

CEMENT.^a

PORTLAND CEMENT.

PRODUCTION.

For the calendar year ending December 31, 1901, the production of Portland cement in the United States was 12,711,225 barrels, an increase of 4,229,205 barrels, or 50 per cent, over the production of 1900; it was valued at \$12,532,360. The increase in this production was not unexpected, it having been predicted in the report on cement made by the Survey last year.

Following is the table showing the production, by States, of Portland cement in the United States in 1899, 1900, and 1901:

Production of Portland cement in the United States in 1899, 1900, and 1901.

State.	1899.			1900.		
	Number of works.	Product.	Value, not including packages.	Number of works.	Product.	Value, not including packages.
		<i>Barrels.</i>			<i>Barrels.</i>	
Arkansas.....	1	50,000	\$87,500	1	40,000	\$70,000
California.....	1	60,000	120,000	1	44,565	89,130
Colorado.....				1	35,708	71,416
Illinois.....	2	53,000	79,500	3	240,442	300,552
Indiana.....				1	30,000	37,500
Kansas.....				1	80,000	100,000
Michigan.....	4	342,566	513,849	6	664,750	830,940
New Jersey.....	2	892,167	1,338,250	2	1,169,212	1,169,212
New Mexico.....	1	1,500	4,500			
New York.....	7	472,386	708,579	8	465,832	582,290
North Dakota.....	1	1,700	5,100	1	400	1,200
Ohio.....	6	480,982	721,473	6	534,215	667,769
Pennsylvania.....	9	3,217,965	4,290,620	14	4,984,417	4,984,417
South Dakota.....	1	35,000	70,000	1	38,000	76,000
Texas.....				2	26,000	52,000
Utah.....	1	45,000	135,000	1	70,000	175,000
Virginia.....				1	58,479	73,099
Total.....	36	5,652,266	8,074,371	50	8,482,020	9,280,525

^aThe entire statistical canvass and compilation of this report has been conducted by L. L. Kimball, of the United States Geological Survey.—EDITOR.

slag cement only, 2 were out of business, 1 was idle, and 1 at Ironton newly erected, in 1901. The new plant at Wellston was already a successful producer. There is but 1 company in the State that reports the use of both rotary and vertical kilns; 6 use rotaries only, and 2 use the vertical kilns. The Diamond Portland Cement Company, at Middle Branch, Ohio, shut down its mills for about thirty days, during which time a natural gas equipment was installed. Although the production of Portland cement in this State was larger than that of the previous year by more than 150,000 barrels, yet, by reason of the increase in the total production of the United States, the percentage of Ohio to the whole was lower than in previous years.

Michigan had 10 plants making Portland cement in 1901, and gave a largely increased production. There are 11 new plants already built which will be producers in 1902, and several more are projected. Only 1 company is reported as having abandoned the enterprise in this State, and none were idle for any great length of time. The use of rotary kilns in this locality seems to be general, only 1 company having used vertical kilns last year. This company has now installed rotary kilns, and expects to see appreciable results in its output for next year; its 1901 production was, however, a large one. The new plants reporting are invariably installing rotary kilns.

The other sections mentioned in the above table include California, Colorado, Illinois, Indiana, Kansas, South Dakota, Texas, and Utah, Virginia being tabulated with Ohio.

IMPORTS.

The table showing the imports of cement into the United States by countries is as follows:

Imports of cement into the United States in 1897, 1898, 1899, 1900, and 1901, by countries.

Country.	1897.	1898.	1899.	1900.	1901.
	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>
United Kingdom.....	344,336	241,198	199,633	267,921	37,390
Belgium.....	529,686	651,204	624,149	826,289	303,180
France.....	19,319	17,294	15,649	32,710	11,771
Germany.....	1,109,280	1,032,429	1,193,822	1,155,550	555,038
Other European countries.....	46,916	51,582	68,348	75,827	19,077
British North America.....	4,907	4,635	4,398	4,517	6,066
Other countries.....	36,480	15,476	2,389	23,869	6,808
Total.....	2,090,924	2,013,818	2,108,388	2,386,683	939,330

The number of barrels used as a base for ascertaining the consumption of cement in the United States in 1901, however, is 922,426, the difference in the figures being due to the fact that a part of the cement brought into the country was immediately exported, and was not, therefore, consumed in the United States, and a part of it was left unused in the warehouse.

The imports of cement for 1901 fell very far short of those of any other year. Such a falling off was anticipated, however, as shown in the report of the Survey for 1900, wherein is set forth the fact that American Portland of an equally high grade as the imported Portland is sold in this country at a greatly reduced price, together with further reasons why the American product should supersede the foreign.

RELATION OF DOMESTIC PRODUCTION TO IMPORTATION.

The following table shows the relation of production to importation in 1891, 1896, 1899, 1900, and 1901. The increase in the percentage of the total consumption of Portland cement produced in the United States is worthy of note. In 1891 it was 13.2 per cent, in 1900 it was 79.1 per cent, and in 1901 it was 96.2 per cent.

Comparison of the domestic production of Portland cement with the imports.

	1891.	1896.	1899.	1900.	1901.
	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>
Production in the United States.....	454,813	1,543,023	5,652,266	8,482,020	12,711,225
Imports	2,988,313	2,989,597	2,108,388	2,386,683	922,426
Total	3,443,126	4,532,620	7,760,654	10,868,703	13,633,651
Exports		85,486	110,272	139,939	417,625
Total consumption.....	3,443,126	4,447,134	7,650,382	10,728,764	13,216,026
Percentage of total consumption produced in the United States.....	13.2	34.7	73.9	79.1	96.2

The production and annual percentage of increase in the last twelve years have been as follows:

Production of Portland cement, with increases each year, since 1890.

Year.	Product.	Increase.	Percentage of increase.	Year.	Product.	Increase.	Percentage of increase.
	<i>Barrels.</i>	<i>Barrels.</i>			<i>Barrels.</i>	<i>Barrels.</i>	
1890.....	335,500			1896.....	1,543,023	552,699	55.8
1891.....	454,813	119,313	35.6	1897.....	2,677,775	1,134,752	73.5
1892.....	547,440	92,627	20.4	1898.....	3,692,284	1,014,509	37.9
1893.....	590,652	43,212	7.9	1899.....	5,652,266	1,959,982	53.1
1894.....	798,757	208,105	35.2	1900.....	8,482,020	2,829,754	50.1
1895.....	990,324	191,567	24.0	1901.....	12,711,225	4,229,205	50.0

The total consumption of all kinds of cement in the United States for 1901 was 20,573,538 barrels.

The total production was 20,068,737 barrels, valued at \$15,786,789.

NATURAL-ROCK CEMENT.

PRODUCTION.

During the calendar year which ended December 31, 1901, the United States produced 7,084,823 barrels of natural-rock cement, valued at \$3,056,278, a continuation of the decrease in production and value observed since 1899.

The output was somewhat smaller than usual in the Rosendale dis-

trict, New York, owing to the fact that a number of plants were idle part of the year while repairs and alterations, such as enlarging, remodeling, and installing new kilns, were being made. Following is the table showing amount and value of the natural-rock cement produced in the United States in 1899, 1900, and 1901:

Production of rock cement for 1899, 1900, and 1901.

State.	1899.			1900.		
	Number of works.	Quantity.	Value.	Number of works.	Quantity.	Value.
		<i>Barrels.</i>			<i>Barrels.</i>	
Georgia.....	1	13,000	\$9,750	1	28,000	\$21,000
Illinois.....	3	537,094	187,983	3	369,276	129,446
Indiana and Kentucky.....	19	2,922,453	1,022,858	19	2,750,000	687,500
Kansas.....	2	150,000	60,000	2	146,000	58,400
Maryland.....	4	362,000	144,800	4	335,070	134,028
Minnesota.....	2	113,986	56,793	2	109,403	54,701
Nebraska.....				1	500	400
New York.....	17	4,689,167	2,813,500	17	3,409,085	2,045,451
Ohio.....	3	34,557	17,279	3	35,029	17,514
Pennsylvania.....	5	511,404	255,702	5	687,838	343,919
Tennessee.....	1	10,000	8,000	1	10,000	8,000
Texas.....	1	12,000	20,400	1	17,000	28,900
Virginia.....	3	63,500	38,100	3	25,313	15,187
West Virginia.....	1	52,727	21,090	1		
Wisconsin.....	1	396,291	158,516	1	461,005	184,402
Total.....	63	9,868,179	4,814,771	64	8,383,519	3,728,848

State.	1901.		
	Number of works.	Quantity.	Value.
		<i>Barrels.</i>	
Georgia.....	2	50,577	\$40,967
Illinois.....	2	469,842	187,936
Indiana and Kentucky.....	15	2,150,000	752,500
Kansas.....	<i>a</i> 2	175,560	97,002
Maryland.....	4	351,329	175,665
Minnesota.....	<i>b</i> 2	126,000	63,000
Nebraska.....	1		
New York.....	<i>c</i> 18	2,234,131	1,117,066
Ohio.....	<i>d</i> 1	104,000	62,400
Pennsylvania.....	7	942,364	376,954
Tennessee.....			
Texas.....	1		
Virginia.....	1		
West Virginia.....	1		
Wisconsin.....	2	481,020	182,788
Total.....	<i>e</i> 60	7,084,823	3,056,278

a Includes product of Nebraska and Texas.

b Includes product of North Dakota.

c The number of companies producing natural cement only, is given, and the numbers given for 1899 and 1900 have been changed accordingly, as in those years, heretofore, the *total* number of companies in the State was given.

d Includes product of Virginia and West Virginia.

e This total includes one plant in North Dakota, which for this year is reported as having a natural cement product.

POZZUOLANA, OR SLAG CEMENT.

PRODUCTION.

Two companies in Alabama, 1 in Illinois, 1 in Maryland, and 1 in Ohio reported products of pozzuolana, or slag cement, for 1901. The entire output amounted to 272,689 barrels, valued at \$198,151, as compared with 365,611 barrels, valued at \$274,208, in 1900.

Owing to the fact that in each of the States producing this cement, Alabama excepted, there is only one plant, it is impossible to give a detailed statement of amounts and values without disclosing individual figures.

The output in Alabama was doubtless smaller than it will be next year, though it was largely in advance of the product for 1900. One plant was idle during part of the year, and it was impossible to run the other one on full time because of the installation of new machinery and of other extensive improvements. This plant is to have a Portland cement department, with all the necessary machinery, including rotary kilns, in 1902. The chemical analyses of its two brands of cement, "Alabama" and "Magnolia," run as follows:

Analyses of slag cement from North Birmingham, Ala.

	Alabama.	Magnolia.
	<i>Per cent.</i>	<i>Per cent.</i>
Alumina.....	13.20	15.00
Lime.....	52.00	47.00
Silica.....	30.00	32.00
Magnesia.....	1.25	2.00
Sulphur.....	1.00	1.00
Iron oxide.....	0.75	1.00
Combined water.....	1.80	2.00
Total.....	100.00	100.00

These analyses show that the products contain sulphur and iron in so small a degree that the danger of oxidation is entirely removed, and the cements are safe for use either above or below the surface of water.

In Illinois the firm manufacturing both slag cement and Portland cement in 1901 produced a nearly equal quantity of each, though the Portland cement was somewhat in excess.

In Maryland the company producing slag cement is engaged in its production only, not attempting to produce any other kind of cement. The plant was idle for about four months during the year.

In 1900 there was a production of slag cement by one company in New Jersey, but in 1901 this company reported a large production of Portland cement and none of slag.

In Ohio the company producing slag cement reported a product which shows an increase over their 1900 output.

CONSUMPTION.

Following is a table showing the consumption of all kinds of cement in the United States up to January 1, 1902:

Total consumption of all kinds of cement in the United States to January 1, 1902.

	Barrels.
Natural-rock cement.....	194, 057, 940
Imported Portland	36, 671, 844
Domestic Portland	40, 030, 598
Total	270, 760, 382

Percentage of each kind.

Natural-rock cement.....	71. 67
Imported Portland	13. 54
Domestic Portland	14. 79
Total	100. 00

PRODUCTION OF CEMENT IN CANADA.

The product of cement in Canada in 1901 was: Natural-rock cement, 133,328 barrels, valued at \$94,415, and Portland cement, 297,066 barrels, valued at \$535,615.