

LIME.

While the sources from which supplies of lime are drawn, continue practically immeasurable, there is a significant tendency towards the concentration of the production to certain localities. Increased facilities for transportation, with a natural sequence in lower cost of handling and delivery, permits the location of extensive works upon beds of excellent limestone which were previously neglected for want of an accessible market; this concentration and cheapening of production must gradually overshadow the old and somewhat crude systems, except in the most isolated localities.

With the actual output of some of the important manufacturing districts as a guide, and assisted by careful estimates from sections where no records are as yet preserved, an estimate of the total production of the United States for 1885 has been reached and placed in comparison with that of three preceding years, as follows:

Estimated production of lime in the United States from 1882 to 1885.

Years.	Barrels of 200 pounds.	Average value at kiln.	Total value.
1882	31,000,000	\$0.70	\$21,700,000
1883	32,000,000	.60	19,200,000
1884	37,000,000	.50	18,500,000
1885	40,000,000	.50	20,000,000

The increase of 3,000,000 barrels would have been exceeded but for certain local influences which have led to a curtailment of production in two or three districts of considerable manufacturing importance. All authorities agree that at 50 cents per barrel a fair average value is shown, there being little if any difference in that respect from the preceding year, while in quality some improvement may be credited. The most decided increase during the year was in the same direction noted in 1884. Following largely the Missouri and Mississippi valleys and making some growth on the Pacific coast, it spread somewhat more freely over Texas and made a slight showing in other Gulf States. Virginia and West Virginia are assuming greater importance as contributors to the general supply, and in the Housatonic valley, near Canaan, Connecticut, another considerable supply has become available. Of the latter a local consumption has been common for many years, but a new and improved plant and ample means for moving the product will greatly extend the area of distribution.

The following analysis of the Canaan, Connecticut, limestone has been furnished:

Analysis of lime from Canaan, Connecticut.

	Per cent.
Carbonate of lime	92.66
Magnesia	1.76
Oxide of iron and alumina14
Silica	5.44
Total	100.00

The use of lime in the manufacture of glass amounts on an average to about 11,000 long tons, and of limestone, some 33,000 tons are consumed. It is more than likely that those amounts were not quite reached during 1885, owing to curtailed glass production during a portion of the year.

Imports and exports.—The imports of lime have proved moderate, and in the main composed of selected varieties peculiarly adapted to some special work. At the port of New York, however, about 15,500 barrels of building lime were received as an experiment and secured fair favor. The cost on the pier was about 50 cents per barrel. The custom-house records still fail to make any division between lime and cement in statistics of exports, but the proportion of lime is unquestionably very small, probably not more than 10 per cent. of the exports named.

Lime imported and entered for consumption in the United States.

Fiscal years ending June 30—	Quantity.	Value.	Fiscal years ending June 30—	Quantity.	Value.
	<i>Barrels.</i>			<i>Barrels.</i>	
1869		\$10,800	1878		\$14,344
1870		9,063	1879		13,196
1871		11,315	1880		15,852
1872		11,014	1881		24,968
1873		8,260	1882	73,093	36,879
1874		10,964	1883	76,889	41,224
1875		7,328	1884	53,505	26,370
1876		7,367	1885	54,676	28,270
1877		12,823			

Lime and cement of domestic production exported from the United States, 1864 to 1885 inclusive.

Fiscal years ending June 30—	Quantity.	Value.	Fiscal years ending June 30—	Quantity.	Value.
	<i>Barrels.</i>			<i>Barrels.</i>	
1864		\$86,386	1877	78,341	\$97,923
1865		94,606	1878	82,507	98,334
1870	31,175	61,490	1879	60,657	74,097
1871	21,575	51,585	1880	41,989	52,584
1872	39,686	69,218	1881	57,555	83,598
1873	27,873	52,848	1882	67,030	100,169
1874	41,349	69,080	1883	74,687	120,156
1875	64,087	98,630	1884	65,768	108,427
1876	53,827	77,568	1885	79,627	127,523

Limestone flux.—The annexed estimates of the amount and value of limestone used in iron smelting from 1882 to 1885, inclusive, have been received from Mr. James M. Swank. Large quantities are also consumed in lead smelting, but estimates received are very indefinite and consequently omitted as practically useless.

Limestone used as flux in iron smelting in the United States from 1882 to 1885.

Years.	Quantity.	Average cost at quarry.	Total value.
	<i>Long tons.</i>	<i>Per ton.</i>	
1882.....	3,850,000	\$9.60	\$2,310,000
1883.....	3,814,273	.50	1,907,136
1884.....	3,401,930	.50	1,700,965
1885.....	3,389,313	.50	1,694,656

From the chief inspector of mines of the State of Ohio the following information is obtained: In 1884 the only record obtained was of limestone quarried for flux in smelting iron, amounting to 183,305 short tons. In 1885, however, an effort was made to extend research to building stone and the quantity burned for lime, with the appended results.

Production of limestone in the State of Ohio during 1885.

	Short tons.
For flux in iron smelting.....	141,957
For building purposes.....	311,971
For lime burning.....	662,447
Total.....	1,116,375

Pacific coast.—Mr. Yale furnishes the following:

The Pacific division of the continent abounds in limestone, there being enough produced in all the States and Territories of the West for local consumption. At one time there was thought to be but little stone of this kind in Oregon and in Washington Territory, but more careful search has brought to light an abundance of it there, and these regions have for the past two years been making enough lime for their own use, and have begun to ship it to California, the most of that exported coming from the vicinity of Puget sound.

California is prolific in limestone of every variety and of the best quality. The most extensive belt of this stone stretches north and south along the western foothills of the Sierra Nevada for a distance of nearly 150 miles, reaching from Mariposa county to Butte. It varies from a quarter of a mile to 3 miles in width, the rock near its southerly end, in the vicinity of Columbia, consisting of marble of good quality, and easily quarried. From 60 to 80 miles farther west a metamorphic limestone occurs in the Coast Range mountains, whence are

obtained the supplies for the seaboard counties, the inland counties being supplied from the foothill belt, large quantities from the kilns there being also shipped to San Francisco. In El Dorado county, at Alabaster Cave, on this belt, are located the Alabaster lime works, consisting of a "Monitor" kiln capable of burning 3,000 barrels per month. The lime made is noted for its purity and whiteness, and is much used for the purification of gas. The extensive kilns erected a few years ago near Clipper Gap, Placer county, were purchased soon after by the H. T. Holmes Company, owners of the Alabaster works, and have since remained closed.

The most of the lime in the Coast Range is burnt near the towns of Santa Cruz and Felton, Santa Cruz county, where several companies have put up large works, facilities for manufacture and shipping being extremely good there. The rock is abundant, of the best kind, and easily quarried. Wood and water are plentiful and transportation to San Francisco can be had by either water or rail.

The three large companies operating here each make between 40,000 and 50,000 barrels of lime per year. Each gives employment the year round to about 40 men, wood choppers and teamsters included, at wages of \$1.50 per day, though much of the work is done on contract. During the past two years lime burning has been carried on more generally over the State than was formerly the case, much having been burnt of late in the southern counties, where very little was made previously, owing to the limited demand, and in most localities, a scarcity of fuel. With the rapid increase in population of that section of the State, this industry has reached considerable proportions, there being no lack of good limestone there.

Several years ago the Hydrocarbon works, at Colton, San Bernardino county, began using crude petroleum as a fuel for burning lime. Although they have not abandoned its use, the experiment has not proved entirely satisfactory, owing to the great cost of this substance. Whether it can continue to be used with economy, the company has not yet determined, though the conditions favoring its employment are here as good as can be hoped for in the State, crude petroleum being cheap, but other fuel costly.

The production of lime in California amounted last year to about 220,000 barrels. The receipts at San Francisco were 160,000 barrels. Formerly some small lots of lime were exported from California to Oregon, Washington Territory and the Sandwich Islands. None, however, is sent away at present, these countries all making what they require at home. That made in the Sandwich Islands is burnt from coral. Though lacking in strength, this lime is of fair quality. The price of lime in San Francisco is lower at present than ever before, not exceeding \$1.50 per barrel.