

CEMENT.

PORTLAND CEMENT.

By SPENCER B. NEWBERRY.

PRODUCTION IN 1895.

The production of Portland cement in the United States during the year 1895 reached a total of 990,324 barrels, as compared with 798,757 barrels in 1894, an increase of 191,567 barrels, or 24 per cent. The increase is to be found almost wholly in the output of the larger factories in New York, New Jersey, Pennsylvania, and Ohio, several of which showed nearly double the production reported for 1894. From one small factory in Indiana and one in Utah no returns could be obtained, and it is therefore supposed that they were not in operation during the year 1895. One factory in Colorado was destroyed by fire near the end of 1894, and has not been rebuilt. The only new factory started during 1895 was one at Phillipsburg, N. J. There were therefore 22 factories producing Portland cement in 1895, as compared with 24 in the previous year.

The increase in production, which has gone on uninterruptedly ever since the industry was first established in this country, will evidently be maintained during the present year. Two of the leading factories near Coplay, Pa., have again doubled their capacity during the past winter, and are now producing over 1,000 barrels per day each. A number of new works are projected, and there is little doubt that the year 1896 will show an increase in production at least proportional to that of 1895.

IMPORTS AND EXPORTS.

The imports of cement for the year 1895 were 2,997,395 barrels, a decided increase over 1894. From this it appears that the increased production of the American factories has by no means kept pace with the growing demand for Portland cement in this country.

The following table shows the relative proportion of Portland cement made in this country and imported during the past five years:

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

	1891.	1892.	1893.	1894.	1895.
	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>
Production in the United States.....	454,813	547,440	590,652	798,757	990,324
Imports.....	2,988,313	2,440,654	2,674,149	2,638,107	2,997,305
Total.....	3,443,126	2,988,094	3,264,801	3,436,864	3,987,719
Exports.....		21,536	14,276	9,725	83,682
Total consumption.....	3,443,126	2,966,558	3,250,525	3,427,139	3,904,087
Percentage of total consumption produced in the United States.....	13.2	18.4	18.2	23.3	22.8

It will be seen from this table that the increase in the amounts of Portland cement manufactured in this country and imported have been as follows: Increased production, 191,567 barrels; increased importation, 359,288 barrels. From this it appears that the increased production of the American factories has fallen far short of supplying the increased demand. New uses for Portland cement are being found every day, and the rapid adoption of concrete construction causes a steadily increasing demand. Portland cement is also coming rapidly into use for building purposes in place of the cheaper natural-rock cements, the production of which in 1895 shows only a very slight increase over the previous year. To meet the increased importation of Portland cement, if the increase in demand should be maintained, as appears decidedly probable, it would be necessary to establish a factory every year, capable of producing 1,000 barrels per day. With the general extension of knowledge of correct methods of testing, American Portland cements are rapidly gaining recognition as fully equal to imported, and the prejudice which once existed against the domestic product has almost entirely disappeared. The writer believes that careful study of the tests of American and foreign cements, as shown by the records of city and Government engineers in various parts of the country, will show that there is no cement made in any foreign country which will show as high tests, at long or short periods, as the product of any one of the three or four leading American factories. During the year 1895 the capacity of all the American works was taxed to the utmost, and it is safe to say that had the supply of the domestic product been equal to the demand, the increased importation would not have taken place.

The following table gives a classified statement of the imports of cement, by countries, during 1895:

Imports of cement into the United States in 1895, by countries.

Country.	Barrels.
United Kingdom	806,884
Belgium.....	708,875
France	22,837
Germany	1,299,919
Other Europe.....	141,909
British North America.....	10,416
Other countries.....	6,555
Total.....	2,997,395

As compared with the previous year, the imports from the United Kingdom show a decided decrease, while those from Germany show a considerable gain. This corresponds with the general gain in reputation of the German cements throughout the country, as compared with the English.

The general condition of the cement trade in this country is at present very favorable to the American manufacturer. The freight rate on foreign cement to interior points has for some years been exceedingly low, owing to a combination of ocean and lake or rail charges. This combination no longer exists, and the freight on cement from Europe to Chicago has advanced during the past two years from 52 cents to 77 cents per barrel. With this freight rate it is impossible for the cheaper grades of foreign cement to compete with the domestic product. Many large dealers have practically ceased to import Belgian and English cements, and are selling American Portland in their place.

Owing to increasing home demand and a combination of the leading manufacturers, the price of cement in Germany has also advanced. The capacity of the largest German factories is fully taxed to meet the increased demand. Importers of the leading brands find some difficulty in getting their orders filled, and show no eagerness in bidding on large contracts. There appears to be a scarcity of good Portland cement in the United States, and, as a result, prices have generally been well maintained.

That the demand for Portland cement in this country will continue to increase for many years to come can hardly be doubted. This is to be expected, not only from the continued growth and development of our cities, railways, and public works, but also from the multitude of new uses of this most valuable material which are constantly being devised. Germany manufactured during the past year 13,000,000 barrels of Portland cement, and exported 2,360,000 barrels. More than 10,000,000 barrels were therefore consumed in Germany, or more than two and

one-half times the quantity consumed in the United States. In this country, however, nearly 8,000,000 barrels of hydraulic (natural-rock) cement were also consumed, while the use of this class of cements in Germany has practically ceased. It thus appears that the total consumption of hydraulic materials in this country was practically equal to that in Germany. Good Portland cement is sold in Germany at \$1.25 to \$1.50 per barrel. When the industry in this country reaches sufficient magnitude to allow Portland cement to be sold at \$1.50 per barrel, there can be little doubt that practically all the natural-rock cement now used will be replaced by Portland. From present indications, however, it will be many years before this result is even approached.

PRODUCTION IN 1894 AND 1895.

The following table shows the product of Portland cement, by States, during 1894 and 1895:

Product of Portland cement in the United States, 1894 and 1895.

State.	1894.			1895.		
	Number of works.	Product.	Value, not including barrels.	Number of works.	Product.	Value, not including barrels.
		<i>Barrels.</i>			<i>Barrels.</i>	
California.....	1	19,300	\$43,425	1	16,283	\$32,566
Colorado.....	1	15,000	37,500			
Dakota.....	1	43,500	80,475	1	6,497	12,994
Illinois.....	1	300	540	1	750	1,325
Indiana.....	1	4,000	7,200			
New York.....	4	117,275	205,231	4	159,320	278,810
New Jersey....	1	72,223	119,168	2	155,000	232,500
Ohio.....	4	80,653	144,425	4	136,698	239,221
Pennsylvania..	7	437,106	718,009	7	504,276	756,414
Texas.....	1	8,000	24,000	1	10,000	30,000
Utah.....	2	1,400	3,500	1	1,500	3,000
Total....	24	798,757	1,383,473	22	990,324	1,586,830

It will be seen from the above table that practically all the Portland cement produced in this country is made in Pennsylvania, New Jersey, New York, and Ohio, and the remarkable increase in production in these States has been accompanied by a falling off at most other points. The returns for the present year will undoubtedly show a decidedly further increase in New Jersey, Pennsylvania, and Ohio, as the factories in these States are being rapidly extended.

THE PORTLAND CEMENT INDUSTRY IN THE VARIOUS STATES.

Arkansas.—New Portland cement works are now in process of erection to work the white chalk cliffs, a few miles north of Texarkana, Ark. This chalk formation lies directly on the banks of Little River and within the three counties of Howard, Sevier, and Little River. The White Cliffs Portland Cement and Chalk Company own the entire chalk formation and a domain of 3,000 acres of well-wooded land. A brickyard and sawmill are turning out material for the new works, which have been projected on a large scale, including a town site.

Colorado.—The factory of the Denver Cement Company, at Denver, was destroyed by fire in November, 1894, and has not been rebuilt.

Dakota.—The works at Yankton were not in operation during the greater part of the year.

Illinois.—The works at Deer Park Glen, referred to in former reports, have not yet been started.

The factory of the Anglo-American Company, near Chicago, has been worked only experimentally up to the present time. It is proposed now to use the limestone from Bedford, Ind., as a material, and to begin the manufacture on a considerable scale.

Michigan.—A company is being organized at Elyria, Ohio, to manufacture Portland cement from a large deposit of marl near Coldwater, Mich.

New Jersey.—The Vulcanite Cement Company, located near the Alpha works at Phillipsburg, began operations in August. The material is a black slaty rock containing carbonate of lime and clay in nearly the proportions for a correct cement mixture. The rotary process of burning is employed, as at the Alpha works.

New York.—The works at Glens Falls, started in 1894, were in operation most of last year. This is a very complete cement plant, built closely after the model of the best German works. A hard, crystalline limestone and clay are the materials employed. The "tube mill" is used for grinding the raw materials together. This is a rotating, horizontal iron cylinder, partly filled with round flint pebbles. It was first brought out in Denmark, and has been widely adopted in Europe for grinding finished cement to extraordinary fineness. At the Glens Falls factory the Shöfer continuous kiln is used for the burning.

New works have been built by Rochester parties at Wayland, near the Millen factory. These will be in operation early in 1896.

The factory at Cassadaga Lake is still working on an experimental scale only.

Ohio.—A new enterprise is under way near Sandusky. This is the manufacture of white Portland cement for artistic and ornamental uses. A deposit of marl at Ransomes, near Sandusky, has been proved to contain only traces of iron or manganese. This, with a clay of peculiar composition, brought from a considerable distance, furnishes a snow-white

product, fully equal to ordinary Portland cement in strength and hardening qualities. The Art Portland Cement Company is erecting a factory for the manufacture of this material. It is expected that the white cement will find extensive use for ornamental artificial stone work. It will also probably find application as mortar for stone buildings, as it does not stain the stone, as most ordinary Portland cement does. Certain brands of cement called stainless, like the Lafarge, are imported from Europe for this purpose and command a high price. The only other white cement, so far as the writer can ascertain, is manufactured at Thale, Switzerland. The Art Portland Cement Company expect to have their factory in operation in September, 1896.

Parties at Dayton have leased a large tract of marl land near Harper, adjoining the property of the Buckeye Portland Cement Company, and expect to proceed at once with the erection of a large plant. The marl deposit near Harper lies in the valley of Rush Creek and extends to its source in Rush Lake. This is probably the largest single deposit of marl as yet found in this country, and covers an area probably not less than a thousand acres in extent. The depth of the deposit at some points reaches 30 feet. The marl is grayish in color and contains a considerable proportion of fragments of shells. At the request of the writer an average sample of this marl was analyzed by Mr. W. B. Newberry, with the following results:

Analysis of marl from near Harper, Ohio.

	Per cent.
Carbonate of lime	82.66
Carbonate of magnesia.....	1.92
Sulphate of lime.....	.45
Iron oxide and alumina.....	1.15
Insoluble (clay)	7.28
Organic matter, etc., by difference.....	6.54
Total	100.00

The above analysis shows the material to be very suitable for the manufacture of cement. It will, however, be necessary to find some method of thoroughly grinding up the coarse shells in the marl in order to produce the fine mixture absolutely necessary for success.

PROCESSES.

As stated in former reports, the three types of kilns used for burning Portland cement in this country are the intermittent or dome kiln, the continuous kiln (Dietzsch or Shöfer), and the rotary kiln.

During the past year the Shöfer continuous kiln has been introduced

at one of the largest factories at Coplay, Pa., at which common dome kilns were previously used. The Shöfer kilns lately erected at these works are stated to be capable of producing over 1,000 barrels per day.

The rapid growth of the rotary process of burning may be seen from the following table:

Amount of Portland cement made in kilns of various kinds.

	1893.	1894.	1895.
	<i>Barrels.</i>	<i>Barrels.</i>	<i>Barrels.</i>
Rotary furnace.....	149,000	242,176	400,821
Vertical kilns (continuous and intermittent)	441,653	556,581	589,503
Total.....	590,653	798,757	990,324
Per cent of total product burned in rotary furnace.....	25.2	30.3	40.5

It appears from the above table that the relative increase in the products of the rotary furnace and the vertical kilns, from 1894 to 1895, were as follows:

Comparison of increased product from cement furnaces in 1895.

	<i>Barrels.</i>
Rotary furnace.....	158,645
Vertical kilns.....	32,922
Total.....	191,567

From these figures we see that the use of the rotary furnace is extending much more rapidly than that of the common or continuous kilns. This is due, as explained in previous reports, to the great economy of labor which the rotary process allows, and also to the growing recognition of rotary-burned cement as equal in quality to the product of the older process. It must be remembered, however, that the rotary furnace has not as yet been successfully used with any other fuel than crude or fuel oil. In case of rise in the price of petroleum the economy of this method of burning may quickly disappear.

SAND CEMENT.

It has been known for many years that a given quantity of Portland cement may be made to go much further by grinding with it, to great fineness, a certain amount of sand. The sand cement so produced is found to carry about as much coarse sand as the undiluted cement would have carried, and a considerable economy is thus obtained. Sand cement was introduced in Europe several years ago by F. L.

Smidth & Co., of Copenhagen, and is finding extensive use. Factories are now producing this material on a large scale in Germany, Russia, France, Denmark, and other countries. The manufacture of this material has been greatly facilitated by the use of the tube mill, which is capable of grinding the sand and cement to the great fineness necessary for good results.

The manufacture of sand cement has been begun in this country within the past year by the Standard Silica Cement Company, of Glens Falls, N. Y. The industry is fully described, with illustrations of the plant, in a paper published in the *Engineering News*, April 16, 1896, page 252.

It is claimed by the manufacturers that the sand cement supplied by them gives only 5 per cent residue on a sieve of 180 meshes to the linear inch. It is stated that about 6,000 barrels of this sand cement were used in the concrete foundations of St. John's Cathedral, at New York. The paper referred to above contains the following table of comparative tests of sand cement, 1 to 1, and Portland cement, each with three parts ordinary sand:

Comparative test of sand cement with Portland.

	Per square inch.		
	7 days.	14 days.	28 days.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Sand-cement (1 to 1) with 3 parts sand.....	156	188	200
Portland cement with 3 parts sand.....	137	170	179

An extensive series of tests on this subject has also been published by Wallin.¹ Wallin concludes that the highest economy is obtained by grinding about three parts of sand with one part cement.

The good results given by sand cement are easily explained. It is wholly a question of the filling up of the voids in the sand. These voids in ordinary building sand amount to about one-third of the total volume; therefore if more than three volumes of sand be mixed with one volume of cement the voids will not be wholly filled. By grinding a part of the sand to great fineness, however, the proportion of voids may be greatly reduced, and a mixture of one of cement to six of sand may thus be made as effective as a one-to-three mixture with ordinary sand. It is evident that many very careful tests will be required to determine the precise proportions of cement and sand which will give a sand cement of the best efficiency. There can be little doubt, however, that the introduction of this new product will tend to increase the consumption of Portland cement, since it will make it possible to use Portland for common purposes at no greater cost than cheap hydraulic cement, and at the same time to obtain greatly superior results.

¹ *Thonindustrie-Zeitung*, 1896, p. 18.

AMERICAN ROCK CEMENT.

By URIAH CUMMINGS.

PRODUCT IN 1895.

The reports for the season of 1895 show a healthy growth in the manufacture of rock cement, and with the exception of the year 1892 the output is the largest in the history of the industry in this country.

The increase in production over that of 1894 was confined to Illinois, Kansas, Minnesota, and New York. In the other districts there was a slight falling off in the volume of trade.

PRICE.

There has been an advance in the prices, as will be seen by the following table:

Prices of American rock cement in bulk at mills.

Year.	Per barrel.	Year.	Per barrel.
	<i>Cents.</i>		<i>Cents.</i>
1890.....	51.37	1893.....	43.87
1891.....	47.26	1894.....	48.07
1892.....	48.61	1895.....	50.32

When it is considered that the Portland cements have, during the past year, declined in price over 13 cents per barrel, and that there is no perceptible recovery from the general business depression, the advance in the price of rock cements during the past season is very gratifying.

NEW DEVELOPMENTS.

Plans are issued for the erection of a large plant at Kings Rock, on the left bank of the Susquehanna River, near Larrys Creek, Pa. It is probable that these works will be in full operation before the close of the present season and will embody several new features in calcination and grinding which will undoubtedly tend to reduce the cost of production.

The cement-rock formation at this place contains many features of unusual interest. It lies almost horizontally in well-defined strata, and rises from the water's edge to a height of 70 feet. Its thickness

below the water line is unknown, but the formation above that line contains over 100,000,000 barrels of the raw material. A series of exhaustive tests, extending over a period of two years, from samples taken from all parts of the deposit, vertically and for nearly a mile along the river, yield tensile-strain results far above the records of existing American rock cements. This cement exhibits no signs of shrinkage, expansion, checking, or disintegration. It bears submersion immediately after being made up into balls, patties, or briquettes. It neither heats nor falls down, and its induration is in perfect keeping with the laws governing the action of first-quality hydraulic cements.

Analyses made from the various layers show a remarkable uniformity in the proportions of its constituent parts, which are such as to insure the production of a cement of a high order.

Analysis of cement from Kings Rock, Pa.

	Per cent.
Silica	28.14
Alumina	9.10
Ferrous oxide	3.20
Lime.....	53.34
Magnesia	1.00
Potash and soda.....	2.80
Water and loss.....	2.42
Total	100.00

A careful study of this analysis reveals the surprising fact that it contains less than 1 per cent of inert matter. The color of the rock is a dark blue, the fracture conchoidal, and the texture is exceedingly fine and uniform, showing the clay and carbonate of lime to be intimately commingled in the rock.

During the summer of 1831 excavations were made for a canal on the left bank of the Susquehanna River to connect Muncy and Lock Haven, Pa. At Kings Rock the excavations disclosed this enormous body of rock, which was ascertained by Mr. Robert Farries, chief engineer of the canal, to be hydraulic cement rock. Col. George Crane, contractor of the canal construction, erected a small cement plant, and the cement was used in the building of the locks, bridges, culverts, dams, and viaducts of the canal system. The manufacture was practically discontinued on the completion of the canal, but the condition of the work done over sixty years ago is still good. A large body of masonry in the Susquehanna River at Williamsport, Pa., constructed with this cement, was the only work of the kind at that point which withstood the memorable flood of 1889.

PRODUCT.

The following table gives the amount and value of rock cements produced in the United States during 1894 and 1895. The values are based on the price per barrel in bulk at the various factories. The cost of package is always added to the price of the cement by the manufacturer. Approximately 60 per cent of the product is sold in paper or cloth sacks, and 40 per cent is sold in wood packages.

Product of rock cement in 1894 and 1895.

State.	1894.			1895.		
	Num- ber of works.	Barrels.	Value.	Num- ber of works.	Barrels.	Value.
Georgia	1	9,266	\$7,094	1	8,050	\$6,038
Illinois	2	446,267	133,880	2	491,012	171,854
Indiana and Kentucky (Louisville district)	13	2,000,000	800,000	14	1,703,000	681,400
Kansas	1	50,000	25,000	2	140,000	56,000
Maryland and West Virginia	6	279,000	136,000	4	242,000	116,700
Minnesota	1	63,290	31,645	2	73,772	33,621
New Mexico	1	Idle.	.....	1	5,000	6,000
New York:						
Ulster County	17	2,659,601	1,595,760	15	3,230,000	1,938,031
Erie County	4	578,800	289,400	4	556,754	269,089
Onondaga County	8	187,929	78,303	6	138,100	69,050
Schoharie County	1	20,000	11,000	1	14,873	8,924
Ohio	3	55,023	33,598	3	38,060	22,836
Pennsylvania	5	605,812	269,701	5	600,895	300,447
Texas	1	12,000	18,000	1	10,000	17,000
Virginia	2	14,500	8,700	2	13,050	7,830
Wisconsin	2	582,000	197,400	1	476,511	190,604
Total	68	7,563,488	3,635,731	64	7,741,077	3,895,424

The following table is given in conformity to the expressed wishes of several manufacturers:

Product of hydraulic rock cement in the United States, 1880 to 1895, inclusive.

Year.	Number of barrels.	Year.	Number of barrels.
1880.....	2,030,000	1889.....	6,531,876
1881.....	2,440,000	1890.....	7,082,204
1882.....	3,165,000	1891.....	7,451,535
1883.....	4,190,000	1892.....	8,211,181
1884.....	4,000,000	1893.....	7,411,815
1885.....	4,100,000	1894.....	7,563,488
1886.....	4,186,152	1895.....	7,741,077
1887.....	6,692,744	Total	89,050,367
1888.....	6,253,295		

This table exhibits a record unparalleled in the history of cement. From the foundation of the industry in this country in 1818, the production has exceeded 150,000,000 barrels. It has been used with unqualified success in the construction of nearly all of the greatest engineering and architectural works in the country. It may confidently be predicted that in future years the intrinsic worth of our rock cements will be more and more appreciated, by reason of their well-proven excellence and enduring qualities, as shown by the records of their use during the past seventy-six years.

IMPORTS.

The following table shows the imports of cement into the United States during the fiscal years ending June 30, 1893, 1894, and 1895, by ports of entry:

Imports of cement, by ports, during the fiscal years ending June 30, 1893 to 1895.

Ports.	1893.		1894.		1895.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
<i>Atlantic coast.</i>	<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>	
Aroostook, Me.....	8	\$2	163,000	\$853	977,225	\$4,980
Baltimore, Md.....	108,479,638	359,144	77,968,821	249,039	113,334,906	353,033
Bath, Me.....			8,400	54		
Boston and Charles- town, Mass.....	61,346,305	308,783	62,072,160	198,653	68,952,320	216,392
Charleston, S. C.....	2,482,409	8,709	6,224,911	21,956	6,350,350	15,295
Georgetown, D. C.....	4,000	10	165,345	655		
New Bedford, Mass.....					20,000	44
Newport News, Va.....			11,304,000	35,920	29,436,949	92,244
New York, N. Y.....	594,135,906	1,690,622	384,406,068	1,251,000	429,254,171	1,419,216

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Imports of cement, by ports, etc.—Continued.

Ports.	1893.		1894.		1895.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Passamaquoddy, Me.....	600	\$4	.....	.....	16,400	\$57
Philadelphia, Pa.....	129,883,778	412,140	111,829,516	\$348,602	106,658,722	336,788
Portland and Fal- mouth, Me.....	.....	.....	1,699,608	5,246	.....	.....
Richmond, Va.....	.....	.....	200,000	613	.....	.....
Savannah, Ga.....	6,350,902	19,031	9,881,156	27,008	16,651,072	48,075
Wilmington, N. C.....	222,224	800	.....	.....	.....	.....
Total.....	812,905,761	2,699,245	666,522,985	2,139,749	771,652,115	2,486,124
<i>Gulf coast.</i>						
Galveston, Tex.....	27,563,767	93,322	10,207,303	58,681	23,703,800	62,879
New Orleans, La.....	112,445,409	377,288	83,794,052	273,570	100,811,527	313,200
Pensacola, Fla.....	806,840	3,261	1,315,559	4,005	1,480,000	4,591
Saluria, Tex.....	.....	.....	.....	.....	3,800	11
Tampa, Fla.....	936,000	3,225	.....	.....	.....	.....
Total.....	141,752,016	477,096	104,317,004	336,266	125,999,127	380,681
<i>Pacific coast.</i>						
Los Angeles, Cal.....	11,027,183	36,068	6,658,448	21,637	8,878,392	30,683
Oregon City, Oreg.....	.....	.....	399,980	1,277	817,000	2,555
Puget Sound, Wash.....	24,141,906	82,079	21,706,002	60,665	6,156,340	12,892
San Diego, Cal.....	22,744,180	79,300	14,761,600	48,802	18,450,800	61,275
San Francisco, Cal.....	82,643,856	279,478	135,889,312	433,364	89,630,282	304,168
Willamette, Oreg.....	14,652,325	49,706	47,560,684	155,222	27,102,654	91,814
Total.....	155,209,450	526,631	226,976,926	726,967	151,035,468	508,387
<i>Lake.</i>						
Buffalo Creek, N. Y.....	115	40	.....	.....	4,000	46
Cape Vincent, N. Y.....	50,900	164	70,450	245	43,750	193
Champlain, N. Y.....	98,900	387	.....	.....	487,500	2,000
Chicago, Ill.....	1,374,262	4,811	998,026	3,289	6,415,582	20,311
Cuyahoga, Ohio.....	40,000	136	194,000	808	1,529,500	5,370
Detroit, Mich.....	11,000	61	313,300	1,420	1,018,750	4,515
Huron, Mich.....	.....	.....	2,700	20	.....	.....
Miami, Ohio.....	.....	.....	412,500	1,750	96,250	437
Oswegatchie, N. Y.....	815,285	2,476	3,605	27	333,005	1,457
Oswego, N. Y.....	2,220	12	74,000	400	232,050	1,044
Total.....	2,392,682	8,087	2,674,561	7,959	10,160,387	35,973
<i>Interior.</i>						
Vermont.....	5,600	26	5,600	26	.....	.....
Cincinnati, Ohio.....	99,207	393	.....	.....	.....	.....
Indianapolis, Ind.....	.....	.....	80,000	255	.....	.....
Kansas City, Mo.....	80,000	257	80,000	260	.....	.....
Louisville, Ky.....	266,138	1,008	200,000	618	.....	.....
Memphis, Tenn.....	.....	.....	.....	.....	200,000	639
St. Louis, Mo.....	12,223,701	47,701	14,877,677	52,997	824,496	3,133
Total.....	12,654,646	49,385	15,243,277	54,156	1,024,496	3,772
Grand total.....	1,124,914,555	3,760,444	1,015,133,873	3,265,087	1,059,871,593	3,409,937