

ABRASIVE MATERIALS.

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BUHRSTONES.

PRODUCTION.

The value of buhrstones and millstones produced in the United States from domestic quarries in 1896 was \$22,567, exactly \$25 more than the value of the product in 1895. The industry compared with what it was when the first volumes of Mineral Resources were published is now very small, and there is no probability that it will regain its former importance. It has given way to modern invention. The roller process for the manufacture of flour has entirely supplanted the use of buhr in all large mills, and the use of stones is now confined to paint, cement, bone, and phosphate mills, and mills for grinding the coarser cereals. Some idea of the decline of the industry is shown by a comparison of the statistics of production and importations in the past fourteen years covered by these reports. In 1882 the value of the domestic product was estimated at \$200,000. In 1895 and 1896 the value of the output was only 11.3 per cent of this amount. The average value for the past six years has been \$19,273, less than 10 per cent of the output in 1882. The imports have shown a similar but not quite so great a falling off. In 1882 the value of imported buhr, rough and manufactured, was \$104,034. In 1895 the imports were valued at \$20,316, less than one-fifth of the 1882 imports; and in 1896 the imports were \$26,965, about 25 per cent of the imports in 1882. Combining the domestic product with the imports, a total value in 1882 is shown of \$304,034. In 1895 the combined value of domestic and imported material was \$42,858, about 14 per cent of the value in 1882, while in 1896 the combined value was 16 per cent, amounting to \$49,532. There will always be a limited demand for the domestic millstones, and for a small amount of imported buhr, and it is probable that the production and imports will continue to average about the same as for the past six years.

Although classed as buhrstone, the domestic material is entirely distinct from any of the buhrs which are imported from France, Belgium, and Germany. The French buhr is considered the best. Both it and the Belgian buhr consist of small particles of silica mixed with calcareous material, and are hard and porous. The German buhr is said to be of basaltic lava. The domestic stone is a quartz conglomerate. All of the foreign stone is quarried in small pieces, which are shipped in the rough state at cheap freight rates to this country, where they are dressed to conformable shapes, fitted together, and bound into solid wheels. The domestic stone is found in large boulders, which are worked down to millstones of the required size, the chief advantage for these being in the fact that they are in one piece. It occurs in several localities along the eastern slope of the Alleghany Mountains, notably in Ulster County, New York, where it is called Esopus stone; in Lancaster County, Pennsylvania, where it goes by the name of Cocalico stone, and in Montgomery County, Virginia, it is quarried as Brush Mountain stone. It has also been quarried in Moore County, North Carolina, under the name of North Carolina grit, but no product has been reported from that locality for several years. The product in 1895 was from New York, Pennsylvania, and Virginia.

In the following table is exhibited the value of the millstones produced in the United States since 1880:

Value of buhrstones produced in the United States from 1880 to 1896.

Year.	Value.	Year.	Value.
1880.....	\$200,000	1889.....	\$35,155
1881.....	150,000	1890.....	23,720
1882.....	200,000	1891.....	16,587
1883.....	150,000	1892.....	23,417
1884.....	150,000	1893.....	16,639
1885.....	100,000	1894.....	13,887
1886.....	140,000	1895.....	22,542
1887.....	100,000	1896.....	22,567
1888.....	81,000		

IMPORTS.

Value of buhrstones and millstones imported into the United States from 1868 to 1896.

Year ended—	Rough.	Made into mill- stones.	Total.
June 30, 1868.....	\$74,224	.....	\$74,224
1869.....	57,942	\$2,419	60,361
1870.....	58,601	2,297	60,898
1871.....	35,406	3,698	39,104
1872.....	69,062	5,967	75,029
1873.....	60,463	8,115	68,578
1874.....	36,540	43,170	79,710
1875.....	48,068	66,991	115,059
1876.....	37,759	46,328	84,087
1877.....	60,857	23,068	83,925
1878.....	87,679	1,928	89,607
1879.....	101,484	5,088	106,572
1880.....	120,441	4,631	125,072
1881.....	100,417	3,495	103,912
1882.....	103,287	747	104,034
1883.....	73,413	272	73,685
1884.....	45,837	263	46,100
1885.....	35,022	455	35,477
Dec. 31, 1886.....	29,273	662	29,935
1887.....	23,816	191	24,007
1888.....	36,523	705	37,228
1889.....	40,432	452	40,884
1890.....	32,892	1,103	33,995
1891.....	23,997	42	24,039
1892.....	33,657	529	34,186
1893.....	29,532	729	30,261
1894.....	.....	.....	^a 18,087
1895.....	.....	.....	20,316
1896.....	.....	.....	26,965

^a Not separately classified after 1893.

GRINDSTONES.

OCCURRENCE.

Grindstones of domestic manufacture are obtained from the sandstone deposits which extend along the shores of Lake Erie for some distance east and west of Cleveland, Ohio, and as far inland as Marietta, and on Lake Huron above Detroit, Michigan. In Mineral Resources for 1886 the methods of manufacture and use are given in detail, together with a tabular statement of the several varieties, foreign or domestic, that occur, with their special uses. Five varieties are produced in the United States—four in Ohio and one in Michigan. The four in Ohio are: (1) Berea, fine sharp grit, used specially for sharpening edge tools; (2) Amherst, soft loose grit, for edge tools and saws; (3) Independence, coarse sharp grit, for grinding springs and files and for dry grinding of castings; (4) Massillon, also coarse sharp grit, for large edge tools, springs, files, and dry castings. The Huron (Michigan) stone has a fine sharp grit, and is used for sharpening edge tools when a very fine edge is required.

PRODUCTION.

The production of grindstones in 1896 shows a wholesome recovery from the depression of the two previous years, amounting in value to \$326,826 against \$205,768 in 1895, a gain of \$121,058, or about 59 per cent. Compared with 1894, there was an increase in 1896 of \$103,612. The industry is now practically controlled by three or four large firms in Ohio, which have the strength necessary to maintain prices.

In the following table is shown the value of grindstones produced in the United States since 1880:

Value of grindstones produced in the United States, 1880 to 1896.

Year.	Value.	Year.	Value.
1880.....	\$500,000	1889.....	\$439,587
1881.....	500,000	1890.....	450,000
1882.....	700,000	1891.....	476,113
1883.....	600,000	1892.....	272,244
1884.....	570,000	1893.....	338,787
1885.....	500,000	1894.....	223,214
1886.....	250,000	1895.....	205,768
1887.....	224,400	1896.....	326,826
1888.....	281,800		

IMPORTS.

The amount and value of grindstones imported into the United States since 1868 are as follows:

Grindstones imported and entered for consumption in the United States, 1868 to 1896, inclusive.

Year ended—	Finished.		Unfinished or rough.		Total value.
	Quantity.	Value.	Quantity.	Value.	
	<i>Long tons.</i>		<i>Long tons.</i>		
June 30, 1868		\$25,640		\$35,215	\$60,855
1869		15,878		99,715	115,593
1870		29,161		96,444	125,605
1871	385	43,781	3,957.15	60,935	104,716
1872	1,202	13,453	10,774.80	100,494	113,947
1873	1,437	17,033	8,376.84	94,900	111,933
1874	1,443	18,485	7,721.44	87,525	106,010
1875	1,373	17,642	7,656.17	90,172	107,814
1876	1,681	20,262	6,079.34	69,927	90,189
1877	1,245	18,546	4,979.75	58,575	77,121
1878	1,463	21,688	3,669.41	46,441	68,129
1879	1,603	24,904	4,584.16	52,343	77,247
1880	1,573	24,375	4,578.59	51,899	76,274
1881	2,064	30,288	5,044.71	56,840	87,128
1882	1,705	30,286	5,945.61	66,939	97,225
1883	1,755	28,055	6,945.63	77,797	105,852
1884					^a 86,286
1885					50,579
Dec. 31, 1886					39,149
1887					50,312
1888					51,755
1889					57,720
1890					45,115
1891					21,028
1892					61,052
1893					59,569
1894					52,688
1895					54,276
1896					66,195

^a Since 1884 classed as finished or unfinished.

CANADIAN PRODUCTION.

The Geological Survey of Canada gives the following statement of the production of grindstones in the Dominion since 1886:

Production of grindstones in Canada since 1886

Calendar year.	Tons.	Value.
1886.....	4,000	\$46,545
1887.....	5,292	64,008
1888.....	5,764	51,129
1889.....	3,404	30,863
1890.....	4,884	42,340
1891.....	4,479	42,587
1892.....	5,283	51,187
1893.....	4,600	38,379
1894.....	3,757	32,717
1895.....	3,475	31,932

OILSTONES AND WHETSTONES.

PRODUCTION.

While the value of oilstones and whetstones produced in the United States in 1895 was the largest on record, the reports for 1896 indicate a value less than in any year since 1890. The total value of the product in 1896 (including oilstones, whetstones, or water hones, scythestones, kitchen and shoemakers rubstones) was \$127,098 against \$155,881 the preceding year. The rough material from which they are made is obtained from various localities in the United States. The higher grades of oilstones are made from two grades of novaculite quarried in the vicinity of Hot Springs, Arkansas, and known, respectively, as "Arkansas" and "Washita" stone. Fine-grained sandstone, called "Hindustan" or "Orange" stone, from Orange County, Indiana; Lake Superior stone, quarried in Cuyahoga County, Ohio, and a similar material known as Labrador stone, from Cortland County, New York, and chocolate stone from Lisbon, New Hampshire, are used for whetstones. Scythestones and rubstones are made from Indian Pond and Lamoille stone, quarried in Grafton County, New Hampshire, and Orleans County, Vermont, from Berea grit (which also furnishes grindstones), and from some of the Indiana sandstone.

The production of oilstones, etc., in the United States has for several years been practically controlled by one concern, the Pike Manufacturing Company, of Pike Station, New Hampshire. This company owns quarries at French Lick, Georgia, Orangeville and Paoli, Indiana; Haverhill, Piermont, Orford, and Lisbon, New Hampshire; Truxton, New

York; Westmore and Brownington, Vermont, and besides having its own quarries and 1,000 acres of quarry land in Garland County, Arkansas, this company has contracted with all the individual quarrymen for their entire output for a number of years. During 1896 the Pike Company erected a mill at Hot Springs, Arkansas, for cutting and finishing the novaculite quarried in that vicinity, and discontinued the manufacture of Labrador stone from Cortland County, New York.

Under existing circumstances the first uniform selling value that can be placed upon the product is for the finished articles, which for the past six years has been as follows:

Value of oilstones, whetstones, etc., produced in the United States since 1891.

Year.	Value.
1891.....	\$150,000
1892.....	146,730
1893.....	135,173
1894.....	136,873
1895.....	155,881
1896.....	127,098

From 1880 to 1890, inclusive, the product and value of the rough stone has been published in these reports, exception being made in the case of the output for 1890, when the value for the unfinished product was given for the novaculite of Arkansas, and in all other cases the value of the finished stones is quoted. The annual production from 1880 to 1890 was as follows:

Product of oilstones and whetstones from 1880 to 1890.

Year.	Pounds.	Value.
1880.....	420,000	\$8,000
1881.....	500,000	8,580
1882.....	600,000	10,000
1883.....	600,000	10,000
1884.....	800,000	12,000
1885.....	1,000,000	15,000
1886.....	1,160,000	15,000
1887.....	1,200,000	16,000
1888.....	1,500,000	18,000
1889.....	5,982,000	32,980
1890.....	.....	69,909

The reports of production by the Pike Manufacturing Company have been furnished this office annually since 1892, with permission to publish. They may be taken as indicative of the condition of the industry, and are shown in the following table. These figures are not claimed to be exact, but are estimated, though sufficiently approximate for all practical purposes. In making its report for 1896, the company states that it still controls the class of goods manufactured by it, and is able to maintain a uniform quality in the finished material, and in this way is securing the confidence of European buyers, and foreign demand is increasing. For the past three years home consumption has been much curtailed on account of the depressed conditions, but during that time export business has improved.

Production of oilstones, etc., by the Pike Manufacturing Company since 1892.

Kind.	1892.		1893.		1894.	
	Output.	Value.	Output.	Value.	Output.	Value.
Washita stone..pounds..	400,000	\$60,000	300,000	\$45,000	300,000	\$45,000
Arkansas stone...do....	20,000	12,000	12,000	12,000	15,000	15,000
Labrador stone...do....	500	50	200	20	100	10
Hindustan stone .do....	300,000	15,000	250,000	13,000	300,000	15,000
Sandstone .....do....	100,000	2,000	100,000	2,000	100,000	2,200
Chocolate stone .do....	20,000	2,000	20,000	2,000	25,000	2,500
Seythstones ....gross..	16,000	50,000	13,000	40,000	15,000	45,000
Total value.....	.....	141,050	.....	114,020	.....	124,710

Kind.	1895.		1896.	
	Output.	Value.	Output.	Value.
Washita stone.....pounds..	250,000	\$40,000	240,000	\$50,000
Arkansas stone.....do....	15,000	20,000		
Hindustan stone.....do....	300,000	12,000	275,000	10,000
Sandstone .....do....	100,000	2,000	100,000	2,000
Chocolate stone.....do....	10,000	1,000	10,000	1,000
Seythstones .....gross..	15,000	47,750	15,000	35,000
Total value.....	.....	122,750	.....	98,000

IMPORTS.

The following table shows the total value of all kinds of hones and whetstones imported since 1880:

Imports of hones and whetstones since 1880.

Year ended—	Value.	Year ended—	Value.
June 30, 1880.....	\$14, 185	Dec. 31, 1889.....	\$27, 400
1881.....	16, 631	1890.....	37, 451
1882.....	27, 882	1891.....	35, 344
1883.....	30, 178	1892.....	33, 420
1884.....	26, 513	1893.....	25, 301
1885.....	21, 434	1894.....	26, 671
Dec. 31, 1886.....	21, 141	1895.....	32, 439
1887.....	24, 093	1896.....	50, 588
1888.....	30, 676		