881.....	7,823	50,326	36,877	85,977	241	181,244
1882.....	32,848	775	37,267	109,505	848	181,243
1883.....	33,429	1,632	45,636	128,520	99	209,316
1884.....	46,232	4,856	45,290	108,771	1,158	206,307
1885.....	28,433	2,068	39,867	102,835	1,756	174,949
1886.....	36,776	4,899	41,984	117,752	9,443	210,864
1887.....	47,819	6,549	41,829	104,250	10,966	211,413
1888.....	84,263	2,110	47,487	94,681	21,077	249,618
1889.....	89,723	10,591	61,341	118,421	15,451	295,527
1890.....	126,456	5,699	84,396	99,353	48,905	364,899
1891.....	151,119	19,771	61,051	107,661	36,348	372,950
1892.....	85,169	10,381	39,479	106,268	15,048	256,345
1893.....	47,609	8,901	49,323	96,177	8,500	210,510
1894.....	48,097	4,811	49,510	94,657	2,429	199,504
1895.....	37,732	6,550	51,050	83,422	84	178,838
1896.....	42,737	11,393	51,499	90,065	Nil	195,694
1897.....	27,442	11,272	34,026	77,150	227	150,117
1898.....	25,322	3,173	41,240	95,894	1,540	167,129
1899.....	43,494	4,546	60,148	104,879	Nil	210,067
1900.....	63,376	1,157	57,039	94,017	63	215,652
1901.....	45,039	1,039	66,639	96,159	116	208,992
1902.....	69,972	29,102	72,397	130,424	1,231	303,126
1903.....	71,202	16,664	78,229	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	173,435	189,589	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	631,822
1910.....	110,997	184,620	223,462	184,798	Nil	703,877
1911.....	126,386	206,224	271,594	307,428	Nil	911,632

* 9 months ending March 1907.

GRANITE.

The production of granite and trap-rock in 1911, according to returns from forty-seven active firms reporting, was valued at \$1,119,865, as compared with a production by thirty-three firms, valued at \$739,516, in 1910; showing an increase of \$380,349, or 51.4 per cent. There was a particularly large increase in the value of granite used for building purposes and in the production of crushed stone.

Quebec province was again the largest producer, the value of sales in 1911 being \$462,678, as compared with \$356,257 in 1910. The value of sales in British Columbia in 1911, however, approached very closely to that of Quebec, being \$460,851, as against \$244,767 in 1910. Ontario produced granite to the value of \$131,816 in 1911, as compared with \$109,678 in 1910. Both New Brunswick and Nova Scotia showed an increased production, the value of the New Brunswick output being \$37,994. Much of the rough stone quarried in New Bruns-

wick, as well as stone imported from Redbeach, Maine, and Mt. Johnston, Que., is worked up into finished monumental and ornamental stone at mills at St. George, the value of the finished product here in 1911 being \$86,658.

Statistics of the production by provinces for 1911 and 1910, showing the purposes for which the stone was sold and the annual total production since 1886, are shown in the following tables:—

Value of Granite Production by Provinces, 1911.

Province.	Building.	Monumental or ornamental.	Curb, or paving.	Rubble.	Crushed.	Total.
	\$	\$	\$	\$	\$	\$
Nova Scotia.....	5,670	17,048	1,400	140	.....	24,258
New Brunswick.....	15,008	*22,986	.....	.....	.....	37,994
Quebec.....	168,759	74,687	116,256	.....	102,976	462,678
Ontario.....	13,100	2,296	27,600	12,000	76,820	131,816
Manitoba.....	.....	.....	.....	.....	2,268	2,268
British Columbia.....	121,474	12,000	26,990	39,812	260,575	460,851
Total.....	324,011	129,017	172,246	51,952	442,639	1,119,865

* The value of the "Finished" stone in 1911 was \$86,658.

Value of Granite Production by Provinces, 1910.

Province.	Building.	Monumental or ornamental.	Curb, or paving.	Rubble.	Crushed.	Total.
	\$	\$	\$	\$	\$	\$
Nova Scotia.....	2,600	11,091	4,600	.....	.....	18,291
New Brunswick.....	.....	*6,880	.....	.....	.....	6,880
Quebec.....	202,435	53,405	40,831	3,055	56,531	356,257
Ontario.....	1,100	200	30,320	33,513	44,545	109,678
Manitoba.....	.....	.....	.....	.....	3,643	3,643
British Columbia.....	62,062	3,000	3,750	10,071	165,884	244,767
Total.....	268,197	74,576	79,501	46,639	270,603	739,516

* "Finished" stone was valued at \$70,000.

Annual Production of Granite.

Calendar Year.	Tons.	Value.	Calendar Year.	Tons.	Value.
		\$			\$
1886.....	6,062	63,309	1899.....	13,418	90,542
1887.....	21,217	142,506	1900.....	.....	80,000
1888.....	21,352	147,305	1901.....	.....	155,000
1889.....	10,197	79,624	1902.....	.....	210,000
1890.....	13,307	65,985	1903.....	.....	200,000
1891.....	13,637	70,056	1904.....	.....	150,000
1892.....	24,302	89,326	1905.....	.....	226,305
1893.....	22,521	94,393	1906.....	.....	278,419
1894.....	16,392	109,936	1907.....	15,136	194,712
1895.....	19,238	84,838	1908.....	.....	282,320
1896.....	18,717	106,709	1909.....	.....	454,824
1897.....	19,345	61,934	1910.....	.....	739,516
1898.....	23,897	81,073	1911.....	.....	1,119,865

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 these exceptions, the total value of the production of limestone in Canada in 1911 was \$2,594,926, as compared with a value of \$2,249,576 in 1910, or an increase of about 15 per cent.

There was a decrease in the production of limestone for building and monumental purposes and for curbstone and paving, but an increased production of crushed stone and rubble. The production of furnace flux was slightly less in tonnage, but of increased value.

The production during 1911 of limestone for building purposes was valued at \$664,148, as against \$695,729 in 1910. The value of crushed stone in 1911 was \$1,066,559, as against \$701,556 in the previous year. Curbstone and paving blocks were produced to the value of \$36,902 in 1911, as compared with \$125,637 in 1910. The value of rubble in 1911 was \$374,327, as against \$295,168 in 1910. The production of furnace flux in 1911 was 874,224 tons, valued at \$452,990, as compared with 896,677 tons, valued at \$431,486, in 1910.

Value of Limestone Production by Provinces, 1911.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
					Tons.	\$	
	\$	\$	\$	\$	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	680,461
Manitoba	74,424	134,576		106,782			315,782
British Columbia					94,633	56,780	56,780
Total	664,148	1,066,559	36,902	374,327	874,224	452,990	2,594,926

Value of Limestone Production by Provinces, 1910.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
					Tons.	\$	
	\$	\$	\$	\$	Tons.	\$	\$
Nova Scotia					385,838	192,919	192,919
New Brunswick	15	200			100	100	315
Quebec	417,506	273,096	124,899	140,875	9,573	6,053	962,429
Ontario	62,830	368,911	738	100,991	406,391	189,293	722,763
Manitoba	215,378	59,349		53,302			328,029
British Columbia					94,772	43,121	43,121
Total	695,729	701,556	125,637	295,168	896,677	431,486	2,249,576

Value of Limestone Production by Provinces, 1909.

Province.	Building and ornamental.	Crushed.	Curbstone and paving.	Rubble.	Furnace flux.		Total.
	\$				\$	Tons.	
Nova Scotia	2,025	.....	.....	.....	319,795	159,897	161,922
New Brunswick	30	.....	.....	.....	.....	.....	30
Quebec	456,333	257,185	154,259	94,221	20,500	10,250	972,253
Ontario	78,823	297,589	169	66,885	427,422	196,208	639,674
Manitoba	224,605	54,575	62	49,312	.....	.....	328,554
British Columbia.....	.....	.....	.....	.....	74,515	37,258	37,258
Total	761,821	609,349	154,490	210,418	842,242	403,613	2,139,691

MARBLE.

From 1886 to 1896 there was a small production of marble, aggregating, however, only \$4,167 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, Que., by the Missisquoi Marble Company, Limited, together with the development of quarries in Ontario and British Columbia, has resulted in a considerable production of marble during the past four years. The total value of the production in 1911 was returned as \$162,783, as compared with \$158,779 in 1910 and \$158,441 in 1909.

Marble quarries were operated during 1911 at Philipsburg and South Stukely, Que.; Dungannon and Hungerford townships in Ontario, and Marblehead, British Columbia.

The value of the Quebec production was \$135,187, as compared with \$151,000 in 1910 and \$130,000 in 1909. Ontario produced marble to the value of \$25,996, as against \$4,100 in 1910 and \$3,441 in 1909. British Columbia production was \$1,600, as compared with \$3,679 in 1910 and \$25,000 in 1909.

With the exception of the Philipsburg and Bancroft quarries, the operations were practically confined to the development of quarries.

Annual Production of Marble.

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

The imports of marble during the calendar year 1911 were valued at \$384,252, as compared with \$267,215 in 1910 and \$182,147 in 1909.

The annual imports of marble since 1880 are shown in the general table of imports of stone, page 50.

SANDSTONE.

The value of sandstone production in 1911 was reported as \$451,183, being a slight falling off as compared with the production in 1910, which was valued at \$502,148. The greater part of the sandstone quarried is used for building purposes, though small quantities are also used as rubble and for paving purposes.

Of the production in 1911, building and ornamental sandstone was sold to the value of \$391,784, or 86.8 per cent of the total sandstone sales. This amount comprised \$86,502 in rough stone and \$305,282 in dressed stone sold by the quarry operators. The production in 1910 of building and ornamental stone was valued at \$454,220, comprising \$118,364 in rough stone and \$335,856 in dressed stone.

Statistics of production in 1909, 1910, and 1911 are shown in the next three tables. There is no complete record of the sandstone production throughout Canada in previous years.

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.....	179,580				179,580
Total.....	391,784	300	24,575	34,524	451,183

Value of Sandstone Production by Provinces, 1910.

Province.	Building and ornamental.	Crushed.	Paving.	Rubble.	Total.
	\$	\$	\$	\$	\$
Nova Scotia.....	16,075	350			16,425
New Brunswick.....	49,032			2,761	51,793
Ontario.....	25,301	1,370	34,530	1,046	62,247
Alberta.....	234,487			6,371	240,858
British Columbia.....	129,325	1,500			130,825
Total.....	454,220	3,220	34,530	10,178	502,148

Value of Sandstone Production by Provinces, 1909.

Province.	Building and orna- mental.	Crushed.	Paving.	Rubble.	Total.
	\$	\$	\$	\$	\$
Nova Scotia.....	15,050	800	.....	6,000	21,850
New Brunswick.....	25,784	.....	.....	4,825	30,609
Ontario.....	29,584	2,563	17,774	12,903	62,824
Alberta.....	87,450	.....	.....	2,933	90,383
British Columbia.....	168,338	.....	.....	175	168,513
Total.....	326,206	3,363	17,774	6,836	374,179