

# “Whetstones in the United States”

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## WHETSTONES IN THE UNITED STATES.\*

THE record of the manufacture of whetstones in the United States is meager. The earliest published item found is that novaculite quarried at Oley, Berks county, Pa., was selling in 1822 for 25 cents per pound. In 1822 also two quarries of oilstone on Lake Memphremagog were reported to have yielded profits exceeding \$5,000 for the two preceding years. The geology of Massachusetts, published in 1835, states that over five thousand dozens of whetstones were quarried annually in Smithfield. The geology of Rhode Island in 1840 reports the production of the same quarries at from six to eight thousand dozens. Twenty-two thousand eight hundred were manufactured in Bellingham, Mass., in 1838. These figures show that there was a pretty active whetstone industry in New England at this time, particularly when it is considered that whetstones were also being manufactured in New Hampshire, Vermont, Pennsylvania, North Carolina and Arkansas at the same time. Possibly the business was overdone at the time and a reaction followed, for the Massachusetts and Rhode Island quarries are not heard of after 1841, and nothing is heard from the Pennsylvania quarries until new ones were reported in 1883. The industry has been a constant one since 1840 in New Hampshire, Vermont and Arkansas, and also in Indiana, where the Hindostan quarries were opened about 1840; though in all these localities quarries have been abandoned and new ones opened during the intervening years. In North Carolina also it is presumed that the manufacture has been fairly constant; the stone is not known in the northern market, so the demand is probably a local one. Exactly when the Berea grit of Ohio came into use for scythe-stones has not been learned, but its use for this purpose is reported in the Geological Survey Report on Economic Geology, 1873. Only a small part of the grit is suitable for use, so the whetstone manufacture can only be carried on in connection with production of stone for other purposes.

There are at the present time in the United States the following old established localities for quarrying whetstones: New Hampshire, Vermont, North Carolina, Ohio, Indiana and Arkansas. In addition to these are more recently worked and less important localities in Alabama, Missouri, Michigan and New York. Of these the business may be considered

\*From Arkansas Geological Report for 1880.

a local one in Alabama and in North Carolina; New York and Missouri localities have more than a local business, but the product in each case is small; Ohio and Michigan furnish coarse scythe-stones only, but the quantity used is large and the industry is important. The great bulk of the whetstones come from Indiana, Arkansas, New Hampshire and Vermont. The quarries of the last two states may be considered together, since they are all controlled by one company. The New Hampshire and Vermont quarries produce stones for many purposes; scythe-stones are the chief product, but carpenters' whetstones, axe-stones and small stones for other purposes are also produced. In Indiana two stones are quarried, one a shoemakers' sandstone and the other a very fine-grained, compact sandstone, used chiefly for whetstones by carpenters, mechanics and others. Arkansas produces two varieties of stones, the "Ouchita," a fine quality of carpenter's stone, and a very dense hard stone, called the "Arkansas," suitable for sharpening the smallest pointed tools, or giving a very fine edge to surgical instruments.

The New York stone is found in Cortland county on the shore of Labrador lake, from which the stone derives its name. It is a fine-grained dark-green sandstone, occurring in beds two or three feet thick, interbedded with shales from two to six feet thick. The formation lies in a nearly horizontal position and is about five hundred feet in thickness. It is tough and sharp-gritted, but feels coarse compared with Turkey or Arkansas grit. The toughness of this stone, due to the presence of the limonite cement, makes it a valuable one where strength is a necessary quality; thus it is particularly well adapted for kitchen stones and for the coarser kinds of files. This stone is not very well known yet and only about 5,000 pounds are manufactured annually.

Its manufacture was begun ten years ago at Manlius Station, with two small saw-gangs and a rub-wheel. Other kinds of stones have since been used and the business increased until now there are nine saw-gangs and three rub-wheels running constantly. Hindostan and Turkey stones are sawed at this factory to some extent; stone from Arkansas has been manufactured here and forms a very large part of the whole product. The sand used in sawing is fine and very purely siliceous, consisting of angular, sub-angular and well-rounded quartz grains frequently iron-stained. The average diameter of the grains is about .20mm.

The whetstone factory at Pierce City, Mo., is a small one containing one large saw-gang, a rub-wheel and a finishing wheel. The finishing wheel is simply a two-foot disk covered with sand-paper on which it is claimed a better finish is obtained than on the rub-wheel. This may be a good method to finish a soft stone like the Adamascobite grit which is manufactured here, but it probably would not be so successful if used with harder stones.



The sawing sand used comes from Pacific, Mo., and is fine and white. The stone is compact and heavy, has a dull, yellow color, and resembles closely some varieties of Hindostan stone, but is softer and finer grained and has a velvety feeling. The microscope shows that the grains of the silica are about .02mm. in diameter. Mingled with the silica is a large amount of muscovite mica, earthy matter and iron. The soft feeling is probably due to the muscovite present. The whetstones manufactured here are good for those who like a fast cutting stone. They make excellent rub-stones also for marble polishers. They have not been put on the market in large quantity, but have been sold in small lots at 50 c. to 65 c. per pound.

Since the manufacture in New Hampshire and Vermont is controlled by the Pike Manufacturing Company, and since their product is so similar, the two are considered together. In Grafton county, N. H., the company works four quarries. The schists in these quarries lie in "rifts" of different lengths and widths. The sheets are cut up or "bolted" into slabs about ten and one-half by twelve inches long by two to four inches thick. These slabs are then marked and broken into rough stones about two inches wide by means of steel knives and hammers. The rough stones are ground into the finished form on a horizontal rubbing bed fed with sand and water. The grinding is done at Pike Station. The stone manufactured here is the Indian Pond scythe-stone. The chocolate stone, quarried at Lisbon, is a finer grained than the Indian Pond stone, and is made into oilstones, knife-stones, or fine scythe-stones. From 10 to 15 tons are produced annually. The chocolate stone is not finished by the Pike Manufacturing Company, but the manufacture is carried on by contract with the Lisbon parties.

In Vermont the stone is finer grained, more compact, and a little harder than the Indian Pond stone. Owing to these differences in character, the Vermont stone is sawed into slabs instead of being cut or broken, but they are finished in the same manner as the Indian Pond. At the works in Evansville 4,000 to 7,000 gross of scythe-stone are manufactured annually. The principal brands of Vermont stone are the "Black Diamond," "Lamoille," "Willoughby Lake" and "Green Mountain." These stones are exported only in small quantities, though of the Indian Pond 5,000 gross or more go abroad every year. The same company owns quarries in Cummington, Mass., the stone of which resembles the Vermont stone closely, but it is a little harder and more liable to glaze.

The manufacture of sandstone scythe-stones in Ohio and Michigan is controlled by a single company, the Cleveland Stone Company, and the productions of these two states may therefore be considered together. The Cleveland Stone Company is the strongest organization in the whetstone business at present, though the whetstone industry, however, forms but a small part of its whole business. It owns a large amount of stock of the

Pike Manufacturing Company, and so influences the production of mica schist stones in New Hampshire and Vermont, and also the manufacture of whetstones from Arkansas. It also has absolute control over the sandstone scythe-stone industry in this country.

The quarries of the Cleveland Stone Company in Ohio are located at Berea, Cuyahoga county; those in Michigan, are at Grindstone City in Huron county. Nine-tenths of the total product is manufactured in Michigan. The method of manufacture consists in sawing the blocks of stone into slabs, which are broken into the required length and then given the slender form of the scythe-stone by breaking again under a knife or "guillotine." The rough strips thus formed are rubbed down on a wheel made of basswood filled with iron scraps driven in edgewise. The wood wears away faster than the iron, so that the projecting edges, with the assistance of sand and water, wear away the stones more rapidly than a smooth rub-wheel would do. The total product is about 8,000 gross per annum, of which about 1,500 gross are exported. The stones are worth on the average \$3.50 per gross.

The whetstone quarried in Orange county, Indiana, is a fine-grained sandstone. The microscope shows it to contain much earthy material and limonite, with a little muscovite mica. The grains of silica are about .02mm. in diameter and are remarkably uniform in size. There are a few shapeless cavities in the stone. The limonite probably forms the cementing substance in this stone, as in the Labrador stone, though it is not so strong; it is stronger, however, than that of the Adamsobite grit, so this stone lies between the other two in hardness. The Indiana whetstones are known in the market by the name of Hindostan; a variety having a buff color goes by the name of Orange stone, while the finest grade of white stones are called "Washita finish." Most of the stone has a dull gray or yellowish color. Some of its micaceous, and thin micaceous layers and laminae of iron ore afford convenient seams along which it is split in quarrying and working. There is considerable variation in hardness among the Hindostan stones coming from different strata.

The natural advantages for working the Hindostan stone are very great. It is found in a nearly horizontal strata, interbedded with shales and some other strata not suitable for whetstones. The different quarries show considerable variation in the thickness and character of the beds worked, but in all a thin coal seam marks the lower limit of the good stone. The amount of cap rock to be removed is usually small, and a large percentage of the rock quarried is suitable for whetstones. Some stone not good for whetstone, is used for flagging. The good stone is wedged up in sheets, frequently of just the proper thickness for use; when not of the right thickness the slabs are easily split along the stratification planes. The



thin sheets of stone are ruled off into the desired sizes, and the lines are deeply marked by a scribing awl. The sheet is then turned over, marked lightly, and then with a broad-edged stone chisel and hammer the whetstones are broken out in rough form. Rubbing down on a wheel finishes them. This is the greater part of the work, but cheap labor is employed, women, girls and boys attending the wheels. Some of the harder and more massive rocks are shipped in blocks to the manufactories in New York, and at New Albany, Indiana, where they are sawed. About 400,000 pounds of Hindostan stone was put on the market in 1886, 100,000 of which was exported. Later reports do not show much change in production, though it has probably increased slightly. The prices in 1886 were considerably higher than they are now, ranging from three and one-half to six cents per pound; at present a very great part of the stone is sold at one and one-fourth to two cents per pound, with higher prices up to ten cents per pound for special orders of selected stone. These stones are excellent to produce a rather coarse edge; they are much used by English cutlery manufacturers to give the first rough edge before the knife-blade receives its final polish. Their export increases annually.

The manufacturers of Hindostan stone are J. A. Chaillaux and Kirk & Pruett, at Orangeville, T. N. Baxton, and William F. Osborn, of Paoli, and Brown Moore, of French Licks. Of these, J. A. Chaillaux is the only one engaged in the whetstone business exclusively. T. N. Baxton and William F. Osborn are merchants who operate quarries. Brown Moore and Kirk & Pruett are farmers who have quarries on their land. At retail the stones command a good price, and in hundred pound cases are quoted at from six cents to thirty cents per pound. Many of the Hindostan stones are beautifully marked with mineral stains. Some of these of fine quality have the special brand of Niagara stones, and are quoted at 25 to 40 cents a pound in small lots. The Hindostan stones are commonly used with water, though oil is sometimes used with the finer grades. The other variety of Indiana stone from which shoemakers' sandstones and glass manufacturers' files are made, is a porous, friable sandstone much coarser than the Hindostan and belonging to the different series of strata. It is more easily worked than the Hindostan; it is sawed by a saw-gang run by horse-power, and the rubbing part of the process is rapidly done by hand on a large block of the same stone. The stones are made in prismatic form one and a half inches on a face and from ten to twelve inches in length. About the same amount of this stone is put on the market annually as of the Hindostan, and about the same proportion of the total product is exported. The price given in 1886 was four cents per pound, but was only one cent in 1890. These stones are quarried by the farmers at dull seasons of the year and traded to the merchants for goods. There are as many as six quarries

in the vicinity of French Licks, probably more. The other American stones manufactured in large quantity are the two varieties found in Arkansas.—*L. S. Griswold.*

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#### STANDARD TIME.

PRIMARILY for the convenience of the railroads, a standard of time was established by mutual agreement in 1883, by which trains are run and local time regulated. According to this system, the United States, extending from  $65^{\circ}$  to  $125^{\circ}$  west longitude, is divided into four time sections, each of  $15^{\circ}$  longitude, exactly equivalent to one hour. The first (eastern) section includes all territory between the Atlantic coast and an irregular line drawn from Detroit to Charleston, S. C., the latter being its most southern point. The second (central) section includes all the territory between the last-named line from Bismarck, N. D., to the mouth of the Rio Grande. The third (mountain) section includes all territory between the last-named line and nearly the western borders of Idaho, Utah and Arizona. The fourth (Pacific) section covers the rest of the country to the Pacific coast. Standard time is uniform inside of each of these sections, and the time of each section differs from the next to it by exactly one hour. Thus, at 12 noon in New York city (eastern time), the time at Chicago (central time) is 11 o'clock a. m.; at Denver (mountain time), 10 o'clock a. m.; and at San Francisco (Pacific time), 9 o'clock a. m. Standard time is 16 minutes slower in Boston than true local time, 3 minutes slower at New York, 8 minutes faster at Washington, 19 minutes faster at Charleston, 28 minutes slower at Detroit, 18 minutes faster at Kansas City, 10 minutes slower at Chicago, 1 minute faster at St. Louis, 28 minutes faster at Salt Lake City and 10 minutes faster at San Francisco.

**Keywords used in the “Whetstones in United States” article include:** Oley, Berks County, Pennsylvania; Lake Memphremagog; Smithfield, Massachusetts; Bellingham, Massachusetts; Rhode Island; New Hampshire; Vermont; North Carolina; “Ouchita” stone; “Arkansas” stonestone; Arkansas; the Hindostan quarries in Indiana; Berea grit, Ohio; Alabama; Missouri; Michigan; New York; on the shore of Labrador Lake, Courtland County, New York (dark-green sandstone); Manlius station; Turkey stone; ; Pierce City, Missouri; Adamascobite grit; Pacific, Missouri; Cleveland Stone Company, Ohio; Berea, Cuyahoga County, Ohio; Grindstone City, Huron County, Michigan; Orange County, Indiana; Labrador stone; “Washita finish”; New Albany, Indiana; J. A. Chaillaux and Kirk & Pruett, Orangeville, whetstones; Hindostan stone; T. N. Baxton, quarrier and merchant; William F. Osborn of Paoli, quarrier and merchant; Brown Moore of French Licks, quarrier and merchant; and Niagara stones.