ABRASIVE MATERIALS.

By EDWARD W. PARKER.

BUHRSTONES.

PRODUCTION.

While the value of the product of buhrstone in 1895 was larger than that of 1893 or 1894, it can not be taken as indicating any tendency toward a permanent improvement in the industry, which has been on the decline for the past fifteen years. In 1880 the value of buhrstones made from domestic material in the United States was placed at $200,000. In 1895 it was $22,542, but 11½ per cent of that of 1880, while in 1894 it was but little more than half this. There will always be a small demand for these domestic stones, and as long as it will pay to make them at all there will continue to be a limited production. Paint mills, cement mills, and mills for the grinding of the coarser cereals, bone, and phosphate rock find their requirements well filled by these stones, which can be obtained at moderate cost. For fine flouring mills the roller process has supplanted domestic buhrstones, and to some extent French buhr also, which, while superior to domestic stone and procurable at comparatively slight expense, does not compete with the more modern roller process.

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 bowlders, which are worked down to millstones of the required size, the chief advantag 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, N. Y., where it is called Esopus stone; in Lancaster County, Pa., where it goes by the name of Cocalico stone,

and in Montgomery County, Va., it is quarried as Brush Mountain stone. It has also been quarried in Moore County, N. C., 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 1895.

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

IMPORTS.

Value of buhrstones and millstones imported into the United States from 1868 to 1895.

Year ended—	Rough.	Made into millstones.	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

Value of buhrstones and millstones imported into the United States, etc.—Continued.

Year ended—	Rough.	Made into millstones.	Total.
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	.....	.....	*a* 20,316

a Not separately classified after 1893.

GRINDSTONES.

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, Mich. 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.

The production of grindstones has been seriously affected by the trade depression of the past few years. In 1891 the value of the output was $476,113. In 1892 it dropped to $272,244, but reacted in 1893 to $338,787. In 1894 it fell to $223,214, and reached the lowest point of $205,768 in 1895, less than 45 per cent of the value of the product in 1891. The large decrease in value is brought about by a combination of smaller output and reduced 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 1895.

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

Grindstones imported and entered for consumption in the United States, 1868 to 1895, inclusive.

Year ended—	Finished.		Unfinished or rough.		Total value.
	Quantity.	Value.	Quantity.	Value.	
	Long tons.		*Long tons.*		
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	5,945.64	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

a Since 1884 classed as finished or unfinished.

OILSTONES AND WHETSTONES.

PRODUCTION.

The value of the finished product in 1895 amounted to $155,881, the highest figure ever attained.

The statement of the production of oilstones and whetstones included also that of scythestones and kitchen and shoemakers' rubstones. 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, Ark., and known, respectively, as "Arkansas" and "Washita" stone. Fine-grained sandstone, called "Hindostan" or "Orange" stone, from Orange County, Ind.; Lake Superior stone, quarried in Cuyahoga County, Ohio, and a similar material known as Labrador stone, from Cortland County, N. Y., and chocolate stone from Lisbon, N. H., are used for whetstones. Scythestones and rubstones are made from Indian Pond Lamoille stone, quarried in Grafton County, N. H., and Orleans County, Vt., 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, N. H. This company owns quarries at French Lick, Georgia, Orangeville and Paoli, Ind.; Haverhill, Piermont, Orford, and Lisbon, N. H.; Truxton, N. Y.; Westmore and Brownington, Vt., and besides having its own quarries and 1,000 acres of quarry land in Garland County, Ark., this company has contracted with all the individual quarrymen for their entire output for a number of years. Under these circumstances the first uniform selling value that can be placed upon the product is for the finished articles, which for the past five 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

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.

Production of oilstones, etc., by the Pike Manufacturing Company in 1892, 1893, 1894, and 1895.

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

Production of oilstones, etc., by the Pike Manufacturing Company, etc.—Continued.

Kind.	1894.		1895.	
	Output.	Value.	Output.	Value.
Washita stone.....pounds..	300,000	$45,000	250,000	$40,000
Arkansas stone.....do....	15,000	15,000	15,000	20,000
Labrador stone.....do....	100	10	.....	.....
Hindostan stone.....do....	300,000	15,000	300,000	12,000
Sandstone .....do....	100,000	2,200	100,000	2,000
Chocolate stone .....do....	25,000	2,500	10,000	1,000
Scythestones .....gross..	15,000	45,000	15,000	47,750
Total value.....	.....	124,710	.....	122,750

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, 1888.....	$30,676
1881.....	16,631	1889.....	27,400
1882.....	27,882	1890.....	37,454
1883.....	30,178	1891.....	35,344
1884.....	26,513	1892.....	33,420
1885.....	21,434	1893.....	25,301
Dec. 31, 1886.....	21,141	1894.....	26,671
1887.....	24,093	1895.....	32,439

CORUNDUM AND EMERY.

PRODUCTION.

In 1895 the total amount of corundum and emery mined in the United States was 2,102 short tons, valued at $106,256, against 1,495 short tons, worth $95,936, in 1894. The amount of the product was larger than in any previous year except 1889 and 1891, and the value, while greater by $10,000 than in 1894, was less than in 1892 or 1893. There was an increased production both of corundum and emery, the output of the latter, from Westchester County, N. Y., showing the greater increase. In 1889 the production of Westchester County emery