CHAPTER III.—CHEMICAL EXAMINATION.

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The optical method of study is not suited to solve all of the problems of lithology, and it becomes necessary to supplement it by chemical examinations. Even when the optical properties of a mineral have been thoroughly worked out, it can generally be determined with certainty only when sections of known relations to its crystalline form can be prepared. The sections of minerals ordinarily obtained in the preparation of microscopic sections of rocks are, however, hap-hazard in their relations to the crystalline forms, and it is only by ascertaining these relations as far as possible, by an examination of outlines, cleavages, and other crystalline properties, that mineral species can be determined in rocks. The degree of accuracy which is thus obtained is sometimes insufficient for the desired purpose; for example, it can be determined that the feldspar in a rock is either the monoclinic orthoclase, the triclinic microline, or some one of the other species of triclinic feldspar, but which one of these it may be cannot with certainty be determined by optical examination. This is sometimes an important point. Again, in the case of minerals which can be determined with the greatest certainty, it is sometimes quite desirable to know the chemical composition of the species; for example, hornblende can, with almost entire certainty, be determined in thin sections of rocks, but this mineral is variable in its composition, and its properties as a constituent of a building stone may be quite different according as its composition varies, and especially according to the percentage of protoxide of iron it may contain. The composition of a rock as a whole, although important geologically, is of much less importance from an economic standpoint than the composition of individual ingredients, for the properties of the stone which fit or unfit it for use as a constructive material depend much more upon the peculiarities of its special ingredients than upon the ultimate composition of the whole. As is well known, a rock of a given ultimate composition may be a granite, a gneiss, a schist, a slate, or a sandstone, according to the circumstances of its origin and its subsequent transformation, and may be composed of very different mineral species; therefore, rocks of the same composition may be very different in their physical properties, and hence, in their capacities for resisting decomposing agencies and disintegration. It is therefore desirable to subject many of the stones which are to be considered as materials of construction to processes by which their individual mineral constituents can be separated from one another and analyzed. This indeed has been the object of those who are interested in the science of lithology, and various extremely complicated methods have been proposed to accomplish the result. A method has recently been proposed, however, which is much more efficacious than any previously applied, and as some of our results have been achieved by this method it will be briefly described:

The red iodide of mercury (HgI_2), possessing the high specific gravity of 6, is but slightly soluble in water; it is, however, very soluble in a solution of the iodide of potassium (KI), which has a specific gravity of 3.08. If, therefore, a saturated solution of the iodide of potassium is subsequently saturated with the iodide of mercury, a very heavy fluid is obtained, and the specific gravity of this fluid is such that many of the common minerals present in a rock will readily float upon it. This method of separation by means of a heavy fluid is said to have been proposed by Fleurian de Bellevue et Cordier at the beginning of this century. The solution of the double iodide of potassium and mercury was proposed by Church, in 1877, for use in the separation of minerals from one another. (*a*) The method was improved and new apparatus was proposed to be used with it by Thoulet, (*b*) who applied it with considerable success in the separation of minerals from granite and in determining the relative proportion of the various species in rocks of this nature. A further advance in the perfection of this solution was made by Goldschmidt, (*c*) who succeeded, by a careful study of the most favorable proportions between the two salts, in increasing the specific gravity of the solution and in extending the utility of its application. He also fully studied its properties and demonstrated its great advantages as a separating fluid. According to Goldschmidt, the heaviest fluid is not obtained by saturating with iodide of mercury a previously-saturated solution of iodide of potassium, but by dissolving the two salts simultaneously in water, using a smaller proportion of iodide of potassium than that found by analyzing such a saturated solution. After some experimenting, the method of preparing this solution adopted by myself, and which gives a solution of the very high specific gravity of 3.28, is as follows: One part of iodide of potassium is weighed out and placed in a beaker, and one and one-fourth parts of iodide of mercury weighed out and placed on top of the iodide of potassium; then water is added in the proportion of 10 c.c. per 100 grams of the mixed salts; in the course of a few hours, with frequent stirrings, the salts will go completely into solution. After filtering from the impurities of the salts, the solution is gently evaporated on a water-bath

a Mineralogical Magazine, November, 1877.

b Bulletin de la Soc. Min. de France, 1879, No. 1.

c Inaugural—Dissertation, Philosophische Facultät der Universetät Heidelberg, Victor Goldschmidt. Stuttgart, 1880.

until crystals just begin to separate upon the surface; it is then removed from the water-bath and allowed to become thoroughly cold, by which means a considerable crop of crystals separates and a fluid of between 3.10 and 3.20 is obtained. By pouring off the fluid from the crystals and again heating gently upon the water-bath until crystals begin to separate, a further portion of water is driven off from the solution, and upon cooling there is a further separation of crystals, and a fluid of the gravity of 3.28 is obtained. My experience in using this solution indicates that there is a double salt formed of the formula (HgI_2) $(KI)_2$ soluble in water, much more soluble, however, in water containing a small amount of iodide of potassium; but any increase of iodide of potassium beyond a certain small amount decreases its solubility, and consequently the specific gravity of the solutions obtained. This solution is a very remarkable one, and besides its use as a separating fluid it finds many other applications; especially is it used by the physicists on account of its high index of refraction.

For use in separating the mineral constituents of rocks it possesses peculiar advantages besides its high specific gravity, the most important being that it can be mixed with water without suffering any change in volume, thus allowing fluids of any desired specific gravity to be prepared; and also by a simple calculation the reduction of any known volume of fluid of any specific gravity to any desired specific gravity, the formula for this reduction being $V_1 = \frac{V(D-\triangle)}{\triangle - 1}$, in which V equals volume of fluid, D its specific gravity, V_1 the volume of water to be added, and $\triangle$ the specific gravity which it is desired the final fluid shall have. There are, however, some disadvantages connected with the use of the fluid, the most important being its poisonous and corrosive properties.

In order to separate the mineral constituents of a rock by the use of this fluid, the rock is first pulverized so that the particles will pass through a fine sieve, the size of the mesh being governed by the fineness or coarseness of the texture of the rock. It is desirable to reduce the rock to as fine a powder as possible to avoid the presence of composite grains; at the same time it is not practicable to reduce it to anything like the fineness of dust, as that would remain for a long time suspended in the fluid without either sinking or rising. The powder thus obtained is washed with water in order to separate from it the exceedingly fine portion which of necessity is formed during the pulverization; when the mass has been so long washed with water that the particles all settle very quickly to the bottom, it is dried and placed in a tube with two stop-cocks at the bottom, provided with a perforated india-rubber cork at the top, with a bent glass tube and an india-rubber tube for making connections, and also a capillary tube from between the two stop-cocks rising nearly to the top of the tube; the tube is also graduated to admit of the ready measurement and consequent calculations of the fluids during the separation; the double iodide solution is added, and the whole throroughly mixed, preferably by drawing a current of air through the apparatus by means of the Bunsen pump; after remaining at rest for some time all those minerals present in the rock which have a higher specific gravity than that of the fluid fall to the bottom, and all that are lighter rise to the top; by opening the stop-cocks the portion which has settled to the bottom is drawn off; by closing the upper stop cock and drawing water into the lower portion of the tube by means of the capillary tube, the powder can be thoroughly washed from the apparatus; by adding water in successively calculated amounts to the fluid which remains in the tube, the other ingredients can be caused to fall to the bottom and be drawn off one by one—not, it is true, in a state of perfect purity, but in such a condition that the analysis of certain ones will very frequently lead to very important and desired results. The material which falls to the bottom when the fluid is at its highest specific gravity, generally complex in its nature, can be further analyzed by a variety of methods; a separation can very frequently be effected upon the ferruginous minerals by employing electro-magnets of successively increasing power. In some cases a separation can be effected by employing a mixture of chloride of lead of the specific gravity of 5 and chloride of zinc of specific gravity of 2.5, which fuses at a low temperature. A suitable mixture of the two chlorides can be fused in an elongated crucible and kept fluid at the lowest possible temperature; the heavy portion of the rock is then introduced and thoroughly incorporated with the liquid. After allowing a sufficient time for the rock materials to range themselves according to gravity, the heat is removed and the crucible is allowed to cool; by taking successive layers of the contents of the crucible and dissolving away the mixed chlorides a satisfactory separation can frequently be made.

The utility and the faults of the method will both be clearly recognized. As an example of its faults it may be mentioned that in the pulverization of the complex crystalline rock, no matter to what degree the pulverization be carried, some of the grains will of necessity be complex and float in the fluid in positions where they are not desired. The control, however, is kept upon the material intended for analysis by microscopic examination; and, although the full weight of the objection above mentioned is recognized, still results can be accomplished by the use of this solution which have been heretofore impossible.

There are cases of considerable importance in which the application of this method is especially satisfactory; for example, it is sometimes desired to separate from a rock one of its constituents which is either much heavier or much lighter than the other, and this can be done with the greatest ease. There are, on the other hand, cases in which the method is entirely inapplicable on account of the manifest impossibility of freeing the mineral constituents from one another, or of separating them from one another, on account of the presence of minerals with nearly identical specific gravities; and in general the perfection or the imperfection of the separations that may be effected

and the consequent value of the results can be determined by a consideration of the special cases as regards the minerals involved and the method of their combination, and by microscopic examinations of the sections and the separated products.

In the examination of the group of carbonates the chemical method has been almost exclusively used, and the classification is based upon this examination.

Of course the most satisfactory method would have been to make a quantitative analysis of each one, but with the large number to examine this was manifestly impossible, and a careful qualitative analysis giving an approximation to the relative amounts of the principal constituents was all that could be attempted. The method adopted was as follows: Measured portions of the powdered samples were introduced into test-tubes of the same size, and cold dilute hydrochloric acid was added, and the evolution of carbonic acid noted; the solutions were then boiled, allowed to settle, and the amount and character of the insoluble portion were carefully noted, and, when necessary, further examined. In a large majority of cases, however, the solutions were immediately precipitated by ammonia, and the amount and character of this precipitate noted; the solutions were then diluted with boiling water, measured portions of solution of oxalate of ammonia added to each, and the whole thoroughly shaken; they were then allowed to stand over night; the next morning the amount of precipitate of oxalate of lime was noted in each case; the solutions were then decanted into a second set of test-tubes, measured portions of phosphate of soda solution were added, and the whole rendered strongly alkaline by ammonia. After a thorough shaking they were allowed to stand twenty-four hours, when the amount of precipitate was noted.

In this way a tolerably fair idea of the approximate composition of the samples was obtained, and while there must necessarily be more or less variation in individual cases, it is thought as a whole the names adopted are just. In this connection it may be well to state that this work presupposes that the samples sent are truly representative samples as judged by the collectors, and that variations in separate quarries represented by specimens from one quarry, or even variations in the different parts of the same quarry, cannot justly be taken into consideration; and it must be borne in mind, too, that no classification of material so variable in composition as the carbonates can be rigidly exact. The system of names adopted is as follows:

Limestone, consisting of carbonate of lime.

Magnesian limestone, consisting of carbonate of lime with from 5 to 30 per cent. of carbonate of magnesia.

Calcareous dolomites, consisting of two portions, one of which is a true dolomite and the other effervescing freely in cold dilute hydrochloric acid.

Dolomite, consisting of carbonate of lime and magnesia, containing 30 per cent. or more of carbonate of magnesia.

Beside these, the following qualifying terms have been used:

Arenaceous, containing sand.

Argillaceous, containing clay.

Bituminous, containing carbonaceous matter.

CHAPTER IV.—QUARRY METHODS.

BY F. W. SPERR.

For quarrying each different class of rocks there is a characteristic method employed, which is, however, ied in detail in nearly every different quarry. The minor details of quarry methods are as various as the erences existing in the textures, structures, and modes of occurrence of the rocks quarried.

The methods of draining the quarries and the methods of ordinary rock drilling are the same as those employed nines.

Machines in great number and variety for quarrying and dressing stones have been invented, but reference nade in this report only to such machines as are actually in use.

THE USE OF EXPLOSIVES.

All building-stone deposits have usually a certain amount of covering, consisting either of a portion of the same posit which has been disintegrated by atmospheric influences or of a later deposit. This covering is called the ap-rock" or "stripping"; the solid portions of it are broken up by blasting, and the whole is carted out of the way.

After a sufficient space is stripped, the next step necessary, when the quarry rock does not stand out in cliffs escarpments, is to excavate a narrow space on one side for a quarry face, either by blasting or by some of the thods of channeling described herein.

For the purposes of stripping the cap-rock and "forcing" the face, the result to be attained by the use of plosives is the breaking up of the rock so that it may be taken out of the way with as little expense as possible, gardless of the shapes into which the pieces are broken; for this no special skill is required in the manipulation the blast. Much, however, depends upon how the blast is made for quarrying the stone which is to be used. In e first place, the directions in which a blast will break any kind of rock from the drill-hole are but two or three, d sometimes four, unless the explosive be too quick and forcible in its action. The limited number of directions which the rock is most liable to break is determined by the structure of the rock and the shape of the drill-hole. uick-acting explosives, like dynamite, have a tendency to shatter the stone and break it in many directions, the kture being affected by the sudden explosion in the same manner as by the blow of a hammer. Coarse gunpowder generally preferred for quarrying stone; and this is seldom used further than for detaching large masses, which e subsequently worked up by means of wedges. The drill-holes are put down to the depth to which the rock is to split, and the requisite amount of powder is put in, covered with sand, and fired by means of a fuse. Sometimes umerous charges in a line of drill-holes are fired simultaneously by means of electricity.

Light charges of powder lightly covered with sand are better than heavy charges tamped in tight; and perience goes to show that better work is done by repeated light blasts in the same hole than by one heavy blast. y means of light charges often repeated a mass of rock may be detached without breaking up, which would be adly shattered by a single charge strong enough to detach the block.

At Conshohocken, Pennsylvania, a peculiarly stratified limestone, containing some schistose seams or layers, is uarried by first detaching large masses by repeated charges of powder. The rift or stratification is nearly vertical. oles are drilled for the blast, sometimes 20 feet or more in depth, as nearly as possible with the rift. After the ock is quite well opened (or "drawn") by the light charges, a charge of several kegs of powder is put in to throw it the mass, sometimes containing several thousand cubic feet. If a heavy charge is at first put in, the break, stead of taking the direction of the rift, is liable to go in three directions, as determined by the triangular shape f the bottom of the hole. It will always be observed that a hole when drilled with a steel-bitted percussion drill never round at the bottom; and when the hand-drill is used the hole is always triangular at the bottom, and blast in such a hole breaks the rock in three directions. The influence of the shape of the hole upon the effects f the blast was observed in the brownstone (sandstone) quarries of Portland, Connecticut, many years ago; and ne following devices for controlling the blast have long been in use there:

Deep holes, from 10 to 12 inches in diameter, are drilled by machinery, and the charges of powder are made to ave definite shapes by being put in canisters, which are placed in the drill-holes and tamped in with sand, so that he effects of the blast are the same as though the holes were drilled of the shape of the canisters. To make one reak across in a straight line the charge is made to have a horizontal cross-section bounded by two minor segments f a circle, the canister being made of two pieces of sheet tin, with the edges unsoldered and the ends made of aper or cloth. The plane passing through the edges of the canister is that in which the rock is broken by the last.

Two breaks may be made with a single blast in planes crossing at right angles to each other by using a canister which is a square prism.

The holes are drilled from 10 to 20 feet or more in depth. Sometimes two holes are drilled close together, so that the core between may be chipped out; and canisters 2 feet across from edge to edge are used with tremendous effect.

In many of the large quarries of sandstone in this country explosives are not used for quarrying the stone; but in nearly all the smaller quarries gunpowder is used. The influence of the shape of the drill-hole upon the effects of the blast does not seem to be generally known, and a great waste of material necessarily follows.

Granitic rocks are less liable to be injured by the use of explosives than the softer rocks; but even for quarrying granite powder is used no further than for detaching large blocks, except in rare instances. In every quarry of this class of stones there is found to be a certain direction in which the stone splits more easily than in others, even when the structure is most decidedly granitic, though quarries are often worked a long time before the cleavage plane is discovered. When the cleavage is not very marked it is called "the grain" by quarrymen; and when it is more decided, as in gneissoid and schistose rock, it is called the "rift". In rifted rock there is a secondary cleavage plane at right angles to the rift, and this is called "the grain". "Across the grain" is in a plane at right angles to the grain and rift, or to the two cleavage planes. When the rift is horizontal, or nearly so, it is said to be "with the lift".

In every different locality the structure of the rock must be carefully studied with a view to take advantage of the cleavage planes and natural joints in the management of the blast. There must be at least one free end to allow the block to move out toward the face; and the ends are often cut off by natural joints called "end joints". Horizontal joints, called "bottom joints", occur in most cases.

To detach a block a bore-hole is put down to the first bottom joint, and light charges of powder, usually of about four pounds each, are repeatedly put in and fired to "draw the break"; and after the rock is well opened a heavy charge of one or more kegs of powder is made to move out the mass. In this manner blocks from 15 to 20 feet in width and 100 feet or more in length may be detached. When the rift is vertical, as in the quarries at Monson, Massachusetts, a blast put in a simple bore-hole will break the rock with the rift, in one direction to the free end, and in the opposite direction to an end joint; or, if there be no end joint in that direction, the break turns out more or less abruptly across the rift to the face.

When the vertical bore-holes for the blast cross the rift the shape of the hole controls the directions of the break as in other classes of rock. A hole with an elliptical, horizontal cross-section will always insure a single straight break in a plane passing through the long diameter of this cross-section. These holes are made by drilling two holes as close to each other as practicable, and then chipping out the core with a chisel-bar. They are called "lewis-holes" from their resemblance in shape to the lewis-hole made in the top of the dressed blocks of stone to receive the clamp or lewis by which the blocks are lifted.

It sometimes happens that there are no bottom joints, except at great intervals. The method adopted for detaching the blocks in a case of this kind at the Penryn quarries, California, has been described to me by Mr. William Foster, who was employed as special agent of the Tenth Census to collect the building-stone statistics in the western states and territories. An undercut is blasted out along the first bottom joint and from one end joint to another; a lewis-hole or line of lewis-holes 20 feet in depth is put down from 15 to 20 feet from the face, and the blast breaks out the block between the end joints and down to the bottom joint, which is about 80 feet from the top. Blasts put into rock in this manner act more nearly like wedges than the ordinary blasts, and are capable of splitting off blocks containing 100,000 cubic feet of stone.

The trap-rock quarried so largely at Weehawken, New Jersey, for paving blocks is blasted out without regard to the shape or the size of the blocks obtained; the main object of the blast being to throw out and break up as much rock as possible. Heavy charges heavily tamped with sand are the most effectual for this kind of work. The detached blocks are drilled again and blasted with smaller charges till they are reduced to about the size of 2 by 3 feet by 1 foot, and these are broken into paving blocks by means of hammers. Sometimes a groove is "chased" across a block and a fire is built on the line of the groove to break open the block.

Such limestones as the massive oolitic limestones of Indiana and the soft limestones of Kansas are quarried by channeling and wedging; but most limestones are used for rubble, cellar walls, and ordinary dimension work, for which cheapness is the first prerequisite; and therefore the stones are quarried by blasting. Undoubtedly the cheapest method of quarrying small blocks is by the use of explosives, unless the rock is quite soft; and for this reason explosives are most generally used in the newest portions of the country for quarrying building stones. In the case of limestones the badly shattered portions of the rock are usually burned for lime. Thin-bedded limestones are often quarried by raising the sheets with iron or steel bars. In a new country, if there are loose bowlders upon the surface, these furnish the first building stones used, and are usually broken up with powder or with fire. Such was the condition of quarrying at Quincy, Massachusetts, one hundred and fifty or two hundred years ago, where are now some of the largest and most systematically worked quarries in the country. The method of breaking up bowlders by heating them with fire, and then striking them with heavy hammers or pouring water upon them, is perhaps the rudest and cheapest, and is certainly the most disastrous in its effect upon the quality of the stone.

THE QUARRYING OF STONE BY CHANNELING AND WEDGING.

By channeling is meant the process of cutting long narrow channels in rock to free the sides of large blocks of stone. The method of cutting the channel depends upon the nature of the rock. Marble was, until quite recently, channeled by hand, using a long steel bar, chisel-shaped at one end, cutting a channel about 1½ inches wide. This method is still in use to some extent, but it has been largely superseded by the use of machinery.

Quite a large number of machines for quarrying stone have been patented in this country, but only the Wardwell channeling-machine and the Sullivan diamond channeling-machine have as yet proved successful. Each of these machines has its special merits for certain kinds of work, and both of them are often used in the same quarry for different portions of the work. In marble, these machines taken together are capable of doing all kinds of channeling required.

The machine illustrated in the cut, Plate VII, is a double-gang Wardwell channeler, it being the one mostly in use and adopted for all kinds of stone, except grit sandstone, and is represented mounted upon a steel-rail track on the bed of a quarry. The frame which supports the boiler, engine, and other machinery consists of one piece of forged iron weighing nearly a ton, thus furnishing great durability. The engine is of six horse-power, its shaft carrying a balance-wheel on each end, to which is attached an adjustable wrist-pin plate. The levers which operate the gangs of cutters are pivoted at their rear ends to an extension of the frame. The free end of the upper lever passes through a sliding stirrup or swivel attached to the wrist-pin plate (not shown), giving an up-and-down motion to that end of the lever as the balance-wheel revolves. The free end of the lower lever passes through a mortise in the back side of the lower clamp. Motion is communicated from the upper to the lower lever by means of clasps, between which the rubber springs are placed, as shown in the cut. The free end of the lower lever actuates the gang of cutters, which consists of five bars of steel sharpened at their lower ends and clamped together by head and foot clamps, the whole sliding freely on the standard. Of the five cutters, two have diagonal cutting edges and three have their edges transverse. The object of the diagonal cutting edges is to insure an even bottom to the channel. The center cutter extends the lowest, and they all together form a stepped arrangement each way from the center; thus when the machine is moving forward the center and two forward cutters operate upon the stone, and when moving in the opposite direction the other two with the center one perform the work. These bars of steel are from 7 to 14 feet in length, according to the depth of the channel to be cut. The upper ends of these bars are grooved to match corresponding grooves in the head clamp, for the purpose of preventing displacement of the cutters. The worm on the main shaft actuates the worm-gear upon the feed-shaft. The feed-shaft extends diagonally downward to the rear of the machine, where it terminates in a bevel pinion; upon the rear axle are placed two bevel gears, and, by means of the lever shown, either of these bevel gears may be thrown into action with the pinion. The motion thus communicated serves to turn the axle either forward or backward, according to which wheel engages the pinion. When the machine is required to be stationary the gears are so placed that neither engages the pinion. The short lever locks the gears in any of the required positions. The windlasses on each side of the machine are for raising the gangs of cutters out of the channels. The opposite side of the machine is exactly the same as the one already described. Channels are usually cut from 4 to 6 feet deep and 1⅛ inches wide, except that in sandstone they are cut 2 inches wide; and they can be cut within 3 inches of a vertical wall.

It requires three men to operate the double-gang machine; from 300 to 400 pounds of coal are used per day, and the cost of operating is from $6 to $9 per day. This machine is calculated to cut from 75 to 150 square feet of channel in marble and limestone, and from 150 to 200 square feet in sandstone, per day, doing the work of fifty men.

One form of the Sullivan diamond channeling-machine is illustrated on Plate VIII. The principle here involved is the communication of rotary and feed motions to drill-rods on spindles; and the special advantages held by the machine are that it is capable of cutting channels vertically or at any angle of inclination, and, with the machine detached from the boiler, that channels may be cut under an overhanging wall. At one end of the drill-rod is the drill-head, 1¾ inches in diameter, armed with carbon or black-diamond points, and supplied with small apertures or outlets for water, which is forced through the spindle and drill-head. The pump which supplies the boiler also supplies the drills, the feed to the different parts being regulated by stop-cocks. The jets of water wash out the borings and keep the drill-head from heating. The drill-rods are made of varying lengths adapted to make any required depth of channel to 9½ feet.

A continuous open channel is cut in the rock by two operations. By the first, a series of holes is drilled, distant from each other a little less than the diameter of the drill-head. The rock partitions thus left between the holes are drilled out by the second operation.

Holes are bored by the first operation, uniformity of distance between them being secured by a guide, and a short plain sleeve is used on the drill-rod just above the boring-head. For the second operation this sleeve is replaced by a double guide, whereby the action of the boring-head is confined to the rock partition between the holes previously bored.

In the above figure the machine is supposed to move back and forth so as to cut a separate channel with each spindle, while on Plate VIII the machine is so mounted as to move sidewise and cut a single channel with the two spindles.

For cutting vertical channels the Wardwell machine is considered the most economical, but for cutting oblique channels the Sullivan machine is used. When the excavation is carried with the inclination of the strata, as

illustrated on Plate II, the Sullivan machine is utilized to cut the oblique channel and portions of the vertical channels next to the overhanging wall. In such quarries the blocks do not come out rectangular in shape, and there is some waste of material, which becomes greater as the inclination of the strata becomes less. When the dip is not less than 50° the advantages of a horizontal quarry floor are sufficient to compensate for this loss of material; but when the dip is less than from 45° to 50° the channels are cut perpendicular to the plane of stratification with the Sullivan machine, and the blocks are quarried out rectangular in shape. A quarry with an inclined floor is illustrated on Plate IV.

After the requisite channel cuts are made about a block of stone it is necessary to undercut the block in order to release it. This is accomplished by drilling a series of holes about 8 inches apart along the bottom, and then splitting the block from its bed by means of wedges.

The work of drilling the holes is by quarrymen called "gadding". In most of the large marble quarries of this country this is accomplished by means of a machine, using the diamond spindle drill on the same principle as the Sullivan channeling-machine, and called a "gadding-machine". The holes are drilled to varying depths, depending upon the width of the block to be raised. In many quarries the blocks are made from 4 to 6 feet in width, and the bottom holes are gadded from 18 to 36 inches deep. The split is made with the common plug-and-feather wedges, which consist of two half-round pieces of iron (called feathers), tapering to a point at one end, and a wedge-shaped piece of steel called the plug. The length of the plugs is a little greater than the depth of the drill-holes in which they are to be used. The feathers are a little shorter than the plugs, and when two of them are placed with their flat sides together the large end just fits into the drill-hole, in which they are so placed that the points are left protruding slightly and the large end nearly reaching the bottom of the hole. The plugs are inserted between the points of the feathers, and when they are all thus set they are driven simultaneously till the block splits from its bed. A few of the wedges are then overdriven to loosen the others, in order that they may be withdrawn and used elsewhere.

In the Cockeysville marble quarries, near Baltimore, Maryland, the blocks are channeled from 8 to 15 feet in width by using one side of the Wardwell machine and cutting single instead of double channels. To raise these blocks the bottom holes are drilled 2, 4, and 6 feet in depth, and a wooden plug about 2 inches in length is put into the bottom of each hole. The wedges or plugs are round bars of steel of a diameter a little less than that of the drill-holes, and their lengths exceed the depth of the holes in which they are to be used by about 3 inches. The portion of the bar which is wedge-shaped is about 8 inches in length, and to this the feathers, of about the same length, are tied, the large end projecting a little beyond the end of the wedge. The feathers and wedges thus tied together are placed in the holes against the wooden plugs, which allow the wedges to be driven through and beyond the feathers if necessary. A block 8 feet thick, 15 feet wide, and of any length may thus be raised. The gadding-machine is further used for gadding the holes for splitting the large blocks into sizes suitable for handling. This operation is illustrated on Plate II. When the machine is adjusted for work it is braced by driving the pointed legs near the trunk-wheels hard upon the quarry floor. The boring apparatus is attached by a swivel to a perpendicular guide-bar, which is secured to the boiler and forms the main support of the machine. The boring apparatus may be raised and lowered upon the guide-bar and turned upon the swivel so as to bore in any direction within the plane of the swivel-plate.

Steel-bitted machines have not yet been improved so as to cut or gad the holes along the bottom of the blocks sufficiently close to the floor, but for gadding the side holes such machines are used to good advantage. They are not capable of doing as much work as the diamond machines, but the high price of the carbon points places the latter machines at a disadvantage.

In Rutland marble an ordinary day's work for one man is to channel by hand 3 square feet; to gad by hand, in depth, 12 feet. An ordinary day's work for the Wardwell channeler is 50 square feet; an ordinary day's work for the diamond channeler is 60 square feet, for the gadder 180 feet, and for the steel-bitted machine (*a*) 100 feet.

The above figures do not indicate the capacities of the machines under wholly favorable circumstances, but only their usual work with the usual contingent delays.

Guides cannot be attached to percussion drills so as to confine the action of the tool to a narrow rock partition between the holes, as is done with the diamond drill; though in some granite quarries continuous open channels are cut with percussion drills by first drilling a series of holes, with a 2- or 2½-inch drill-bit, about three-quarters of an inch apart, which is as close as they can be cut without running into each other and wedging the tool. The cores are then chipped out by replacing the drill-bit by a tool of the same diameter, having a circular cutting rim and a diametrical cutting edge. The tendency to run off the core is partly obviated by the shape of the tool and partly by placing in the holes, on each side of the core, strips of hard wood of a thickness that will just allow the tool to go down between them. This seems to be the only practical method yet devised for channeling granite, though very little of this kind of work is done for the reason that the operation is very expensive on account of the hardness of the rock and because granite sustains less injury than the softer rocks by the use of explosives, which, therefore, may be employed for detaching large blocks without serious objection.

a The Ingersol rock-drill is the steel-bitted machine used for gadding in the Rutland quarries. The Rand drill is used in some other marble quarries.

The work of breaking the large blocks of granite into smaller sizes is accomplished altogether by means of plug-and-feather wedges. To break the largest blocks of gneiss or gneissoid granite with the rift plug-holes from 4 to 6 inches deep and 8 inches apart are sufficient; but to break such blocks across the rift, or to split blocks having a truly granitic structure, about every third or fourth hole is drilled to a depth depending upon the thickness of the block and firmness of the texture, by which a more perfect fracture is insured. These deep holes are drilled with a striking-drill operated by three men, one holding and turning the tool and two men striking with heavy hammers or sledges. The other holes are drilled with small hand-drills. The feathers or half-rounds and plugs or wedges are smaller than those used in the softer kinds of stone. The 4-inch plug-holes, about three-quarters of an inch in diameter, and wedges and half-rounds 3 inches in length, are used for splitting blocks of considerable size. The wedges draw more perfectly if they are oiled before they are driven.

In most of the large sandstone quarries, except those in the hardest kind of sand-rock, channel cuts are made to some extent. Usually in the softer sandstones channels about 18 inches in width and from 4 to 6 feet and sometimes even 15 or 20 feet in depth are dug around the sides of the quarry with sharp steel picks, and the loosened material is thrown out with shovels. Other similar channels are often made, especially in large quarries, to cut off a certain portion of rock. Sometimes these channels are cut only on three sides of a quarry, to give a face and free ends. In the brownstone quarries of Portland, Connecticut, the channel necessary for a quarry face is made and the ends are broken off by blasting, as already described.

Having a face and free ends in a bedded, stratified, or unstratified sand-rock, a groove parallel to the face is cut across the top. The distance of this groove from the face may depend somewhat upon the thickness of the bed. A row of wedges is set in this groove and simultaneously driven till the rock breaks open. A long rectangular block is thus detached, and afterward cut into smaller sizes by means of wedges. For splitting small blocks, instead of the continuous groove a short groove is cut for each wedge.

When wedges alone are not sufficient to split off a block, holes are drilled at intervals and to depths as may be required, and plugs and feathers are used in connection with the wedges. When the rock is stratified, but not bedded, a row of wedges with or without plugs and feathers, as the case may require, is driven along the bottom to raise the block at the same time that the top row of wedges is driven. When the rock is neither bedded nor stratified it is best to channel off blocks of such width that they can be raised by wedging along the bottom.

The process of quarrying sandstone by the methods most commonly employed is illustrated on Plate V.

The Wardwell channeling-machine has recently come into considerable use for quarrying sandstone. The cutting-bars for this purpose are made to cut a channel 2 inches wide and 4 feet deep, and are sharpened at both ends so that they may be reversed when one end is dull. These cutting-bars need to be sharpened more frequently in sandstone than in marble.

The work of channeling with picks and shovels is very injurious to the health of the workmen on account of the sand-dust inhaled into the lungs.

In the North River blue-stone quarries the rock is bedded and so jointed that no artificial channels are necessary for freeing the sides of large blocks. A quarry face is secured by excavating the rock between two parallel joints, which may usually be found but a few feet apart. This is called "forcing", and is done by drilling holes and blasting out the rock with powder.

The blocks are raised by driving wedges into the bed joints, unless the beds are too thick, in which case a row of plug-holes for splitting the block is put in along a line of stratification. The lines of stratification are called "reeds", and mark the planes along which the stone can be split up into thin slabs; they usually occur at intervals of from 2 to 6 inches, though sometimes at greater intervals, when the stone cannot be split up into flagging, but is suitable for dimension work.

After the blocks are raised from their beds they are broken across by means of plug-holes, about 8 inches apart, drilled across the top. Small point-holes are also made between the plug-holes. The quarryman first drives the plugs tight and then drives the point into one point-hole after another all along the line, the object of this being to assist the wedges and to secure a straight fracture. The wedges and point are driven alternately till the stone breaks. Small blocks can usually be split along the planes of stratification by simply driving the point in along a reed.

Where the rock lies in thin beds or sheets the blocks are pried up with long steel bars. If slabs of less thickness than that of the natural beds are desired the blocks are split before they are broken across.

A peculiar method of reducing large blocks by means of wedges is employed in the limestone quarries at Conshohocken, Pennsylvania. This limestone is magnesian in composition, has a rifted or foliated structure, is capable of withstanding a great transverse strain, and works in a manner peculiar to itself. The large blocks are detached by blasting, as described on page 33, and are made to lie with the rift horizontal; lines of holes are drilled from the top as nearly through the blocks as possible without chipping out a piece at the bottom, and from one side horizontal rows of holes are gadded to a depth of from 1 foot to 3 feet, depending upon the size of the blocks. In this manner all the drill-holes necessary for reducing a large block with plug-and-feather wedges to blocks of required dimensions are drilled; the holes from the top crossing the rift (or "split") are drilled about 8 inches apart, and those from the side several feet apart. The blocks are first split with the rift and then across it.

In the soft-limestone quarries at Winfield, Kansas, a common auger, not pointed, is used for boring holes for the plug-and-feather wedges. A 1½-inch auger bores 6 inches in depth per minute.

In soap-stone quarries the blocks are at once cut up by the channels into sizes suitable for handling, wedges being used for cutting off the bottom only. A wedge fracture in soap-stone is somewhat ragged. The channel is cut to its full depth at one end, from which it is then cut back by paring off successive increments from top to bottom with a long steel bar having the cutting end beveled from one side. These bars are called chisel-bars or channeling-bars.

As all the softer rocks are more or less shattered when quarried by the use of explosives, the process of channeling has largely superseded that of blasting in this country for quarrying all kinds of rocks for building purposes, except slate and granitic rocks. It is the improved methods employed in quarrying that give the American marbles a claim to superiority over the Italian or Carrara marble.

At Carrara, Italy, the marble stands in immense cliffs on the sides of steep and rough mountains, and masses weighing many tons are blasted off and allowed to fall sometimes from 400 to 500 feet before striking. The jar sustained, both by the blast and by the fall, injures the texture of the stone, and causes, what is noticed everywhere in our cemeteries, the cracking of Italian marble after a few years' exposure. (*a*)

The worst feature attending the use of explosives for quarrying stone is that incipient cracks are produced, which do not open while the stone is being handled and dressed. Costly buildings are often marred and sometimes ruined by the cracking of some of the stones used in their construction. This disintegration is usually attributed to the non-resistance of the material to atmospheric influences, but it is more often due to the incipient cracks started in the quarry.

THE WORKING OF SLATE.

As slate is distinct in structure from all other rocks, so is the working of it essentially different. A few of the technical terms used by slate-workers it will be necessary to explain before proceeding with the discussion of the manner of working.

The SPLIT is the cleavage.

The GRAIN is a secondary cleavage at right angles to the split, and usually to a regular system of natural joints.

FLINT is a term applied to hard clay stones, quartz, or any hard rock which may be interstratified with the slate rock or occur in veins or concretions.

A QUARRY is where good slate rock exists developed or undeveloped.

STOCK is the useful rock taken out of a quarry.

The BUTT of a quarry is where the overlying rock comes in contact with an inclined stratum of slate rock.

The NOSE of a quarry is the line of contact between the underlying rock and an inclined stratum of slate rock.

END JOINTS are vertical joints running back from and perpendicular to the quarry face.

BACK JOINTS run parallel to the quarry face.

BOTTOM JOINTS are horizontal or nearly so.

The ENDS of a block are the surfaces which cross the split and are perpendicular to the grain.

The SIDES of a block are the surfaces which cross the split and are parallel with the grain.

To SCULP is to split a block with the grain by driving a chisel into a notch made in the end of the block.

To PLUG is to drill a hole near the middle of and through a block, and drive in a plug-and-feather wedge or put in a blast of powder to split the block with the grain.

To BREAK ACROSS is to break a block in a plane perpendicular to the grain and split by cutting a notch in one edge and then supporting the block at each end on this edge and striking with a heavy wooden mallet on the other edge and directly opposite the notch, or the block may be supported near the notch and struck near the ends on the opposite edge.

To SPLIT is to separate the slate along the cleavage planes.

In this country the slate is all taken out of open quarries, and the successive steps to be taken in quarrying slate are similar to those taken in quarrying other kinds of rock: The weathered material near the surface is removed; a quarry face is made by excavating a narrow channel down into the solid rock; large blocks are detached, and these are worked up into sizes suitable for handling, hoisted out of the quarry, and worked up by different processes for different uses.

The method of working a quarry depends chiefly upon the inclination of the cleavage plane and upon the direction of the grain; a quarry should always, however, be worked from the butt toward the nose.

In the Maine slate region the cleavage or split is nearly vertical and corresponds very nearly with the stratification. The grain in some of the quarries is vertical, and in others it is horizontal. The slate veins or strata occur alternately with flint veins, the former varying in thickness from 2 to 10 feet, the latter being less, but

a Mr. Edwin Greble, a marble dealer of Philadelphia, says that when he visited the Carrara marble quarries the scene reminded him of the bombardment of a fort; that he has examined blocks of marble in some of the old ruins of Rome and found that the stone was somewhat worn but not cracked, but that scarcely a block of marble quarried since the introduction of gunpowder can be found free from cracks.

also variable in thickness. The quarries are worked from the butt, a slate vein is excavated for the face, and the flint vein on the upper side is allowed to stand for a wall. The face is excavated from 20 to 30 feet in depth and about the same in length before any stock is taken out. The flint vein on the lower side is then blasted out with powder and the next slate vein will usually be found cut up into blocks of greater or less size by end joints and bottom joints, and may be detached by driving in wedges at the top. Sometimes a hole is drilled in from the top so as to strike the next lower flint vein at a depth of 8 or 10 feet, light blasts are made to loosen the back joints, which in this case are joints along the cleavage, and the blocks are pried off with bars. Whenever no bottom joint is available at or near the floor of the quarry, an undercut must be made, and this is called blasting off the roots. When the grain is horizontal the excavation is carried down in steps, each from 20 to 40 feet or more in height. When the grain is vertical the step system is not uniformly adopted; but each underlying bed or vein is allowed to stand until a bottom joint is reached, which is seldom at any great depth; and, if the end joints are so far apart that the rock between them cannot be detached at once from the top, a space is blasted out at one end in the same manner as the roots are blasted off when the grain is horizontal; a hole is drilled half way between the top and bottom and from 10 to 20 feet from the free end, and a blast put in this hole splits the block from top to bottom. For splitting (or "plugging") off blocks in this manner the drill-hole must go through to a back joint; though such a joint may be made at any depth by putting a small charge of powder in the bottom of the hole and tamping it in tightly with sand, and the effect of the blast will be to cleave the rock along the cleavage plane passing through the bottom of the hole. If the hole is filled nearly full with powder and covered lightly with sand, the effect of the blast will be to make a clean break along the grain from top to bottom without shattering the rock; but if the powder is made to fill but half the hole and is heavily tamped, the effect of the blast is to break up and shatter the rock.

Experienced slate quarrymen show unusual sagacity by the manner in which they take advantage of the position of the rock as determined by the cleavage, grain, and natural joints, and by manipulating the blast so that it will produce just the effects desired. In the Vermont slate region the cleavage dips at an angle of about 45°, and, if the quarries are opened in the butt, one face cut will be sufficient for taking out all the rock which can be obtained without carrying the excavation under the overlying strata; but small quarries are often opened near the nose, where there is but a small amount of slate above the underlying strata, and when this is taken out a new face cut must be started from the top. There are a great number of small quarries opened in this region without regard to future workings and without any idea apparently of developing large operations. The débris is thrown on good slate rock, and the progress of large quarries has already in some instances been stopped by these piles of débris.

In the different Pennsylvania slate quarries may be found every different inclination of cleavage, direction of grain, and manner of jointing, but the general principles of quarrying are the same in all; that is, a face and free end are first made, after which large blocks are wedged off, pried off with levers, or plugged off with powder, and these blocks are plugged, split, and broken across till they are reduced to such sizes that they may be hoisted out of the quarry with derricks. If a block is small and less than one foot in thickness, it can be split by driving the sculp or paring-chisel into the edge of the block along a cleavage line; if the block is large, and it is necessary to use wedges for splitting, a series of wedge-shaped holes is cut along a cleavage line with the paring-chisel, two thin strips of iron are placed in each hole, and the wedges are placed between the strips of iron and driven.

Slate is used for a great variety of purposes, and if the blocks are to be worked up into roofing slate they are taken from the quarry to the splitters' shanties on small cars run on rail tracks between the quarry and the shanties. At each shanty are a splitter and two assistants. The first assistant takes the block upon its arrival and reduces it to pieces of about 2 inches in thickness and of a length and breadth a little greater than those of the slates to be made. The splitter cleaves these pieces into slates with the splitting-chisel. The second assistant trims the slates with irregular edges into rectangular shape and to definite sizes.

The process of sculping, which is carried out by the first assistant, is as follows: A notch is cut in one end of the block with the sculping chisel, and the edge of the notch is trimmed out with the gouge to a smooth groove extending across the end of the block and perpendicular to the upper and lower surfaces; the sculping chisel is set into this groove and driven with a mallet, and thereupon a cleft soon starts, which by skillful manipulation is guided directly across the block. The upper surface of the block is wet with water so that the crack may be more readily seen. If the block were perfectly uniform in shape and texture, and the blows upon the sculp directed straight with the grain, the crack would follow the grain in a straight line across the block. Almost invariably, however, the crack will deviate to the right or to the left, and must be brought back by directing the blow on the sculp in the direction in which it is desired to turn the break, or by striking with a heavy mallet against the right-hand side of the notch, if the break is to be turned in that direction, and *vice versa*. Some slate rock can be sculped across the grain, but most of it has to be broken across the grain.

The splitter uses a broad thin chisel for his work. He always splits the piece of slate through the middle, and continues to divide the pieces into equal halves until they are reduced to the required thinness. The edges of the blocks must be kept moist from the time the rock is taken from the quarry until it is split up, and when it is necessary to allow the blocks to lie a day or more some precautions must be taken to keep the edges moist. In some quarries the blocks split best from the side and in others from the end, and in some qualities of slate the splitting chisel may be driven in its whole length at once without danger of breaking the slate, while in others it is necessary to lead the split by driving the chisel slightly all around the edges of the block before driving it in at any one point.

There are many other little peculiarities which need to be watched by the splitter, and almost every different quarry presents some characteristic features which modify the working of the slate.

To trim slate by hand a straight-edged strip of iron or steel is fastened horizontally on one of the upper edges of a rectangular block about 18 inches in height; the trimmer lays the slate upon the block, allowing one of the irregular edges to project over the iron plate, and cutting it off by a chopping stroke with a heavy knife; in this manner he trims two edges at right angles to each other and then marks out the other two edges with a measuring stick before trimming them. The measuring stick has a nail through one end and notches or steps toward the other end at distances from the point of the nail corresponding with the lengths and breadths of slates made.

The machine for trimming slates consists of a horizontal steel plate, with a beveled edge upward, past which a heavy curved knife is made to pass by being revolved on an axle like that of an ordinary straw-cutter, or by being hung on a hinge and pulled up by a spring and down by a treadle operated by the trimmer. Projecting at right angles from the plate, a little upward and toward the operator, is an iron arm upon which there are steps at distances from the knife-edge corresponding with the lengths and breadths of slates made, and which thus serves as a guide for making the slates both rectangular and of definite sizes. The trimmed slates are set on end outside of the shanties, each different size in a row or pile by itself. Each square, which is the number of slates that will cover 100 square feet of roof, is set off in the piles by allowing one slate to project over the sides of the others.

For many purposes slate is worked up principally by machinery. The blocks are taken from the quarries to the slate-mills and there split into slabs about 2 inches in thickness and sawed into the required sizes with circular saws. If thinner slabs are required the sawed pieces are split. The sawed slabs are planed on one side or on both sides, as may be required, with a planing-machine like the machines used for planing iron. The planer-chisels vary in width from 2 to 6 inches, according to the softness of the slate. The planed slabs are laid on the rubbing-bed and rubbed with sand put on with water. The rubbing-bed is a flat, circular piece of cast-iron, from 8 to 10 feet in diameter, revolving horizontally on a shaft. The sand is put in a trough above the rubbing-bed. One end of the trough is a little lower than the other, and is near the shaft above the center of the bed, so that a small stream of water entering the upper end of the trough washes the sand slowly upon the bed and near its center. The sand gradually works to the outer edge of the bed, and is finally washed off as silt. The slabs of slates are prevented from being carried around with the bed by stationary arms or timbers extending across the bed, and within about one-quarter of an inch of its surface.

Slate does not receive a gloss polish, but if a finer surface is desired than that which can be given by the rubbing-bed it is rubbed by hand with fine sand or emery. Slates for billiard-table tops are jointed after being rubbed, the slabs being fastened to a table moving back and forth before a large revolving grindstone.

For mantels, table-tops, etc., and all kinds of marbleized work, the softer varieties of slate are preferred; they can be sawed with both circular and band saws, and are easily planed and rubbed. For tiling and other uses in which the slate is subjected to considerable wear the harder varieties are employed; the slate from the quarries at Chapmanville, Pennsylvania, is especially applicable for these purposes, and has to be sawed with diamond band-saws and diamond reciprocating saws. These saws are made by setting in teeth of black diamond or carbon points to do the cutting. In the quarries at Chapmanville steel drills are used, but at the mills all the drilling is done with diamond-set tools.

School slates are manufactured quite extensively at some of the quarries in the vicinity of Slatington, Pennsylvania. A large part of the work is done by machinery, and the improvements which have been made in this line are important. The slates are quarried and split the same as for roofing.

The following table shows the different steps taken in finishing the slates after they are split, and the number of persons required for one set of machinery capable of turning out about 20,000 slates per day:

Operations.	Number of men.	Number of boys.	Number of women.
TRIMMING THE SLATES.			
Marking into rectangles and sawing with small circular saws	2		
Shaving the surfaces smooth with draw-knives	6		
FRAMING THE SLATES.			
Sawing boards into lengths for frame-pieces	1		
Sawing and grooving frame-pieces	1		
Tenoning and mortising frame-pieces	1		
Gluing tenons, mortises, and grooves, and sticking together an end and two side pieces		1	
Placing the frames on the slates		1	
Pressing the frames firmly on the slates with a machine-press		1	
Trimming the corners of the frames	2		
Planing the frames	1		
Printing rules on the inner edges of the frames			2
Punching holes in the frames			2
Sewing cloth upon the frames with shoe-strings			24
Packing and boxing the slates		1	
Total	14	4	28

The machine for printing the rules on the frames is a recent and valuable invention. The rules are divided into inches, half inches, and quarter inches.

These slates now supply almost the entire market of this country, and are quite extensively shipped to England, Germany, and other foreign countries.

THE GENERAL METHODS OF DRESSING THE VARIOUS CLASSES OF ROCKS.

1. The tools employed in dressing granite are the set, the spalling-hammer, the pean-hammer, the bush-hammer, the chisel, the bush-chisel, and the hand-hammer. The set is used for dressing the edges of a block to a line. The spalling-hammer is sometimes used for taking off larger projections than can be dressed off with the set; but such projections are commonly taken off with wedges (or "plugged off"). The point is used for roughing out the contour of surfaces. With the pean-hammer the projections left by the point are cut down. The bush-hammer imparts a finish according to the number of cuts employed. The chisel is used for finishing moldings, for cutting drafts around rock-faced and pointed work, and for lettering and tracing. The bush-chisel is used for dressing portions of surfaces not accessible with the bush-hammer. The set, point, and chisels are driven with the hand-hammer.

The steps in the process of dressing a granite surface are: 1st, dressing the edges to a line with the set; 2d, roughing out the surface with the point; 3d, cutting down the irregularities left by the point with the pean-hammer; and, 4th, dressing down, with the 4-cut, 6-cut, 8-cut, 10-cut, and 12-cut bush-hammers successively, the irregularities left by each preceding tool.

This process is carried out to different degrees for the different kinds of finished dressing known as rock-faced work, pointed work, single-cut or pean-hammer work, and 4-cut, 6-cut, 8-cut, 10-cut, and 12-cut work. For pointed work there is usually a draft chiseled around the face, after which the space within is dressed to a level with the draft or is given a certain projection, and may be rough-pointed or fine-pointed. Rock-faced work is sometimes drafted. The surfaces which come against other surfaces in masonry are dressed to a degree of fineness depending upon the closeness of joint required. Exposed surfaces are not often finished with the pean-hammer, the principal use of the single-cut being to prepare the surface for the next finer cut.

The condition of the surface at the completion of any particular cut work should be such that each cut in the hammer traces a line its full length on the stone at every blow. The single-cut should leave no unevenness exceeding one-eighth of an inch, and each finer cut reduces the amount of unevenness; and the 12-cut should leave no irregularities other than the indentations made by the impinging of the cuts in the hammer upon the surface of the stone. The lines of the cuts are made to be vertical on exposed vertical faces, and on the horizontal and unexposed faces they are made straight across in the direction which is most convenient.

For fine and accurate work all the tools designated in the complete process are used, except that a 5-cut hammer is often substituted for the 4-cut and the 6-cut hammers; but some of the tools are ordinarily omitted, the 6-cut being made to follow the pean-hammer, and the 10-cut to follow the 6-cut, etc.

A machine operating a bush-hammer by steam has been used, but not extensively. The hammer can be made to strike with any force up to a certain degree, but it cannot be guided with the delicate accuracy with which the bush-hammers are manipulated by hand. There are two other inventions for dressing granite by machinery not yet extensively tried. One of these inventions is the sawing of granite with gang-saws by the aid of chilled-iron globules.

Granite has been sawed with gang-saws by the aid of sand and with diamond-toothed saws; but the former process is too slow and the latter is too expensive to be profitable.

The essential feature of the other invention above referred to is a tool- or cutter-holder called the "chuck", which is furnished with three or more circular cutters set at an angle to the plane of their track or the path described by the edges of the cutters as they are carried round in a circle by the revolution of the chuck upon its axis.

Machines are made with the chucks and cutters variously adjusted for dressing plain and curved surfaces, the top and sides of blocks, different kinds of stone, and for turning columns.

The principal objections which have heretofore been urged against these machines are that the sand made by the dressing gets into the journals and between all the rubbing surfaces of the machinery, producing rapid wearing of these parts, and that the cutters are liable to chip out the edges of the blocks of stone. To overcome the latter objection an arrangement has recently been invented for producing more perfect arrises.

Granite is now used rock-faced in all cases where this mode of dressing is at all applicable. The use of granite for tombstones and ornamental work in general has greatly increased since the introduction of machinery for polishing. The cost of preparing a granite surface for polishing is, however, still great.

Before the introduction of machinery for polishing a polished granite surface was seldom seen; but now the polishing of granite is an extensive industry. The surfaces are prepared for polishing with the 10-cut or the 12-cut bush-hammer. The process of polishing consists in: 1st, rubbing with sand; 2d, with emery; and 3d, with putty-powder. All these polishing materials are put on with just sufficient water to make a paste which is not gummy. The process is commenced with rather coarse sand. The sand constantly works off and is caught on a shelf or in a pit, and for a time fresh sand is supplied; but as the surface becomes smoother the sand is taken from the shelf or pit

and put back upon the stone, the sand being ground finer and finer at the same time that a finer surface is produced. The impalpable powder or mud produced is carried off by the water. Emery is applied in the same manner as sand after as fine a finish as possible has been given by the latter. Putty-powder is rubbed on with a felt-covered block to give the surface a gloss finish. Flat surfaces are brought to a horizontal position, and the sand and emery are rubbed on with a horizontally-revolving iron wheel made of several concentric rings. The rubbing-wheels are usually from 12 to 18 inches in diameter; the machines are constructed on various plans, so that the wheels may be carried about over the whole surface to be polished, and so that the vertical shaft upon which the wheels are carried may be raised or lowered within certain limits by the operator to give different degrees of pressure. The felt-covered block for rubbing on the putty-powder is attached to the bottom of the wheel. Straight moldings are polished with blocks made to fit them, and worked back and forth by machines called "pendulum machines". Granite columns are polished in lathes.

2. The steps taken in the process of cutting marble are: 1st, shaping up the block with the spalling-hammer and pitching-tool; 2d, roughing out the surface with the point; 3d, cutting down the projection left by the point with the tooth-chisel; and 4th, cutting the surface smooth with the drove.

The spalling-hammer is used for breaking off the larger projections, and the pitching-tool is used for dressing the edges to a line. Chisels having a bit more than one inch in width are called "droves"; smaller sizes are called "tools".

A finished surface is usually drove, tooled, or polished. Rock-faced, pointed, and tooth-chiseled work are seldom employed. A tooled surface is made with the chisel, and has a ridged or wavy appearance due to the lines of indentations made by the tool. Surfaces are drove preparatory to polishing. The steps involved in the process of polishing are: 1st, rubbing with coarse sand; 2d, with finer sand; 3d, with coarse grit; 4th, with finer grit; 5th, with pumice-stone; 6th, polishing with Scotch hone; and 7th, glossing with putty-powder, with sometimes an addition of oxalic acid. Water is applied in every step of the process.

It is usually specified in contracts for polished work that no oxalic acid shall be used, because a more durable polish is obtained by the use of the putty-powder alone.

Small blocks are rubbed with sand on the rubbing-bed; otherwise, machines similar to those used for polishing granite are used for applying the sand and putty-powder. The grit consists of spalls from sand-rock which has a texture suitable for grindstones. The grit and pumice-stone and Scotch hone are applied by hand. Each step in this process must eradicate all traces of the preceding step; skillful workmen are required, and the work of imparting the gloss finish cannot proceed so long as there are any scratches whatever left in the surface.

A dressed surface of most colored marbles will have cavities, which must be filled before the marble is polished. This filling is done with a wax made of shellac and colored with any non-oily substance, which is applied with a red-hot strip of iron, and before the wax cools a little of the marble-dust is rubbed into it. The same material is also used for cementing pieces of colored marble together. There is yet no substance known with which white marbles can be filled; and, fortunately, the need of filling them is not often felt. White marbles are usually compact and colored marbles vesicular in structure.

Marble is quite extensively sawed with machines called "gang-saws", employing horizontally reciprocating saws which are aided by sand. The saws are plates of iron from 3 to 4 inches wide and one-eighth of an inch thick; their edges are smooth, and the actual cutting is done by the sand. As many saws are used at once on a block of stone as there are parallel cuts to be made. The saw-frames are supported by iron rods working on hinge-joints at both ends. Some machines are so constructed that the pressure on the saws is simply the weight of the saws and frame; but in other machines the frame is let down a certain amount at each stroke by screws worked by the machinery. By the latter arrangement the feed can be regulated to suit the texture of the stone.

The sand is placed on the top of the stone and fed into the kerfs with a water-drip. The sludge from the ends of the saws is caught in a pit, the silt is carried off by the water, and the sand is shoveled back upon the stone.

Iron plates, the cutting edges of which are segments of a circle, are revolved by a vertical shaft for sawing circular pieces out of marble slabs for sinks, wash-stands, etc. The saw prepares the surface for the process of polishing.

Various machines have been invented for doing different kinds of work in marble dressing, but only a few of them are found at all in use, excepting those referred to above.

In many localities in this country thinly-bedded limestones are the only stone material near at hand for purposes of construction. The beds of these stones are usually smooth enough to be used in ordinary masonry without dressing; the ends are jointed with the pitching-tool and point, and the faces are commonly dressed rock-face. Such stones are not used to any extent for superstructures, except for church edifices, their principal use being for building foundations, bridge piers and abutments, and other like structures.

Heavily-bedded limestones are commonly sawed with gang-saws, and the various kinds of finish given the faces are rock-face, pointed, tooled, drove, or rubbed. On some limestones the tooth-ax is used after the point, after that the ax-hammer, and then the diamond hammer.

For carving marble and other stones, as for carving wood, chisels, gouges, and drills, of various sizes, and special tools for special kinds of work, are used.

3. The steps in the process of cutting sandstone are similar to those in the process of cutting marble, except that the crandal takes the place of the tooth-chisel on large surfaces. The diamond-hammer is used after the crandal on some kinds of sandstone, and the bush-hammer is used on hard, compact, argillaceous sandstones like the North River blue-stone.

Blocks of sandstone are sawed with gang-saws, like blocks of marble. Some sandstones are so soft when first taken from the quarry that they can be sawed with gang-saws without the aid of sand. Diamond-toothed saws have been successfully used for sawing the Portland (Connecticut) brownstone. These saws, while they cut the harder varieties of sandstones more rapidly, are much more expensive than the ordinary gang-saws.

A rubbed surface is the finest finish of which sandstone is susceptible. The surfaces may be rubbed with sand alone, or with sand followed by grit.

Slabs of North River blue-stone are planed, like slabs of slate, before they are rubbed.

4. The greenstone, or serpentine, which has been used so largely for the construction of dwellings and other buildings in Philadelphia, and to some extent in other eastern cities, is dressed rock-face. The rock is considerably broken up in quarries by natural joints, and is still more broken up by the powder used in quarrying. A greenstone building standing among other buildings presents a pleasing appearance, but many greenstone buildings together present a less agreeable appearance; there is a harshness which has become more apparent with the increased use of the stone, and which has finally driven the stone almost entirely out of use. But the greenstone is certainly capable of producing beautiful architectural effects by contrast. Thus far the quarries have been worked in the outcrop only. Upon the further development of the quarries, and more systematic working, larger blocks applicable to a greater variety of purposes, and a material more susceptible of dressing, may be produced.

For carving stones, as for carving wood, chisels, gouges, and drills of various sizes, and special tools for special kinds of work, are used.

There can hardly be said to have been any advance made in the method of carving stone since the stone age, when the savage chipped one stone with another; but the sand-blast method bids fair to supersede the old method for some kinds of work.

The sand-blast has been most extensively used for engraving glass, but it has been to some extent used for carving stones. At a high velocity of impact, grains of sand will cut or wear away substances much harder than themselves. For engraving or carving, sand, grains of quartz, or any other hard material is rapidly driven against the surface to be cut by any propelling force; a rapid jet or current of steam, air, water, or other suitable gaseous or liquid medium is preferred.

A peculiarity of the sand-blast is that the grinding or cutting action may be made to take place upon irregular surfaces, cavities, corners, and recesses hardly accessible to ordinary methods.

The business of carving stones is yet in its infancy in this country, but it is rapidly increasing; buildings, both public and private, being more ornamented with carved stones as the wealth of the country increases.

DESCRIPTION OF PLATES ILLUSTRATING QUARRIES AND QUARRY METHODS.

PLATE XIX.—Portions of several more or less connected excavations, worked independently of each other. Posts or pillars are left to support the hanging wall or roof. On the floor, in the foreground, is a Wardwell channeling-machine for cutting the marble into long rectangular blocks. Whenever it is necessary to make the quarry deeper (to "go down in the floor"), one of the long blocks is cut into short, nearly cubical pieces, called "key-blocks". The first key-block may be broken off more or less near the bottom by driving wedges into one of the channels. After the first key-block is completely removed (the bottom may have to be dug out in fragments) a row of holes is drilled along the bottom of the second key-block, and wedges are driven into these holes to raise the block from its bed. In this manner each succeeding key-block is taken out. A long block is then raised by driving wedges into holes drilled along the bottom. The long blocks are split, along the lines of stratification, into pieces which can be handled by the hoisting machinery. The small, waste material is raised to the surface in cages, which are shown attached to the derricks.

PLATE XX.—Small portion of the second excavation of Plate XIX, as seen from the opposite direction. The inclined channels on the hanging-wall side are cut with the diamond channeling-machine. The machine in operation is a diamond gadding-machine, by which the necessary holes for splitting up a long block are being drilled. The quarried blocks are attached to the derrick ropes, as shown in the foreground, and hoisted to the surface.

PLATE XXI.—Portion of the second excavation of Plate XIX, at an earlier period, when the excavation was just being cut through under the pillar. The excavations are usually carried down by steps, as shown on this plate.

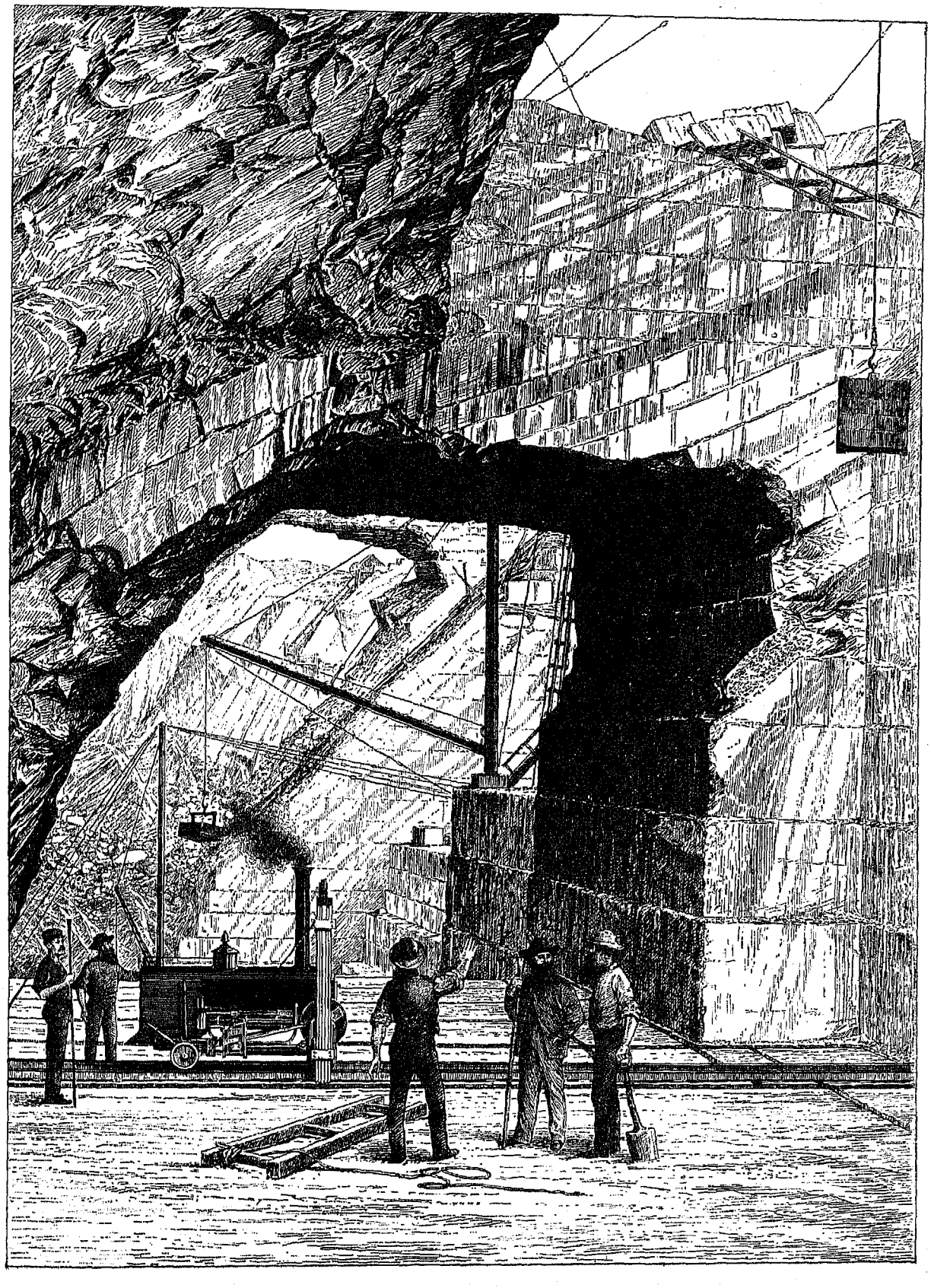
PLATE XXII.—Excavation in nearly horizontally stratified marble. The quarry floor is kept parallel with the stratification, and the channels are cut at right angles to the stratification with bars by hand or with the diamond channeling-machines. The roof is strong and capable of supporting itself over a wide span. However, the pillars left in these quarries are not sufficient to support the roof properly, and large masses of roof occasionally scale off and fall into the bottom of the quarries. It can hardly be hoped that no serious accident will ever result from these falls, though it is claimed that no person was ever injured by them.

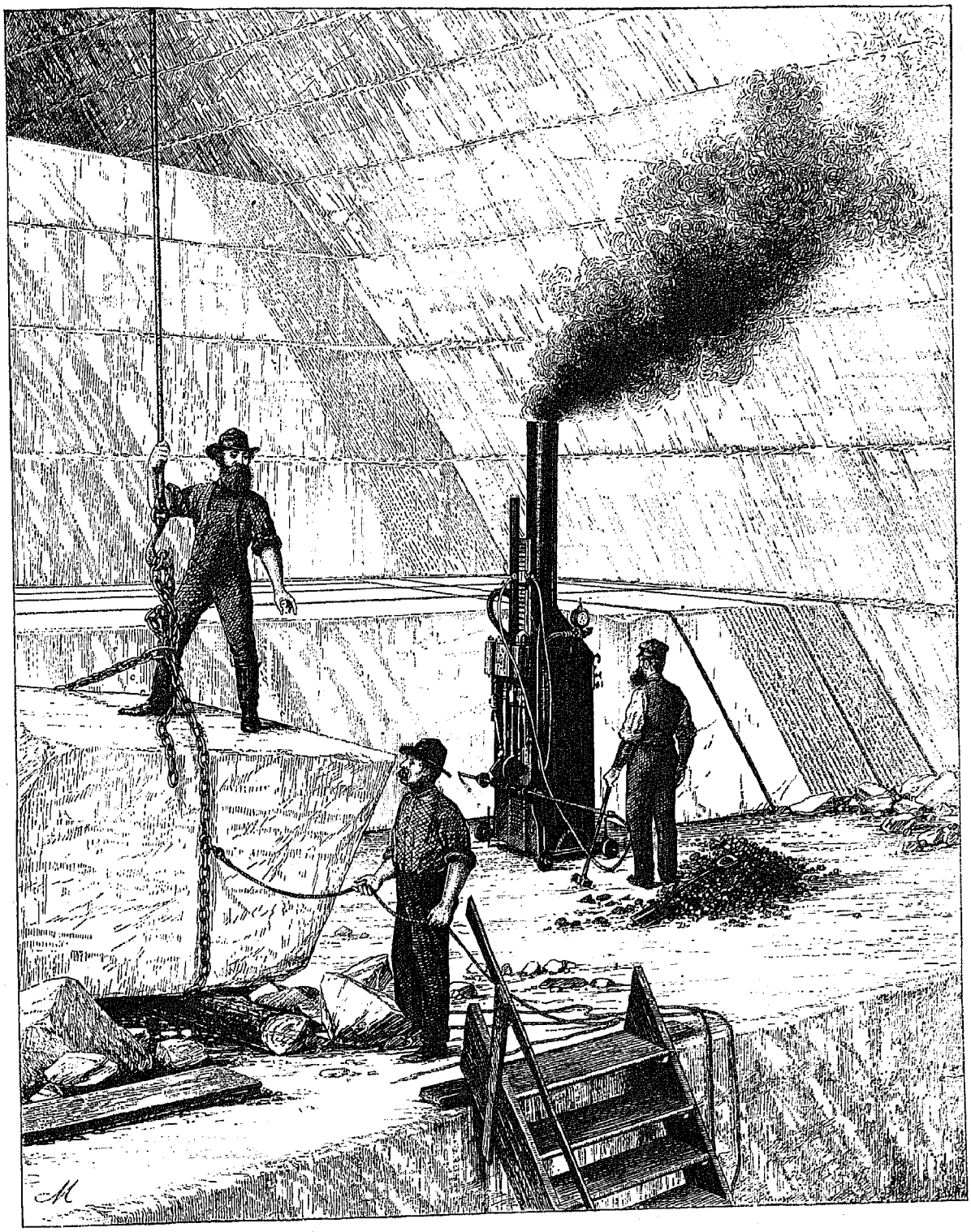
PLATE XXIII.—Illustration of the method of quarrying sandstone by channeling and wedging. The end of the quarry on the left of the picture is cut off by a channel about two feet in width, and the back of the quarry is cut off by a similar channel, so that a block may be detached by a row of wedges parallel to the first channel. Two men are driving a row of wedges, each man striking an alternate wedge as he moves forward. Two others, with picks, are cutting grooves for rows of wedges. The manner of splitting the blocks with the stratification is shown in the foreground to the right.

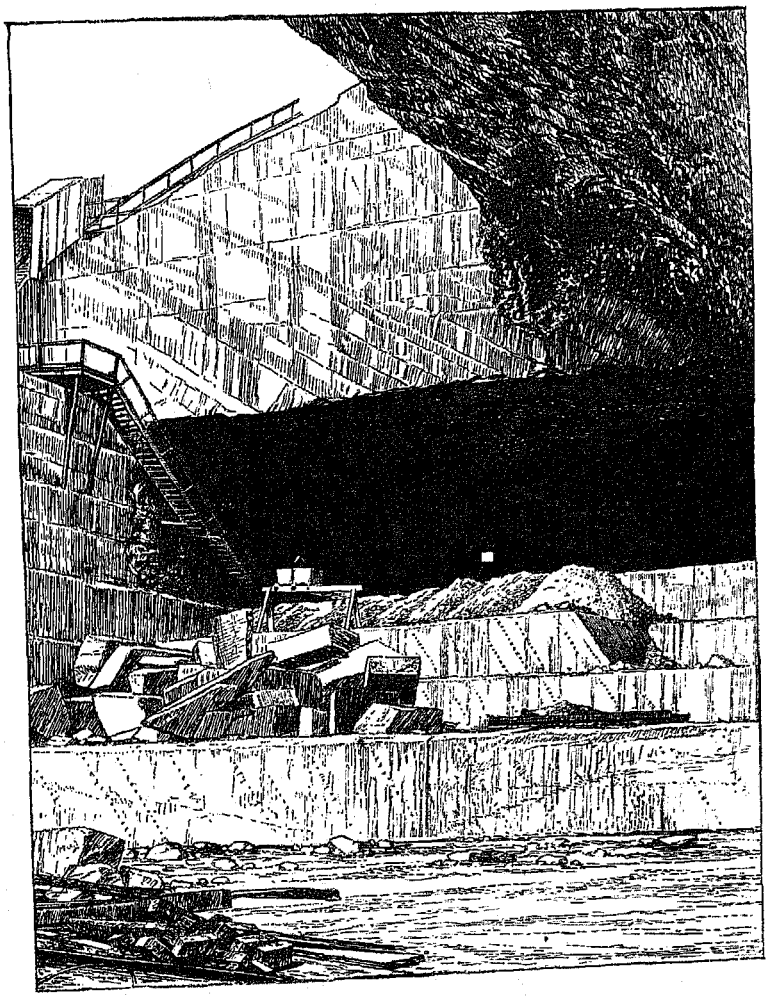
PLATE XXIV.—Greenstone or serpentine quarry. The rock is naturally much broken up by joints, and it is still more broken up by the powder with which it is quarried.

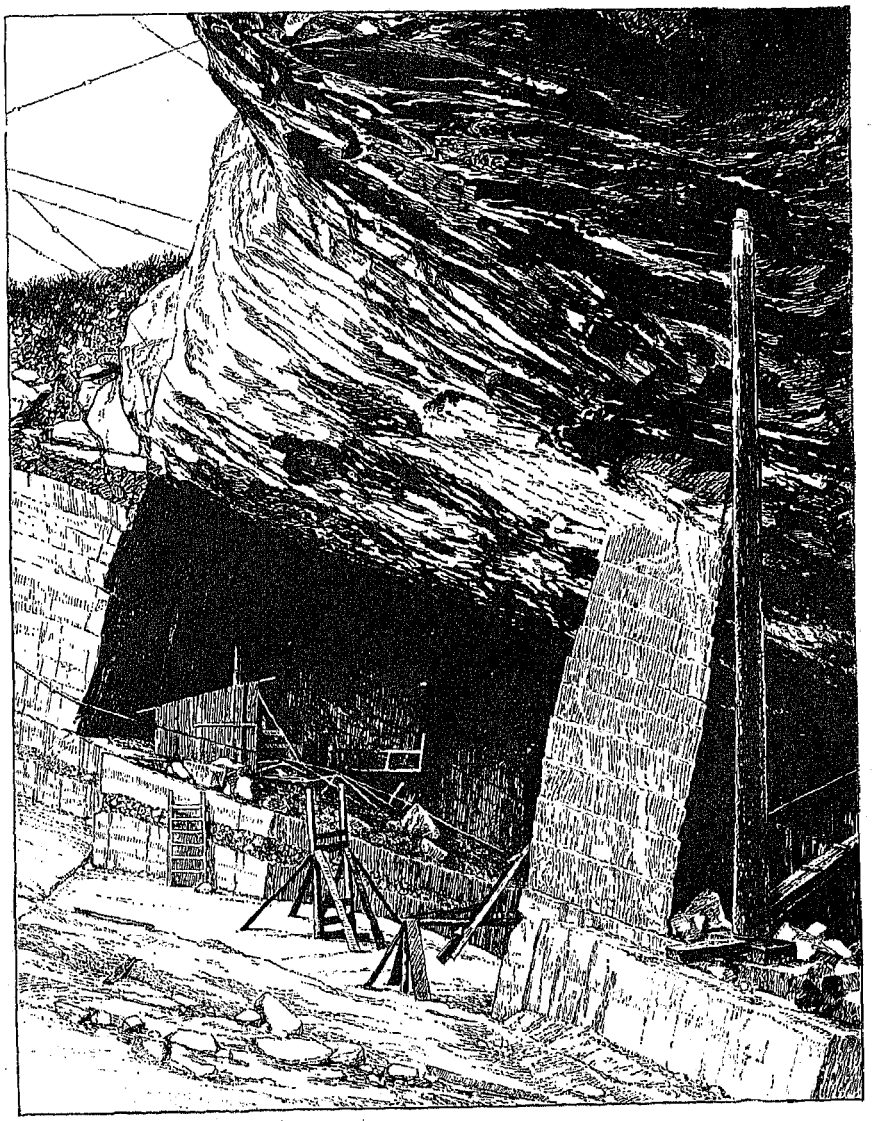
PLATE XXV.—Wardwell channeling-machine. For description, see page 35.

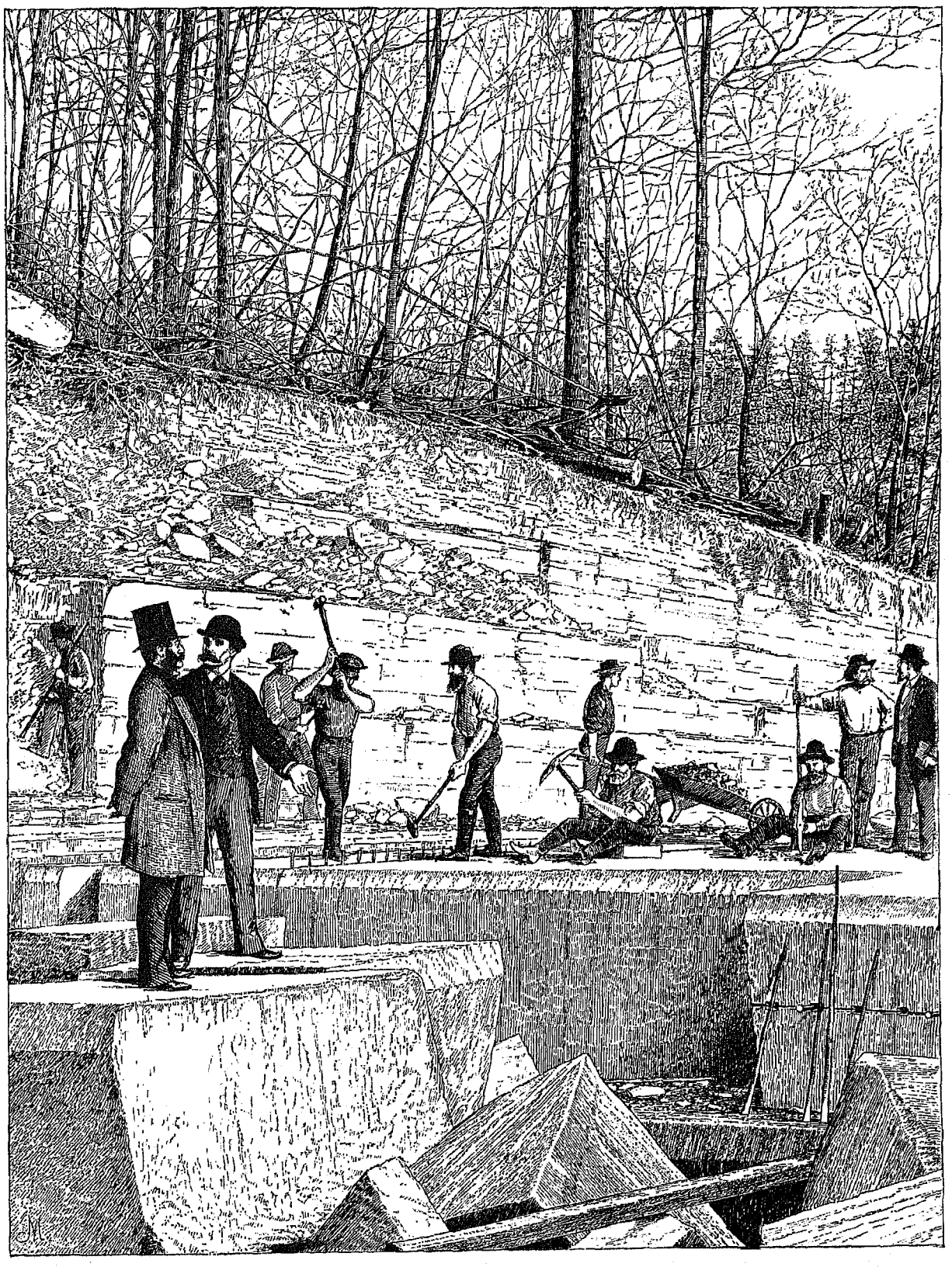
PLATE XXVI.—Two-spindle diamond channeling-machine. For description and use, see page 35.

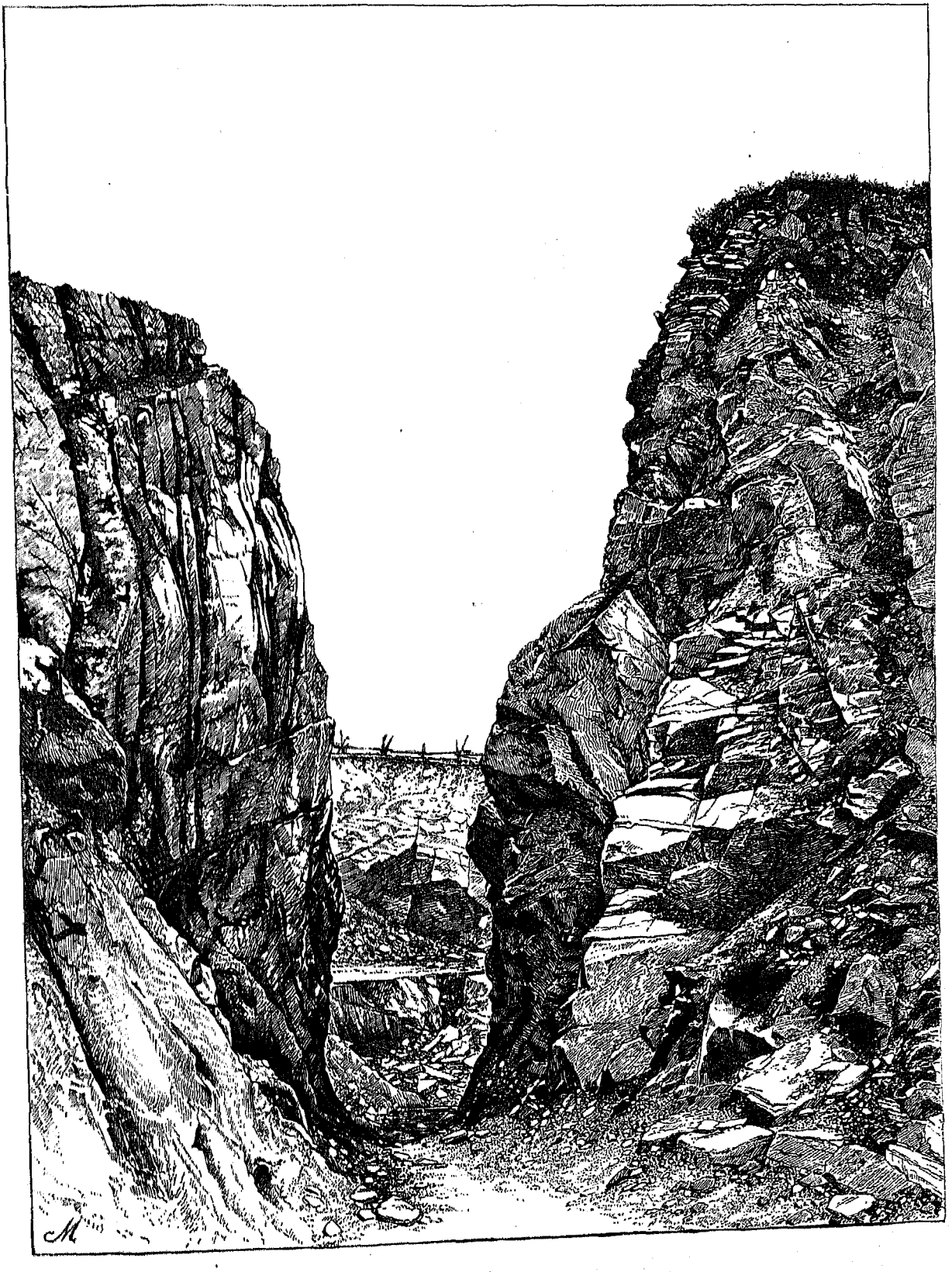


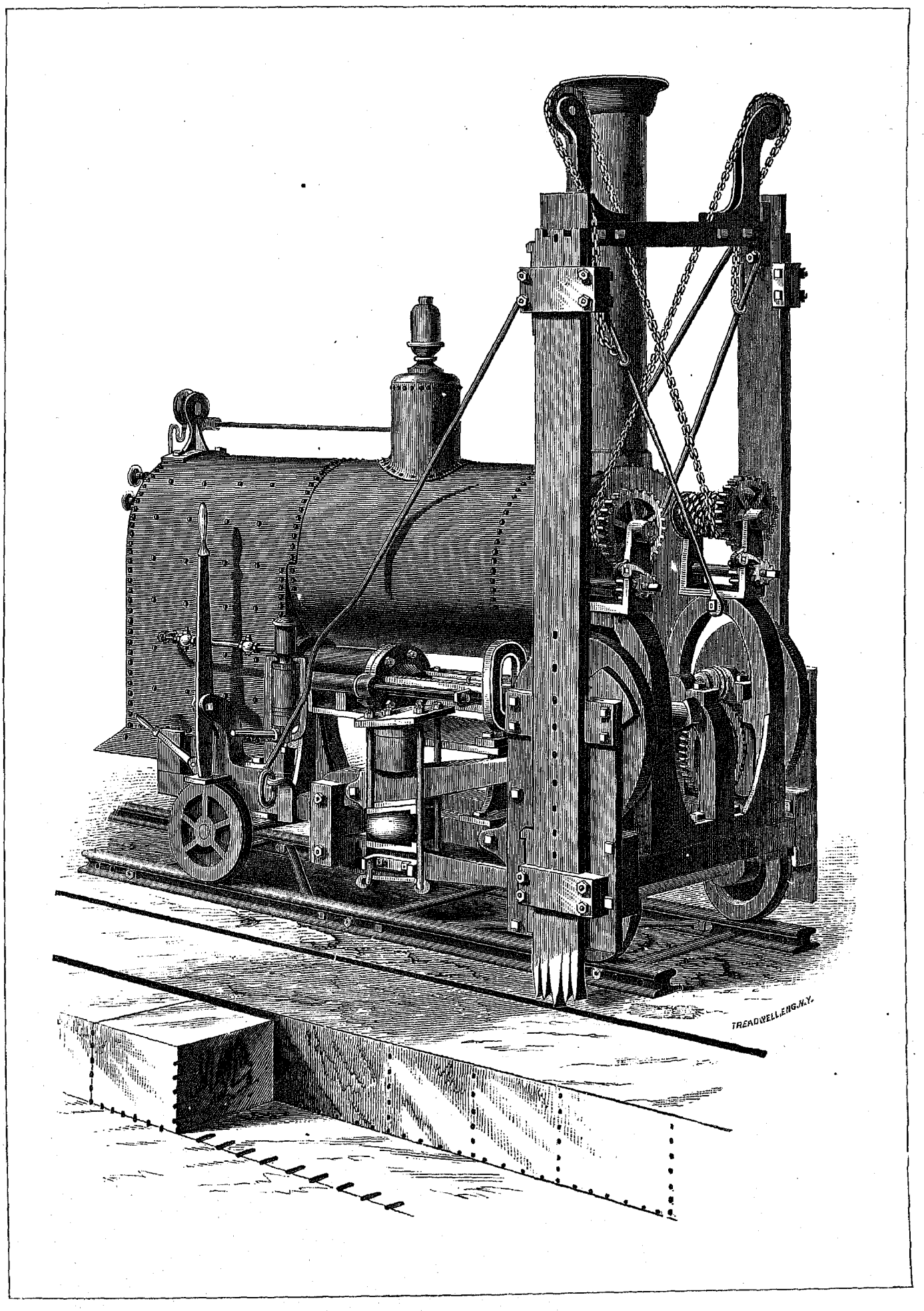








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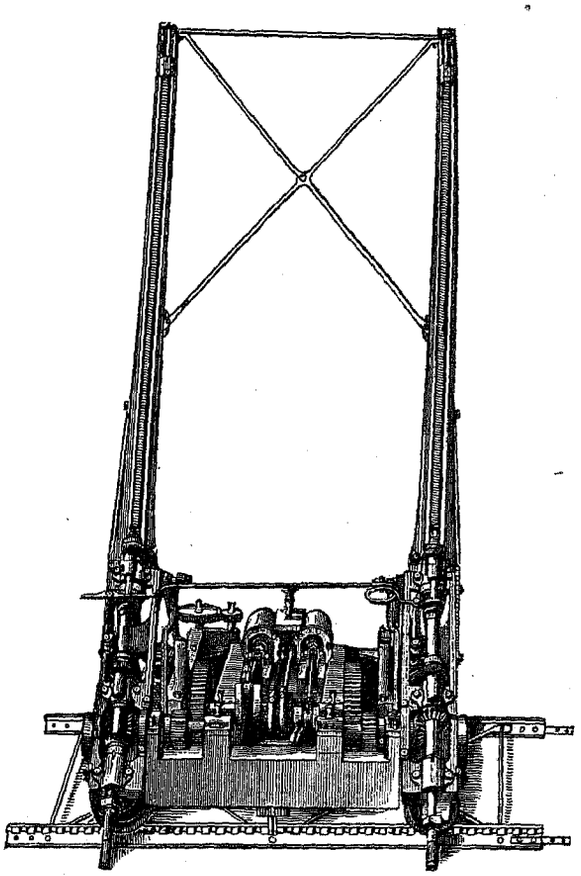

CHAPTER V.

STATISTICS OF BUILDING STONES.

TABLE I.—GENERAL STATISTICS OF THE QUARRYING INDUSTRIES OF THE UNITED STATES: 1880.

	States and Territories.	Number of quarries.	Capital invested.	Product in census year.	Value of product in census year.	Number of machines employed. For quarrying.	For hoisting.	For dressing.	Value of explosives used in census year.
			Dollars.	*Cubic feet.*	*Dollars.*				*Dollars.*
	Total for United States	1,525	25,414,497	115,380,133	18,356,055	339	2,290	1,308	192,175
	TOTALS BY KINDS OF ROCKS.								
1	Marble and limestone (a)	616	10,565,497	65,523,965	6,856,681	100	709	499	61,408
2	Sandstone	502	6,229,600	24,776,930	4,780,391	40	634	95	27,571
3	Crystalline siliceous rocks	313	5,291,250	20,506,568	5,188,998	64	763	322	70,307
4	Slate	94	3,328,150	4,572,670	1,529,985	45	184	392	32,790
	TOTALS BY STATES AND TERRITORIES.								
1	California	2	100,000	413,000	172,450	.....	6	14	1,000
2	Colorado	6	13,500	662,790	50,400	.....	8	.....	500
3	Connecticut	38	1,730,560	3,527,400	1,087,425	27	116	5	18,590
4	Dakota	1	3,500	38,400	12,000	.....	1	.....	324
5	Delaware	3	4,800	45,900	12,600	.....	3	.....	.....
6	Georgia	3	60,600	288,960	68,980	2	2	.....	615
7	Illinois	43	2,120,000	13,321,199	1,342,572	15	68	22	6,805
8	Iowa	131	556,775	10,929,788	670,754	2	109	11	6,859
9	Indiana	70	613,560	8,413,827	633,775	13	107	14	2,300
10	Kansas	19	73,700	1,406,346	142,570	.....	34	3	35
11	Kentucky	19	143,250	1,724,675	92,216	2	18	2	927
12	Maine	74	2,285,500	2,465,670	1,259,086	29	178	95	14,744
13	Maryland	17	307,935	1,375,917	346,620	4	31	19	5,725
14	Massachusetts	113	1,616,850	5,468,030	1,711,104	22	265	169	29,355
15	Michigan	9	74,700	648,060	79,165	.....	13	.....	1,222
16	Minnesota	41	284,225	3,169,113	255,818	.....	67	3	3,812
17	Missouri	34	328,550	4,699,600	613,171	6	29	6	3,050
18	Nebraska	1	5,000	330,000	15,000	.....	4	.....	125
19	New Hampshire	39	128,800	1,920,340	303,066	1	109	14	4,216
20	New Jersey	25	231,900	3,251,621	514,420	2	29	.....	2,696
21	New York	251	1,080,445	6,057,278	1,261,495	14	152	52	14,812
22	Ohio	245	4,166,802	19,673,309	2,541,647	16	447	79	18,703
23	Pennsylvania	164	3,077,885	15,810,184	1,944,208	56	173	213	33,820
24	Rhode Island	17	476,000	1,352,900	623,000	6	43	22	2,228
25	Tennessee	13	131,700	792,621	192,695	14	30	4	605
26	Vermont	61	4,732,040	2,468,150	1,752,333	88	183	537	12,300
27	Virginia	14	721,250	1,316,556	410,678	2	30	24	3,011
28	Washington	2	2,500	32,500	3,044	.....	1	.....	20
29	West Virginia	10	55,350	294,700	16,089	3	13	.....	606
30	Wisconsin	60	286,820	3,981,304	227,065	15	21	.....	7,213

a With "Marble and limestone" is included one quarry of serpentine rocks.

TABLE I.—GENERAL STATISTICS OF THE QUARRYING INDUSTRIES OF THE UNITED STATES: 1880.

Number of months in operation in census year.			Number of laborers employed during census year.					Number of animals employed.			Means of transportation.				
On full time.	On three-fourths time.	On one-half time.	Greatest number employed.	Males above 16 years of age.	Males below 16 years of age.	Employed in quarrying.	Employed in dressing.	Number of horses.	Number of mules.	Number of oxen.	Number of wagons.	Number of vessels.	Number of cars.	Number of locomotives.	
13,021	293	112	39,723	38,945	778	25,726	9,840	8,059	851	1,096	3,685	265	651	5	
5,001	87	58	15,646	15,363	283	11,269	2,756	4,439	586	163	1,571	111	363	2	1
4,166	22	16	9,567	9,428	139	6,623	1,219	2,091	140	277	1,023	73	72	2	2
2,832	126	38	11,477	11,340	137	6,139	4,501	1,258	105	652	981	81	144	1	3
1,022	58	.....	3,033	2,814	219	1,695	1,364	271	20	4	110	.....	72	.....	4
23	.....	.....	105	104	1	50	100	8	.....	16	3	.....	.....	.....	1
60	.....	.....	134	134	.....	129	.....	17	5	.....	9	.....	.....	.....	2
341	36	2	1,902	1,883	19	1,369	466	112	54	266	455	46	15	.....	3
6	.....	3	35	35	.....	26	.....	18	.....	.....	9	.....	.....	.....	4
30	.....	.....	30	30	.....	.....	14	7	.....	.....	2	.....	.....	.....	5
36	.....	.....	146	143	3	84	50	6	44	.....	13	.....	.....	.....	6
314	4	.....	2,315	2,287	28	1,987	298	380	39	.....	177	41	51	.....	7
914	34	23	2,091	2,075	16	1,819	198	824	343	.....	160	8	40	.....	8
579	5	.....	1,788	1,701	87	1,121	142	545	.....	.....	153	.....	46	.....	9
158	.....	13	434	422	12	273	104	86	16	14	31	.....	.....	.....	10
160	2	1	806	791	15	486	140	199	.....	.....	57	1	.....	.....	11
606	31	17	4,011	3,936	75	1,793	2,058	241	.....	218	181	29	85	.....	12
153	22	.....	701	682	19	480	211	34	12	12	37	2	5	2	13
1,055	48	13	2,951	2,907	44	1,795	957	371	3	166	214	14	29	.....	14
73	.....	.....	200	190	10	187	13	56	.....	.....	15	2	2	.....	15
228	12	15	1,175	1,173	2	865	253	333	4	2	151	.....	.....	.....	16
316	6	4	783	764	19	437	122	71	96	.....	69	.....	6	.....	17
8	.....	.....	55	55	.....	40	15	22	.....	.....	.....	.....	.....	.....	18
325	16	4	595	595	.....	323	190	204	.....	84	114	3	7	.....	19
265	.....	.....	812	812	.....	615	130	85	6	37	68	5	.....	.....	20
2,186	6	3	3,302	3,220	82	2,426	656	774	23	24	429	12	22	.....	21
2,083	11	5	4,902	4,856	46	2,943	329	1,853	49	60	516	29	35	2	22
1,458	43	.....	4,284	4,078	206	2,904	1,212	810	57	.....	451	26	270	.....	23
166	.....	.....	962	953	9	342	418	134	.....	52	75	2	6	1	24
124	.....	.....	443	440	3	377	36	18	65	.....	26	2	.....	.....	25
627	5	.....	2,762	2,694	68	1,487	1,230	281	.....	131	130	38	5	.....	26
144	8	6	919	908	11	554	365	44	29	.....	34	.....	.....	.....	27
17	.....	.....	16	16	.....	10	6	.....	.....	.....	.....	.....	.....	.....	28
85	.....	.....	154	154	.....	75	42	28	.....	.....	11	3	20	.....	29
481	4	3	820	817	3	729	91	489	6	14	95	2	7	.....	30

TABLE II.—STATISTICS OF THE QUARRYING INDUSTRIES OF THE UNITED STATES, SHOWING NUMBER OF QUARRIES AND PRODUCTION, BY KINDS OF ROCK AND BY STATES AND TERRITORIES: 1880.

States and Territories.	Number of quarries.	Capital invested.	Product in census year.	Value of product in census year.
		Dollars.	*Cubic feet.*	*Dollars.*
Total United States	1,525	25,414,497	115,380,133	18,356,055
MARBLE AND LIMESTONE (a)	616	10,565,497	65,523,965	6,856,681
Illinois	38	2,101,200	13,013,130	1,326,742
Indiana	65	539,600	8,102,115	593,375
Iowa	128	552,775	10,772,286	666,554
Kansas	17	59,700	1,340,346	131,570
Kentucky	19	143,250	1,724,675	92,210
Maryland	3	142,435	70,617	65,929
Massachusetts	4	284,500	99,425	230,495
Michigan	4	61,050	97,800	26,085
Minnesota	33	159,575	2,816,298	201,593
Missouri	27	242,350	4,419,300	421,311
Nebraska	1	5,000	330,000	15,000
New York	55	508,620	2,836,025	431,430
Ohio	119	872,102	11,098,583	669,723
Pennsylvania (a)	24	592,160	3,339,722	240,934
Tennessee	13	131,700	792,621	102,695
Vermont	18	3,886,000	1,192,100	1,340,050
Virginia	2	35,000	20,000	27,750
Wisconsin	46	248,420	3,458,916	189,320
SANDSTONE	502	6,229,600	24,776,930	4,780,391
Colorado	3	2,000	108,750	9,000
Connecticut	6	1,107,500	988,200	680,200
Dakota	1	3,500	38,400	12,000
Illinois	5	18,800	308,060	21,830
Indiana	5	78,900	311,712	40,400
Iowa	3	4,000	157,500	4,200
Kansas	2	14,000	66,000	11,000
Massachusetts	15	95,800	720,080	144,204
Michigan	5	13,650	550,200	59,080
Minnesota	5	118,600	324,000	41,150
Missouri	5	51,200	194,000	81,900
New Jersey	20	210,100	2,384,701	400,420
New York	181	510,775	2,980,353	724,550
Ohio	126	3,294,700	8,574,726	1,871,924
Pennsylvania	95	560,825	6,220,110	627,943
Washington	1	1,500	14,000	2,000
West Virginia	10	55,350	294,700	16,080
Wisconsin	14	38,400	522,388	37,745
CRYSTALLINE SILICEOUS ROCKS	318	5,291,250	20,506,568	5,188,998
California	2	100,000	413,000	172,450
Colorado	3	11,500	554,040	41,400
Connecticut	32	563,000	2,530,200	407,225
Delaware	3	4,800	45,000	12,000
Georgia	2	60,000	278,000	64,480
Maine	68	1,625,500	2,203,670	1,175,280
Maryland	7	106,000	1,182,500	224,000
Massachusetts	92	1,217,150	4,023,125	1,320,315
Minnesota	3	11,050	28,815	13,075
Missouri	2	35,000	86,300	110,000

a With "Marble and limestone" is included one quarry of serpentine rocks.

TABLE II.—STATISTICS OF THE QUARRYING INDUSTRIES OF THE UNITED STATES—Cont'd.

States and Territories.	Number of quarries.	Capital invested.	Product in census year.	Value of product in census year.
CRYSTALLINE SILICEOUS ROCKS—Continued.		*Dollars.*	*Cubic feet.*	*Dollars.*
New Hampshire	39	128, 800	1, 920, 340	303, 066
New Jersey	2	10, 500	820, 000	90, 000
New York	3	16, 000	42, 400	10, 000
Pennsylvania	15	243, 500	3, 028, 222	211, 454
Rhode Island	17	476, 000	1, 352, 000	623, 000
Vermont	12	50, 140	187, 140	59, 075
Virginia	10	631, 250	1, 181, 556	331, 028
Washington	1	1, 000	18, 500	1, 044
			Squares.	
SLATE	94	3, 328, 150	457, 267	1, 520, 985
Georgia	1	600	1, 000	4, 500
Maine	6	660, 000	26, 200	83, 800
Maryland	7	50, 500	12, 280	56, 700
Massachusetts	2	10, 400	1, 550	7, 000
New Jersey	3	11, 300	4, 683	15, 000
New York	12	45, 050	19, 850	95, 500
Pennsylvania	30	1, 681, 400	271, 313	863, 877
Vermont	31	795, 000	108, 891	352, 008
Virginia	2	55, 000	11, 500	51, 000

TABLE III.—EXTENT TO WHICH BUILDING STONES AND SLATES ARE QUARRIED FOR APPLIANCES

LIMESTONE AND MARBLE.

	States and Territories.	Number of quarries.	Capital invested.	Total amount of excavation.	Product in census year.	Value of product in census year.	Number of machines employed: For quarrying.	For hoisting.	For dressing.	Value of explosives used in census year.	Number of months in operation in census year: On full time.	On three-quarter time.	On half time.
			Dollars.	*Cubic yards.*	*Cubic feet.*	*Dollars.*				*Dollars.*			
	The United States	615	10,540,497	50,529,854	65,373,965	6,846,681	190	706	407	61,358	4,993	87	53
1	Illinois	38	2,101,200	10,073,350	13,013,139	1,320,742	15	63	21	6,705	296	4	.....
2	Indiana	65	539,660	5,619,495	8,102,115	593,375	13	90	14	1,690	593	5	.....
3	Iowa	128	552,775	6,491,897	10,772,283	666,554	2	108	11	6,644	894	34	23
4	Kansas	17	59,700	219,390	1,340,346	131,570	.....	34	3	35	138	.....	13
5	Kentucky	19	143,250	634,466	1,724,675	92,216	2	18	2	927	160	2	1
6	Maryland	3	142,435	121,424	70,617	65,929	2	2	1	.....	17	.....	.....
7	Massachusetts	4	284,500	173,000	99,425	230,405	10	3	.....	35	39	4	.....
8	Michigan	4	61,050	501,130	97,800	26,085	.....	1	.....	600	30	.....	.....
9	Minnesota	33	159,575	1,305,149	2,816,298	201,593	.....	56	3	3,522	173	3	15
10	Missouri	27	242,350	822,775	4,419,300	421,211	.....	8	.....	2,525	254	6	4
11	Nebraska	1	5,000	200,000	330,000	15,000	.....	4	.....	125	8	.....	.....
12	New York	55	508,620	7,958,628	2,836,025	431,439	11	103	26	7,830	484	4	1
13	Ohio	119	872,102	7,681,563	11,098,583	669,723	10	62	.....	12,140	1,029	3	1
14	Pennsylvania (a)	23	567,160	4,192,000	3,189,722	230,934	16	27	2	7,215	232	9	.....
15	Tennessee	13	131,700	331,255	792,621	102,695	14	30	4	605	124	.....	.....
16	Vermont	18	3,886,000	2,438,858	1,192,100	1,340,050	88	81	404	3,971	170	2	.....
17	Virginia	2	35,000	1,280	20,000	27,750	.....	.....	12	.....	12	2	.....
18	Wisconsin	46	248,420	1,464,200	3,458,916	189,320	12	16	.....	6,730	400	4	.....

a The quarry of serpentine included in this group in Table II is here omitted.

SANDSTONE.

	The United States	502	6,229,600	38,185,533	24,776,930	4,780,391	40	634	95	27,571	4,166	22	16
1	Colorado	3	2,000	10,000	108,750	9,000	.....	4	.....	200	24	.....	.....
2	Connecticut	6	1,167,500	4,357,000	988,200	680,200	18	26	.....	4,329	53	12	.....
3	Dakota	1	3,500	7,260	38,400	12,000	.....	1	.....	324	6	.....	3
4	Illinois	5	18,800	19,900	308,000	21,830	.....	5	1	100	18	.....	.....
5	Indiana	5	73,900	107,730	311,712	40,400	.....	17	.....	610	46	.....	.....
6	Iowa	3	4,000	137,000	157,500	4,200	.....	1	.....	215	20	.....	.....
7	Kansas	2	14,000	17,000	66,000	11,000	.....	.....	.....	.....	20	.....	.....
8	Massachusetts	15	95,800	860,000	729,980	144,294	.....	10	1	2,026	144	2	6
9	Michigan	5	13,050	240,600	550,260	53,080	.....	12	.....	622	43	.....	.....
10	Minnesota	5	113,600	79,822	324,000	41,150	.....	6	.....	210	35	.....	.....
11	Missouri	5	51,200	425,185	194,000	81,960	4	15	5	35	41	.....	.....
12	New Jersey	20	210,100	2,384,000	2,384,791	400,420	2	23	.....	1,424	212	.....	.....
13	New York	181	510,775	7,727,523	2,980,353	724,556	.....	28	.....	4,229	1,537	.....	.....
14	Ohio	126	3,294,700	15,210,763	8,574,726	1,871,924	6	385	70	6,623	1,054	8	4
15	Pennsylvania	95	560,825	5,858,650	6,229,110	627,943	4	73	9	5,425	735	.....	.....
16	Washington	1	1,500	2,000	14,000	2,000	.....	1	.....	20	12	.....	.....
17	West Virginia	10	55,350	551,500	294,700	16,689	3	13	.....	690	85	.....	.....
18	Wisconsin	14	38,400	180,000	522,388	37,745	3	5	.....	483	81	.....	3

CRYSTALLINE SILICEOUS ROCKS.

	The United States	313	5,291,250	27,090,841	20,506,568	5,188,998	64	763	322	70,397	2,832	120	38
1	California	2	100,000	377,000	413,000	172,450	.....	6	14	1,000	23	.....	.....
2	Colorado	3	11,500	114,000	554,040	41,400	.....	4	.....	300	36	.....	.....
3	Connecticut	32	563,060	1,832,9[illegible]0	2,539,200	407,225	9	90	5	9,261	288	24	2
4	Delaware	3	4,800	2,100	45,000	12,600	.....	3	.....	.....	30	.....	.....
5	Georgia	2	60,000	5,050,000	278,960	64,480	2	2	.....	515	24	.....	.....
6	Maine	68	1,625,500	1,957,453	2,203,670	1,175,286	20	166	74	9,494	550	22	17
7	Maryland	7	106,000	1,460,000	1,182,500	224,000	2	20	.....	3,275	67	13	.....
8	Massachusetts	92	1,217,150	5,985,105	4,623,125	1,329,315	11	242	168	26,894	856	34	7
9	Minnesota	3	11,050	14,821	28,815	13,075	.....	5	.....	80	20	4	.....
10	Missouri	2	35,000	15,500	86,300	110,600	2	6	1	490	21	.....	.....
11	New Hampshire	39	128,800	4,332,566	1,920,340	303,066	1	109	14	4,216	325	16	4
12	New Jersey	2	10,500	34,700	820,000	99,000	.....	2	.....	1,108	20	.....	.....
13	New York	3	16,000	92,822	42,400	10,000	3	5	.....	220	27	.....	2
14	Pennsylvania	15	243,500	4,008,600	3,028,222	211,454	5	15	.....	8,170	159	9	.....
15	Rhode Island	17	476,000	1,024,224	1,352,000	623,000	6	43	22	2,228	166	.....	.....
16	Vermont	12	50,140	241,760	187,140	59,675	1	17	16	215	99	.....	.....
17	Virginia	10	631,250	546,900	1,181,556	331,028	2	28	8	2,931	110	4	6
18	Washington	1	1,000	1,000	18,500	1,044	.....	.....	.....	.....	5	.....	.....

SLATE.

	The United States	94	3,328,150	13,740,891	a 457,267	1,529,985	45	184	392	32,799	1,022	58	.....
1	Georgia	1	600	50,000	1,000	4,500	.....	.....	.....	100	12	.....	.....
2	Maine	6	660,000	440,000	26,200	83,806	9	12	21	5,250	50	9	.....
3	Maryland	7	59,500	403,310	12,280	56,708	.....	9	18	2,450	69	9	.....
4	Massachusetts	2	19,400	84,000	1,550	7,000	1	1	.....	400	16	8	.....
5	New Jersey	3	11,300	37,344	4,683	15,600	.....	4	.....	64	33	.....	.....
6	New York	12	45,050	1,198,100	19,850	95,500	.....	16	32	2,481	138	2	.....
7	Pennsylvania	30	1,681,400	6,383,437	271,313	863,877	31	55	200	12,960	324	25	.....
8	Vermont	31	795,900	4,973,800	108,891	352,608	4	85	117	8,114	358	3	.....
9	Virginia	2	55,000	170,000	11,500	51,000	.....	2	4	980	22	2	.....

a Squares.

PURPOSES OF CONSTRUCTION IN THE UNITED STATES, AND THE CAPITAL, LABOR, AND DEVOTED THERETO.

LIMESTONE AND MARBLE.

NUMBER OF LABORERS EMPLOYED DURING CENSUS YEAR.					NUMBER OF ANIMALS EMPLOYED.			MEANS OF TRANSPORTATION.				AVERAGE DAY'S WAGES.		
Greatest number employed.	Males above 16 years of age.	Males below 16 years of of age.	Employed in quarrying.	Employed in dressing.	Number of horses.	Number of mules.	Number of oxen.	Number of wagons.	Number of vessels.	Number of cars.	Number of locomotives.	Skilled labor.	Unskilled labor.	
15,632	15,349	283	11,259	2,752	4,427	580	163	1,566	111	363	2	$2 24	$1 34	
2,208	2,181	27	1,913	265	355	38	.....	171	41	51	.....	2 41	1 55	1
1,668	1,573	65	1,054	132	504	.....	.....	137	.....	46	.....	2 32	1 30	2
2,018	2,002	16	1,786	192	798	323	.....	160	6	40	.....	2 04	1 35	3
404	392	12	257	101	82	8	2	23	.....	.....	.....	2 41	1 30	4
806	791	15	486	140	199	.....	.....	57	1	.....	.....	2 06	1 41	5
153	147	6	113	30	4	4	.....	8	.....	5	2	3 00	1 21	6
152	126	26	123	29	10	.....	10	7	.....	.....	.....	1 58	1 25	7
45	43	2	45	.....	30	.....	.....	10	2	.....	.....	.....	1 37	8
1,035	1,033	2	708	210	316	4	.....	140	.....	.....	.....	2 53	1 58	9
354	335	19	267	22	64	75	.....	59	.....	.....	.....	2 44	1 74	10
55	55	.....	40	15	22	.....	.....	.....	.....	.....	.....	2 75	1 75	11
1,201	1,260	22	744	442	326	21	24	186	5	22	.....	2 48	1 25	12
1,781	1,760	21	1,150	98	1,041	22	2	346	14	4	.....	2 00	1 20	13
642	632	10	577	36	128	20	.....	95	.....	187	.....	1 70	1 18	14
443	440	3	377	30	18	65	.....	26	2	.....	.....	1 76	1 05	15
1,896	1,862	34	915	943	103	.....	113	53	38	5	.....	1 93	1 15	16
51	51	.....	45	6	.....	.....	.....	.....	.....	.....	.....	2 50	1 95	17
660	657	3	599	61	427	6	12	88	2	3	.....	2 16	1 45	18

SANDSTONE.

9,567	9,428	139	6,623	1,219	2,089	140	277	1,023	73	72	2	$2 35	$1 46	
39	39	.....	39	.....	5	5	.....	2	.....	.....	.....	3 50	2 17	1
984	984	.....	791	172	43	41	160	282	25	.....	.....	1 98	1 29	2
35	35	.....	26	.....	18	.....	.....	9	.....	.....	.....	2 00	1 50	3
107	106	1	74	33	25	1	.....	6	.....	.....	.....	2 08	1 17	4
150	128	22	67	10	41	.....	.....	16	.....	.....	.....	3 00	1 50	5
73	73	.....	33	6	26	20	.....	.....	2	.....	.....	1 50	1 42	6
30	30	.....	16	3	4	8	12	8	.....	.....	.....	1 62	1 13	7
332	330	2	271	61	55	.....	8	32	.....	.....	.....	2 05	1 50	8
155	147	8	142	13	26	.....	.....	5	.....	2	.....	2 12	1 31	9
74	74	.....	59	15	14	.....	.....	7	.....	.....	.....	2 50	1 60	10
169	169	.....	90	15	4	15	.....	4	.....	.....	.....	2 19	1 56	11
582	582	.....	389	126	79	6	37	65	5	.....	.....	2 30	1 40	12
1,830	1,772	58	1,540	176	426	.....	.....	235	7	.....	.....	1 54	1 13	13
3,121	3,096	25	1,793	231	812	27	58	170	15	31	2	2 15	1 45	14
1,560	1,537	23	1,082	280	423	17	.....	164	16	15	.....	2 18	1 42	15
12	12	.....	6	6	.....	.....	.....	.....	.....	.....	.....	4 25	1 75	16
154	154	.....	75	42	28	.....	.....	11	3	20	.....	2 71	1 40	17
160	160	.....	130	30	62	.....	2	7	.....	4	.....	2 62	1 52	18

CRYSTALLINE SILICEOUS ROCKS.

11,477	11,340	137	6,139	4,501	1,258	105	652	981	81	144	1	$2 07	$1 36	
195	194	1	50	100	8	.....	16	3	.....	.....	.....	3 37	2 12	1
95	95	.....	90	.....	12	.....	.....	7	.....	.....	.....	2 66	2 00	2
918	899	19	578	294	69	13	106	173	21	15	.....	2 46	1 55	3
30	30	.....	.....	14	7	.....	.....	2	.....	.....	.....	2 00	1 25	4
136	133	3	77	47	3	44	.....	10	.....	.....	.....	2 50	95	5
3,800	3,733	67	1,712	1,975	206	.....	218	167	29	23	.....	1 81	1 25	6
422	412	10	293	129	28	2	12	28	2	.....	.....	2 58	1 28	7
2,445	2,429	16	1,383	863	306	3	148	175	14	29	.....	2 06	1 49	8
66	66	.....	38	28	3	.....	2	4	.....	.....	.....	2 53	1 62	9
260	260	.....	80	85	3	6	.....	6	.....	6	.....	2 68	1 33	10
595	595	.....	323	190	204	.....	84	114	3	7	.....	2 15	1 35	11
188	188	.....	184	4	.....	.....	.....	.....	.....	.....	.....	1 50	1 50	12
38	38	.....	28	9	3	.....	.....	.....	.....	.....	.....	3 00	1 58	13
437	437	.....	406	16	157	14	.....	150	10	58	.....	1 82	1 21	14
962	953	9	342	418	134	.....	52	75	2	6	1	1 78	1 24	15
111	110	1	104	1	86	.....	14	38	.....	.....	.....	2 15	1 19	16
775	764	11	447	328	29	23	.....	29	.....	.....	.....	2 22	97	17
4	4	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	2 25	.....	18

SLATE.

3,033	2,814	219	1,695	1,364	271	20	4	110	.....	72	.....	$1 75	$1 17	
10	10	.....	7	3	3	.....	.....	3	.....	.....	.....	1 75	1 08	1
211	203	8	81	83	35	.....	.....	14	.....	62	.....	1 75	1 27	2
126	123	3	74	52	2	6	.....	1	.....	.....	.....	1 66	1 11	3
22	22	.....	18	4	.....	.....	.....	.....	.....	.....	.....	2 00	1 50	4
42	42	.....	42	.....	6	.....	.....	3	.....	.....	.....	1 75	1 21	5
143	141	2	114	20	19	2	.....	8	.....	.....	.....	1 57	1 25	6
1,631	1,458	173	829	876	90	6	.....	37	.....	10	.....	1 70	1 14	7
755	722	33	468	286	92	.....	4	30	.....	.....	.....	1 59	1 23	8
93	93	.....	62	31	15	6	.....	5	.....	.....	.....	2 00	80	9

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NOTE.—It will be noted that the numbers of quarries represented in this table do not in all cases agree with those given in the tables preceding. This is due to the fact that the data for this table were not obtained for all quarries from which statistics of business were received; and, on the other hand, it was judged advisable, for various reasons, to introduce certain quarries here, although their product during the census year did not reach a valuation of $1,000.

MAINE—CRYSTALLINE SILICEOUS ROCKS.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Red Beach	Washington	Maine Red Granite Company	Granite	Biotite granite
2	2 miles east of Jonesboro'	do	Bodwell Granite Company	do	do
3	4 miles southwest of Indian River	do	H. B. Nash (Diamond Granite Quarry)	do	Diabase
4	6 miles southeast of Addison Point	do	Pleasant River Black Granite Company	do	Olivine diabase
5	West Sullivan	Hancock	J. H. Stimpson	do	Biotite granite
6	West Sullivan	Hancock	Crabtree & Harvey	Granite	Biotite granite
7	do	do	Joseph H. West	do	do
8	Franklin	do	Blaisdell Brothers	do	do
9	2 miles south of Mount Desert	do	Whiting & Allen	do	do
10	2½ miles south of Mount Desert	do	C. J. Hall	do	do
11	East Bluehill	Hancock	Collins Granite Company	Granite	Biotite granite
12	do	do	G. W. Collins & Co	do	do
13	do	do	Chase & Hall	do	do
14	Deer Isle	do	Paul Thurlow & Co	do	do
15	do	do	Owens & McGee	do	do
16	Deer Isle	Hancock	Goss & Goss	Granite	Biotite granite
17	Green's Landing	do	James & C. A. Bayard	do	do
18	Frankfort	Waldo	Mount Waldo Granite Works	do	
19	Prospect	do	Edward Avery	do	
20	Swanville	do	Oak Hill Granite Company	do	Biotite granite
21	Lincolnville	Waldo	Beach Grove Granite Company	Granite	Muscovite-biotite granite
22	3 miles north by west of Vinal Haven.	Knox	John S. Hopkins	do	Biotite granite
23	Vinal Haven	do	J. S. Black	do	do
24	do	do	Bodwell Granite Company	do	do
25	do	do	do	do	do
26	Vinal Haven	Knox	Bodwell Granite Company	Granite	Biotite granite (light); olivine diabase (dark).
27	Hurricane island	do	Davis Tilson	do	Biotite granite
28	Dix island	do	Dix Island Granite Company	do	do
29	South Thomaston	do	Ward & Woodward	do	do
30	do	do	Bodwell Granite Company	do	do
31	South Thomaston	Knox	Mirrick Sawyer	Granite	Biotite granite
32	do	do	M. T. Jamerson & Co	do	do
33	do	do	Nathan Stanton	do	do
34	4 miles east of Saint George	do	Atlantic Granite Company	do	do
35	3½ miles southeast of Saint George	do	Clark's Island Granite Company	do	do
36	Saint George	Knox	Wild Cat Granite Company	Granite	Biotite granite
37	do	do	Long Cove Granite Company	do	Hornblende-biotite granite (dark); biotite granite (light).
38	Waldoboro'	Lincoln	Day & Otis	do	Biotite granite
39	Jefferson	do	J. P. Glidden	do	Muscovite-biotite gneiss
40	Round Pond	do	Brown, McAllister & Co	do	Biotite granite
41	2½ miles east of Augusta	Kennebec	A. A. Young	Granite	Muscovite-biotite granite
42	2 miles west of Augusta	do	Kennebec Granite Company	do	do
43	Augusta	do	J. L. Dutton	do	do
44	do	do	Wall & Packard	do	do
45	2½ miles west of Hallowell	do	Hallowell Granite Company	do	do
46	Wayne	Kennebec	J. F. Gordon	Syenite	Biotite granite
47	2½ miles south of S. Norridgewock	Somerset	Lawton Brothers	Granite	
48	3 miles south of Norridgewock	do	Joseph Taylor	do	
49	3 miles northwest of Canaan	do	Sam. L. Fowler	do	Biotite granite
50	3 miles north of Canaan	do	Nathaniel Hall	do	do
51	North Jay	Franklin	A. W. Woodman	Granite	Muscovite-biotite granite
52	do	do	Maine Central Railroad Company	do	do
53	do	do	Emerson & Bryant	do	do
54	4 miles northeast of Chesterville	do	J. H. Plummer	do	Biotite granite
55	Bryant's Pond	Oxford	Grand Trunk Railway	do	do
56	3½ miles south of Turner	Androscoggin	C. H. Barrell	Granite	Biotite gneiss
57	2½ miles south of Brunswick	Cumberland	A. P. Woodside	do	Biotite granite
58	2½ miles south of Pownal	do	Charles H. Hodson	do	do
59	3½ miles south of Pownal	do	Thomas S. Reed	do	do
60	Biddeford	York	J. M. Andrews	do	do
61	Biddeford	York	C. H. Bragdon	Granite	Biotite granite
62	do	do	C. H. & A. Goodwin	do	do
63	do	do	Gooch & Haine	do	do
64	Kennebunkport	do	Smith & Walker	do	do
65	7 miles northwest of Kennebunkport.	do	George W. Ross	do	do
66	8 miles north of Kennebunkport	York	Francis Day	Granite	Biotite granite
67	9 miles north of Kennebunkport	do	Leavitt & Downes	do	do
68	4 miles southeast of South Berwick	do	Albert L. Goodwin	do	do

NOTE.—Thanks are due Mr. J. P. Iddings, of the United States Geological Survey, for aid in determining certain of the crystalline siliceous rocks of doubtful nature.

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MAINE—CRYSTALLINE SILICEOUS ROCKS.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Red	Coarse	Massive	Vertical, transverse, and horizontal.	Archæan		1875	1
do	do	do	Vertical and horizontal	do		1870	2
Black	Fine	do	Vertical and transverse	Devonian		1880	3
do	do	do	do	do		1878	4
Light gray	do	Indistinctly laminated	Horizontal and vertical	Archæan		1840	5
Light gray	Coarse	Massive	Inclined sheets	Archæan		1872	6
do	Fine	do	Irregular	do		1876	7
do	do	do	Vertical, transverse, and horizontal.	do		1879	8
Light pinkish gray	do	do	Horizontal sheets	do		1875	9
do	Coarse	do	Inclined sheets	do		1871	10
Light pinkish gray	Fine	Massive	Irregular	Archæan		1873	11
Light gray	Coarse	do	Inclined sheets	do		1879	12
do	do	do	do	do		1872	13
do	do	Indistinctly laminated	do	do		1877	14
do	do	do	do	do		1870	15
Light gray	Coarse	Indistinctly laminated	Inclined sheets	Archæan		1871	16
do	do	do	do	do		1878	17
Gray	Coarse, porphyritic	Massive	do	do		1853	18
do	Coarse	do	Horizontal sheets	do		1871	19
do	Fine	Indistinctly laminated	Horizontal and parallel, vertical.	do		1873	20
White, or very light gray	Fine	Massive	Vertical and horizontal	Archæan		1876	21
Dark gray	Coarse	Indistinctly laminated	Horizontal sheets	do		1872	22
Light gray	Fine	do	do	do		1879	23
do	Coarse	do	Vertical, transverse, and horizontal.	do		1857	24
do	do	do	do	do		1858	25
Light gray and black	Fine	Indistinctly laminated	Horizontal sheets	Archæan		1850	26
Dark gray	Coarse, porphyritic	do	Irregular	do		1870	27
do	Coarse	do	do	do		1851	28
do	Medium	do	do	do		1878	29
do	Coarse	do	Horizontal sheets	do		1860	30
Dark gray	Coarse	Indistinctly laminated	Horizontal sheets	Archæan		1859	31
do	Fine	do	Irregular	do		1878	32
do	do	do	do	do		1870	33
Gray	Fine, porphyritic	do	do	do		1879	34
Dark gray	Fine	do	Horizontal and parallel, vertical.	do		1871	35
Dark gray	Fine	Indistinctly laminated	Horizontal and parallel, vertical.	Archæan		1874	36
Dark gray and black	do	do	Vertical, transverse, and horizontal.	do		1874	37
Gray	do	do	Horizontal sheets	do		1830	38
Light gray	do	Laminated	Irregular	do		1876	39
Dark gray	do	Indistinctly laminated	Broken, irregular	do		1877	40
Gray	Fine	Massive	Horizontal sheets	Archæan		1873	41
do	do	do	do	do		1877	42
do	do	do	do	do		1856	43
do	do	do	do	do		1876	44
White, or very light gray	do	Indistinctly laminated	do	do		1860	45
Spotted, black, and white	Coarse	Massive	Irregular	Archæan		1860	46
Dark gray	Fine	do	Horizontal sheets	do		1866	47
do	do	Indistinctly laminated	Horizontal and parallel, vertical.	do		1850	48
do	Coarse	do	Horizontal sheets	do		1830	49
do	do	do	do	do		1860	50
Light gray	Fine	Massive	Horizontal sheets	Archæan		1872	51
do	do	do	do	do		1877	52
do	do	do	do	do		1876	53
do	do	Indistinctly laminated	Horizontal and parallel, vertical.	do		1845	54
Dark gray	do	do	Irregular	do		1864	55
Dark gray	Fine	Laminated	Horizontal and vertical	Archæan		1856	56
Light gray	Coarse	Massive	Horizontal sheets	do		1836	57
Gray	Fine	do	do	do		1860	58
do	do	do	do	do		1872	59
Light gray	Coarse, porphyritic	do	Irregular	do		1872	60
Gray	Coarse	Massive	Irregular	Archæan		1868	61
do	do	do	Horizontal sheets	do		1862	62
do	do	do	Irregular	do		1866	63
Light gray	do	do	Horizontal sheets	do		1876	64
Gray	do	do	Irregular	do		1868	65
Gray	Coarse	Massive	Irregular	Archæan		1860	66
do	do	do	do	do		1878	67
do	Fine	Indistinctly laminated	do	do		1878	68

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

MAINE—SLATE.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Brownville	Piscataquis	Adams H. Merrill	Slate	
2	2 miles northwest of Brownville	do	Piscataquis Central Slate Company	do	
3	Monson	do	Monson Pond Slate Company	do	
4	do	do	Dirigo Slate Company	do	
5	do	do	Hebron Pond Slate Company	do	
6	3 miles north of Blanchard	Piscataquis	Blanchard Slate Mining Company	Slate	

MASSACHUSETTS—CRYSTALLINE SILICEOUS ROCKS.

1	Gloucester	Essex	Stephen P. Andrews	Syenite	Hornblende-biotite granite
2	do	do	Cape Ann Granite Company	do	Hornblende granite
3	do	do	Trumble Granite Company	do	do
4	do	do	Solomon Trumble	do	do
5	do	do	John Butman	do	do
6	Gloucester	Essex	Barker Brothers	Syenite	Hornblende granite
7	do	do	Vernon Brothers	do	do
8	Rockport	do	Rockport Granite Company	do	Hornblende-biotite granite
9	do	do	Pigeon Hill Granite Company	do	do
10	Lynn	do	J. R. Jordan	Granite	Hornblende granite
11	Lynn	Essex	J. D. Wilson	Granite	Hornblende granite
12	Peabody	do	Samuel Brown	Syenite	do
13	do	do	Putnam & Linneham	do	do
14	do	do	Scott Brothers	do	do
15	do	do	H. A. Newhall	do	do
16	Lynnfield	Essex	Thomas R. Newhall	Syenite	Hornblende granite
17	do	do	T. J. Newhall	Granite	do
18	West Andover	do	J. Maddox	Bastard granite	Muscovite gneiss
19	Lawrence	do	Jesse Moulton	do	do
20	Lowell	Middlesex	S. L. Ward	Gneiss	Biotite gneiss (granitoid)
21	Medford	Middlesex	Town of Medford	Diabase	Diabase (micaceous)
22	do	do	Nicholas White	do	do
23	Ashland	do	Judson W. Cole	Granite	
24	Framingham	do	J. G. Cloyse	Porphyry	Biotite granite
25	Westford	do	Andrew Fletcher	Granite	Muscovite gneiss (granitoid)
26	Westford	Middlesex	Prescott & Son	Granite	Muscovite gneiss (granitoid)
27	do	do	David Reed	do	do
28	do	do	Swett & Smith	do	Biotite-muscovite gneiss (granitoid)
29	do	do	Sol. Spaulding	do	do
30	do	do	Benjamin Palmer & Sons	do	Muscovite gneiss (granitoid)
31	Westford	Middlesex	William Reed	Granite	Muscovite gneiss (granitoid)
32	do	do	Samuel Fletcher	do	do
33	Ayer	do	do	do	do
34	Fitchburg	Worcester	S. P. Litchfield	do	Muscovite-biotite granite
35	do	do	Fred. Hale	do	Biotite granite
36	Leominster	Worcester	S. L. Kittredge	Granite	Biotite granite
37	Clinton	do	L. M. Allen	do	do
38	2 miles northeast of Worcester	do	G. D. Webb	do	Biotite-muscovite granite
39	1½ miles northeast of Worcester	do	B. Converse	do	Muscovite granite
40	1½ miles north of Milford	do	Richard Carroll	do	
41	Northbridge	Worcester	Diamond Hill Granite Company	Gneissoid granite	Biotite gneiss
42	do	do	Samuel Fowler, jr	do	do
43	do	do	George M. Blanchard	do	do
44	Charlton	do	Lamson & Woodbury	do	Muscovite gneiss
45	do	do	Stone & Hiscox	do	do
46	Northfield	Franklin	Bassett & Lyons	Gneissoid granite	Biotite gneiss
47	Deerfield	do	Westcott & Ames	Mica-schist	Biotite schist
48	do	do	J. G. Noakes	do	do
49	Pittsfield	Berkshire	E. L. Humphrey	Limestone	Limestone
50	Becket	do	McClellan & Goodwin	Gneiss	Muscovite-biotite gneiss
51	Becket	Berkshire	Chester Granite Company (York & Baldwin).	Granite and gneiss	Muscovite-biotite gneiss
52	Monson	Hampden	W. N. Flynt & Co	Gneiss	Biotite (dark) muscovite (light) gneiss (granitoid).
53	Brighton	Suffolk	S. W. Brown, jr	Blue-stone	Melaphyre
54	do	do	do	do	do
55	Dedham	Norfolk	M. Bullard	Porphyry	Epidote granite
56	Dedham	Norfolk	John Delaney	Porphyry	Epidote granite
57	Sharon	do	John Moyle	Granite	
58	Quincy	do	James Marks	Blue syenite	Hornblende granite
59	do	do	John O'Neal	do	do
60	do	do	Kennedy & Mahan	do	do
61	Quincy	Norfolk	Churchill & Hitchcock	Dark blue syenite	Hornblende granite
62	do	do	S. Dill	Blue syenite	do
63	do	do	Lee E. Faxar	Pink syenite	do
64	do	do	Barker & Sons	Pink and blue syenite.	do
65	do	do	McDonnell & Bros	Blue syenite	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MAINE—SLATE.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Bluish black	Fine	Rhomboidal	Irregular	Lower Silurian		1846	1
do	do	Rectangular	do	do		1875	2
do	do	Rectangular and irregular.	Smooth	do		1879	3
do	do	Rhomboidal	do	do		1872	4
do	do	do	do	do		1871	5
Bluish black	Fine	Irregular	Even	Lower Silurian		1880	6

MASSACHUSETTS—CRYSTALLINE SILICEOUS ROCKS.

Dark gray	Coarse	Massive	Irregular, broken	Archæan		1876	1
Light and dark gray	do	do	Few joints	do		1860	2
do	do	do	do	do		1870	3
do	do	do	do	do		1879	4
Dark gray	do	do	Irregular	do		1853	5
Dark gray	Coarse	Massive	Few joints	Archæan		1851	6
do	do	do	Irregular	do		1878	7
do	Medium	do	Horizontal and vertical	do		1830	8
do	do	do	do	do		1870	9
Dark greenish gray	Coarse	do	Horizontal, inclined, and vertical.	do		1850	10
Dark greenish gray	Coarse	Massive	Horizontal, inclined, and vertical.	Archæan		1860	11
Pinkish gray	do	do	Irregular	do		1841	12
Dark gray	do	do	Horizontal and irregular, vertical.	do		1872	13
do	do	do	do	do		1861	14
do	do	do	do	do		1871	15
Dark gray	Coarse	Massive	Few joints	Archæan		1870	16
do	do	do	Irregular	do		1861	17
do	Coarse, porphyritic	Laminated	Horizontal, vertical, and transverse.	do		1879	18
do	do	do	Horizontal and vertical	do		1847	19
do	Fine	do	Irregular	do		1876	20
Black	Coarse	Massive	Irregular	Lower Silurian		1872	21
do	do	do	do	do		1871	22
Gray	do	do	do	Archæan		1874	23
Pinkish gray	Coarse, porphyritic	do	do	do		1851	24
Light gray	Fine, porphyritic	Laminated	do	do		1880	25
Bluish gray	Fine	Laminated	Irregular	Archæan		1850	26
Pinkish gray	do	do	do	do		1854	27
Light gray	Fine, porphyritic	do	Horizontal and vertical	do		1845	28
do	do	do	do	do		1847	29
do	Fine	do	Irregular	do		1847	30
Dark gray	Fine	Laminated	Irregular	Archæan		1847	31
Pinkish gray	Fine, porphyritic	do	do	do		1847	32
Gray	Fine	Indistinctly laminated	do	do		1877	33
Light gray	do	do	do	do		1831	34
do	do	do	do	do		1876	35
Dark gray	Fine	Indistinctly laminated	Irregular	Archæan		1872	36
do	do	Massive	do	do		1875	37
Light gray	Medium	do	do	do		1830	38
do	do	do	Irregular, broken	do		1870	39
Reddish yellow	do	do	Horizontal, vertical, and transverse.	do		1869	40
Light gray	Medium	Indistinctly laminated	Irregular	Archæan		1865	41
do	do	do	Few joints	do		1869	42
do	do	do	Irregular	do		1865	43
do	do	do	Parallel, vertical, and inclined.	do		1864	44
do	do	do	do	do		1879	45
Light gray	Fine	Indistinctly laminated	Horizontal, inclined, and vertical.	Archæan		1875	46
Rusty brown	do	Laminated	Inclined, vertical, and transverse.	Upper Silurian		1880	47
do	do	do	do	do		1880	48
Light blue	Coarse	do	Vertical, transverse, and inclined.	Lower Silurian		1871	49
Light gray	Fine	do	Irregular, broken	Archæan		1880	50
Light gray	Fine	Laminated	Horizontal and vertical	Archæan		1878	51
Light and dark gray	do	do	Horizontal sheets	do		1839	52
Dark greenish blue	do	Indistinctly laminated	Irregular, broken	do		1878	53
do	do	do	do	do		1850	54
Red	Fine, porphyritic	Massive	Irregular	do		1870	55
Red	Fine, porphyritic	Massive	Irregular	Archæan		1868	56
Light blue	Coarse	do	do	do		1874	57
Blue	do	do	do	do		1831	58
do	do	do	do	do		1876	59
do	do	do	do	do		1878	60
Dark blue	Coarse	Massive	Irregular	Archæan		1840	61
Blue	do	do	do	do		1875	62
Pink	do	do	do	do		1862	63
Pink and blue	do	do	do	do		1834	64
Blue	do	do	Irregular and broken	do		1832	65

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

MASSACHUSETTS—CRYSTALLINE SILICEOUS ROCKS—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
66	Quincy	Norfolk	E. De Gruney	Blue syenite	Hornblende granite
67	do	do	C. Dunn	Blue granite	do
68	do	do	E. Baker	do	do
69	do	do	Lewis Dill	do	do
70	do	do	Wild & Field	do	do
71	Quincy	Norfolk	Hector Murry	Gray granite	Hornblende granite
72	do	do	McKinza & Patterson	Blue granite	do
73	do	do	H. Farnum	Syenite	do
74	do	do	William Moore	do	do
75	do	do	James Garrity	Blue syenite	do
76	Quincy	Norfolk	C. Hardwicke & Co	Blue syenite	Hornblende granite
77	do	do	Frederick & Field	do	do
78	do	do	Wendell & Co	Granite	do
79	do	do	William Tranior	Blue syenite	do
80	do	do	Charles Johnson	do	do
81	Quincy	Norfolk	E. Roberts & Co	Blue syenite	Hornblende granite
82	West Quincy	do	Elcock & Sons	Syenite	do
83	do	do	James Berry	do	do
84	do	do	Walter Berry	do	do
85	do	do	F. J. Fuller & Co	do	do
86	West Quincy	Norfolk	O. T. Rogers & Co	Syenite	Hornblende granite
87	do	do	Granite Railroad Company	do	do
88	do	do	Charles Wilson	do	Hornblende granite
89	Randolph	do	S. B. Corliss	Granite	Biotite granite
90	Brockton	Plymouth	W. T. Cleveland	do	do
91	Fall River	Bristol	William Beatty	Granite	Biotite granite
92	do	do	Nathaniel Thurston	do	do
93	Freetown	do	Fall River Granite Company	do	do

MASSACHUSETTS—MARBLE AND LIMESTONE.

1	Pittsfield	Berkshire	E. L. Humphrey	Granite	Magnesian limestone
2	Lee	do	F. S. Gross	Marble	Dolomite
3	Alford	do	Horace S. Fitch	do	Limestone
4	Sheffield	do	Briggs Company	do	Magnesian limestone

MASSACHUSETTS—SANDSTONE.

1	Lowell	Middlesex	W. E. Livingstone	Mortar stone	
2	do	do	City of Lowell	do	
3	Newton	do	Patrick Grace	Pudding stone	
4	Brighton	Suffolk	J. Welch	do	
5	Boston Highlands	do	Owen Mawn	do	
6	Boston Highlands	Suffolk	Michael Leonard	Pudding stone	
7	do	Norfolk	T. McCarty	do	
8	do	do	Hugh Anan	do	
9	Deerfield	Franklin	James Smith	Sandstone	
10	do	do	Blake Brothers	do	
11	Northampton	Hampshire	John Delaney	Sandstone	
12	Holyoke	Hampden	L. P. Bosworth	do	
13	West Springfield	do	Curtis D. Stoddard	do	
14	Longmeadow	do	S. J. Billings & Co	do	
15	do	do	Norcross Bros. & Taylor	do	

MASSACHUSETTS—SLATE.

1	Cambridge	Middlesex	City of Cambridge	Slate	
2	Lancaster	Worcester	Lancaster Slate Company	do	

RHODE ISLAND—CRYSTALLINE SILICEOUS ROCKS.

1	Pascoag	Providence	Garvey Brothers	Gneissoid granite	Biotite gneiss
2	Woonsocket	do	Fairmount Farm Company	Mica-schist	Biotite schist
3	Diamond Hill	do	Diamond Hill Granite Company	Gneissoid granite	Hornblende gneiss
4	Smithfield (4 miles east of)	do	Smithfield Granite Company	Granite	Biotite granite
5	Cranston	do	Richard Fenner	Mica-schist	Mica-schist
6	West Greenwich	Kent	Horace Vaughn	Granite	Biotite granite
7	do	do	Joseph Tarbox	do	do
8	do	do	James Ray	do	do
9	Newport	Newport	J. S. Stacey	do	do
10	2 miles east of Westerly	Washington	Charles P. Chapman	do	do
11	2 miles east of Westerly	Washington	New England Granite Works	Granite	Biotite granite
12	do	do	Smith Granite Company	do	do
13	do	do	do	do	do
14	do	do	Charles P. Chapman	do	do
15	do	do	John R. Macomber	do	do
16	2 miles east of Westerly	do	R. L. Means	Granite	Biotite granite
17	Niantic	do	A. G. Crumb & Co	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MASSACHUSETTS—Crystalline Siliceous Rocks—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Blue	Coarse	Massive	Irregular and broken	Archæan		1879	66
do	do	do	Vertical and horizontal	do		1879	67
do	do	do	do	do		1879	68
do	do	do	do	do		1857	69
do	do	do	Irregular	do		1810	70
Gray	Coarse	Massive	Irregular	Archæan		1840	71
Blue	do	do	do	do		1818	72
do	do	do	do	do		1878	73
do	do	do	do	do		1874	74
Dark gray	do	do	do	do		1868	75
Dark gray	Coarse	Massive	Irregular	Archæan		1810	76
do	do	do	do	do		1809	77
Gray	do	do	do	do		1820	78
Blue	do	do	do	do		1850	79
do	Medium	do	do	do		1845	80
Blue	Medium	Massive	Irregular	Archæan		1838	81
do	Coarse	do	Irregular, broken	do		1830	82
do	do	do	do	do		1850	83
do	do	do	do	do		1827	84
do	Medium	do	Horizontal and vertical	do		1840	85
Blue	Medium	Massive	Horizontal and vertical	Archæan		1826	86
do	do	do	Vertical, horizontal, and inclined.	do		1826	87
Dark gray	Coarse	do	Irregular	do		1852	88
Red	Medium	do	do	do		1872	89
do	do	do	do	do		1879	90
Gray	Medium	Massive	Horizontal, vertical, and transverse.	Archæan		1840	91
do	do	do	do	do		1873	92
do	do	do	Horizontal and vertical	do		1874	93

MASSACHUSETTS—Marble and Limestone.

Gray	Coarse crystalline	Irregular	Uneven, thick	Lower Silurian		1871	1
White	Coarsely crystalline	Massive	do	do		1852	2
Bluish white	Crystalline	do	do	do		1843	3
White	do	do	do	do		1845	4

MASSACHUSETTS—Sandstone.

Green	Fine	Irregular	Uneven, thick	Archæan		1850	1
do	do	do	do	do		1856	2
Light blue	Coarse, conglomerate	Massive	Thick	Lower Silurian		1880	3
Blue	do	do	do	Archæan		1878	4
do	Coarse	do	do	Lower Silurian		1878	5
Blue	Coarse	Massive	Thick	Lower Silurian		1860	6
do	do	do	do	do		1840	7
do	do	do	do	do		1850	8
Red	do	do	Uneven, thick	Triassic		1880	9
do	do	do	do	do		1880	10
Dark brown	Coarse	Massive	Even, thick	Triassic		1840	11
Dark rusty brown	do	do	do	do		1874	12
Reddish brown	Inferior	Irregular	do	do		1850	13
Red	Fine, even	Massive	do	do		1867	14
do	do	do	do	do		1800	15

MASSACHUSETTS—Slate.

Dark blue	Very fine	Irregular	Even	Archæan		1841	1
Bluish black	Porous	Rectangular	Stratification lines distinct	do		1879	2

RHODE ISLAND—Crystalline Siliceous Rocks.

Pink, black, and white	Coarse	Massive	Parallel and vertical	Archæan		1873	1
Blue to green	Fine to coarse	Laminated	do	do		1859	2
Blue and bluish black	Medium	do	do	do		1840	3
Light pink	Coarse	Massive	do	do		1871	4
Bluish black	Variable	Laminated	Irregular	Carboniferous?		1820	5
Red	Coarse	Massive	Parallel and vertical	Archæan		1865	6
do	do	do	do	do		1863	7
Black and white	do	do	do	do		1877	8
Red	Medium fine	do	Irregular	do		1855	9
Red and blue	Fine	Indistinctly laminated	Parallel and vertical	do		1862	10
Red, white, and blue	Fine	Indistinctly laminated	Parallel and vertical	Archæan		1850	11
White and blue	do	do	Irregular and vertical	do		1843	12
Red	Medium coarse	Massive	Few joints	do		1850	13
White and blue	Fine	do	Parallel and vertical	do		1874	14
Gray, red, and white	Medium coarse	do	Irregular	do		1860	15
White	Medium coarse	Massive	Few joints	Archæan		1870	16
do	Fine	do	Vertical	do		1859	17

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NEW HAMPSHIRE—CRYSTALLINE SILICEOUS ROCKS.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Plymouth	Grafton	Jarvis Sanborn	Granite	Biotite granite
2	Lebanon	do	Charles Freeman	Granitic gneiss	Biotite-epidote gneiss
3	do	do	P. H. Freets & Son	Granite	do
4	Hanover	do	David L. Tilton	do	Biotite granite
5	Rumney	do	George D. Kenaston	do	Biotite-muscovite granite
6	Sunapee	Sullivan	Charles E. Boyce	Granite	Biotite-muscovite granite (light and dark).
7	West Concord	Merrimack	Putney & Nutting	do	Biotite-muscovite granite.
8	do	do	Crowley & Quinn	do	do
9	do	do	George A. Bosworth	Concord granite	do
10	Concord	do	Donagan & Davis	Granite	do
11	Concord	Merrimack	Abijah Hollis	Granite	Biotite-muscovite granite
12	do	do	Harrison Granite Company	do	do
13	do	do	M. H. Johnson	do	do
14	do	do	Francis Hodgman	do	do
15	do	do	Fuller & Pressy	do	do
16	Concord	Merrimack	Granite Railway Company	Granite	Biotite-muscovite granite
17	Allenstown	do	Charles A. Bailey	do	do
18	Durham	Strafford	Joseph S. Abbott	Syenite	Biotite granite
19	Raymond	Rockingham	Aaron F. Keys	Granite	do
20	Peterborough	Hillsborough	Dennis O'Keefe	Gneiss	Muscovite-biotite gneiss
21	Milford	Hillsborough	Kittredge & Carlton	Granite	Biotite granite
22	do	do	Everett & Hutchingson	do	do
23	do	do	Thomas King	do	do
24	do	do	Nathan Merrill	do	do
25	do	do	George F. Parker	do	do
26	2 miles southwest of Milford	Hillsborough	L. M. Burns	Granite	Biotite granite
27	2 miles northwest of Milford	do	A. D. Bates	do	do
28	Mason	do	James Maxwell	do	do
29	do	do	William Braman	do	do
30	do	do	Alexander MacDonald	do	do
31	Nashua	Hillsborough	C. W. Stevens	Gneiss	Muscovite granite
32	Manchester	do	Amoskeag Manufacturing Company	Granite	Biotite granite
33	Fitzwilliam	Cheshire	D. H. Read	do	Muscovite-biotite granite
34	do	do	R. L. Angier & Co	do	Biotite granite
35	do	do	Melvin Wilson	do	Muscovite-biotite granite (light); biotite granite (dark).
36	Fitzwilliam	Cheshire	Ethan Blodgett	Granite	Biotite granite (dark)
37	do	do	John E. Fisher	do	Muscovite-biotite granite
38	do	do	Albert Hayden	Granitic gneiss	Muscovite-biotite gneiss
39	Marlborough	do	Albert G. Mann	Granite	Muscovite-biotite granite

VERMONT—CRYSTALLINE SILICEOUS ROCKS.

1	Brunswick	Essex	Saint Johnsbury Granite Company	Granite	Biotite granite
2	Morgan	Orleans	D. T. Turner & Son	do	do
3	Ryegate	Caledonia	R. F. Carter	do	Biotite-muscovite granite
4	do	do	R. W. Laird	do	do
5	2½ miles northeast of Woodbury	Washington	C. W. Cilley	do	Biotite granite
6	Woodbury	Washington	J. Ainsworth & Son	Granite	Biotite granite
7	do	do	Voodry & Towne	do	do
8	Barre	do	E. L. Smith	do	do
9	do	do	G. W. Mann	do	do
10	do	do	Wetmore & Morse	do	do
11	Bethel	Windsor	Edwin Kittredge	Granite	Muscovite biotite (dark); muscovite granite (light).
12	do	do	E. Sturtevant & Co	do	Muscovite granite

VERMONT—MARBLE AND LIMESTONE.

1	Swanton	Franklin	G. & R. L. Barney	Lyonnaise marble	Magnesian limestone
2	Isle La Motte	Grand Isle	Ira & I. P. Hall	Marble and limestone	do
3	do	do	Estate of Peter Fleury	do	do
4	do	do	Goodsell & Hursh	Limestone and marble.	do
5	do	do	H. C. Fisk & Son	do	do
6	Pittsford	Rutland	F. W. Smith & Co	Marble	Magnesian limestone
7	Rutland	do	Flint Brothers & Co	do	Magnesian limestone and calcareous dolomite.
8	do	do	Sutherland Falls Marble Company	do	Limestone
9	do	do	Columbian Marble Company	do	do
10	West Rutland	do	Rutland Marble Company	do	do
11	do	Rutland	Gilson & Woodfin	Marble	Limestone
12	do	do	Sheldons & Slason	do	do
13	do	do	Sherman & Gleason	do	do
14	South Wallingford	do	William W. Kelly	do	do
15	Dorset	Bennington	S. F. Prince & Co	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

NEW HAMPSHIRE—CRYSTALLINE SILICEOUS ROCKS.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
	Fine	Massive	Horizontal sheets	Archæan		1870	1
Light pink	Medium	Obscurely stratified	Horizontal and vertical	do		1865	2
Gray	Coarse	Indistinctly laminated	do	do		1844	3
do	do	Massive	Horizontal sheets	do		1870	4
do	Fine	do	do	do		1870	5
	Fine	Massive	Inclined sheets	Archæan		1846	6
Gray	do	do	Horizontal and vertical	do		1851	7
do	do	do	do	do		1866	8
do	do	do	Irregular	do		1870	9
	do	do	Horizontal and vertical	do		1866	10
	Fine	Massive	Horizontal and vertical	Archæan		1865	11
Gray	do	Indistinctly laminated	do	do		1875	12
	do	Massive	do	do		1879	13
Gray	do	Indistinctly laminated	Horizontal sheets	do		1874	14
do	do	Massive	Horizontal and vertical	do		1867	15
Gray	Fine	Massive	Horizontal sheets	Archæan		1862	16
do	Medium	do	Horizontal and vertical	do		1876	17
do	Coarse	do	Inclined sheets	do		1871	18
Light pink	Medium	Indistinctly laminated	do	do		1850	19
	Coarse	Laminated	do	do		1850	20
Gray	Medium	Indistinctly laminated	Irregular	Archæan		1877	21
do	Fine	do	do	do		1871	22
do	do	do	Vertical and transverse	do		1871	23
do	Coarse	Massive	do	do		1874	24
	Fine	Indistinctly laminated	Irregular	do		1870	25
	Coarse	Massive	Horizontal sheets	Archæan		1820	26
	Fine	Indistinctly laminated	Vertical and transverse	do		1865	27
	Medium	do	Solid	do		1875	28
Gray	do	do	Horizontal and vertical	do		1860	29
do	Fine	do	do	do		1869	30
	Coarse	Indistinctly laminated	Irregular	Archæan		1822	31
Pink	do	do	Horizontal and vertical	do		1873	32
Gray	Fine	Massive	Horizontal sheets	do		1864	33
Light and dark gray	do	do	Inclined sheets	do		1864	34
Gray	do	do	Horizontal sheets	do		1860	35
Gray	Fine	Massive	Irregular	Archæan		1868	36
do	Medium	do	Horizontal and vertical	do		1879	37
do	Fine	Indistinctly laminated	do	do		1870	38
do	do	Massive	Inclined sheets	do		1812	39

VERMONT—CRYSTALLINE SILICEOUS ROCKS.

Dark gray	Fine	Massive	Rectangular	Archæan		1854	1
Light gray	do	Indistinctly laminated	Vertical and transverse	Upper Silurian		1870	2
Gray	Coarse	do	Vertical joints	do		1875	3
Light gray	Fine	Laminated	Horizontal and vertical joints.	do		1850	4
Light pinkish gray	Medium	Indistinctly laminated	Inclined sheets	do		1880	5
Light pinkish gray	Medium	Indistinctly laminated	Horizontal and vertical joints.	Upper Silurian		1876	6
Light gray	do	Massive	Parallel vertical joints	do		1879	7
do	Fine	do	Horizontal and vertical joints.	do		1835	8
Dark gray	do	do	Horizontal and parallel vertical joints.	do		1878	9
Light gray	Medium	do	Horizontal and vertical joints.	do		1840	10
Light gray	Fine	Massive	Inclined sheets	Upper Silurian		1868	11
do	Medium	do	Parallel vertical joints	do		1879	12

VERMONT—MARBLE AND LIMESTONE.

Red, variegated	Coarse and fine	Massive	Thick	Lower Silurian		1866	1
Black, gray, and variegated	Fine	do	Even, thick	do		1874	2
do	Coarse	do	Thick	do		1820	3
do	Coarse and fine	do	Even, thick	do		1874	4
do	do	do	do	do		1776	5
White to dark blue	Fine	Massive	Even, thick	Lower Silurian		1880	6
White with dark shades	do	do	Thick	do		1866	7
White with dark bands and streaks.	do	do	do	do		1836	8
White with dark shades	do	do	do	do		1867	9
White to dark blue	do	do	do	do		1845	10
White and blue	Fine	Massive	Thick	Lower Silurian		1845	11
do	do	do	do	do		1844	12
White and mottled	do	do	Obscure	do		1844	13
White	do	do	Even, thick	do		1867	14
White and mottled	do	do	do	do		1850	15

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

VERMONT—MARBLE AND LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
16	Dorset	Bennington	Freedly & Son	Marble	Limestone
17	East Dorset	do	Hollister, Tyrell & Co. (New Dorset Marble Company).	do	
18	do	do	D. L. Kent & Co	do	Magnesian limestone

VERMONT—SLATE.

1	Northfield	Washington	Adams Slate and Tile Company	Slate	
2	Castleton	Rutland	Richard Conway	do	
3	do	do	Clifford & Litchfield	do	
4	do	do	Lake Shore Slate Company	do	
5	do	do	Blue Slate Company	do	
6	Castleton	Rutland	Snowden Slate Company	Slate	
7	Fair Haven	do	Pierce Roberts	do	
8	do	do	Jones, Owens & Co	do	
9	do	do	Vermont Union Slate Company	do	
10	do	do	Fair Haven Marble and Marbleized Slate Company.	do	
11	Fair Haven	Rutland	Griffiths, Owen & Co. (north quarry)	Slate	
12	do	do	Griffiths, Owen & Co. (south quarry)	do	
13	Poultney	do	Eureka Slate Company	do	
14	do	do	Globe Slate Company	do	
15	do	do	Evergreen Slate Company	do	
16	Poultney	Rutland	Lloyd, Owens & Co	Slate	
17	do	do	R. E. Lloyd	do	
18	do	do	Griffith & Nathaniel	do	
19	do	do	Daniel Culver	do	
20	do	do	Williams Brothers & Co	do	
21	Poultney	Rutland	J. Evans & Co	Slate	
22	Pawlet	do	M. Welch	do	
23	do	do	H. J. Williams	do	
24	do	do	E. R. Norton	do	
25	do	do	J. S. Warren	do	
26	Pawlet	Rutland	W. J. Evans	Slate	
27	West Pawlet	do	H. W. Hughes	do	
28	do	do	Rising & Nelson	do	
29	do	do	Owen Evans & Son	do	
30	do	do	The Brownell Slate and Flagging Company.	do	
31	West Pawlet	Rutland	H. Dillingham	Slate	

CONNECTICUT—CRYSTALLINE SILICEOUS ROCKS.

1	East Killingly	Windham	Joseph Oatley	Gneiss	Hornblende-biotite gneiss
2	Sterling	do	Jeremiah W. Boswell	Granite	Biotite gneiss
3	do	do	Samuel Townsend	do	
4	do	do	Oneco Ledge Company	do	Biotite gneiss
5	Willimantic	do	Alanson Humphrey	Gneiss	
6	Bolton	Tolland	Bolton Quarry Company (S. Beldon & Son)	Mica-schist	Biotite gneiss
7	Glastonbury	Hartford	Chester Hentze	Gneiss	do
8	West Norfolk	Litchfield	Snow & Wooster	do	Biotite-muscovite granite
9	Thomaston	do	Plymouth Granite Company	Gneissoid granite	do
10	Roxbury	do	E. Mower	Granitic gneiss	do
11	Greenwich	Fairfield	John Voorhis	Gneiss	Hornblende-biotite gneiss
12	do	do	Sylvester D. Hill	do	do
13	do	do	William Ritch	do	do
14	do	do	Thomas Ritch	do	do
15	North Bridgeport	do	Wheeler Beers	do	do
16	Ansonia	New Haven	Spring & Wilcox	Gneiss	Muscovite-biotite gneiss
17	New Haven	do	Patrick Dowling	Trap	Diabase
18	do	do	Francis Donnelly	do	do
19	do	do	C. W. Blakeslee	do	do
20	Branford (south of)	do	C. D. Allen (2 quarries)	Granite	Biotite gneiss
21	Leetes island	New Haven	John Beattie	Granite	Biotite granite
22	Stony Creek	do	John Robbins	do	do
23	Haddam	Middlesex	Isaac Arnold	Gneiss	Hornblende-biotite gneiss
24	Middletown	do	Burr & Whitmore	do	do
25	Lyme	New London	C. J. McCurdy and E. E. Salisbury	Red porphyry granite	Biotite granite
26	Lyme (6 miles east of)	New London	Luce & Hoskins	Gray granite	Biotite gneiss
27	Waterford	do	J. B. Palmer & Co	Granite	Biotite granite
28	Niantic (2½ miles southeast of)	do	Warren Gates' Sons	do	do
29	Groton	do	Groton Granite Company	do	do
30	do	do	Charles F. Stoll	do	do
31	Groton	New London	Merritt, Gray & Company	Granite	Biotite granite
32	Mason's island	do	F. K. Ballou	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

VERMONT—Marble and Limestone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
White and mottled	Fine	Massive	Even, thick	Lower Silurian		1840	16
do	do	do	do	do		1860	17
do	do	do	do	do		1827	18

VERMONT—Slate.

Blue-black	Fine	Rectangular	Even and smooth	Lower Silurian		1855	1
Purple	do	Rhomboidal	do	do		1865	2
do	do	Rhomboidal and rectangular.	do	do		1854	3
Purple and green	do	Rhomboidal	Regular	do		1852	4
Blue and green	do	Trapezoidal	do	do		1865	5
Purple	Fine	Rectangular	Regular	Lower Silurian		1864	6
Purple and green	do	Rhomboidal	Even, smooth	do		1879	7
Variegated	do	do	do	do		1879	8
Purple, green, and variegated.	do	do	do	do		1867	9
Variegated, various shades.	do	Irregular	Even	do		1852	10
Green and purple, variegated.	Fine	Rhomboidal	Even	Lower Silurian		1876	11
Purple, variegated	do	do	do	do		1876	12
Green	do	Irregular	do	do		1852	13
Green, purple, and variegated.	do	Rhomboidal and rectangular.	do	do		1868	14
Green	do	Rhomboidal	Irregular	do		1867	15
Green, purple, and variegated.	Fine	Rhomboidal	Even	Lower Silurian		1868	16
do	do	Irregular	do	do		1870	17
Green	do	do	do	do		1871	18
Sea-green	do	Variable	do	do		1870	19
Green	do	do	do	do		1879	20
Green	Fine	Variable	Even	Lower Silurian		1874	21
Sea-green	do	Rhomboidal	do	do		1870	22
do	do	do	do	do		1878	23
Purple	do	Variable	do	do		1878	24
Sea-green	do	do	do	do		1872	25
Sea-green	Fine	Variable	Even	Lower Silurian		1872	26
do	do	Rhomboidal	do	do		1873	27
do	do	Rectangular	do	do		1876	28
do	do	Irregular	do	do		1876	29
Sea-green and blue-black	do	Joints parallel	Smooth and fine	do		1872	30
Sea-green	Fine	Rectangular	Smooth	Lower Silurian		1878	31

CONNECTICUT—Crystalline Siliceous Rocks.

Light gray	Coarse	Laminated	Irregular, vertical	Archæan		1842	1
Gray and light gray	do	do	do	do		1877	2
do	do	do	do	do		1875	3
do	do	do	do	do		1855	4
	Fine	do	Irregular	do		1877	5
	Fine	Laminated	Irregular; nearly vertical	Archæan		1805	6
Dark gray	Coarse	do	Irregular sheet and vertical	do		1850	7
Light gray	Fine	do	do	do		1873	8
do	do	do	Irregular, vertical, and inclined sheet.	do		1855	9
do	do	do	do	do		1873	10
Black	Coarse to fine	Laminated	Irregular sheet and vertical	Archæan		1835	11
do	do	do	do	do		1830	12
do	do	do	do	do		1850	13
do	do	do	do	do		1850	14
Dark gray	Coarse	do	do	do		1873	15
Bluish gray	Compact, granular	Laminated	Horizontal sheet and vertical.	Archæan		1848	16
Black	Fine	Massive	Irregular, vertical	Triassic		1870	17
do	do	do	do	do		1871	18
do	do	do	do	do		1863	19
Dark gray	Coarse	do	Much broken	Archæan		1879	20
Gray to red	Coarse, porphyritic	Massive	Irregular sheet and vertical	Archæan		1870	21
do	do	do	do	do		1878	22
Black	Fine	Laminated	do	do		1800	23
do	Coarse	do	Solid	do		1830	24
Red	Coarse, porphyritic	Massive	Irregular sheet and vertical	do		1876	25
Gray	Coarse, striated	Laminated	Irregular sheet and vertical	Archæan		1875	26
Light gray	Fine	Massive	do	do		1835	27
do	do	do	do	do		1832	28
do	do	Indistinctly laminated	do	do		1857	29
do	do	do	do	do		1869	30
Light gray	Fine	Indistinctly laminated	Irregular sheet and vertical	Archæan		1840	31
	Coarse to fine	Massive	Much broken	do		1879	32

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

CONNECTICUT—SANDSTONE.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Manchester	Hartford	Charles O. Wolcott	Sandstone	Sandstone
2	East Haven	New Haven	Francis Donelly	do	do
3	do	do	Robert Redfield	do	do
4	Portland	Middlesex	Brainerds & Co	do	do
5	do	do	Middlesex Quarry Company	do	do
6	Portland	Middlesex	Shaler & Hall Quarry Company	Sandstone	Sandstone

NEW YORK—CRYSTALLINE SILICEOUS ROCKS.

1	Hastings-upon-Hudson	Westchester	Munson & Co	Gneiss	Biotite gneiss
2	Cold Spring	Putnam	J. E. Bailey	Granite	Hornblende gneiss
3	Clayton	Jefferson	Robert Forsyth	do	Hornblende granite

NEW YORK—MARBLE AND LIMESTONE.

1	Tuckahoe	Westchester	Tuckahoe Marble Company	Marble	Dolomite
2	do	do	John M. Masterton	do	do
3	Greenport	Columbia	F. W. Jones	Limestone	Limestone
4	Sandy Hill	Washington	Kingsbury Blue Stone Company	do	do
5	Saratoga	Saratoga	Prince Wing	do	Magnesian limestone
6	South Glens Falls	Saratoga	Thomas Reynolds & Co	Limestone	Magnesian limestone
7	Glens Falls	Warren	Glens Falls Company	do	do
8	Crown Point	Essex	Frank Clark	do	do
9	Willsborough	do	Lake Champlain Quarry Company	do	do
10	Plattsburgh	Clinton	Burlington Manufacturing Company	do	
11	Gouverneur	Saint Lawrence.	Gouverneur Marble and Whitney Granite Company.	Limestone	Magnesian limestone
12	Three Mile Bay	Jefferson	Oren Fish	do	do
13	Lowville	Lewis	L. H. Carter	do	Limestone
14	Talcottville	do	Melchor Aner	do	
15	Prescott	Oneida	Evan T. Thomas	do	Magnesian limestone
16	Prescott	Oneida	H. & L. N. Jones	Limestone	Magnesian limestone
17	Canajoharie	Montgomery	Charles Shaper	do	do
18	Tribes Hill	do	James Shanahan	do	do
19	do	do	Henry Hurst	do	do
20	do	do	James Shanahan & Co	do	do
21	Amsterdam	Montgomery	James Griswold	Limestone	Magnesian limestone
22	do	do	James Shanahan	do	do
23	do	do	D. C. & N Hewitt	do	do
24	Sharon Springs	Schoharie	Charles J. Smith	do	do
25	Cobleskill	do	Reilly & Scanlon	do	do
26	Howe's Cave	Schoharie	Howe's Cave Association	Limestone	Magnesian limestone
27	Springfield Centre	Otsego	McCabe Brothers	do	do
28	Onondaga	Onondaga	Hughes, Brother & Co	do	do
29	do	do	John Murray	do	do
30	do	do	Patrick McElroy	do	do
31	Fairmount	Onondaga	John Connors	Limestone	Magnesian limestone
32	do	do	M. Degnan	do	do
33	Manlius	do	O. P. Hughes	do	do
34	Auburn	Cayuga	Goodrich & Son	do	do
35	do	do	John Bennett	do	do
36	Auburn	Cayuga	Albert Garret	Limestone	Magnesian limestone
37	Union Springs	do	A. B. Niles	do	do
38	Waterloo	Seneca	Loren Thomas	do	do
39	do	do	John Emmett	do	do
40	Rochester	Monroe	J. B. Pike	do	Dolomite
41	Rochester	Monroe	J. B. Bennett	Limestone	Dolomite
42	do	do	H. S. Brown	do	do
43	Le Roy	Genesee	J. W. Woodruff	do	Magnesian limestone
44	do	do	Wm. S. Brown	do	do
45	Lockport	Niagara	R. & J. Carpenter	do	Calcareous dolomite
46	Williamsville	Erie	J. B. Young	Limestone	Limestone
47	do	do	Lautz & Co	do	do
48	do	do	W. Foglesange	do	do
49	do	do	J. Uebelhoer	do	Magnesian limestone
50	East Buffalo	do	W. W. Bailey	do	do
51	Buffalo	Erie	J. Uebelhoer	Limestone	Magnesian limestone
52	do	do	John Gehsl	do	do
53	do	do	Mrs. J. Gehres	do	do
54	do	do	John Ortner	do	do
55	do	do	A. Kaple	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

CONNECTICUT—SANDSTONE.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Red	Fine	Massive	Irregular	Triassic		1855	1
do	Coarse	do	do	do		1840	2
do	do	do	do	do		1874	3
Brown	Fine	do	do	do		1700	4
do	do	do	do	do		1826	5
Brown	Fine	Massive	Irregular	Triassic		1827	6

NEW YORK—CRYSTALLINE SILICEOUS ROCKS.

Light gray	Coarse, porphyritic	Laminated	Few joints	Archæan		1861	1
Gray	Fine	do	Irregular	do		1877	2
Red	Coarse	Massive	Not jointed	do		1876	3

NEW YORK—MARBLE AND LIMESTONE.

White	Fine, crystalline	Massive	Even, thick	Archæan		1860	1
"Water blue"	Medium, crystalline	do	Uneven, thick	do		1825	2
Gray	Semi-crystalline, fossiliferous.	do	do	Upper Silurian		1850	3
Dark gray	Fine	do	Even, thick	Lower Silurian		1870	4
Blue-black	Fine, fossiliferous	Irregular	Even, medium thick	do		1800	5
Blue-black	Fine, fossiliferous	Massive	Even, thick	Lower Silurian		1850	6
do	do	do	do	do		1850	7
do	Fine	do	do	do		1876	8
do	Fine, fossiliferous	do	do	do		1835	9
Gray and red	do	do	do	do		1879	10
Gray	Fine, semi-crystalline	Massive	Uneven, thick	Archæan		1876	11
Dark drab	Fine, crystalline	Even, parallel	Even, thin to medium	Lower Silurian		1873	12
Drab	Fine, fossiliferous	Massive	Even, medium to thick	do		1838	13
Dark drab	Fine and coarse	Even, parallel	Even, thin to medium	do		1850	14
Gray	Fine, crystalline	Massive	Even, thick	do		1852	15
Gray	Fine, crystalline	Massive	Even, thick	Lower Silurian		1860	16
Dark drab	Fine and coarse	Indistinct	Even, thin to medium	do		1855	17
Blue-black	Medium, semi-crystalline.	Massive	Even, medium	do		1830	18
do	do	do	Even, thick	do		1852	19
do	do	do	do	do		1864	20
Blue-black	Medium, semi-crystalline	Massive	Even, medium to thick	Lower Silurian		1873	21
do	do	do	do	do		1860	22
do	do	do	Even, thin, medium, and thick.	do		1865	23
do	Fine	Indistinct	Even, thin to thick	Upper Silurian		1850	24
Blue and gray	do	Massive	Thin to thick	Devonian		1850	25
Blue-black and gray	Fine	Indistinct	Uneven, thin to thick	Upper Silurian		1866	26
Blue-black	do	Massive	Medium to thick	Devonian		1869	27
Gray	Fine, semi-crystalline	Indistinct	Thick	do		1840	28
do	do	do	do	do		1840	29
do	do	do	do	do		1840	30
Gray	Fine, semi-crystalline	Indistinct	Uneven, medium	Devonian		1830	31
do	do	do	do	do		1830	32
do	do	do	do	do		1870	33
do	Fine, crystalline	Massive	Even, medium	do		1830	34
do	do	do	do	do		1860	35
Gray	Fine, crystalline	Massive	Even, medium	Devonian		1880	36
Blue-black	Fine	do	Even, medium to thick	do		1834	37
Dark gray	do	do	Even, thick	do		1830	38
do	do	do	do	do		1820	39
Dark drab	do	do	Irregular	do		1868	40
Dark drab	Fine	Massive	Irregular	Devonian		1872	41
Blue-black	do	do	Uneven, medium	Upper Silurian		1869	42
Dark gray	Fine, semi-crystalline	do	Even, medium	Devonian		1850	43
do	do	do	do	do		1874	44
Light gray	Medium, semi-crystalline.	do	Thick	Upper Silurian		1836	45
Light gray	Medium, semi-crystalline.	Massive	Uneven, medium	Devonian		1838	46
do	do	do	do	do		18[illegible]8	47
do	do	do	do	do		1850	48
do	do	do	Even, medium thick	do		1870	49
Gray	do	do	do	do		1835	50
Light gray	Medium, semi-crystalline.	Massive	Even, medium thick	Devonian		1865	51
Gray	do	do	do	do		1850	52
Dark drab	do	do	Even, thick	do		1858	53
do	do	do	do	do		1868	54
do	Fine, semi-crystalline	do	do	do		1820	55

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NEW YORK—SANDSTONE.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Potsdam	Saint Lawrence	Potsdam Sandstone Company	Sandstone	Sandstone
2	Hammond	do	James Finnegan	do	do
3	Fort Ann	Washington	Jenkins White	do	do
4	Schenectady	Schenectady	Upper Aqueduct Quarry Company	do	do
5	Eminence	Schoharie	Simmonds & Bogardus	Blue-stone	do
6	Hunter's Land	Schoharie	Middleburgh Bluestone Company	Blue-stone	Sandstone
7	Reidsville	Albany	William Stoneburne & Isaac Brate	do	do
8	do	do	Edward Udell	do	do
9	do	do	James B. Winne	do	do
10	Dormansville	do	Allen Kniffen	do	do
11	Leeds	Greene	Leeds Quarries	Blue-stone	Sandstone
12	Kiskatom	do	Jessup & McCarthy	do	do
13	do	do	Moon & Meyer	do	do
14	do	do	James Butler	do	do
15	do	do	Peter Jessup & Co	do	do
16	Kiskatom	Greene	McCabe & Co. and William Dorsey	Blue-stone	Sandstone
17	Palenville	do	Alfred Griffin	do	do
18	do	do	H. B. Walters	do	do
19	Quarryville	Ulster	Peter Daly & Co	do	do
20	do	do	S. O. Haggadon	do	do
21	Quarryville	Ulster	Asa Cook & Co	Blue-stone	Sandstone
22	do	do	Schoonmaker & Cook	do	do
23	do	do	D. Lyman	do	do
24	do	do	Mason & Mack	do	do
25	do	do	John Fawley	do	do
26	Quarryville	Ulster	Mower & Co	Blue-stone	Sandstone
27	do	do	A. Carwright	do	do
28	do	do	Thomas Fitzpatrick	do	do
29	do	do	Daniel Driscoe	do	do
30	do	do	Michael Maloy	do	do
31	Quarryville	Ulster	Patrick Merinor	Blue-stone	Sandstone
32	do	do	Daniel Driscoe & Co	do	do
33	do	do	Cunningham Brothers	do	do
34	do	do	Francis Stone	do	do
35	do	do	W. Teetsel & Co	do	do
36	Quarryville	Ulster	Adam Sax	Blue-stone	Sandstone
37	do	do	Corcoran & Kelley	do	do
38	do	do	Patrick Devery & Co	do	do
39	do	do	Michael Kelley	do	do
40	Saugerties	do	John Hackett	do	do
41	Saugerties	Ulster	Thomas Maher	Blue-stone	Sandstone
42	do	do	Thomas Rafferty	do	do
43	do	do	Pat Moore & Co	do	do
44	do	do	Berhaus & Brainard	do	do
45	do	do	Margaret Pierce	do	do
46	Saugerties	Ulster	John Dorgan	Blue-stone	Sandstone
47	do	do	John Lanagan	do	do
48	do	do	Thomas Malone	do	do
49	do	do	Scott Brothers	do	do
50	Kingston	do	William Hart	do	do
51	Kingston	Ulster	Phillip Stauble	Blue-stone	Sandstone
52	do	do	Jno. H. Carle & Co	do	do
53	do	do	Mean, Goldbaugh, Kull & Saan	do	do
54	do	do	R. Short & Co., H. Brink & Co., and others	do	do
55	do	do	Barney Burns	do	do
56	Kingston	Ulster	McDonald & Co., Riley & Co., and others	Blue-stone	Sandstone
57	do	do	Frank Young	do	do
58	do	do	Carle & Van Hautenburgh	do	do
59	do	do	Patrick Maguire	do	do
60	do	do	Burke & Co	do	do
61	Kingston	Ulster	Christopher Maguire	Blue-stone	Sandstone
62	do	do	Leahy & Co	do	do
63	do	do	David Henderson	do	do
64	do	do	Osterhout & Sheehan	do	do
65	do	do	Robert & Robert J. Charlton	do	do
66	Kingston	Ulster	William Charlton	Blue-stone	Sandstone
67	do	do	Michael Coogan	do	do
68	do	do	Welsh & Hays	do	do
69	do	do	David Murphy	do	do
70	do	do	James Leahy	do	do
71	Kingston	Ulster	B. Leahy	Blue-stone	Sandstone
72	do	do	James Ryan	do	do
73	do	do	Ryan & Co	do	do
74	do	do	McCrief Brothers	do	do
75	do	do	William Donaldson	do	do
76	Kingston	Ulster	Morrissey Brothers	Blue-stone	Sandstone
77	do	do	Patrick Conlon	do	do
78	do	do	James F. Burke	do	do
79	do	do	Michael Lamb	do	do
80	do	do	Michael H. Fisher	do	do
81	Kingston	Ulster	James Highland, P. Urel	Blue-stone	Sandstone
82	do	do	James Haggerty	do	do
83	West Hurley	do	Thomas Conlon	do	do
84	do	do	Thomas Grant	do	do
85	do	do	Patrick Bahan	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

NEW YORK—SANDSTONE.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Red	Coarse	Even, parallel	Even, thin to medium	Lower Silurian		1856	1
do	do	Indistinct	Even, thin to thick	do		1876	2
Light gray	Medium to fine	Massive	Uneven, medium	do		1840	3
Blue-black	Fine	do	Uneven, thick	do		1867	4
Dark gray	Fine and coarse	Even, parallel	Even, thin	Devonian		1879	5
Dark gray	Coarse	Even, parallel	Variable	Devonian		1865	6
do	do	do	Even, thin	do		1850	7
do	do	do	do	do		1860	8
do	do	do	do	do		1850	9
do	do	do	do	do		1870	10
Dark gray	Fine and coarse	Even, parallel	Even, thin	Devonian		1840	11
do	do	do	do	do		1873	12
do	Medium	do	Even, thin to medium	do		1860	13
do	do	do	do	do		1850	14
do	Fine	do	do	do		1860	15
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1873	16
do	do	Indistinct	Even, thin to medium	do		1855	17
do	do	do	do	do		1850	18
do	do	Even, parallel	Even, thin to thick	do		1860	19
do	do	do	do	do		1845	20
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	21
do	do	Even, parallel	do	do		1850	22
do	do	do	do	do		1854	23
do	do	Indistinct	Even, thin to medium	do		1850	24
do	do	do	do	do		1860	25
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	26
do	do	do	do	do		1845	27
do	do	do	do	do		1845	28
do	do	do	do	do		1845	29
do	do	do	do	do		1845	30
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1840	31
do	do	do	do	do		1850	32
do	do	do	do	do		1840	33
do	do	do	do	do		1862	34
do	do	Even, parallel	do	do		1855	35
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1845	36
do	do	do	do	do		1845	37
do	do	do	Even, thin to medium	do		1850	38
do	Coarse	do	Even, thin to thick	do		1877	39
do	do	Indistinct	do	do		1850	40
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1845	41
do	do	do	do	do		1850	42
do	do	do	do	do		1870	43
do	do	do	do	do		1860	44
do	do	do	do	do		1845	45
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	46
do	do	do	do	do		1845	47
do	do	do	do	do		1850	48
do	do	do	do	do		1845	49
do	do	Even, parallel	do	do		1860	50
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	51
do	do	do	do	do		1845	52
do	do	Indistinct	do	do		1850	53
do	do	Even, parallel	do	do		1861	54
do	do	Indistinct	do	do		1850	55
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1865	56
do	do	do	do	do		1860	57
do	do	do	do	do		1842	58
do	do	do	do	do		1840	59
do	do	do	do	do		1858	60
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1845	61
do	do	do	do	do		1850	62
Gray	do	do	do	do		1860	63
Dark gray	do	do	Even, thin to medium	do		1864	64
do	do	do	Even, thin to thick	do		1850	65
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	66
do	do	do	do	do		1850	67
do	do	do	do	do		1850	68
do	do	do	do	do		1871	69
do	do	do	do	do		1871	70
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	71
do	do	do	do	do		1868	72
do	do	do	do	do		1871	73
do	do	do	Even, thin to medium	do		1850	74
do	do	do	Even, thin to thick	do		1869	75
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1870	76
do	do	do	do	do		1840	77
Bluish gray	do	do	do	do		1850	78
Dark gray	do	do	do	do		1847	79
do	do	do	do	do		1840	80
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1847	81
do	do	do	do	do		1850	82
do	do	do	do	do		1860	83
do	do	do	do	do		1850	84
do	do	do	do	do		1860	85

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NEW YORK—SANDSTONE.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Potsdam	Saint Lawrence	Potsdam Sandstone Company	Sandstone	Sandstone
2	Hammond	do	James Finnegan	do	do
3	Fort Ann	Washington	Jenkins White	do	do
4	Schenectady	Schenectady	Upper Aqueduct Quarry Company	do	do
5	Eminence	Schoharie	Simmonds & Bogardus	Blue-stone	do
6	Hunter's Land	Schoharie	Middleburgh Bluestone Company	Blue-stone	Sandstone
7	Reidsville	Albany	William Stoneburne & Isaac Brate	do	do
8	do	do	Edward Udell	do	do
9	do	do	James B. Winne	do	do
10	Dormansville	do	Allen Kniffen	do	do
11	Leeds	Greene	Leeds Quarries	Blue-stone	Sandstone
12	Kiskatom	do	Jessup & McCarthy	do	do
13	do	do	Moon & Meyer	do	do
14	do	do	James Butler	do	do
15	do	do	Peter Jessup & Co	do	do
16	Kiskatom	Greene	McCabe & Co. and William Dorsey	Blue-stone	Sandstone
17	Palenville	do	Alfred Griffin	do	do
18	do	do	H. B. Walters	do	do
19	Quarryville	Ulster	Peter Daly & Co	do	do
20	do	do	S. O. Haggadon	do	do
21	Quarryville	Ulster	Asa Cook & Co	Blue-stone	Sandstone
22	do	do	Schoonmaker & Cook	do	do
23	do	do	D. Lyman	do	do
24	do	do	Mason & Mack	do	do
25	do	do	John Fawley	do	do
26	Quarryville	Ulster	Mower & Co	Blue-stone	Sandstone
27	do	do	A. Carwright	do	do
28	do	do	Thomas Fitzpatrick	do	do
29	do	do	Daniel Driscoe	do	do
30	do	do	Michael Maloy	do	do
31	Quarryville	Ulster	Patrick Merinor	Blue-stone	Sandstone
32	do	do	Daniel Driscoe & Co	do	do
33	do	do	Cunningham Brothers	do	do
34	do	do	Francis Stone	do	do
35	do	do	W. Teetsel & Co	do	do
36	Quarryville	Ulster	Adam Sax	Blue-stone	Sandstone
37	do	do	Corcoran & Kelley	do	do
38	do	do	Patrick Devery & Co	do	do
39	do	do	Michael Kelley	do	do
40	Saugerties	do	John Hackett	do	do
41	Saugerties	Ulster	Thomas Maher	Blue-stone	Sandstone
42	do	do	Thomas Rafferty	do	do
43	do	do	Pat Moore & Co	do	do
44	do	do	Berhaus & Brainard	do	do
45	do	do	Margaret Pierce	do	do
46	Saugerties	Ulster	John Dorgan	Blue-stone	Sandstone
47	do	do	John Lanagan	do	do
48	do	do	Thomas Malone	do	do
49	do	do	Scott Brothers	do	do
50	Kingston	do	William Hart	do	do
51	Kingston	Ulster	Phillip Stauble	Blue-stone	Sandstone
52	do	do	Jno. H. Carle & Co	do	do
53	do	do	Mean, Goldbaugh, Kull & Saan	do	do
54	do	do	R. Short & Co., H. Brink & Co., and others	do	do
55	do	do	Barney Burns	do	do
56	Kingston	Ulster	McDonald & Co., Riley & Co., and others	Blue-stone	Sandstone
57	do	do	Frank Young	do	do
58	do	do	Carle & Van Hautenburgh	do	do
59	do	do	Patrick Maguire	do	do
60	do	do	Burke & Co	do	do
61	Kingston	Ulster	Christopher Maguire	Blue-stone	Sandstone
62	do	do	Leahy & Co	do	do
63	do	do	David Henderson	do	do
64	do	do	Osterhout & Sheehan	do	do
65	do	do	Robert & Robert J. Charlton	do	do
66	Kingston	Ulster	William Charlton	Blue-stone	Sandstone
67	do	do	Michael Coogan	do	do
68	do	do	Welsh & Hays	do	do
69	do	do	David Murphy	do	do
70	do	do	James Leahy	do	do
71	Kingston	Ulster	B. Leahy	Blue-stone	Sandstone
72	do	do	James Ryan	do	do
73	do	do	Ryan & Co	do	do
74	do	do	McCrief Brothers	do	do
75	do	do	William Donaldson	do	do
76	Kingston	Ulster	Morrissey Brothers	Blue-stone	Sandstone
77	do	do	Patrick Conlon	do	do
78	do	do	James F. Burke	do	do
79	do	do	Michael Lamb	do	do
80	do	do	Michael H. Fisher	do	do
81	Kingston	Ulster	James Highland, P. Urel	Blue-stone	Sandstone
82	do	do	James Haggerty	do	do
83	West Hurley	do	Thomas Conlon	do	do
84	do	do	Thomas Grant	do	do
85	do	do	Patrick Bahan	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

NEW YORK—SANDSTONE.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Red	Coarse	Even, parallel	Even, thin to medium	Lower Silurian		1856	1
do	do	Indistinct	Even, thin to thick	do		1876	2
Light gray	Medium to fine	Massive	Uneven, medium	do		1840	3
Blue-black	Fine	do	Uneven, thick	do		1867	4
Dark gray	Fine and coarse	Even, parallel	Even, thin	Devonian		1879	5
Dark gray	Coarse	Even, parallel	Variable	Devonian		1865	6
do	do	do	Even, thin	do		1850	7
do	do	do	do	do		1860	8
do	do	do	do	do		1850	9
do	do	do	do	do		1870	10
Dark gray	Fine and coarse	Even, parallel	Even, thin	Devonian		1840	11
do	do	do	do	do		1873	12
do	Medium	do	Even, thin to medium	do		1860	13
do	do	do	do	do		1850	14
do	Fine	do	do	do		1860	15
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1873	16
do	do	Indistinct	Even, thin to medium	do		1855	17
do	do	do	do	do		1850	18
do	do	Even, parallel	Even, thin to thick	do		1860	19
do	do	do	do	do		1845	20
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	21
do	do	Even, parallel	do	do		1850	22
do	do	do	do	do		1854	23
do	do	Indistinct	Even, thin to medium	do		1850	24
do	do	do	do	do		1860	25
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	26
do	do	do	do	do		1845	27
do	do	do	do	do		1845	28
do	do	do	do	do		1845	29
do	do	do	do	do		1845	30
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1840	31
do	do	do	do	do		1850	32
do	do	do	do	do		1840	33
do	do	do	do	do		1862	34
do	do	Even, parallel	do	do		1855	35
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1845	36
do	do	do	do	do		1845	37
do	do	do	Even, thin to medium	do		1850	38
do	Coarse	do	Even, thin to thick	do		1877	39
do	do	Indistinct	do	do		1850	40
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1845	41
do	do	do	do	do		1850	42
do	do	do	do	do		1870	43
do	do	do	do	do		1860	44
do	do	do	do	do		1845	45
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1850	46
do	do	do	do	do		1845	47
do	do	do	do	do		1850	48
do	do	do	do	do		1845	49
do	do	Even, parallel	do	do		1860	50
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	51
do	do	do	do	do		1845	52
do	do	Indistinct	do	do		1850	53
do	do	Even, parallel	do	do		1861	54
do	do	Indistinct	do	do		1850	55
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1865	56
do	do	do	do	do		1860	57
do	do	do	do	do		1842	58
do	do	do	do	do		1840	59
do	do	do	do	do		1858	60
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1845	61
do	do	do	do	do		1850	62
Gray	do	do	do	do		1860	63
Dark gray	do	do	Even, thin to medium	do		1864	64
do	do	do	Even, thin to thick	do		1850	65
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	66
do	do	do	do	do		1850	67
do	do	do	do	do		1850	68
do	do	do	do	do		1871	69
do	do	do	do	do		1871	70
Dark gray	Fine	Even, parallel	Even, thin to thick	Devonian		1850	71
do	do	do	do	do		1868	72
do	do	do	do	do		1871	73
do	do	do	Even, thin to medium	do		1850	74
do	do	do	Even, thin to thick	do		1869	75
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1870	76
do	do	do	do	do		1840	77
Bluish gray	do	do	do	do		1850	78
Dark gray	do	do	do	do		1847	79
do	do	do	do	do		1840	80
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1847	81
do	do	do	do	do		1850	82
do	do	do	do	do		1860	83
do	do	do	do	do		1850	84
do	do	do	do	do		1860	85

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NEW YORK—SANDSTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
86	West Hurley	Ulster	John Dunn	Blue-stone	Sandstone
87	do	do	Thomas Pearl	do	do
88	do	do	Dumond, Ferguson, France	do	do
89	do	do	Patrick O'Neil	do	do
90	do	do	William H. Shader	do	do
91	West Hurley	Ulster	Ira Ploss & Co	Blue-stone	Sandstone
92	do	do	Obediah Wolven	do	do
93	do	do	L. Lawson	do	do
94	do	do	William F. Stewart	do	do
95	do	do	Rufus Smedes	do	do
96	West Hurley	Ulster	Joseph Scully	Blue-stone	Sandstone
97	do	do	Michael Handreen, Michael Doyle	do	do
98	do	do	Purcell & Doolan, P. Finnigan	do	do
99	do	do	Patrick Keeney and others	do	do
100	do	do	Richard Dunn	do	do
101	West Saugerties	Ulster	Elias Snider	Blue-stone	Sandstone
102	do	do	Edward Bach	do	do
103	do	do	Wesley Lewis	do	do
104	High Woods	do	W. Short & Co	do	do
105	do	do	Van Aken & Co	do	do
106	High Woods	Ulster	Nathan Van Aken	Blue-stone	Sandstone
107	do	do	James Van Aken	do	do
108	do	do	Carle & Co	do	do
109	do	do	Green & Co	do	do
110	Woodstock	do	Philip H. Lapo	do	do
111	Woodstock	Ulster	Elting & Maxwell	Blue-stone	Sandstone
112	do	do	Lawson & Fitch	do	do
113	do	do	Noah Wolven	do	do
114	do	do	Michael Brophy	do	do
115	do	do	Thomas Mead, John Gable	do	do
116	Woodstock	Ulster	Thomas Hennessy	Blue-stone	Sandstone
117	do	do	Henry Russell & Co	do	do
118	Shandaken	do	J. H. Risley	do	do
119	do	do	do	Sandstone	do
120	Phœnicia	do	J. L. McGrath	Blue-stone	do
121	Phœnicia	Ulster	Janneson Brothers	Blue-stone	Sandstone
122	do	do	George Wilson	do	do
123	do	do	Darius Rider	do	do
124	do	do	Delamater & Bouse	do	do
125	do	do	Merritt & Delamater	do	do
126	Phœnicia	Ulster	J. McGrath	Blue-stone	Sandstone
127	Boiceville	do	James Schermerhorn	do	do
128	do	do	Lane & Co	do	do
129	do	do	Uriah A. Avery	do	do
130	Brodhead	do	James H. Shaw	do	do
131	Brodhead	Ulster	Cornish & Rowe	Blue-stone	Sandstone
132	do	do	J. B. Hammond	do	do
133	do	do	P. W. Van Kleek	do	do
134	do	do	A. Bishop & Co	do	do
135	do	do	Hungerford & Boice	do	do
136	Ellenville	Ulster	Rochester and Wawarsing Quarries	Blue-stone	Sandstone
137	3 miles north of Poughkeepsie	do	William Fuller	do	do
138	Nyack	Rockland	Nelson Puff	Brownstone	do
139	Pond Eddy	Sullivan	Whalen, Martin & Van Aken	Blue-stone	do
140	3 miles west of West Brookville	do	West Brookville Quarries	do	do
141	Rockland	Delaware	Patrick Fenden and others	Blue-stone	Sandstone
142	Trout Brook	do	John Rhodes	do	do
143	do	do	Patrick Riley	do	do
144	do	do	George Whitehead	do	do
145	Margarettville	do	Grant Brothers	do	do
146	Roxbury	Delaware	B B. Boughton	Blue-stone	Sandstone
147	do	do	Robinson & Soop	do	do
148	Grand Gorge	do	Samuel Draffen and Andrew Elflein	do	do
149	Cooperstown	Otsego	John Wood	Sandstone	do
150	Oneonta	do	D. Orr	Blue-stone	do
151	Guilford	Chenango	Mrs. W. W. Davis	Blue-stone	Sandstone
152	Smithville Flats	do	John Miller	do	do
153	3 miles from New Hartford	Oneida	Mallory & Griffith	Sandstone	do
154	Camden	do	Nathan Beebe	do	do
155	Atwater	Cayuga	J. G. Baeger	Blue-stone	do
156	Ithaca	Tompkins	McClune's Quarry	Blue-stone	Sandstone
157	Trumansburg	do	Dumont & Cusic	Flag-stone	do
158	Covert	Seneca	T. H. King	do	Sandstone (calcareous)
159	do	do	C. O. Ogden	do	do
160	Watkins Glen	Schuyler	Northern Central Railway Company	Sandstone	Sandstone
161	Corning	Steuben	John Kelley	Sandstone	Sandstone (calcareous)
162	do	do	George Barnard	do	do
163	do	do	L. Field	do	do
164	Canisteo	do	James Mullen	do	do
165	Brockport	Monroe	Hugh Quinn	do	Sandstone
166	Brockport	Monroe	George Coon	Sandstone	Sandstone
167	Hulburton	Orleans	O'Brien & O'Reilly	do	do
168	do	do	A. J. Squires	do	do
169	Albion	do	Gilbert Brady	do	do
170	do	do	Albion and Medina Sandstone Company	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

NEW YORK—SANDSTONE—Continued.

Color.	STRUCTURE.			GEOLOGICAL AGE OF FORMATION.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1874	86
do	Coarse	do	do	do		1877	87
do	Fine	do	do	do		1865	88
do	do	do	Even, thin to thick	do		1864	89
do	do	do	Even, thin to medium	do		1860	90
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1860	91
do	do	do	do	do		1879	92
do	do	do	do	do		1845	93
do	do	do	do	do		1878	94
do	do	do	Medium to thick	do		1855	95
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian		1840	96
do	do	do	do	do		1860	97
do	do	do	do	do		1875	98
do	do	do	do	do		1860	99
do	do	do	do	do		1856	100
Dark gray	Fine	Indistinct	Even, thin to medium	Devonian		1850	101
do	do	do	do	do		1857	102
do	do	do	Even, thick	do		1850	103
do	do	do	Even, thin to thick	do		1860	104
do	do	do	do	do		1860	105
Dark gray	Fine	Indistinct	Even, thin to thick	Devonian		1860	106
do	do	do	do	do		1871	107
do	Coarse	do	do	do		1860	108
do	do	do	do	do		1860	109
do	Fine	do	Uneven, thin to thick	do		1875	110
Dark gray	Fine	Indistinct	Even, thick	Devonian		1869	111
do	do	do	do	do		1850	112
do	Coarse	do	do	do		1860	113
do	Fine	do	Even, thin to medium	do		1878	114
do	Coarse	do	Even, medium to thick	do		1850	115
Dark gray	Coarse	Indistinct	Even, medium to thick	Devonian		1850	116
do	do	do	do	do		1850	117
do	do	Even, parallel	Even, thin to medium	do		1872	118
do	do	do	do	do		1874	119
do	do	do	do	do		1871	120
Dark gray	Coarse	Massive	Even, thin to medium	Devonian		1876	121
do	do	do	do	do		1879	122
do	Fine	do	do	do		1875	123
do	do	do	do	do		1878	124
Reddish brown	do	do	Even, medium to thick	do		1879	125
Dark drab	Fine	Massive	Medium to thick	Devonian		1869	126
Dark gray	do	do	Even, thick	do		1877	127
do	do	do	do	do		1877	128
do	do	do	do	do		1877	129
do	do	do	do	do		1870	130
Blue-black	Coarse	Indistinct	Even, thick	Devonian		1878	131
Dark gray	Fine	do	do	do		1871	132
do	do	do	do	do		1871	133
do	do	do	do	do		1877	134
do	do	Massive	do	do		1877	135
Dark gray	Coarse	Even, parallel	Thin to medium	Devonian		1871	136
do	do	Variable	Even, thick	Lower Silurian		1870	137
Red	Fine	Massive	Even, medium to thick	Triassic			138
Gray	do	Even, parallel	Even, thin to medium	Devonian		1870	139
Dark gray	Coarse	do	Even, thin to thick	do		1850	140
Gray	Coarse	Even, parallel	Even, thin to thick	Devonian		1880	141
Dark gray	do	Indistinct	do	do		1880	142
do	do	do	do	do		1879	143
do	do	do	do	do		1879	144
do	Fine	do	Even, thin to medium	do	Catskill	1879	145
Grayish brown	Coarse	Indistinct	Even, thin to medium	Devonian	Catskill	1860	146
do	do	do	do	do	do	1871	147
Gray	Medium	do	do	do	do	1871	148
Dark gray	Fine	do	Even, thick	do	Hamilton	1862	149
do	do	do	Even, thin to medium	do	Chemung	1870	150
Dark gray	Fine	Massive	Even, thin to medium	Devonian	Chemung	1850	151
do	do	Indistinct	Even, medium to thick	do	do	1871	152
Light gray	Coarse	Massive	Uneven, medium to thick	Upper Silurian	Oneida	1860	153
do	do	Indistinct	Even, thin to medium	do	Medina	1863	154
Dark gray	Fine	Even, parallel	do	Devonian	Portage	1873	155
Dark gray	Fine	Even, parallel	Even, thin to medium	Devonian	Portage	1820	156
do	do	Massive	do	do	Chemung	1864	157
do	do	Even, parallel	Even, medium	do	do	1850	158
do	do	do	do	do	do	1849	159
do	do	Massive	Even, medium to thick	do	do	1878	160
Dark drab	Fine	Massive	Uneven, medium to thick	Devonian	Chemung	1871	161
do	do	do	do	do	do	1871	162
do	do	do	do	do	do	1830	163
Light blue	do	do	Even, medium	do	do	1871	164
Light gray	do	do	Uneven, thin to medium	Upper Silurian	Medina	1870	165
Light gray	Fine	Massive	Uneven, thin to medium	Upper Silurian	Medina	1876	166
Red	do	Indistinct	Uneven, thick	do	do	1873	167
do	Coarse	do	do	do	do	1869	168
do	Fine	do	Even, medium	do	do	1860	169
Light gray	do	Massive	Even, thick	do	do	1860	170

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

NEW YORK—SANDSTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
171	Medina	Orleans	Kearney, Barrett & Co	Sandstone	Sandstone
172	do	do	Isaac Holloway	do	do
173	do	do	Patrick Horan	do	do
174	do	do	A. J. McCormick	do	do
175	Lockport	Niagara	Charles Whitmore	do	do
176	Warsaw	Wyoming	Morris & Son	Flag-stone	Sandstone (calcareous)
177	do	do	Philander Twesdell	do	do
178	Castile	do	George Sutherland	Sandstone	Sandstone
179	Belfast	Allegany	John Lang	do	do
180	Jamestown	Chautauqua	John McVeigh	do	do
181	Jamestown	Chautauqua	J. O'Brien	Sandstone	do

NEW YORK—SLATE.

1	Hampton	Washington	New England Slate Company	Slate	
2	do	do	Boston and New York Slate Company	do	
3	do	do	David Williams & Brothers	do	
4	do	do	Lyman J. Warren	do	
5	do	do	do	do	
6	Middle Granville	Washington	Penrhyn Slate Company	Slate	
7	do	do	Albany Slate Company	do	
8	do	do	Middle Granville Slate Company	do	
9	Granville	do	Empire Slate Company	do	
10	do	do	Mettowee Red Slate Company	do	
11	Granville	Washington	North Bend Slate Company	Slate	
12	Salem	do	Salem Slate Company	do	

NEW JERSEY—CRYSTALLINE SILICEOUS ROCKS.

1	Bergen Hill	Hudson	Bergen Hill	Trap-rock	Diabase
2	Dover	Morris	Delaware, Lackawanna and Western Railroad Company.	Gneiss	Gneiss

NEW JERSEY—SANDSTONE.

1	Flagstone Hill, Wantage township.	Sussex	Asa & George Carr	Graywacke	
2	Southern outskirts of Paterson	Passaic	William P. Hartley	Sandstone	
3	Belleville. Avondale post-office	Essex	A. Philip & Son	do	
4	do	do	William A. Joyce	do	
5	do	do	J. B. I. Robinson	do	
6	Pleasant Valley, West Orange	Essex	F. W. Shrump	Sandstone	
7	Orange Mountain	do	James Bell & Co	do	
8	Newark	do	Newark Quarry Company	do	
9	do	do	Kocher Bros.	do	
10	do	do	Philip Hochule	do	
11	Martinville	Somerset	William E. Bartle & Bro	Sandstone	
12	Milford, Belvidere, and Delaware Railroad.	Hunterdon	Smith Clark	do	
13	1 mile northwest of Prallsville	do	Pennsylvania Railroad Company	do	
14	Stockton	do	James Lilley	do	
15	do	do	Peter Best	do	
16	Princeton	Mercer	Thomas Jewell	Sandstone	
17	Greensburg	do	L. Clark & Bro	do	
18	do	do	Chas. Keeler & Son	do	
19	do	do	Greensburg Granite and Freestone Company.	do	
20	Egg Harbor City	Atlantic	Wolfsieffer Bros	do	

NEW JERSEY—SLATE.

1	Princeton	Mercer	Stephen Margerum	Sandstone (slate)	
2	La Fayette	Sussex	Williams & Titus	Slate	
3	do	do	Thos. Jones	do	

PENNSYLVANIA—CRYSTALLINE SILICEOUS ROCKS.

1	Twenty-third ward, Philadelphia	Philadelphia	Barbour & Ireland and S. France	Gneiss	Biotite granite
2	do	do	House of Correction, Employment, and Reformation.	Syenite	
3	Twenty-first ward, Philadelphia	do	McKinney's	Gneiss	Hornblende gneiss
4	Twenty-second ward, Philadelphia	do	John Nolan	do	Muscovite gneiss
5	do	do	Nester & Shelmine	do	Hornblende gneiss
6	Jenkintown	Montgomery	James Conn	Gneiss	Hornblende gneiss
7	Jenkintown and Mill Creek	do	Eldridge & Stewart (2 quarries)	do	do
8	Chester	Delaware	A. O. & J. O. Deshong, jr	do	Biotite-muscovite gneiss
9	do	do	George G. Leiper	do	do
10	do	do	H. L. Powell	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

NEW YORK—Sandstone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Pinkish gray	Fine	Massive	Even, thick	Upper Silurian	Medina	1840	171
Light gray	do	do	Even, medium	do	do	1851	172
Red	do	Indistinct	do	do	do	1845	173
Red and gray	do	do	do	do	do	1872	174
Light gray	do	Massive	do	do	do	1825	175
Gray	Fine	Massive	Even, medium	Devonian	Portage	1876	176
do	do	do	do	do	do	1873	177
do	do	do	Even, medium to thick	do	do	1873	178
Dark drab	do	do	Even, thick	do	Chemung	1876	179
Gray	do	do	Even, medium	do	do	1840	180
Gray	Fine	Massive	Even, medium	Devonian	Chemung	1840	181

NEW YORK—Slate.

Purple	Fine	Rhomboidal	Even	Lower Silurian	Cambrian	1850	1
Red	do	do	do	do	do	1860	2
Green and purple	do	do	do	do	do	1863	3
do	do	Rhomboidal, irregular	do	do	do	1876	4
Red	do	do	do	do	do	1880	5
Purple and green, variegated.	Fine	Prismatic, quadrangular	Even	Lower Silurian	Cambrian	1850	6
do	do	do	do	do	Potsdam	1869	7
do	do	do	do	do	do	1853	8
Variegated and purple	do	Rhomboidal	Uneven	do	Cambrian	1853	9
Red	do	do	Even	do	Potsdam	1877	10
Red	Fine	Rhomboidal	Even	Lower Silurian	Potsdam	1872	11
Purple variegated, green	do	do	do	do	Cambrian	1868	12

NEW JERSEY—Crystalline Siliceous Rocks.

Dark gray	Variable	Massive	Irregular	Triassic			1
Gray	Medium		Thick	Archæan		1869	2

NEW JERSEY—Sandstone.

Gray	Fine	Variable	Even, thin to thick	Lower Silurian		1859	1
Grayish brown	Medium	Massive	Thin to thick	Triassic		1848	2
do	do	Indistinct	Thick	do		1775	3
do	do	do	do	do		1854	4
do	do	do	do	do		1800	5
Grayish brown	Fine	Variable	Thick	Triassic		1871	6
do	Coarse	Massive	do	do		1880	7
do	Medium	Indistinct	do	do		1812	8
do	do	do	do	do		1872	9
do	do	Irregular	do	do		1858	10
Dark gray	Fine	Massive	Thick	Triassic		1837	11
do	do	Even, parallel	Thin	do		1859	12
Grayish brown	Coarse, conglomerate	Massive	Thick	do		1850	13
do	Coarse	do	do	do		1876	14
do	do	do	do	do		1876	15
Gray	Medium	Irregular	Thick	Triassic		1800	16
Grayish brown	do	Massive	do	do		1843	17
do	Coarse	do	do	do		1833	18
do	Medium		do	do		1843	19
Brown	Coarse, conglomerate	Irregular	do	Cretaceous		1873	20

NEW JERSEY—Slate.

	Fine			Triassic		1843	1
Blue-black	do			Lower Silurian	Hudson River slate	1844	2
do	do			do			3

PENNSYLVANIA—Crystalline Siliceous Rocks.

Dark gray	Fine	Indistinct	Horizontal sheet and vertical.	Archæan		1850	1
Gray	Coarse and fine	Laminated	do	do		1874	2
Dark gray	Fine	do	do	do		1837	3
Gray	Coarse	do	Irregular	do		1730	4
Dark gray	Fine	do	Horizontal and vertical	do		1860	5
Gray	Coarse and fine	Laminated	Irregular	Archæan		1858	6
do	do	do	do	do		{1800 1878}	7
do	Fine	do	do	do		1800	8
do	Medium	do	Horizontal and vertical	do		1750	9
do	do	do	Irregular	do		1800	10

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

PENNSYLVANIA—CRYSTALLINE SILICEOUS ROCKS—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
11	2½ miles east by northeast from Chester.	Delaware	Joseph H. Ward	Gneiss	Biotite gneiss
12	2½ miles north from Chester	do	Leiper & Lewis	do	Muscovite-biotite gneiss
13	Collins station or Falmouth post-office.	Lancaster	John Keller	Granite	Diabase
14	Etters	York	Northern Central Railway Company	Conowago granite	do
15	2½ miles south of Gettysburg	Adams	D. F. Pittenturf	Granite	do

PENNSYLVANIA—MARBLE AND LIMESTONE.

1	Easton	Northampton	George & Isaac A. Smith	Limestone	Dolomite
2	William Penn	Montgomery	E. C. Potts	Marble and limestone	Limestone
3	East Conshohocken	do	East Conshohocken Stone Company	Limestone	Magnesian limestone
4	West Conshohocken	do	Conshohocken Stone Quarry Company	do	do
5	Bridgeport	do	Henderson Marble Company	Marble	Limestone
6	King of Prussia station	Montgomery	I. I. Derr	Marble	Limestone
7	Henderson station	do	Daniel O. Hitner, sr	do	do
8	Downingtown	Chester	Matthew Berry	Limestone	Calcareous dolomite
9	Tuckerton	Berks	Philadelphia and Reading Railroad Co	do	do
10	Reading	do	W. M. Staufman	do	do
11	Reading	Berks	Jno. H. Sternburg	Limestone	Calcareous dolomite
12	Aurille station	Lebanon	John W. Beaver	do	Limestone
13	Harrisburg (4½ miles southeast of)	Dauphin	Cumber & Zimmerman	do	Magnesian limestone
14	Leaman Place	Lancaster	H. H. Witmer (James Young, lessee)	do	Calcareous dolomite
15	Lancaster	do	John W. Mentzer	do	Dolomite
16	Lancaster	Lancaster	William Westman	Limestone	Dolomite
17	York	York	C. F. Winter	do	Calcareous dolomite
18	Harrisburg	Cumberland	McCormick & Co	do	Dolomite
19	do	do	L. Greek	do	do
20	Shiremanstown (3 miles south of)	do	Moser & Sidle	do	Calcareous-dolomitic limestone
21	Carlisle	Cumberland	W. F. Noble	Limestone	Calcareous dolomite
22	Chambersburg	Franklin	Henry Lippy	do	do
23	Connellsville (3 miles southeast of)	Fayette	A. R. Banning	Blue-stone	Limestone

PENNSYLVANIA—SANDSTONE.

1	Lumberville	Bucks	Thomas H. Kemble	Sandstone	
2	Yardleyville	do	S. B. & E. W. Twining	do	
3	Newtown	do	Buckman & Farley	do	
4	Norristown	Montgomery	Louis Flum	do	
5	Bridgeport	do	J. J. Davis	do	
6	Mohn's Store	Berks	Eppler & Rischville	Sandstone	
7	Hummelstown (3 miles south of)	Dauphin	Hummelstown Brown Stone Company	do	
8	Columbia	Lancaster	Henry E. Wolfe	do	
9	Bethlehem	Lehigh	Brinker & Wagner	do	Argillaceous schist
10	Weissport	Carbon	Henry Mertz	Sandstone	Sandstone (bituminous)
11	Pond Eddy	Pike	C. W. Maxwell & Co	Blue-stone	
12	Scranton (3 miles north of)	Lackawanna	Jeremiah Williams	Sandstone	
13	do	do	do	do	
14	Laurel Run (Plains)	Luzerne	Philip Banker	do	
15	Shickshinny	do	Delaware, Lackawanna, and Western R. R.	do	
16	Shickshinny	Luzerne	George Nicely	Sandstone	
17	Danville	Montour	C. C. Ranch, agent	do	
18	Meshoppen	Wyoming	Brownscombe & King	do	
19	do	do	do	Flag-stone	
20	Black Walnut	do	Wyoming Stone Company	Sandstone	
21	Skinner's Eddy	Wyoming	A. R. Fordyce & Co	Sandstone	
22	do	do	Brink & Knapp	do	
23	Nicholson	do	Moses Shields & Son	do	
24	Brandt	Susquehanna	Harmony Brick Company	Flag-stone	
25	do	do	Joseph Botts	do	
26	Brandt	Susquehanna	McCoy & Co	Flag-stone	
27	Mainsburg	Tioga	Mainsburg Flagging Company	Sandstone	
28	Antrim	do	Patrick Bradley	do	
29	Farrandsville	Clinton	H. F. Hawk & Co	do	
30	do	do	Jno. McNally	do	
31	McVeytown	Mifflin	Joseph Watson	Sandstone	
32	Jack's Narrows	Huntingdon	Frank Hefright	do	
33	Altoona	Blair	William Myers	do	
34	Altoona (5 miles from)	do	Booth & Mackey	do	
35	Somerset	Somerset	John McAdams	Flag-stone	
36	Johnstown	Cambria	Cambria Iron Company	Mahoning sandstone	
37	do	do	Gore & Levergood	Sandstone	
38	Fuller	Jefferson	Allegheny Valley Railroad Company	do	
39	Freeport	Armstrong	David Taylor	do	
40	Lucesco	Westmoreland	John A. Huffman	do	
41	Derry	Westmoreland	Loyalhanna Coal and Coke Company	Sandstone	
42	do	do	John C. Campbell	do	
43	Greensburg	do	S. Zimmermann	do	
44	Webster	do	William Nelson	Flag-stone	
45	Scottdale	do	Samuel Dunmire	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

PENNSYLVANIA—Crystalline Siliceous Rocks—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Gray	Fine	Laminated	Horizontal sheet	Archæan		1880	11
do	Coarse	do	Few joints	do		1770	12
Dark gray	Fine	Massive	Irregular	Triassic		1868	13
Gray	Coarse	do	do	do		1861	14
do	do	do	Bowlders	Archæan		1840	15

PENNSYLVANIA—Marble and Limestone.

Blue	Fine	Massive	Even, medium to thick	Lower Silurian		1870	1
Light blue	Coarse, fine, crystalline	Irregular	do	do		1756	2
Gray	Medium, crystalline	do	Uneven, thin to thick	do		1849	3
do	do	do	Uneven, medium to thick	do		1840	4
Light blue	Fine, crystalline	do	Even, medium to thick	do		1800	5
Blue	Fine, crystalline	Irregular	Uneven, thick	Lower Silurian		1825	6
do	do	do	Uneven, medium to thick	do		1808	7
do	Fine	do	Even, thick	do		1831	8
Gray	do	Massive	do	do		1840	9
Blue	do	Indistinct	Even, thin to thick	do		1830	10
Blue	Fine	Indistinct	Even, thin to thick	Lower Silurian		1881	11
Blue-black	Fine, crystalline	Irregular	Even, medium to thick	do		1866	12
Blue	Fine	do	Even, thin to thick	do		1830	13
Dark gray	do	Indistinct	Even, medium to thick	do		1809	14
Blue-black	do	do	Even, thin to thick	do		1840	15
Blue-black	Fine	Indistinct	Even, thin to thick	Lower Silurian		1840	16
Black	Fine, porphyritic	Massive	Even, medium to thick	do		1840	17
Dark drab	Fine	Even, parallel	Uneven, medium to thick	do		1860	18
do	do	do	do	do		1879	19
Blue	do	do	Even, thin to thick	do		1850	20
Blue-black	Fine	Indistinct	Even, thin to thick	Lower Silurian		1878	21
do	do	Massive	do	do		1812	22
Drab	Fine, crystalline, and compact.	Even, parallel	Even, thick	Sub-Carboniferous	Umbral	1875	23

PENNSYLVANIA—Sandstone.

Brown	Medium	Indistinct	Even, thick	Triassic		1874	1
do	Coarse	do	do	do		1840	2
do	do	Even	do	do		1856	3
do	do	Indistinct	Even, medium to thick	do		1878	4
do	do	do	Even, thick	do		1868	5
Brown	Medium	Massive	Even, thick	Triassic		1780	6
do	do	do	do	do		1867	7
	Fine			Lower Silurian		1843	8
Gray	do	Massive	Even, thick	do		1850	9
Dark gray	do	Even, parallel	Even, thin	Devonian		1878	10
Dark gray	Fine	Massive	Even, thin to medium	Devonian		1865	11
do	Medium	do	Even, thin to thick	Sub-Carboniferous		1864	12
Buff	do	Indistinct	Even, thin to medium	Devonian		1860	13
Red	do	Even, parallel	do	do		1850	14
Dark gray	do	do	Even, thick	Carboniferous		1840	15
Gray	Coarse	Even, parallel	Even, medium to thick	Carboniferous		1835	16
Dark gray	Fine	Massive	do	Upper Silurian		1830	17
do	do	do	Even, parallel, thick	Devonian		1867	18
do	do	do	Even, thin to medium	do		1876	19
do	do	do	Even, thin to thick	do		1860	20
Dark gray	Fine	Massive	Even, thin to thick	Devonian		1870	21
do	do	do	do	do		1860	22
do	do	do	do	do		1870	23
do	do	do	Even, thin to medium	do		1878	24
do	do	do	do	do		1878	25
Dark gray	Fine	Massive	Even, thin to medium	Devonian		1878	26
do	do	Variable	Even, thin	do		1871	27
Light gray	Coarse	Massive	Even, thick	Carboniferous		1872	28
Buff	Medium	do	Even, thin to thick	Devonian		1836	29
Dark gray and brown	Fine	Indistinct	Even, medium	do		1830	30
Gray	Coarse	Even, parallel	Even, thin to thick	Devonian		1830	31
Light gray	Medium	Irregular	Bowlders	Upper Silurian		1868	32
Gray	do	Even, parallel	Even, thin to thick	Sub-Carboniferous		1880	33
do	do	Irregular	Bowlders	Devonian		1810	34
do	do	do	Even and thin	Carboniferous		1830	35
Dark gray	Medium	Massive	Even, medium	Carboniferous		1865	36
Gray	Coarse	Indistinct	Uneven, medium to thick	do		1867	37
do	do	Massive	Even and thick	do		1872	38
Gray and light brown	do	Irregular	Uneven, medium	do		1865	39
Gray	do	do	Even, thick	do		1870	40
Gray	Medium	Massive	Even, thin to thick	Carboniferous		1850	41
Reddish gray	Coarse	Indistinct	Bowlders	do		1840	42
Gray	Medium	Irregular	Uneven, thin to medium	do		1881	43
do	Fine	Even, parallel	Even, thin to medium	do		1850	44
Brown	Medium	Irregular	Even, thin	do		1876	45

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS.

PENNSYLVANIA—SANDSTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
46	Connellsville	Fayette	Christian Shibley	Sandstone	Sandstone
47	Uniontown (3 miles southeast of)	do	James Fraser	do	do
48	Uniontown (4 miles southeast of)	do	D. Shipley	do	do
49	Waynesburgh	Greene	Simeon Rinehart	do	do
50	West Union	do	John Lapham	do	do
51	Washington (5 miles west of)	Washington	D. Haggerty	Sandstone	Sandstone
52	Washington (3 miles east of)	do	Hallam Bros	do	do
53	Washington	do	John Brady	do	do
54	Canonsburg	do	John Cook	Freestone	do
55	Monongahela city	do	William Nelson	Sandstone	do
56	Sewickley	Allegheny	United States Government	Sandstone	Sandstone
57	Walker's Mills	do	Pittsburgh, Cincinnati, and Saint Louis R. R. Co.	do	do
58	do	do	Isaac Walker	do	do
59	Mansfield Valley	do	M. B. Brown	do	do
60	Pittsburgh	do	Thos. Rourke	do	do
61	Pittsburgh	Allegheny	Jesse P. Scharf	Sandstone	Sandstone
62	do	do	Evan Jones	do	do
63	do	do	Seely Bros	do	do
64	do	do	George Wright	do	do
65	do	do	Alf. Harrison	do	do
66	Allegheny	Allegheny	Henry James	Sandstone	Sandstone
67	do	do	Ritchie & Sauerbrier	do	do
68	do	do	John Schetzel	do	do
69	do	do	John Huckenstein	do	do
70	do	do	Charles King	do	do
71	Allegheny	Allegheny	Fred. Altevater	Sandstone	Sandstone
72	Baden	Beaver	I. G. Gallagher	do	do
73	Baker's Landing	do	Reed & Ewing	do	do
74	Beaver Falls	do	Jos. Hartman	do	do
75	Homewood	do	A. I. Jolly	do	do
76	Wampum	Lawrence	Jacob Friday	Sandstone	Sandstone
77	Sharon	Mercer	Jno. T. Anderson	do	do
78	do	do	Clemens Herrmann	do	do
79	Greenville	do	P. Leech	do	do
80	Shenango	do	Craigs, Pinkerton & Co	do	do
81	Greenville	Mercer	Amy & Kappenberger	Sandstone	Sandstone
82	do	do	Amy & Brown	do	do
83	do	do	Charles Fry	do	do
84	Stoneboro'	do	L. W. Odell	do	do
85	Franklin	Venango	Joseph Bell & Son	do	do
86	Franklin	Venango	W. Brodhead	Sandstone	Sandstone
87	Oil City	do	David Ready	do	do
88	Garland	Warren	Linn & Leary	do	do
89	do	do	Pennsylvania Railroad Company	do	do
90	Titusville	Crawford	Denis Brenan	do	do
91	Meadville	Crawford	B. McNeil	Sandstone	Sandstone
92	do	do	Frank Hock	do	do
93	Corry	Erie	J. M. Colegrove	do	do
94	Leboeuf	do	Frank Senger	do	do
95	Erie (4 miles east of)	do	James Leask	do	do

PENNSYLVANIA—SLATE.

1	East Bangor	Northampton	Bray & Short	Slate	
2	do	do	Star Slate Company	do	
3	Bangor	do	Bangor Slate Company	do	
4	do	do	Bangor Union Slate Company	do	
5	do	do	North Bangor Manufacturing Company	do	
6	Pen Argyl	Northampton	John Jackson & Co	Slate	
7	do	do	H. Jory & Co	do	
8	do	do	West Bangor Slate Company	do	
9	do	do	Stephen Jackson & Co	do	
10	Chapman's station	do	Chapman and New York Slate Company	do	
11	6 miles northwest of Catasauqua; 9 miles from Allentown.	Lehigh	North Peach Bottom Slate Company	Slate	
12	5½ miles east of Slatington	do	R. Henry & Co	do	
13	1½ miles east of Slatington	do	John Paulus & Co	do	
14	1 mile east of Slatington	do	Caskie & Emack	do	
15	Slatington	do	James Hess & Co	do	
16	Slatington	Lehigh	W. H. Seibert	Slate	
17	do	do	David Williams	do	
18	½ mile west of Slatington	do	Columbia Slate Company	do	
19	do	do	Kuntz & Jacobs	do	
20	West of Slatington	do	The Industrial Slate Company	do	
21	West of Slatington	Lehigh	Krum & Maser	Slate	
22	Slatington	do	Joel Neff	do	
23	Slatedale	do	Locker Slate Company	do	
24	Lynnsport	do	Laurel Hill Slate Company	do	
25	1 mile west of Stinesville	do	Keever & Lutz	do	
26	1½ miles west of Stinesville	Lehigh	Greesimer & Bro	Slate	
27	Bangor	York	Peach Bottom Slate Manufacturing Co	do	
28	West Bangor	do	Jones & McLaughlin	do	
29	do	do	Robert L. Jones & Co	do	
30	½ mile from West Bangor	do	William C. Parry & Co	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

PENNSYLVANIA—SANDSTONE—Continued.

Color.	STRUCTURE.			GEOLOGICAL AGE OF FORMATION.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Gray	Coarse	Indistinct	Even, thin to thick	Carboniferous		1867	46
do	do	Irregular	Bowlders	do		1810	47
Light gray	Medium	do	Even, thin	Sub-Carboniferous		1876	48
Gray	Coarse	Massive	Even, thick	Carboniferous		1850	49
do	do	do	do	do		1880	50
Gray	Coarse	Irregular	Solid	Carboniferous		1860	51
do	do	do	Even, medium to thick	do		1880	52
do	do	do	do	do		1816	53
do	Medium	Even, parallel	Even, thin to medium	do		1847	54
do	Coarse	Massive	Even, thick	do		1830	55
Gray	Medium	Massive	Even, thick	Carboniferous		1830	56
do	do	Irregular	Even, medium to thick	do		1864	57
do	do	do	do	do		1818	58
do	do	do	Uneven, medium to thick	do		1850	59
do	do	do	Even, thin to thick	do		1845	60
Gray	Medium	Irregular	Even, thin to thick	Carboniferous		1845	61
do	do	do	do	do		1845	62
do	do	do	do	do		1840	63
do	do	do	do	do		1864	64
do	do	do	do	do		1845	65
Gray	Medium	Irregular	Even, thin to thick	Carboniferous			66
do	do	do	do	do		1860	67
do	do	do	do	do		1845	68
do	do	do	do	do		1840	69
do	do	do	do	do		1840	70
Gray	Medium	Irregular	Even, thin to thick	Carboniferous		1870	71
do	Coarse	Massive	Even, thick	do		1840	72
do	do	do	do	do		1830	73
do	do	Irregular	Even, thin to thick	do		1872	74
Gray and brown	do	do	Uneven, thick	do		1880	75
Gray	Coarse	Massive	Even, thick	Carboniferous		1860	76
do	do	do	Medium to thick	do		1872	77
do	do	do	Even, medium to thick	do		1878	78
do	Fine	Even, parallel	Even, thin	do		1868	79
do	do	do	do	do		1876	80
Gray	Fine	Even, parallel	Even, thin	Carboniferous		1871	81
do	do	do	do	do		1864	82
do	do	do	do	do		1876	83
Gray and light brown	Coarse	Massive	Irregular, medium to thick	do		1865	84
Gray	Fine	Even, parallel	Even, thin to medium	Sub-Carboniferous		1865	85
Gray	Fine	Even, parallel	Even, thin to medium	Sub-Carboniferous		1820	86
do	Coarse	Massive	Even, thick	Carboniferous		1869	87
do	do	do	do	do		1872	88
do	do	do	do	do		1865	89
do	do	do	do	Sub-Carboniferous		1863	90
Gray	Coarse	Massive	Even, thick	Carboniferous		1879	91
do	do	do	do	do		1835	92
do	Fine	Variable	Uneven, medium	Sub-Carboniferous		1868	93
do	do	Even, parallel	Even, medium	Devonian		1840	94
do	do	Indistinct	do	do		1835	95

PENNSYLVANIA—SLATE.

Dark blue	Fine	Irregular	Smooth, even	Lower Silurian		1863	1
do	do	do	Smooth	do		1867	2
do	do	do	do	do		1865	3
do	Compact	do	Even	do		1872	4
do	do	do	do	do		1872	5
Dark blue	Compact	Irregular	Smooth	Lower Silurian		1875	6
do	do	do	do	do		1853	7
do	Fine	do	do	do		1872	8
do	do	do	Smooth, even	do		1875	9
Blue-black	do	Variable		do		1875	10
Blue-black	Fine	Rhomboidal	Even	Lower Silurian		1845	11
Blue	do	Irregular	do	do		1846	12
Dark blue	do	Rectangular		do		1877	13
Black	do	do		do		1857	14
Dark blue	do	do		do		1848	15
Dark blue and black	Fine	Irregular	Smooth, even	Lower Silurian		1865	16
Black	do	do		do		1864	17
Dark blue	do	Rhomboidal		do		1865	18
do	do	do		do		1853	19
do	Hard	Rectangular		do		1866	20
Dark blue	Fine	Rectangular		Lower Silurian		1848	21
do	do	Irregular	Smooth	do		1849	22
do	do	do		do		1860	23
Blue	do	do		do		1877	24
Dark blue	do	do	Even	do		1878	25
Dark blue	Tough	Rectangular	Smooth	Lower Silurian		1867	26
Blue-black	Fine	Irregular		Archæan (?)		1846	27
Dark blue	do	do	Even, smooth	do		1881	28
Blue-black	do	do	do	do		1852	29
Dark blue	do	do	do	do		1835	30

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

DELAWARE—CRYSTALLINE SILICEOUS ROCKS.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Near Wilmington	New Castle	Philip P. Tyre	Granite	
2	do	do	Hughes & Walker	do	
3	do	do	James McKendrick	do	

MARYLAND—CRYSTALLINE SILICEOUS ROCKS.

1	Near Port Deposit	Cecil	John Keaveny	Grasite	Biotite gneiss
2	do	do	McClenahan & Brother	do	do
3	Half mile from Baltimore	Baltimore	John Harris	Gneiss	do
4	Granite	do	Gill & McMahon	Granite	Biotite granite
5	Near Woodstock	do	William F. Weller	do	do
6	Near Woodstock	Baltimore	J. J. Evans	Granite	Biotite granite
7	Opposite Ellicott City	do	Charles J. Werner	do	Biotite gneiss

MARYLAND—MARBLE AND LIMESTONE.

1	Cockeysville	Baltimore	Beaver Dam Marble Company	Marble	
2	Hagerstown	Washington	T. G. Jones	Limestone	Magnesian limestone
3	do	do	Swartz Quarry	do	do

MARYLAND—SLATE.

1	Near Pennsylvania state line—West Bangor, Pennsylvania.	Harford	W. E. Williams & Co	Slate	
2	do	do	Thomas W. Jones & Co	do	
3	do	do	John W. Jones & Co	do	
4	do	do	Harford Peach Bottom Slate Manufacturing Company.	do	
5	do	do	W. C. Roberts & Co	do	
6	Near Pennsylvania state line—Delta, Pennsylvania.	Harford	John A. Barnett & Co	Slate	
7	do	do	Harford Peach Bottom Slate Company	do	

VIRGINIA—CRYSTALLINE SILICEOUS ROCKS.

1	Near Catlett station	Fauquier	Chase Andrews	Diabase	Diabase
2	1½ miles from Fredericksburg	Spotsylvania	E. J. Leyburn	Granite	Biotite-muscovite granite
3	Tuckahoe district	Henrico	J. B. Mitchell & Co	do	Biotite granite
4	Near Richmond	do	Richmond Granite Company	do	do
5	Granite post-office	Chesterfield	Old Dominion Granite Company	do	do
6	Manchester	Chesterfield	Westham Granite Company	Granite	Biotite granite
7	Near Lynchburg	Amherst and Campbell.	Casey & O'Connel	Gneiss and mica-schist.	Biotite gneiss
8	do	Campbell	S. Patterson & Son	Gneiss	do
9	Namozine district	Dinwiddie	Smith & Southall	Granite	Biotite granite
10	do	do	Gill & Hubbard	do	do

VIRGINIA—MARBLE AND LIMESTONE.

1	2 miles northeast of Staunton	Augusta	Red Bud Slate Company	Slate	
2	Craigsville	do	Coral Marble Company	Marble	Magnesian limestone and limestone

VIRGINIA—SLATE.

1	New Canton	Buckingham	J. R. Williams & Co	Slate	
2	Orebanks	do	Edwards & Roberts	do	

WEST VIRGINIA—SANDSTONE.

1	Wheeling	Ohio	Adolph Yhaka	Sandstone	Sandstone
2	do	do	Henry Gunther	do	do
3	do	do	Schiller & Lotz	do	do
4	do	do	Andrew Long	do	do
5	Rowlesburg	Preston	Sullivan & Peat	do	do
6	Grafton	Taylor	Baltimore and Ohio Railroad Company	Sandstone	Sandstone
7	Parkersburg	Wood	B. F. Bacon	do	do
8	do	do	Nugent Keenan	do	do
9	do	do	Patrick Hopkins	do	do
10	Near Charleston	Kanawha	Joel T. Quarrier and others	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

DELAWARE—Crystalline Siliceous Rocks.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Black	Medium	Laminated	Irregular	Archæan		1872	1
do	do	do	do	do		1870	2
do	do	do	do	do		1873	3

MARYLAND—Crystalline Siliceous Rocks.

Dark gray	Coarse	Wavy	Vertical	Archæan		1840	1
do	do	do	Inclined sheets	do		1825	2
Dark greenish gray	Fine	Even, parallel	Irregular	do		1830	3
Gray	Coarse	Indistinctly laminated	Horizontal sheets	do		1830	4
do	Fine	do	Irregular	do		1879	5
Gray	Coarse	Massive	Inclined sheets	Archæan		1836	6
Dark gray	do	Wavy	Horizontal and vertical	do		1872	7

MARYLAND—Marble and Limestone.

White	Fine and coarse crystalline.	Massive	Uneven, thick	Lower Silurian	Auroral	1840	1
Dark blue	Fine	Irregular	do	do	do		2
Blue	do	do	do	do	do		3

MARYLAND—Slate.

Bluish black	Fine	Rhomboidal	Silky fracture	Archæan		1849	1
do	do	do	do	do		1870	2
do	do	do	do	do		1870	3
do	Fine and clear	do	Even and smooth	do		1867	4
do	do	do	do	do		1866	5
Bluish black	Fine and clear	Rhomboidal	Medium smooth	Archæan		1870	6
Dark blue	do	Irregular	Even	do		1872	7

VIRGINIA—Crystalline Siliceous Rocks.

Dark gray	Fine	Massive	Broken, irregular	Mesozoic (Trias)		1880	1
Light gray	Medium	Indistinctly laminated	Vertical and horizontal	Archæan		1880	2
Gray	do	Massive	do	do		1880	3
do	do	do	Irregular	do		1895	4
do	do	do	Inclined sheets	do		1850	5
Light gray	Fine	Massive	Horizontal sheets	Archæan		1837	6
Blue	do	Laminated	Irregular	do		1867	7
do	do	Massive	Inclined sheets	do		1858	8
Greenish gray	Medium	Indistinctly laminated	Few joints	do		1840	9
do	do	do	Solid	do		1870	10

VIRGINIA—Marble and Limestone.

Drab	Fine	Even, parallel	Vertical and transverse	Lower Silurian		1879	1
Pinkish gray	Fine semi-crystalline, fossiliferous.	Indistinct	Uneven, thick	Upper Silurian		1879	2

VIRGINIA—Slate.

Bluish black	Fine	Rectangular	Even, smooth	Archæan		1840	1
do	do	do	do	do		1859	2

WEST VIRGINIA—Sandstone.

Light gray	Coarse	Irregular	Even, thick	Carboniferous	Upper Coal Measures.	1856	1
do	do	do	do	do	do	1860	2
do	do	do	do	do	do	1852	3
do	do	do	do	do	do	1852	4
Dark gray	Fine, compact	Even, parallel	do	Devonian	Catskill?	1877	5
Reddish gray	Coarse	Massive	Even, thick	Carboniferous	Barren Measures	1870	6
Gray	Medium	Even, parallel	do	do	Upper Coal Measures.	1877	7
do	do	do	do	do	do	1859	8
do	do	do	do	do	do	1859	9
do	Coarse	do	Uneven, thick	do	Barren Measures	1780	10

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

GEORGIA—CRYSTALLINE SILICEOUS ROCKS.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Atlanta	Fulton	Patrick Lynch	Granite	Hornblende-biotite gneiss
2	16 miles from Atlanta	De Kalb	Callahan & Welsh	do	Muscovite granite

GEORGIA—SLATE.

1	Rock Mart	Polk	G. W. Jones & Co	Slate	

TENNESSEE—MARBLE AND LIMESTONE.

1	Near Rogersville	Hawkins	Chesnut & Chesnut (Crescent quarry)	Marble	Limestone
2	4½ miles from Rogersville	do	John Hasson	do	do
3	Mooresburg	do	E. D. Dougherty	do	do
4	7 miles from Whitesburg	do	Joseph Stamps (Star quarry)	do	do
5	4 miles from Knoxville	Knox	Knoxville Marble Company	do	do
6	2 miles from Knoxville	Knox	Frierson & Morgan	Marble	Limestone
7	¼ mile from Knoxville	do	John M. Ross	do	do
8	5½ miles southwest of Knoxville	do	Tennessee River Marble Company	do	do
9	9 miles from Cleveland	Bradley	Patrick & Smith	do	Magnesian limestone and limestone
10	2 miles from Chattanooga	Hamilton	Dominick Selare	Limestone	Magnesian limestone
11	Near Nashville	Davidson	Williams & Jones	Limestone	Siliceous dolomite and limestone
12	do	do	Callahan & Welsh	do	
13	Near Clarksville	Montgomery	John Conroy	do	

KENTUCKY—MARBLE AND LIMESTONE.

1	Newport	Campbell	Fitzsimmons & Sons	Limestone	Limestone
2	do	do	H. & F. Boehme	do	do
3	West of Covington	Kenton	J. G. Fadders	do	do
4	do	do	W. Clark	do	do
5	do	do	J. W. Rich	do	do
6	South of Covington	Kenton	Thomas Woods	Limestone	Limestone
7	On Ohio river	Pendleton	David Irwin	do	do
8	1 mile east of Louisville	Jefferson	Michael Gleason	do	Magnesian limestone
9	Louisville	do	City of Louisville	do	do
10	do	do	Dennis Maloney	do	do
11	Louisville	Jefferson	A. Steugh	Limestone	Magnesian limestone
12	do	do	Joseph Nevin	do	do
13	do	do	George Faust	do	do
14	do	do	John Jamison	do	do
15	do	do	A. Holocher	do	do
16	Leaches	Bullitt	Louisville & Nashville Railroad Company	Limestone	Magnesian limestone
17	Lexington	Fayette	City of Lexington	do	Limestone
18	Near Bowling Green	Warren	Belknap, Dunnsville Stone Company	do	Bituminous limestone
19	2½ miles east of Princeton	Caldwell	Princeton Stone and Marble Company	do	do

OHIO—SANDSTONE.

1	3 miles north of Wakeman	Erie	Nicholl & Miller	Sandstone	Sandstone
2	Berlin Heights	do	G. A. Baillie	do	do
3	Brownhelm	Lorain	Worthington & Sons	do	do
4	Amherst	do	do	do	do
5	do	do	L. Haldeman & Sons	do	do
6	Amherst	Lorain	Amherst Stone Company	Sandstone	Sandstone
7	do	do	Wilson & Hughes	do	do
8	do	do	W. H. Bryant	do	do
9	do	do	James Nicholl	do	do
10	do	do	Clough Stone Company	do	do
11	Grafton	Lorain	W. E. Miller	Sandstone	Sandstone
12	Elyria	do	Mussey & Co	do	do
13	do	do	John Weller	do	do
14	3½ miles north of Elyria	do	John Eschtruth	do	do
15	Ridgeville	do	H. L. Beebe	do	do
16	West View	Cuyahoga	Columbia Stone Company	Sandstone	Sandstone
17	Olmsted Falls	do	L. Barnum	do	do
18	Berea	do	McDermott & Berea Stone Company	do	do
19	3 miles east of Berea	do	Barnard Rafferty	do	do
20	Brooklyn	do	Jacob Hoehn	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

GEORGIA—Crystalline Siliceous Rocks.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Blue	Fine	Massive	Irregular	Archæan		1854	1
Light gray	do	do	Horizontal and inclined sheets.	do		1865	2

GEORGIA—Slate.

Blue	Fine	Irregular	Even	Archæan		1859	1

TENNESSEE—Marble and Limestone.

Variegated	Fine, semi-crystalline	Massive	Thick	Lower Silurian		1880	1
do	Fine, compact, semi-crystalline, fossiliferous.	do	do	do		1872	2
do	Fine, semi-crystalline, fossiliferous.	do	do	do		1854	3
do	do	do	do	do		1873	4
Pinkish gray	Medium, semi-crystalline	do	Medium to thick	do		1869	5
Pinkish gray	Medium, semi-crystalline	Massive	Even, thick	Lower Silurian		1879	6
Pink	do	do	Thick	do		1879	7
Pinkish gray	Medium, semi-crystalline, fossiliferous.	do	do	do		1880	8
do	Medium, semi-crystalline	do	do	do		1879	9
Blue-black	Fine, compact	do	Medium to thick	do		1855	10
Gray	Fine, compact	Massive	Medium to thick	Lower Silurian		1877	11
do	do	do	Thick	do		1840	12
do	do	do	Medium to thick	Sub-Carboniferous		1869	13

KENTUCKY—Marble and Limestone.

Blue	Semi-crystalline, fossiliferous.	Massive	Even, thin to medium	Lower Silurian (Cincinnati).		1867	1
do	do	do	do	do		1870	2
do	do	do	do	do		1870	3
do	do	do	do	do		1878	4
do	do	do	do	do		1860	5
Blue	Semi-crystalline, fossiliferous.	Massive	Even, thin to medium	Lower Silurian (Cincinnati).		1876	6
do	do	do	do	do		1871	7
Drab	Semi-crystalline	do	Even, medium	Sub-Carboniferous		1858	8
do	do	do	do	do		1870	9
do	do	do	Even, thick	do		1879	10
Drab	Semi-crystalline	Massive	Even, thick	Sub-Carboniferous		1877	11
do	do	do	Medium to thick	do		1850	12
do	do	do	do	do		1870	13
do	do	do	Even, medium to thick	do		1855	14
do	do	do	do	do		1865	15
Drab	Medium, fine	Massive	Even, thick	Sub-Carboniferous		1864	16
Gray	Semi-crystalline, fossiliferous.	do	Even, thin to medium	Lower Silurian		1850	17
do	Granular, fossiliferous	do	Even, medium to thick	Sub-Carboniferous		1872	18
do	Oolitic and compact	do	Even, thick	do		1878	19

OHIO—Sandstone.

Gray	Medium	Variable	Even, thickness varies	Sub-Carboniferous	Berea grit	1876	1
do	do	do	do	do	do	1870	2
do	do	do	do	do	do	1848	3
do	do	do	do	do	do	1856	4
do	do	do	do	do	do	1870	5
Gray	Medium	Variable	Even, thickness varies	Sub-Carboniferous	Berea grit	1872	6
do	do	do	do	do	do	1855	7
do	do	do	do	do	do	1874	8
do	do	do	do	do	do	1845	9
do	do	do	do	do	do	1852	10
Gray	Medium	Variable	Even, thickness varies	Sub-Carboniferous	Berea grit	1860	11
do	do	do	do	do	do	1871	12
do	do	do	do	do	do	1865	13
do	do	do	do	do	do	1873	14
do	do	do	do	do	do	1875	15
Gray	Medium	Variable	Even, thickness varies	Sub-Carboniferous	Berea grit	1867	16
do	do	do	do	do	do	1855	17
do	Fine	do	Uneven, thickness varies	do	do	1840	18
do	Medium	do	Even, thickness medium	do	do	1876	19
do	do	Coarse		do	do	1840	20

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS:

OHIO—SANDSTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
21	Brooklyn	Cuyahoga	Anthony James' estate	Sandstone	Sandstone
22	East Cleveland	do	James Haycox	do	do
23	do	do	C. E. Reader	do	do
24	do	do	W. G. Neff	do	do
25	do	do	H. P. Gale	do	do
26	Bedford	Cuyahoga	Bedford Stone Company	Sandstone	Sandstone
27	Independence	do	J. R. Hurst	do	do
28	do	do	T. D. Smith	do	do
29	do	do	Wilson & Hughes	do	do
30	Newburgh	do	Edwards Brothers	do	do
31	Newburgh	Cuyahoga	W. H. Caine	Blue-stone	Sandstone
32	do	do	Richard Braund	do	do
33	do	do	T. C. Garfield	do	do
34	Euclid	do	Maxwell & Malone	do	do
35	do	do	John Wagner	do	do
36	Euclid	Cuyahoga	Forest City Stone Company	Blue-stone	Sandstone
37	do	do	McFarland Brothers	do	do
38	do	do	Slosson, Meeker & Co	do	do
39	Windsor	Ashtabula	Robert Stewart	Sandstone	do
40	Mesopotamia	Trumbull	Mesopotamia Freestone Company	Freestone	do
41	3 miles northeast of Warren	Trumbull	Austin Flagstone Company	Flag-stone	Sandstone
42	Near Warren	do	Braceville Ridge Quarries	Sandstone	do
43	Windham	Portage	Case & King	do	do
44	Twinsburg	Summit	Gardner Parmelee	do	do
45	do	do	Newton Herrick	do	do
46	Akron	Summit	Joseph Hugill	Sandstone	Sandstone
47	do	do	Wilhelm & Schroeder	do	do
48	Northampton township	do	Hovey & Brown	Blue-stone	do
49	Peninsula	do	Ferdinand Schumacher	Sandstone	do
50	Greenfield	Huron	George Graham	Flag-stone	do
51	3 miles east of Norwalk	Huron	William Perrin	Sandstone	Sandstone
52	3 miles south of Norwalk	do	Charles Grannell	do	do
53	Monclova	Lucas	Samuel Wagner	do	do
54	Leesville	Crawford	Leesville Stone Company	do	do
55	do	do	Morrow & Miller	do	do
56	Plymouth	Richland	S. W. Tuttle	Sandstone	Sandstone
57	do	do	William J. Bevier	do	do
58	Mansfield	do	Christian Voetsch	do	do
59	do	do	Tobias Cline	do	do
60	Weller township	do	Hughes & Cotter	do	do
61	Weller township	Richland	S. Shively	Sandstone	Sandstone
62	Bellville	do	D. W. Zent	do	do
63	Wooster	Wayne	Coe Brothers	do	do
64	Warwick	do	Walnut Grove Stone Company	do	do
65	West of Massillon	Stark	Warthorst & Co	do	do
66	Northwest of Massillon	Stark	Suter & Everhard	Sandstone	Sandstone
67	5 miles north of Massillon	do	John Paul	do	do
68	3 miles north of Massillon	do	John Vogt	do	do
69	Youngstown	Mahoning	Kirk Quarry, John Holden	do	do
70	2½ miles northwest of Youngstown	do	Brier Hill Stone Company	do	do
71	2½ miles southwest of Youngstown	Mahoning	Thomas Connell	Sandstone	Sandstone
72	Near Austintown	do	Austintown Quarries	do	do
73	New Lisbon	Columbiana	J. H. O'Mara	do	do
74	2 miles north of Carrollton	Carroll	Dr. N. M. Smith	do	do
75	5 miles north of Canal Dover	Tuscarawas	Tuscarawas Valley Coal and Iron Company	do	do
76	3 miles east of New Philadelphia	Tuscarawas	Alfred Mathias	Sandstone	Sandstone
77	3½ miles southwest of Millersburg	Holmes	W. H. Ling	do	do
78	Northeast of Mount Vernon	Knox	Bartlett Brothers	do	do
79	10 miles east of Mount Vernon	do	Isaac Crichfield	do	do
80	Washington township	Morrow	Green & Coyle	do	do
81	North Bloomfield	Morrow	John Flowers	Sandstone	Sandstone
82	Iberia	do	Wilson & Sharrock	do	do
83	do	do	Crane Brothers	do	do
84	2 miles south of Iberia	do	William Goorley	do	do
85	Mount Gilead	do	B. S. Russell	do	do
86	4 miles east of Cardington	Morrow	Robert Edgell	Sandstone	Sandstone
87	do	do	W. Brooke	do	do
88	Sunbury	Delaware	H. Fleckner	do	do
89	do	do	C. B. Gaylord	do	do
90	10 miles east of Columbus	Franklin	William A. Forrester	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

OHIO—SANDSTONE—Continued.

Color.	STRUCTURE.			GEOLOGICAL AGE OF FORMATION.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Gray	Medium	Coarse	Even, thickness medium	Sub-Carboniferous	Berea grit	1845	21
do	do	do	do	do	do	1864	22
do	do	do	do	do	do	1879	23
do	do	do	do	do	do	1850	24
do	do	do	do	do	do	1804	25
Gray	Medium	Coarse	Irregular	Sub-Carboniferous	Berea grit	1880	26
do	do	do	do	do	do	1855	27
do	do	do	do	do	do	1872	28
do	do	do	do	do	do	1848	29
do	do	do	Uneven, thickness medium	do	do	1820	30
Gray	Fine	Massive	Even, thickness medium	Sub-Carboniferous	Bedford shale	1862	31
do	do	do	do	do	do	1872	32
do	do	do	do	do	do	1869	33
do	do	do	do	do	do	1873	34
do	do	do	do	do	do	1875	35
Gray	Fine	Massive	Even, thickness medium	Sub-Carboniferous	Bedford shale	1868	36
do	do	do	do	do	do	1875	37
do	do	do	do	do	do	1871	38
do	do	Variable	Even, thickness varies	do	Berea grit	1875	39
do	Medium	do	do	do	do	1874	40
Dark gray	Fine	Fine	Even, thin	Sub-Carboniferous	Cuyahoga shale	1872	41
Gray	Coarse	Coarse	Irregular, thick	Carboniferous	Base of Lower Coal Measures.	1820	42
Light gray	do	Massive	do	do	do	1873	43
Gray	do	do	Even, thick	do	do	1860	44
do	do	do	do	do	do	1866	45
Gray	Coarse	Coarse	Uneven, thick	Carboniferous	Base of Lower Coal Measures.	1872	46
do	do	do	do	do	do	1866	47
do	Fine	Massive	Even, variable, thick	Sub-Carboniferous	Berea grit	1875	48
do	Medium	Coarse and massive	Even, thick	do	do	1875	49
do	Fine	Fine and irregular	Rough, thin	do	do	1840	50
Gray	Medium	Variable	Even, variable, thick	Sub-Carboniferous	Berea grit	1835	51
do	do	do	Even, th n to medium	do	do	1840	52
Dark gray	Coarse	Massive	Even, medium thick	Devonian	Lower Corniferous	1870	53
do	Fine	Fine and massive	Even, variable, thick	Sub-Carboniferous	Berea grit	1840	54
do	do	do	do	do	do	1847	55
Gray	Fine	Massive	Uneven, medium thick	Sub-Carboniferous	Berea grit	1872	56
do	do	Coarse	Even, medium thick	do	do	1872	57
Gray and brown	Coarse	Massive	do	do	Waverly conglomerate.	1820	58
Gray	do	do	do	do	do	1857	59
do	do	do	Even, thick	do	do	1877	60
Gray	Coarse	Massive	Even, thick	Sub-Carboniferous	Waverly conglomerate.	1875	61
Gray and brown	do	Coarse	Even, variable, thick	do	do	1840	62
Gray	do	Massive	do	do	do	1869	63
do	do	do	Even, thick	Carboniferous	Base of Lower Coal Measures.	1860	64
Gray and pink	do	do	Uneven, thick	do	Lower Coal Measures.	1835	65
Gray and pink	Coarse	Massive	Uneven, thick	Carboniferous	Lower Coal Measures.	1880	66
do	Medium	do	do	do	do	1870	67
do	Coarse	do	do	do	do	1869	68
Gray	Medium	do	Even, thick	do	Base of Lower Coal Measures.	1873	69
do	do	Coarse and irregular	do	do	Lower Coal Measures.	1865	70
Gray	Medium	Coarse and irregular	Even, thick	Carboniferous	Lower Coal Measures.	1868	71
Light brown	Coarse	Coarse and massive	Uneven, variable, thick	do	do	1820	72
Gray	do	Irregular	Thick	do	do	1830	73
do	do	Massive	Uneven, thick	do	do	1840	74
do	do	do	do	do	do	1870	75
Gray	Coarse	Massive	Uneven, thick	Carboniferous	Lower Coal Measures.	1840	76
do	do	do	do	do	do	1820	77
do	do	Coarse and massive	Even, thick	do	Base of Lower Coal Measures.	1810	78
do	do	Coarse	Even, variable	Sub-Carboniferous	Waverly conglomerate.	1872	79
do	Fine	Fine and massive	Uneven, medium	do	Berea grit	1860	80
Gray	Fine	Fine and massive	Uneven, medium	Sub-Carboniferous	Berea grit	1875	81
Dark gray	do	Not distinct	Thin and smooth	do	do	1870	82
do	do	do	do	do	do	1880	83
Gray	do	Fine and massive	Uneven, thin to medium	do	do	1850	84
do	do	do	do	do	do	1837	85
Gray	Fine	Fine and massive	Uneven, thin to medium	Sub-Carboniferous	Berea grit	1869	86
do	do	do	do	do	do	1850	87
do	do	do	Even, thin to medium	do	do	1850	88
do	do	do	do	do	do	1855	89
do	do	Massive	Even, medium	do	do	1840	90

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

OHIO—SANDSTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
91	Newark	Licking	James Coyle	Freestone	Sandstone
92	8 miles east of Newark	do	Charles Daugherty	Sandstone	do
93	do	do	O. Z. Hillery	do	do
94	2 miles southwest of Coshocton	Coshocton	Moses Cheney	do	do
95	Roscoe	do	Robert Dickinson	do	do
96	Zanesville	Muskingum	T. B. Townsend	Sandstone	Sandstone
97	Cumberland	Guernsey and Noble.	do	do	do
98	2½ miles northwest of Cambridge	Guernsey	Samuel Barr	do	do
99	2 miles southeast of Tippecanoe	Harrison	Robert Hosie	do	do
100	West side of Steubenville	Jefferson	Floto & Brothers	do	do
101	West side of Steubenville	Jefferson	Archer & Boal	Sandstone	Sandstone
102	West side of Martin's Ferry	Belmont	Charles Seabreght	do	do
103	2 miles west of Bellaire	do	John R. Robinson	do	do
104	West side of Bellaire	do	W. J. McClain	do	do
105	Lewis' Mills	do	Joseph Hutchinson	do	do
106	Barnesville	Belmont	Baltimore and Ohio Railroad Company	Sandstone	Sandstone
107	Marietta	Washington	T. B. Townsend	do	do
108	2 miles southwest of Marietta	do	C. Finch	do	do
109	6 miles southwest of Marietta	do	Marietta Stone Company	do	do
110	do	do	Constitution Stone Company	do	do
111	7 miles southwest of Marietta	Washington	P. L. Cole	Sandstone	Sandstone
112	8 miles southwest of Marietta	do	D. Briggs	do	do
113	8½ miles southwest of Marietta	do	D. B. Calder	do	do
114	2½ miles west of Constitution	do	Constitution Stone Company	do	do
115	Lithopolis	Fairfield	Joseph Leydecker	Freestone	do
116	Lancaster	Fairfield	Charles Bowmaster	Sandstone	Sandstone
117	Lancaster (east)	do	Sharp & Crook	do	do
118	Lancaster (south)	do	do	do	do
119	Logan	Hocking	Weitzell Brothers	do	do
120	Piketon	Pike	Hays & Green	do	do
121	Piketon	Pike	Waverly Brown Stone Quarries	Freestone	Sandstone
122	2 miles west of Portsmouth	Scioto	Reitz & Co	do	do
123	12 miles from Portsmouth	do	J. M. Inskeep	do	do
124	Freestone P. O. (Buena Vista)	do	Buena Vista Freestone Company	do	do
125	Freestone	Scioto & Adams	John M. Mueller	do	do
126	Rockville	Scioto & Adams.	W. J. Stewart	Freestone	Sandstone

OHIO—LIMESTONE.

1	Point Marblehead	Ottawa	Fred. Roesling	Limestone	Bituminous dolomite
2	do	do	Clemons & Sons	do	do
3	do	do	Johnson & Clemons	do	do
4	do	do	W. A. Clemons	do	do
5	do	do	Ohlemacher Bros	do	do
6	Point Marblehead	Ottawa	John H. Hudson	Limestone	Bituminous dolomite
7	do	do	John H. James	do	do
8	Johnson's island	do	L. B. Johnson & Co	do	
9	White House	Lucas	Pray & Hall	do	Magnesian limestone
10	5 miles from Weston	Wood	L. S. Pugh	do	Dolomite
11	1 mile west of Fremont	Sandusky	Quilter Brothers	Limestone	Bituminous dolomite
12	Kelley's island	Erie	N. Kelley & Co	do	Dolomite
13	Sandusky	do	Ira T. Davis	do	do
14	do	do	David McGoray	do	do
15	do	do	Watson Hubbard	do	do
16	Sandusky	Erie	Charles Schoepfle	Limestone	Dolomite
17	do	do	Ambrose Lieb	do	Bituminous dolomite
18	do	do	Michael Callan	do	Dolomite
19	do	do	Michael O'Donnell	do	do
20	Bloomville	Seneca	Fred. Seavert	do	Magnesian limestone
21	Bloomville	Seneca	A. Reichert	Limestone	Magnesian limestone
22	do	do	E. H. France	do	do
23	Tiffin	do	J. L. King	do	Bituminous dolomite
24	do	do	H. W. Creeger	do	do
25	do	do	Thill & Graesner	do	do
26	Holmes township	Crawford	L. B. Gearhart	Limestone	Dolomite
27	Findlay	Hancock	Altman & Pressnell	do	Bituminous magnesian limestone
28	do	do	L. J. Turley	do	do
29	1 mile east of Findlay	do	I. Hershey	do	do
30	7 miles southeast of Ottawa	Putnam	John Hager	do	Bituminous dolomite

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

OHIO—SANDSTONE—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Gray	Fine	Fine, not distinct	Even, thick	Sub-Carboniferous	Cuyahoga shale	1830	91
do	Coarse	Coarse and massive	do	do	Waverly conglomerate.	1834	92
do	do	do	do	do	do	1834	93
Gray and light red	do	do	One 30-foot stratum	Carboniferous	Lower Coal Measures.	1880	94
do	do	do	Even	do	do	1830	95
Gray	Coarse	Massive	One 40-foot stratum	Carboniferous	Lower Coal Measures.	1868	96
do	Medium	Fine, not distinct	One 10-foot stratum	do	Lower Barren Measures.	1855	97
Gray	Coarse	Massive	One 12-foot stratum	do	do	1850	98
do	do	Coarse and regular	Even, thick	do	do	a1881	99
do	do	Coarse and massive	do	do	Upper Coal Measures.	1870	100
Gray	Coarse	Coarse and massive	Even, thick	Carboniferous	Upper Coal Measures.	1872	101
do	do	Coarse and regular	One 30-foot stratum	do	do	1879	102
do	do	Massive	Even, thick	do	do	1875	103
do	Medium	Fine and variable	Even, medium	do	do	1865	104
do	Coarse	Variable and massive	Broken and irregular	do	do	1850	105
Gray	Coarse	Coarse and massive	One thick stratum	Carboniferous	Lower Barren Measures.	1867	106
do	do	do	Uneven, thick	do	Upper Coal Measures.	1880	107
do	Variable	Coarse and variable	One 25-foot stratum	do	do	1830	108
do	do	do	do	do	do	1830	109
do	do	do	do	do	do	1830	110
Gray	Variable	Coarse and variable	One 25-foot stratum	Carboniferous	Upper Coal Measures.	1830	111
do	do	do	do	do	do	1830	112
do	do	do	do	do	do	1830	113
do	do	do	do	do	do	1830	114
do	Fine	Massive	Even and thin to medium	Sub-Carboniferous	Cuyahoga shale	1830	115
Gray and red	Coarse	Massive	One 30-foot stratum	Sub-Carboniferous	Waverly conglomerate.	1865	116
Gray and brown	Coarse and fine	Coarse and massive	Even, thick	do	do	1878	117
do	do	do	do	do	do	1835	118
Gray	Coarse and conglomerate	Coarse	do	do	do	1879	119
do	Fine	Variable	Even, thin to medium	do	Berea grit	1830	120
Brown	Fine	Massive	Even, thick	Sub-Carboniferous	Cuyahoga shale	1870	121
Gray and brown	do	do	Even, medium thick	do	do	1865	122
Gray	do	do	Even, thin to medium	do	do	1874	123
do	do	do	Even, medium thick	do	do	1840	124
Dark gray	do	do	do	do	do	1849	125
Dark gray	Fine	Massive	Even, medium thick	Sub-Carboniferous	Cuyahoga shale	1814	126

a This quarry, though opened in 1881, was considered of sufficient importance to have a place in the tables.

OHIO—LIMESTONE.

Gray	Semi-crystalline fossiliferous.	Massive	Even, medium to thick	Devonian	Corniferous	1830	1
do	do	do	do	do	do	1830	2
do	do	do	do	do	do	1830	3
do	do	do	do	do	do	1830	4
do	Semi-crystalline	do	do	do	do	1854	5
Gray	Fossiliferous	Massive	Even, medium to thick	Devonian	Corniferous	1840	6
do	do	do	do	do	do	1874	7
do	do	do	do	do	do	1850	8
do	Fine, compact, and vesicular.	Even and massive	Even and uneven, medium thick.	do	do	1860	9
do	Compact and vesicular	Massive	Uneven, thin to medium	do	do	1850	10
Gray	Vesicular	Parallel, wavy	Even, medium thick	Upper Silurian	Helderberg (water-lime).	1868	11
do	Semi-crystalline, fossiliferous.	Massive	do	Devonian	Corniferous	1857	12
Bluish gray	do	do	do	do	do	1837	13
do	do	do	do	do	do	1837	14
do	do	do	do	do	do	1837	15
Bluish gray	Semi-crystalline, fossiliferous.	Massive	Even, medium thick	Devonian	Corniferous	1874	16
do	do	do	do	do	do	1873	17
do	do	do	do	do	do	1873	18
do	do	do	do	do	do	1873	19
Drab	do	do	do	do	do	1877	20
Drab	Semi-crystalline, fossiliferous.	Massive	Even, medium thick	Devonian	Corniferous	1850	21
do	do	do	do	do	do	1880	22
do	Vesicular	Wavy and massive	do	Upper Silurian	Helderberg (water-lime).	1878	23
do	do	do	do	do	do	1868	24
do	do	do	do	do	do	1862	25
Gray and bluish gray	Compact	Massive	Uneven, thin to medium	Devonian	Corniferous	1866	26
Drab	Porous and vesicular	Irregular	do	Upper Silurian	Niagara	1875	27
do	do	do	do	do	do	1876	28
do	do	do	do	do	do	1874	29
Dark drab	Compact and vesicular, porphyritic.	Even, irregular, and massive.	Even, thin to medium	do	Helderberg (water-lime).	1845	30

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

OHIO—LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
31	2 miles north of Columbus Grove.	Putnam	J. Postlewait	Limestone	Bituminous dolomite
32	3 miles northeast of Van Wert	Van Wert	Miss Z. Palmer	do	Dolomite
33	4 miles east of Delphos	Allen	A. J. Patton	do	Bituminous dolomite
34	Lima	do	William Pugh	do	do
35	4 miles north of Lima	do	Mrs. B. A. Armentrout	do	do
36	5½ miles northeast of Lima	Allen	Jacob Custer	Limestone	Bituminous dolomite
37	Bluffton	do	John T. Bates	do	do
38	do	do	Ritzler & Greenwald	do	do
39	6 miles northeast of Marion	Marion	F. Hinamon	do	Dolomite
40	1 mile north of Marion	do	Marion Stone Company	do	do
41	1 mile north of Marion	Marion	T. R. Roberts & Co	Limestone	Dolomite
42	Marion	do	Haberman & Riley	do	do
43	do	do	Beattie & Sherbonda	do	do
44	do	do	Peters & Lawrence	do	do
45	Delaware	Delaware	R. J. Akers	do	
46	½ mile east of Bell Centre	Logan	W. L. Sickles	Limestone	Bituminous dolomite
47	1 mile northwest of Bellefontaine	do	J. H. Eaton	do	Dolomite
48	½ mile northwest of Bellefontaine	do	Angel, Miller & Co	do	do
49	1 mile east of Sidney	Shelby	A. Hall & Son	do	Arenaceous magnesian limestone
50	¾ mile west of Ludlow	Miami	G. Rumburg	do	Magnesian limestone
51	1 mile south of Covington	Miami	I. P. Watts & Co	Limestone	Arenaceous magnesian limestone
52	Covington	do	Conrad Shefbuch	do	do
53	do	do	N. W. Furnas	do	do
54	do	do	Lewis Face	do	do
55	do	do	Butt & Battorff	do	do
56	Covington	Miami	J. W. Ruhl	Limestone	Arenaceous magnesian limestone
57	do	do	Covington Stone Company	do	do
58	1½ miles south of Piqua	do	D. C. Stattler & Co	do	Magnesian limestone
59	2½ miles south of Piqua	do	H. G. Deweese	do	do
60	At Piqua	do	H. Clark & Son	do	do
61	At Piqua	Miami	Mitchell & Mitchell	Limestone	Magnesian limestone
62	do	do	J. Hamilton	do	do
63	4½ miles north of Urbana	Champaign	D. W. Happersett	do	Bituminous dolomite
64	2 miles west of Springfield	Clarke	W. S. Thompson	do	Dolomite
65	do	do	A. Robert	do	do
66	2 miles west of Springfield	Clarke	A. L. Eppley	Limestone	Dolomite
67	4 miles west of Springfield	do	Mrs. E. Moores	do	Arenaceous dolomite
68	do	do	A. Holcomb	do	do
69	2 miles west of Springfield	do	Robert Moores	do	do
70	1½ miles west of Springfield	do	James Mowatt	do	do
71	1 mile west of Springfield	Clarke	George Sintz	Limestone	Arenaceous dolomite
72	North edge of Springfield	do	Petticrew & Bro	do	do
73	do	do	George H. Frey	do	do
74	3 miles west of Columbus	Franklin	Wilcox Bros	do	Limestone
75	4 miles northwest of Columbus	do	M. M. Williams	do	do
76	4 miles northwest of Columbus	Franklin	M. D. Slyh	Limestone	Limestone
77	do	do	Peter Burns	do	do
78	3 miles west of Columbus	do	Andrew McNinck	do	do
79	do	do	Lilley & Poston	do	do
80	4 miles west of Columbus	do	T. J. Price & Co	do	do
81	4 miles northwest of Columbus	Franklin	Smith & Price	Limestone	Limestone
82	Newtonville	Muskingum	T. B. Townsend	do	do
83	¼ mile southwest of Zanesville	do	Philip Moran	do	do
84	Rockville	Fayette	I. N. Bonum	do	Bituminous dolomite
85	Yellow Springs	Greene	W. Sroufe	do	Argillaceous dolomite
86	4½ miles east of Xenia	Greene	Boots & Bickette	Limestone	Magnesian limestone
87	4 miles southeast of Xenia	do	W. McDonald	do	do
88	6 miles east of Dayton	do	John Archer	do	do
89	8 miles east of Dayton	do	H. Huston	do	do
90	1¼ miles southeast of Dayton	Montgomery	Huffman Stone Company	do	do
91	1½ miles southeast of Dayton	Montgomery	D. Renner	Limestone	Magnesian limestone
92	do	do	C. Fauver	do	do
93	do	do	M. Bosler	do	do
94	1½ miles southeast of Dayton	do	S. Fauver	do	do
95	7½ miles north of Dayton	do	J. S. Booker	do	do
96	1 mile east of Lewisburg	Preble	C. Dishler	Limestone	Arenaceous dolomite
97	1 mile northwest of Euphemia	do	I. J. Weaver	do	Dolomite
98	do	do	R. Swisher	do	do
99	do	do	Bowman & Thompson	do	do
100	New Paris	do	T. J. Smith	do	Arenaceous magnesian limestone
101	New Paris	Preble	Sam. Smith & Co	Limestone	Arenaceous magnesian limestone
102	3 miles northeast of Eaton	do	Young & Christman	do	Dolomite
103	5½ miles northeast of Eaton	do	John O. Deem	do	do
104	At Hamilton	Butler	Kilfoyle & Joyce	do	Limestone
105	3 miles northeast of Hamilton	do	R. Andrews	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

OHIO—LIMESTONE—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Dark drab	Compact and vesicular	Even and parallel	Even, medium thick	Upper Silurian	Helderberg (water-lime).	1854	31
Light gray	Semi-crystalline, vesicular	Even, parallel, and massive.	Uneven, medium thick	do	do	1876	32
Drab	Vesicular	Even, wavy, and irregular.	Uneven, thin	do	do	1878	33
do	do	Irregular	Uneven, thin and broken	do	do	1868	34
Drab and blue-black	Compact and vesicular	Massive, irregular, and even.	Even, thin to medium	do	do	1840	35
Drab	Compact and vesicular	Massive, irregular, and even.	Even, thin to medium	Upper Silurian	Helderberg (water-lime).	1877	36
Dark drab	Compact and porphyritic	Wavy and irregular	Even and thin	do	do	1880	37
do	do	do	do	do	do	1878	38
Bluish gray	Fine and compact	Massive	Even, thin to medium	Devonian	Corniferous	1840	39
Gray and bluish gray	do	do	Even, medium thick	do	do	1878	40
Gray and bluish gray	Fine and compact	Massive	Even, medium thick	Devonian	Corniferous	1877	41
do	do	do	do	do	do	1845	42
do	do	do	do	do	do	1878	43
do	do	do	do	do	do	1825	44
do	Compact	do	do	do	do	1860	45
Drab	Vesicular	Wavy and irregular	Even and thin	Upper Silurian	Helderberg (water-lime).	1855	46
Gray	Porous	Massive	Even, medium thick	Devonian	Corniferous	1877	47
do	do	do	do	do	do	1830	48
Drab	Vesicular	Wavy and irregular	Even, medium thick	Upper Silurian	Niagara (Guelf)	1869	49
do	do	Irregular	do	do	do	1851	50
Drab	Vesicular	Irregular	Even, medium thick	Upper Silurian	Niagara (Guelf)	1830	51
do	do	do	do	do	do	1870	52
do	do	do	do	do	do	1856	53
do	do	do	do	do	do	1865	54
do	do	do	do	do	do	1850	55
Drab	Vesicular	Irregular	Even, medium thick	Upper Silurian	Niagara (Guelf)	1868	56
do	do	do	do	do	do	1874	57
do	Semi-crystalline	Wavy and irregular	do	do	do	1858	58
do	do	do	do	do	do	1874	59
do	do	do	do	ko	do	1868	60
Drab	Semi-crystalline	Wavy and irregular	Even, medium thick	Upper Silurian	Niagara (Guelf)	1851	61
do	do	do	do	do	do	1851	62
Light drab	Vesicular	Irregular	Even and uneven, medium thick.	do	Helderberg (water-lime).	1802	63
Drab	do	Wavy and irregular	Even, medium thick	do	Niagara	1849	64
do	do	do	do	do	do	1870	65
Drab	Vesicular	Wavy and irregular	Even, medium thick	Upper Silurian	Niagara	1873	66
do	do	do	do	do	do	1862	67
Light drab	do	Irregular	do	do	do	1865	68
do	do	do	do	do	do	1860	69
do	do	do	do	do	do	1850	70
Light drab	Vesicular	Irregular	Even, medium thick	Upper Silurian	Niagara	1870	71
Drab	do	Wavy and irregular	do	do	do	1868	72
do	do	do	do	do	do	1840	73
Gray	Semi-crystalline, fossiliferous.	Irregular	Even, thick, and medium	Devonian	Corniferous	1881	74
do	do	do	do	do	do	1860	75
Gray	Semi-crystalline, fossiliferous.	Irregular	Even, thick, and medium	Devonian	Corniferous	1840	76
do	do	do	do	do	do	1860	77
do	do	do	do	do	do	1870	78
do	do	do	do	do	do	1880	79
do	do	do	do	do	do	1858	80
Gray	Semi-crystalline, fossiliferous.	Irregular	Even, thick, and medium	Devonian	Corniferous	1872	81
Drab	Fine, semi-crystalline	Massive	Even, thin to medium	Sub-Carboniferous	Maxville limestone.	1874	82
Blue-black	Compact and fossiliferous	do	One 3-foot stratum	Carboniferous	Lower Coal Measures.	1875	83
Drab	Vesicular	Irregular	Even and thin	Upper Silurian	Helderberg (water-lime).	1866	84
Drab and light drab	do	do	Even, variable, thick	do	Niagara	1864	85
Drab	Semi-crystalline	Irregular	Even, medium thick	Upper Silurian	Niagara	1840	86
do	do	do	do	do	do	1825	87
do	do	do	do	do	do	1870	88
do	do	do	do	do	do	1875	89
do	do	do	do	do	do	1861	90
Drab	Semi-crystalline	Irregular	Even, medium thick	Upper Silurian	Niagara	1845	91
do	do	do	do	do	do	1851	92
do	do	do	do	do	do	1873	93
do	do	do	do	do	do	1866	94
do	do	do	do	do	do	1871	95
Drab	Compact and vesicular	Irregular	Even, thin to medium	Upper Silurian	Niagara	1830	96
do	do	do	do	do	do	1869	97
do	do	do	Even, medium thick	do	do	1860	98
do	do	do	do	do	do	1840	99
do	Porphyritic	Wavy and irregular	Even, thin to medium	do	do	1840	100
Drab	Porphyritic	Wavy and irregular	Even, medium thick	Upper Silurian	Niagara	1840	101
do	Semi-crystalline	do	do	do	do	1830	102
do	do	do	do	do	do	1835	103
Blue	Semi-crystalline, highly fossiliferous.	Irregular	do	Lower Silurian	Cincinnati	1865	104
do	do	do	do	do	do	1874	105

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

OHIO—LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
106	5 miles east of Hamilton	Butler	J. Rupp	Limestone	Limestone
107	1½ miles southwest of Lumberton	Clinton	W. F. Oglesbee	do	Magnesian limestone
108	Greenfield	Ross	G. I. Rucker & Son	do	Bituminous dolomite
109	do	Highland	do	do	do
110	do	do	McAltin & Co	do	do
111	2 miles south of Lexington	Highland	Mrs. L. Dunn	Limestone	Bituminous dolomite
112	do	do	A. Carriff	do	do
113	Point Pleasant	Clermont	J. Delaney	do	Limestone
114	Cincinnati	Hamilton	F. Teating	do	do
115	do	do	L. Grover	do	do
116	Cincinnati	Hamilton	J. Delaney	Limestone	Limestone
117	do	do	L. Lutterbey	do	do
118	do	do	J. Cinck	do	do
119	do	do	E. Howe	do	do

INDIANA—MARBLE AND LIMESTONE.

1	Decatur	Adams	B. P. Rice	Limestone	Dolomite
2	Bluffton	Wells	Kapp & Gardner	do	do
3	Wabash	Wabash	Bridges & Scott	do	Limestone
4	do	do	Hubbard & Smith	do	do
5	do	do	Philip Hipskin	do	do
6	Wabash	Wabash	William J. Ford	Limestone	Limestone
7	do	do	Moellering & Paul	do	Dolomite
8	do	do	Lillie & Shoemaker	do	Limestone
9	Logansport	Cass	Lux & Lux	do	Limestone and dolomite
10	do	do	J. E. Barnes	do	
11	Logansport	Cass	August Gleitz	Limestone	
12	3½ miles southwest of Kokomo	Howard	J. V. Smith	do	Magnesian limestone
13	Kokomo	do	George W. Defenbaugh	do	Limestone
14	Marion	Grant	D. R. McKinney	do	Magnesian limestone
15	do	do	Silvester Fankboner	do	do
16	Marion	Grant	John Murphy	Limestone	Magnesian limestone
17	Montpelier	Blackford	William Twibell	do	Dolomite
18	Eaton	Delaware	George W. Carter	do	do
19	do	do	Bosman Brothers	do	do
20	Yorktown	do	L. D. Koontz	do	do
21	Anderson	Madison	William Crim	Limestone	Magnesian limestone
22	do	do	J. W. Sansberry	do	do
23	Greencastle	Putnam	Patrick Ash	do	Limestone
24	2 miles southwest of Greencastle	do	William Steegs	do	do
25	do	do	A. J. Crawford	do	do
26	2 miles southwest of Greencastle	Putnam	Vandalia Railroad Company	Limestone	Limestone
27	Oakalla	do	Moss & Hillis	do	do
28	do	do	Torr & Brother	do	do
29	Putnamville	do	James Lee	do	Siliceous limestone
30	Longwood	Fayette	Wilson Ball	do	Ferruginous dolomite
31	Longwood	Fayette	R. H. Moffitt	Limestone	Ferruginous dolomite
32	2¾ miles northwest of Laurel, Franklin county.	do	H. Reese	do	Dolomite
33	2¼ miles west of Laurel	Franklin	M. E. Secrest	do	do
34	2½ miles west of Laurel	do	John McGlin	do	do
35	3 miles southwest of Laurel	do	A. Cloud	do	do
36	3 miles south of Laurel	Franklin	J. A. Thomas	Limestone	Dolomite
37	New Point	Decatur	W. W. Hollensbe	do	do
38	5 miles southwest of Greensburg	do	Greensburg Limestone Company	do	do
39	Saint Paul	do	W. W. Lowe	do	do
40	do	do	J. L. Scanlan	do	do
41	2 miles west of Saint Paul	Shelby	G. W. McNeely	Limestone	Dolomite
42	Ellettsville	Monroe	John Matthews & Sons	do	Bituminous limestone
43	do	do	Perry Brothers	do	do
44	Stinesville	do	W. H. McHenry	do	do
45	do	do	McHenry & Brother	do	do
46	Stinesville	Monroe	Davis & Cassner	Limestone	Bituminous limestone
47	Spencer	Owen	B. Schweitzer	do	Limestone
48	3½ miles northeast of Spencer	do	Simpson & Archer	do	Bituminous limestone
49	do	do	E. R. Bladen	do	do
50	do	do	Howard & Denig	do	do
51	5 miles west of Bedford	Lawrence	N. C. Hinsdale & Co	Limestone	Limestone
52	4½ miles west of Bedford	do	Voris, Rodgers & Co	do	do
53	Bedford	do	Chicago-Bedford Stone Company	do	do
54	do	do	Fillion & Smith	do	do
55	Lawrenceport	do	A. F. Berry	do	do
56	Fort Ritner	Jackson	E. B. Dixon	Limestone	Bituminous limestone
57	3½ miles north of North Vernon	Jennings	Hicks & Holmes	do	Limestone
58	North Vernon	do	P. Conklin & Co	do	do
59	3 miles south of North Vernon	do	H. C. Herrman	do	do
60	Oakdale	do	Hicks & Holmes	do	Magnesian limestone

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

OHIO—Limestone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Blue	Semi-crystalline, highly fossiliferous.	Irregular	Even, medium thick	Lower Silurian	Cincinnati	1850	106
Drab	Semi-crystalline	Wavy	do	Upper Silurian	Niagara	1860	107
do	Compact and vesicular	Even and massive	Very even, thin to medium.	do	Helderberg (water-lime).	1850	108
do	do	do	do	do	do	1850	109
do	do	do	do	do	do	1840	110
Drab	Vesicular	Even and parallel	Even, medium thick	Upper Silurian	Niagara	1870	111
do	do	do	do	do	do	1825	112
Blue	Semi-crystalline, fossiliferous.	Irregular	Even, thin to medium	Lower Silurian	Cincinnati	1873	113
do	do	do	do	do	do	1850	114
do	do	do	do	do	do	1860	115
Blue	Semi-crystalline, fossiliferous.	Irregular	Even, thin to medium	Lower Silurian	Cincinnati	1867	116
do	do	do	do	do	do	1861	117
do	do	do	do	do	do	1861	118
do	do	do	do	do	do	1868	119

INDIANA—Marble and Limestone.

Drab	Compact and vesicular	Even and parallel	Thin to medium	Upper Silurian		1876	1
do	Finely vesicular	Massive	Even, medium thick	do		1867	2
do	Semi-crystalline	Wavy and irregular	Even and thin	do		1866	3
do	do	do	do	do		1876	4
do	do	do	do	do		1878	5
Drab	Semi-crystalline	Wavy and irregular	Even and thin	Upper Silurian		1873	6
do	Vesicular	Irregular	Even, medium thick	do		1866	7
do	do	do	Uneven and thin	do		1873	8
do	Semi-crystalline	Massive	Uneven, medium thick	do		1872	9
Gray	Fine and compact	Even and massive	Even, medium thick	do		1840	10
Gray	Fine and compact	Even and massive	Even, medium thick	Upper Silurian		1840	11
Drab	do	do	do	do		1876	12
do	Fine and compact (conchoidal fracture).	Even and indistinct	Even and thin	Devonian		1850	13
do	Semi-crystalline	Variable	do	Upper Silurian		1864	14
do	do	do	do	do		1864	15
Drab	Fine and compact	Variable	Even, thin to medium	Upper Silurian		1867	16
do	Semi-crystalline	Irregular	do	do		1870	17
do	Semi-crystalline, vesicular	do	Even and thin	do		1855	18
do	do	do	do	do		1855	19
do	Vesicular	Variable	do	do		1835	20
Gray	Fine and compact	Even	Even, thin to medium	Upper Silurian		1840	21
do	do	do	do	do		1840	22
Drab	Semi-crystalline	Massive	Even, medium thick	Sub-Carboniferous		1869	23
do	do	do	do	do		1860	24
do	do	do	do	do		1870	25
Drab	Semi crystalline	Massive	Even, medium thick	Sub-Carboniferous		1858	26
do	do	do	do	do		1873	27
do	do	do	do	do		1870	28
do	do	do	Even and thick	do		1865	29
Drab and buff	Vesicular	Wavy and massive	Even, medium thick	Upper Silurian		1862	30
Drab and buff	Vesicular	Wavy and massive	Even, medium thick	Upper Silurian		1879	31
Drab	Semi-crystalline	do	do	do		1877	32
do	do	do	do	do		1876	33
do	do	do	do	do		1870	34
do	do	do	do	do		1850	35
Drab	Semi-crystalline	Wavy and massive	Even, medium thick	Upper Silurian		1878	36
do	do	Massive	Even, thin to medium	do		1875	37
do	do	do	do	do		1850	38
do	do	do	Even, medium thick	do		1854	39
do	do	do	do	do		1859	40
Drab	Semi-crystalline	Massive	Even, medium thick	Upper Silurian		1859	41
Gray and drab	Granular (oolitic)	do	Even and thick	Sub-Carboniferous		1862	42
do	do	do	do	do		1866	43
Gray	do	do	do	do		1878	44
do	do	do	do	do		1879	45
Gray	Granular (oolitic)	Massive	Even and thick	Sub-Carboniferous		1875	46
Drab	Fine and compact (conchoidal fracture).	do	Even, medium thick	do		1869	47
Gray	Granular (oolitic)	do	Even and thick	do		1870	48
do	do	do	do	do		1879	49
do	do	do	do	do		1878	50
Gray	Granular (oolitic)	Massive	Even and thick	Sub-Carboniferous		1879	51
do	do	do	do	do		1879	52
do	do	do	do	do		1876	53
do	do	do	do	do		1867	54
do	do	do	do	do		1879	55
Gray	Granular (oolitic)	Even and parallel	Even and thick	Sub-Carboniferous		1860	56
Drab	Semi-crystalline	Massive	Even, medium thick	Upper Silurian		1875	57
do	do	Irregular	do	do		1873	58
do	do	do	do	do		1850	59
do	do	Massive	do	do		1876	60

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

INDIANA—MARBLE AND LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
61	Osgood	Ripley	Peter Wagner	Limestone	Magnesian limestone
62	...do	...do	Ashman & Glasgow	...do	...do
63	Salem	Washington	Emanuel Zink	...do	Limestone
64	3 miles west of New Albany	Floyd	Christian Haller	...do	...do
65	...do	...do	N. Bittinger	...do	...do

INDIANA—SANDSTONE.

1	Williamsport	Warren	B. F. Gregory estate	Sandstone	Sandstone
2	Attica	...do	S. Bernhart	...do	...do
3	French Lick	Orange	W. F. Osborne	...do	...do
4	...do	...do	T. N. Braxtan	...do	...do
5	3½ miles east of Cannelton	Perry	A. Hallabach	...do	...do

ILLINOIS—LIMESTONE.

1	300 yards south of Roseclair	Hardin	W. W. Wright	Limestone	Magnesian and bituminous limestone.
2	44 miles above Roseclair	...do	C. Howard & Sons	...do	
3	2 miles from Roseclair, Jacks Point	...do	Gus A. Craigen	...do	Limestone
4	5 miles from Roseclair, Shethuville	...do	...do	...do	
5	Chester village	Randolph	John Hern	...do	Limestone
6	1 mile north of Chester village	Randolph	Southern Illinois penitentiary	Limestone	Limestone
7	3 miles north of Chester village	...do	John Hern	...do	...do
8	City of Belleville	Saint Clair	G. F. Liebnert	...do	
9	...do	...do	John Kloes	...do	
10	½ mile east of Columbia	Monroe	Peter Friedrich & Son	...do	Limestone
11	6 miles north of Bruse station	Clinton	Joseph Taylor	Limestone	Siliceous magnesian limestone
12	Saline	Madison	Stephen Bardill	Black lime	Calcareous dolomite
13	½ mile below Grafton	Jersey	Grafton Quarry Company	Limestone	
14	City of Quincy	Adams	F. W. Monck	...do	
15	City of Kankakee	Kankakee	Taylor & Orr	...do	
16	City of Kankakee	Kankakee	Kankakee Stone and Lime Company	Limestone	Dolomite
17	1½ miles southwest of Lemont	Will	Excelsior Stone Company	...do	...do
18	1½ miles northeast of Joliet	...do	Joliet Stone Company	...do	...do
19	2 miles east of center of Joliet	...do	E. C. Hagar & Co	...do	
20	5th ward, Joliet	...do	Charles Warner	...do	Dolomite
21	3d ward, Joliet	Will	Simon Hausser	Limestone	
22	West side of Joliet	...do	J. Whittier & Co	...do	
23	...do	...do	Joseph Warner	...do	
24	1½ miles from C. H., Joliet	...do	Davidson Bros	...do	Dolomite
25	End of Cass station, Joliet	...do	Joliet Stone Company	...do	...do
26	2½ miles north of Joliet	Will	Isaac Nobes	Limestone	Dolomite
27	North of Joliet	...do	William Kronmeyer	...do	...do
28	...do	...do	Bruce & Co	...do	...do
29	2½ miles north of Joliet	...do	Sanger & Moody	...do	...do
30	1 mile east of Lemont	Cook	Chicago and Lemont Stone Company	...do	...do
31	1½ miles east of Lemont	Cook	Illinois Stone Company	Limestone	Dolomite
32	½ mile northeast of Lemont	...do	The Singer-Talcott Company	...do	...do
33	Village of Lemont	...do	Chicago and Lemont Stone Company	...do	...do
34	½ mile southwest of Lemont	...do	Earnshaw & Bodenschatz	...do	...do
35	1 mile southwest of Lemont	...do	Singer & Talcott	...do	...do
36	City of Batavia	Kane	F. F. Brody	Limestone	
37	...do	...do	O. P. Barker & Son	...do	
38	City of Aurora	...do	Anthon Berthold	...do	Dolomite

ILLINOIS—SANDSTONE.

1	Golconda	Pope	C. M. Cole	Sandstone	Sandstone
2	Chester	Randolph	Southern Illinois penitentiary	...do	...do
3	2½ miles from Pinckneyville	Perry	John D. Day	White sandstone	...do
4	Xenia	Clay	William Haug	Sandstone	...do
5	Mississippi river, 4 miles up Hop Hollow.	Madison	J. W. Crawford	...do	...do

MICHIGAN—LIMESTONE.

1	2½ miles southeast of Raisinville	Monroe	Fritz Rath	Limestone	
2	2½ miles from Raisinville	...do	John Knaggs	...do	
3	Dundee	...do	Nagor & Bemis	...do	
4	Sibley's station	Wayne	F. Sibley	...do	
5	Alpena	Alpena	Owen Fox	White and blue limestone.	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

INDIANA—Marble and Limestone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Drab	Semi-crystalline	Wavy and massive	Even, thin	Upper Silurian		1871	61
do	do	do	do	do		1874	62
Gray	Granular (oolitic)	Massive	Even and thick	Sub-Carboniferous		1861	63
do	do	do	do	do		1840	64
do	do	do	do	do		1850	65

INDIANA—Sandstone.

Gray	Coarse	Coarse and massive	Even and thick	Carboniferous	Conglomerate	1860	1
Gray and bluish gray	do	do	do	do	do	1873	2
Gray	Fine and medium	Even, fine and coarse	Even, medium thick	Sub-Carboniferous		1850	3
do	do	do	do	do		1830	4
Light brown	Medium	Irregular	Even, one 30-foot stratum	Carboniferous		1871	5

ILLINOIS—Limestone.

Drab	Fine, compact, partly oolitic	Variable	Even, medium	Sub-Carboniferous		1867	1
Light gray	Medium, compact	Massive	Even, thick	do		1877	2
Drab	Fine, compact	do	do	do		1878	3
Dark drab	Medium, fossiliferous	do	Even, thin to thick	do		1880	4
do	Fine, fossiliferous	do	Uneven, thin to thick	do		1880	5
Drab	Fine, fossiliferous	Variable	Medium to thick	Sub-Carboniferous		1877	6
do	do	Massive	Even, thin to medium	do		1877	7
Light drab	Fine, compact	Indistinctly laminated	Irregular, thin to medium	do		1874	8
Drab	Medium, compact	Massive	Even, thin to medium	do		1873	9
Gray	Medium, crystalline	do	Even, thick	do		1856	10
Gray	Fine, fossiliferous	Massive	Even, thin to medium	Sub-Carboniferous		1879	11
Dark gray	Medium, fossiliferous	do	Even, thick	do		1867	12
Gray	Variable	do	Even, medium	Upper Silurian		1859	13
do	Variable, crystalline	do	Thin to medium	Devonian		1874	14
Light drab	Medium, vesicular	do	Even, thick	Upper Silurian		1867	15
Light drab	Medium, vesicular	Massive	Medium to thick	Upper Silurian		1855	16
do	Fine, compact	Indistinctly laminated	Even, thick	do		1867	17
do	Compact	do	do	do		1874	18
Drab	do	do	do	do		1880	19
Light drab	Fine, compact	do	Even, thin to thick	do		1871	20
Light drab	Fine, vesicular	Indistinctly laminated	Even, thin to thick	Upper Silurian		1850	21
do	Fine, compact	do	Thin to thick	do		1867	22
do	do	do	Medium to thick	do		1881	23
Drab	do	do	Even, thin to thick	do		1853	24
Light drab	do	do	Even, thin to medium	do		1874	25
Drab	Fine, compact	Indistinctly laminated	Even, thin to thick	Upper Silurian		1855	26
do	do	do	do	do		1852	27
do	do	do	do	do		1852	28
Light drab	do	do	do	do		1866	29
do	do	do	do	do		1854	30
Light drab	Fine, compact	Indistinctly laminated	Even, thin to thick	Upper Silurian		1852	31
do	do	do	Even, medium to thick	do		1854	32
do	do	do	do	do		1878	33
do	do	do	do	do		1869	34
Drab	do	do	Even, thin to thick	do		1869	35
Drab	Variable	Massive	Even, thin to thick	Upper Silurian		1872	36
do	Fine, compact	do	do	do		1848	37
Light drab	Medium, compact, and vesicular.	do	Even, medium to thick	do		1848	38

ILLINOIS—Sandstone.

Buff	Coarse	Massive	Even, thick	Sub-Carboniferous		1879	1
do	Fine, compact	Irregular	Even, thin to thick	do		1878	2
Gray	Medium, compact	Massive	Even, thick	Carboniferous		1866	3
do	Compact	Indistinctly laminated	do	do		1873	4
Drab	Medium, compact	Massive	do	Sub-Carboniferous		1876	5

MICHIGAN—Limestone.

Drab	Medium, compact, semi-crystalline.	Massive	Even, thin to thick	Devonian		1880	1
do	Fine, compact	do	do	do		1880	2
Gray	Fine, fossiliferous	do	Uneven, thick	Upper Silurian			3
Light drab	do	do	Even, thick	Devonian		1824	4
Gray	Medium	do	Even, thin to thick	do		1879	5

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS.

MICHIGAN—SANDSTONE.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Lulu	Monroe	Henry McCarthy	Sandstone	
2	Stony Point	Jackson	Michigan Stone Company	do	
3	Ionia township	Ionia	C. S. Marsh & Co	do	
4	do	do	W. E. Avery & Co	do	
5	Marquette	Marquette	Watson & Palmer	do	

WISCONSIN—SANDSTONE.

1	3 miles west of Waterloo (a)	Dane	Chicago and Wisconsin Granite Quarrying Company.	Sandstone	
2	Madison, 3 miles from capitol building.	do	David Stevens	do	
3	Madison, 3 miles west of capitol building.	do	August Pennack	do	
4	Mazomanie	do	Fred. Stickney	Calciferous sandstone	
5	Ableman	Sauk	Chicago and Northwestern Railway Co	Sandstone	
6	Mauston	Juneau	C. W. Potter	Sandstone	
7	do	do	H. V. Train	do	
8	3 miles northwest of Alma	Buffalo	Beef Slough Company	do	
9	4½ miles west of Grand Rapids	Wood	J. Edwards & Co	do	
10	Plover	Portage	Mrs. E. L. Baker	do	
11	Stevens Point	Portage	J. A. Avery	Sandstone	
12	do	do	A. D. Sager	do	

a This quarry was considered of sufficient importance to tabulate, though opened in 1881.

WISCONSIN—LIMESTONE.

1	2½ miles west of center of Racine.	Racine	C. Fox & Sons	Limestone	Dolomite
2	do	do	William Beswick	do	
3	1½ miles west of C. H., Janesville city.	Rock	Andrew Byron	do	
4	2 miles west of C. H., Janesville city.	do	Cornelius Stout	do	
5	1½ miles northwest of Beloit	do	Samuel Goss	do	
6	½ mile east of Westport	Dane	William Veerhusen	Limestone	
7	Westport, 2½ miles north of Mendota.	do	P. O'Malley	do	
8	3 miles west of Madison	do	Andrew Keimear	Magnesian limestone	Magnesian limestone
9	Waukesha	Waukesha	Hadfield & Co	Limestone	Dolomite
10	3½ miles west of bridge, Milwaukee.	Milwaukee	A. F. Manegold & Bro	do	
11	Wauwatosa	Milwaukee	Story Bros	Limestone	
12	Kildare station	do	Schweickart & Manegold	do	
13	3 miles northwest of Watertown	Dodge	Herman Bentert	do	
14	3 miles east of La Crosse	La Crosse	Frank Wekkert	do	
15	do	do	Leypold Ebner	do	
16	3 miles east by south of La Crosse.	La Crosse	Richard Waggoner	Limestone	
17	3 miles east of La Crosse	do	John Neilson	do	Dolomite
18	3 miles south of east of La Crosse.	do	Magnus Nelson	do	do
19	2 miles east of La Crosse	do	Royall Reynolds	do	
20	7 miles southeast of Fond du Lac	Fond du Lac	Nast Bros. & Co	do	Dolomite
21	7 miles southeast of Fond du Lac	Fond du Lac	Marblehead Lime Company	Limestone	Dolomite
22	4¾ miles southeast of Fond du Lac	do	James Sylvester	do	do
23	4½ miles southeast of Fond du Lac	do	Matthew V. Butler	do	do
24	Byron, 4½ miles south of Fond du Lac	do	S. Sylvester	do	do
25	Byron, 2 miles from Fond du Lac	do	S. Sylvester, jr	do	do
26	2½ miles northeast from Oak Centre	Fond du Lac	C. E. Town	Limestone	
27	6 miles from Fond du Lac	do	Christian Geiger	do	Dolomite
28	Waupun	do	John McCune	do	do
29	2 miles northwest of Sheboygan	Sheboygan	H. E Roth	do	do
30	Sheboygan Falls	do	Kelhagen Bros	do	do
31	6 miles west of north of Manitowoc.	Manitowoc	Lewis Miller & Co	Limestone	Dolomite
32	Menasha	Winnebago	Orville J. Hall	do	
33	Neenah	do	Charles Gerhardt	do	
34	do	do	Patrick McGarth	do	Dolomite
35	do	do	T. T. Moulton	do	
36	2 m. southwest of center of Oshkosh	Winnebago	Schneider & Frank	Limestone	Dolomite
37	Oshkosh	do	Frank Last	do	do
38	River Falls	Pierce	Thomas Walker	do	do
39	North side of Fountain City	Buffalo	Richtman & Kerckner & Mattansch	Sandy limestone	do
40	Alma	do	Matthias Brann	do	
41	Kaukauna	Outagamie	United States Government	Limestone	Dolomite
42	Ledyard village	do	Kaukauna Water Power Company	do	do
43	Appleton	do	Waters & Green	do	
44	3½ miles south of C. H., Appleton	do	Y. B. Waters	do	
45	Hortonville	do	H. W. Thompson	do	
46	Duck Creek station	Brown	Manuel Baunotto	Limestone	Dolomite
47	do	do	Chicago and Northwestern Railway Co	do	do
48	6 miles east of Hudson	Saint Croix	Henry Gibson	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MICHIGAN—SANDSTONE.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Buff	Medium, compact, uniform	Massive	Medium to thick	Devonian		1876	1
do	Medium	do	Even, thick	Sub-Carboniferous		1876	2
				Carboniferous		1865	3
				do		1879	4
Brown	Medium, uniform	Massive	Thin to thick	Lower Silurian		1871	5

WISCONSIN—SANDSTONE.

Light gray	Fine	Massive	Uneven, thick	Archæan		1881	1
Buff	do	do	Thin to thick	Lower Silurian		1858	2
do	Fine, compact	do	Even, thick	do		1876	3
do	Coarse	do	Even, medium to thick	do		1850	4
Light pink	Fine, compact	Indistinct	Even, thick	do		1880	5
Light gray	Fine, compact	Indistinct	Even, thin to thick	Lower Silurian		1880	6
do	do	do	do	do		1872	7
Buff	Medium to coarse	Massive	Even, thin to medium	do		1879	8
Light gray	Compact	Indistinctly laminated	Uneven, thin to thick	do		1874	9
do	Medium	Irregular	Even, thin to medium	do		1868	10
Light gray	Medium	Irregular	Even, thin to thick	Lower Silurian		1872	11
do	do	do	do	do		1859	12

WISCONSIN—LIMESTONE.

Drab	Variable, vesicular	Massive	Even, thin to medium	Upper Silurian		1879	1
do	do	do	do	do		1850	2
do	Medium, vesicular	do	Variable, thin to thick	Lower Silurian		1840	3
do	do	do	Even, thin to thick	do		1878	4
do	Coarse, variable	do	Uneven, thin to thick	do		1860	5
Buff	Medium, compact	Massive	Medium to thick	Lower Silurian		1857	6
Light buff	Fine, compact	do	Variable, thin to thick	do		1869	7
Buff	Variable	do	Even, medium to thick	do		1855	8
Drab	Fine, compact	do	do	Upper Silurian		1871	9
do	Variable	do	Even, thin to thick	do		1873	10
Drab	Variable	Massive	Even, thin to thick	Upper Silurian		1856	11
do	Coarse	do	do	do		1845	12
do	Variable	do	Even, medium to thick	Lower Silurian		1878	13
Light drab	do	Even, parallel	Even, medium to thin	do		1870	14
do	do	Irregular	Uneven, medium to thin	do		1880	15
Light drab	Variable	Irregular	Even, medium to thin	Lower Silurian		1879	16
do	do	do	Even, medium	do		1860	17
do	do	Even, parallel	Even, thin to medium	do		1872	18
do	do	do	do	do		1850	19
do	do	do	Uneven, thin to medium	Upper Silurian		1855	20
Light drab	Variable	Even, parallel	Even, thin to medium	Upper Silurian		1880	21
do	Fine, compact	do	do	do		1850	22
do	do	do	do	do		1858	23
do	do	do	do	do		1864	24
do	do	do	Thin to medium	do		1864	25
Drab	Medium to fine	Massive	Even, thin to medium	Upper Silurian		1878	26
do	Fine, compact	Even, parallel	do	do		1873	27
do	Fine, vesicular	do	do	do		1850	28
Light drab	Fine, crystalline	Massive	Even, thin to thick	do		1854	29
do	do	Indistinct	do	do		1879	30
Drab	Fine, compact	Massive	Uneven, thin to medium	Upper Silurian		1868	31
do	Medium, crystalline	Irregular	Uneven, thin to thick	Lower Silurian		1878	32
do	Coarse	do	Uneven, thin	do		1876	33
do	do	do	do	do		1872	34
do	do	do	Uneven, thin to medium	do		1857	35
Drab	Medium	Indistinct	Even, thin to thick	Lower Silurian		1864	36
do	do	do	Even, medium to thick	do		1857	37
Drab and buff	Medium, vesicular	Variable	Even, thin to medium	do		1871	38
Light gray	do	Massive	Even, medium	do		1880	39
Gray	do	do	do	do		1877	40
Drab	Medium, vesicular	Irregular	Even, medium to thick	Lower Silurian		1867	41
do	Fine, porphyritic	do	do	do		1880	42
do	Variable	Massive	Uneven, thin to thick	do		1880	43
do	do	Irregular	Uneven, thin to medium	do		1860	44
do	Fine, compact	Massive	Even, thin to medium	do		1875	45
Drab	Fine, porphyritic	Irregular	Even, thick	Lower Silurian		1857	46
do	do	do	do	do		1879	47
do	Medium, fossiliferous	Massive	Even, medium to thick	do		1879	48

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

MINNESOTA—CRYSTALLINE SILICEOUS ROCKS.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
1	Sauk Rapids	Benton	G. S. Reeder	Granite	Hornblende-biotite granite
2	East Saint Cloud	Sherburne	Breen & Young	do	Hornblende granite
3	Taylor's Falls	Chisago	Minneapolis and Saint Louis Railroad Co	"Trap"	Olivine diabase

MINNESOTA—MARBLE AND LIMESTONE.

1	Stillwater	Washington	David Prescott	Limestone	Siliceous dolomite and dolomite
2	do	do	D. Donahue	do	do
3	do	do	Ed. McGee	do	Siliceous dolomite
4	do	do	John Conkling	do	Siliceous dolomite and dolomite
5	Saint Paul	Ramsey	M. Roche	do	Magnesian limestone
6	Saint Paul	Ramsey	William Zollman	Limestone	Magnesian limestone
7	do	do	William Dawson, lessor	do	do
8	do	do	Breen & Young	do	do
9	do	do	A. Gotzian	do	do
10	do	do	William Dawson, lessor	do	do
11	Saint Paul	Ramsey	William Dawson, lessor	Limestone	Siliceous magnesian limestone
12	West Saint Paul	do	Adam Rau	do	Magnesian limestone
13	Minneapolis	Hennepin	W. W. Eastman	do	do
14	do	do	Franklin Cook	do	do
15	do	do	Ole Dahl	do	do
16	Minneapolis	Hennepin	Charles Sandhoff	Limestone	Magnesian limestone
17	do	do	Weeks & Holscher	do	do
18	do	do	James Baxter	do	Magnesian limestone and siliceous dolomite.
19	do	do	Foley & Herbert	do	do
20	Red Wing	Goodhue	G. A. Carlson	do	Dolomite
21	Red Wing	Goodhue	R. S. Berglund	Limestone	Dolomite
22	Frontenac	do	Fosterin & Co	do	do
23	Cannon City	Rice	Phillip Cromer	do	Calcareous dolomite and limestone
24	Kasota	Le Sueur	J. W. Babcock	Sand-rock	Dolomite
25	do	do	Breen, Young & Co	do	do
26	4 miles north of Mankato	Blue Earth	J. R. Beatty & Co	Sand-rock	Dolomite
27	Mankato	do	O. R. Mather	do	do
28	do	do	J. H. Beatty	Limestone	do
29	Clinton Falls	Steele	Lindersmith & Son	Lime-rock	Siliceous dolomite
30	Mantorville	Dodge	H. Hook, P. Mantor, A. Doig	Limestone	do
31	Stockton	Winona	Chicago and Northwestern Railroad Company.	Sand-rock	Dolomite
32	Winona	do	C. H. Porter	Limestone	do
33	do	do	John O'Dac	do	do

MINNESOTA—SANDSTONE.

1	Fond du Lac	Saint Louis	M. Boyle	Sand-rock	Sandstone
2	Hinckley	Pine	Saint Paul and Duluth Railroad	do	do
3	Jordan	Scott	Phillip Kipp	do	do
4	do	do	F. Nicolin	do	do
5	Courtland	Nicollet	Fritz Meyerding	Quartzite	Quartzite

IOWA—MARBLE AND LIMESTONE.

1	Lansing	Allamakee	City of Lansing	Limestone	Dolomite, siliceous
2	do	do	John Nelson	do	Dolomite
3	1 mile southeast of Waukon	do	Frank Sohn	do	do
4	½ mile north of Decorah	Winneshiek	D. B. Ellsworth	do	Magnesian limestone
5	do	do	M. Steyer	do	do
6	1 mile south of Osage	Mitchell	David Armstrong	Limestone	Dolomite
7	½ mile northeast of Mason city	Cerro Gordo	Poyfeir & Son	do	Limestone
8	½ mile east of Mason city	do	A. T. Lien & Brother	do	Magnesian limestone
9	½ mile southeast of Mason city	do	J. L. Parker	do	Dolomite
10	¾ mile northwest of Marble Rock	Floyd	Boone Brothers	do	Limestone
11	1 mile southeast of Charles city	Floyd	J. S. Trigg	Limestone	Argillaceous-magnesian limestone
12	4 miles northeast of Clermont (Fayette county).	Clayton	E. H. Williams	do	Siliceous dolomite
13	McGregor	do	A. C. Boyle	do	
14	1 mile west of Bristow	Butler	E. Frick	do	Dolomite
15	Humboldt	Humboldt	C. A. Lonbeer	do	do
16	Humboldt	Humboldt	A. B. Snyder	Limestone	Dolomite
17	1 mile southeast of Dakota City	do	Miner & Howell	do	do
18	Fort Dodge	Webster	John Linebon	do	Magnesian limestone and dolomite
19	1½ miles west of Iowa Falls	Hardin	George W. Chapman	do	Dolomite
20	Iowa Falls	do	A. A. Wells & Son	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MINNESOTA—Crystalline Siliceous Rocks.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Dark gray	Medium	Massive	Horizontal and vertical	Archæan		1870	1
Dark gray and red	Fine	do	Irregular	do		1868	2
Black	Medium	do (a)	do	Lower Silurian		1880	3

a Two other granites of a different structure and appearance quarried at this place.

MINNESOTA—Marble and Limestone.

Light buff	Medium, vesicular	Irregular	Even, thin to thick	Lower Silurian	Saint Lawrence	1854	1
do	do	do	Even, medium to thick	do	do	1854	2
do	do	do	do	do	do	1857	3
do	do	do	Even thin to medium	do	do	1847	4
Light blue	Fine, semi-crystalline	do	do	do	Trenton	1856	5
Light blue	Fine, semi-crystalline	Irregular	Even, thin to medium	Lower Silurian	Trenton	1856	6
do	do	do	do	do	do	1870	7
do	do	do	Even, thick	do	do	1856	8
do	do	do	Even, thin to medium	do	do	1870	9
do	do	do	Even, medium	do	do	1869	10
Light blue	Fine, semi-crystalline	Irregular	Even, thin to medium	Lower Silurian	Trenton	1858	11
do	do	do	Even, medium	do	do	1871	12
do	Fine, compact	Massive	Even, thick	do	do	1865	13
do	do	Irregular	Even, thin to medium	do	do	1873	14
Light blue and drab	do	Massive	Even, thin to thick	do	do	1870	15
Drab	Fine, compact	Irregular	Even, medium	Lower Silurian	Trenton	1876	16
Light blue	do	do	Even, medium to thick	do	do	1864	17
do	Fine, vesicular	Massive	Even, thin to thick	do	do	1878	18
do	do	Irregular, wavy	Thin to medium	do	do	1879	19
Buff	Fine, vesicular, & compact	Massive	Even, medium to thick	do	Saint Lawrence	1868	20
Light drab	Fine, vesicular, & compact	Massive	Even, thin to thick	Lower Silurian	Saint Lawrence	1868	21
Light gray	Medium, vesicular	do	Even, thick	do	do	1855	22
Drab	Fine, compact	do	Even, thin to thick	do	Trenton	1865	23
Buff	Semi-crystalline, vesicular	Irregular	Even, thick	do	Shakopee	1870	24
do	do	do	Even, thin to medium	do	do	1868	25
Buff	Semi-crystalline, vesicular	Irregular	Even, medium to thick	Lower Silurian	Shakopee	1879	26
do	do	do	Even, thin to thick	do	do	1853	27
do	Fine, semi-crystalline	do	Even, thin to medium	do	do	1854	28
Drab	Fine, compact	do	do	do	Hudson River	1868	29
Light buff	Variable, vesicular	do	Even, medium to thick	do	Galena	1856	30
Light drab	Fine, vesicular	Irregular	Even, thin to medium	Lower Silurian	Saint Lawrence	1876	31
Drab	do	do	Even, thin to thick	do	do	1870	32
do	do	do	Even, thick	do	do	1854	33

MINNESOTA—Sandstone.

Brown	Medium	Massive	Even, thin to thick	Lower Silurian	Potsdam	1870	1
Red	do	do	Even, medium	do	Saint Croix	1870	2
Light gray	Fine, friable	Irregular	Even, thin to medium	do	Jordan	1862	3
do	do	do	do	do	do	1858	4
Red	Fine, compact	Massive	Even, thin to thick	do	Potsdam	1857	5

IOWA—Marble and Limestone.

Light drab	Coarse	Massive	Even, medium thick	Lower Silurian	Potsdam	1880	1
do	Coarse, vesicular	do	do	do	Lower magnesian	1870	2
Mottled gray	Fine, homogeneous	do	Uneven, thin	do	Trenton	1880	3
do	Semi-crystalline, vesicular	Wavy, irregular	Even, thin to medium	do	do	1879	4
do	do	do	Even, medium thick	do	do	1860	5
Bluish gray, mottled, and buff.	Fine, compact, porphyritic	Irregular	Even, medium thick	Devonian	Hamilton	1874	6
Light drab	do	Massive	do	do	do	1872	7
Drab and light drab mottled.	Variable	Massive and irregular	do	do	do	1876	8
Drab with buff tint	Crystalline, compact, and vesicular.	Irregular	do	do	do	1872	9
Dark drab and light buff	Semi-crystalline	Irregular and massive	Even, thick to medium	do	do	1875	10
Drab with buff patches	Semi-crystalline, fossiliferous.	Irregular	Uneven, thin to medium	Devonian	Hamilton	1874	11
Light buff	Vesicular	do	Even, thick to medium	Upper Silurian	Niagara	1854	12
do	Coarse, vesicular	Massive	Uneven, thick	Lower Silurian	Lower magnesian	1872	13
Drab and yellowish drab	Semi-crystalline, porphyritic.	do	Even, medium thick	Devonian	Hamilton	1880	14
Drab mottled with buff	Fine, compact	Irregular	do	Sub-Carboniferous	Kinderhook	1870	15
Drab	Fine, semi-crystalline	Irregular	Uneven, thin	Sub-Carboniferous	Kinderhook	1879	16
Light brown, or olive and drab.	Fine, compact	Massive	Even, thick to medium	do	do	1859	17
Drab	do	Irregular	Uneven, medium to thick	Carboniferous	Lower Coal Measures.	1868	18
Light brown	Porous	Massive	Even, thick	Sub-Carboniferous	Kinderhook	1865	19
do	Variable	do	Even, medium thick	do	do	1854	20

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

IOWA—MARBLE AND LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
21	1 mile southeast of Iowa Falls	Hardin	L. L. Kelly	Limestone	Limestone and dolomite
22	Conrad	Grundy	William T. Crealius	do	Limestone
23	1 mile northwest of Waterloo	Black Hawk	William Love	do	Siliceous dolomite
24	Cedar Falls	do	Edwin Carpenter	do	Dolomite
25	¾ mile west of La Porte	do	G. A. Knowles	do	do
26	½ mile east of Independence	Buchanan	James Forrester	Limestone	Limestone
27	3 miles southeast of Manchester	Delaware	Charles A. & S. A. Davis	do	Dolomite
28	1 mile north of Farley	Dubuque	B. N. Arquitte	do	do
29	1 mile east of Farley	do	C. E. De Rome & Co	do	do
30	Dubuque	do	Martin & Strane	do	do
31	do	Dubuque	Speer & Lee	Limestone	Dolomite
32	do	do	Joseph Hug	do	do
33	do	do	William Rebman	do	do
34	do	do	F. W. Kringle	do	do
35	Near Sabula	Jackson	E. A. Woods	do	Ferruginous dolomite
36	4 miles east of Maquoketa	Jackson	A. Connel	Limestone	Ferruginous dolomite
37	Maquoketa	do	Blush, Seaner, Becker & Dunham	do	do
38	½ mile east of Hale	Jones	O. Horton	do	Bituminous dolomite
39	1½ miles south of Hale	do	Solomon & J. N. Garrison and others	do	do
40	1¼ miles southeast of Olin	do	A. Rummel	do	do
41	1¾ miles southeast of Olin	Jones	J. Easterly	Limestone	Bituminous dolomite
42	do	do	William Gordon	do	do
43	1 mile northeast of Monticello	do	J. S. Fuller	do	Dolomite
44	2 miles northwest of Anamosa	do	Iowa State penitentiary	do	do
45	Stone City	do	John A. Green	do	do
46	do	Jones	James & Ronan	Limestone	Dolomite
47	do	do	Henry Dearborn	do	do
48	1½ miles north of Central City	Linn	S. T. Granger	do	
49	½ mile southeast of Mount Vernon	do	D. S. Hahn	do	Dolomite
50	2 miles southeast of Cedar Rapids	do	Three Bohemians	do	
51	1¼ miles southeast of Cedar Rapids	Linn	E. J. C. Bealer	Lmestone	
52	¼ mile south of Vinton	Benton	R. H. Quinn	do	Bituminous limestone
53	3 miles northwest of Vinton	do	Samuel Aungst	do	do
54	¾ mile east of Garrison	do	Kokbrick & Frazer	do	Bituminous limestone and dolomite
55	4¼ miles northwest of Garrison	Benton	Stonley & Co	do	
56	1 mile northeast of Le Grand	Tama	Le Grand Quarry Company	Limestone	Magnesian limestone
57	Quarry	Marshall	do	do	Calcareous dolomite and limestone
58	1½ miles north of Dillon	do	do	do	Limestone
59	2, 3, and 4 miles north of Ames	Story	P. R. Craig, R. Coe, and R. Hannum	do	Dolomite
60	3 miles northeast of Earlham	Dallas	Laird & Royce	do	Limestone
61	Iowa City	Johnson	Edward Crowley	Limestone	Siliceous limestone
62	do	do	L. O. Hoffman	do	Dolomite and limestone
63	10 miles north-northwest of Iowa City.	do	Penn Quarry Company and D. A. Schaeffer	do	Limestone
64	3½ miles south of Mount Vernon	do	John P. McOune	do	Bituminous dolomite
65	3½ miles southwest of Tipton	Cedar	M. Carey and Charles Miller	do	Limestone
66	3½ miles southwest of Tipton	Cedar	Shearer & Gray	Limestone	Limestone and dolomite
67	Rochester	do	Rochester Quarry	do	Limestone
68	Cedar Bluff	do	Cedar Bluff Quarry	do	do
69	5 miles northwest of Wilton	do	Kott & Hornie	do	do
70	4 miles northeast of Dixon	Clinton	J. D. Binford	do	Ferruginous dolomite and bituminous dolomite.
71	2 miles southeast of Grand Mound	Clinton	J. Collenbaugh	Limestone	Ferruginous dolomite
72	Lyons	do	Klaus Nagel	do	do
73	do	do	William Bell	do	do
74	Clinton	do	John Anthony	do	do
75	do	do	Thomas Purcell	do	do
76	8 miles east of Long Grove	Scott	Hans Topp	Limestone	Ferruginous dolomite
77	1 mile north of Le Claire	do	Edward Theleman	do	do
78	Davenport	do	A. C. Fulton	do	Limestone
79	do	do	William L. Cook	do	do
80	1 mile west of Davenport	Scott	E. S. Glaspell	do	do
81	do	do	Heinrich Schmiedt	Limestone	Limestone
82	Buffalo	do	Christian Metzger	do	Calcareous dolomite
83	3 miles northeast of Muscatine	Muscatine	A. M. Hare	do	do
84	3½ miles northwest of Washington	Washington	James Eckles and James Saville	do	Limestone
85	do	do	Minnick & Donovan	do	do

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

IOWA—MARBLE AND LIMESTONE—Continued.

Color.	STRUCTURE.			GEOLOGICAL AGE OF FORMATION.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Drab	Variable	Massive	Even, medium to thick	Sub-Carboniferous	Kinderhook	1855	21
Light drab	Granular (oolitic)	Regular	do	do	do	1854	22
Light buff and olive	Fine, semi-crystalline	Irregular	do	Devonian	Hamilton	1877	23
Drab	do	Massive	Even, thin	do	do	1835	24
do	Medium, fine and compact	Irregular	Even, medium thick	do	do	1856	25
Mottled and light buff	Porphyritic, fossiliferous	Irregular	Uneven, thin	Devonian	Hamilton	1860	26
Pale green and drab mottled.	Semi-crystalline, porous	do	Uneven, variable thickness	Upper Silurian	Niagara	1866	27
Light drab and buff mottled.	Porous	Even and wavy	Even, medium thick	do	do	1866	28
Light drab	Vesicular	Uneven	do	do	do	1878	29
Buff and drab	Semi-crystalline, vesicular	Massive	do	Lower Silurian	Trenton	1871	30
Buff	Semi-crystalline, vesicular	Massive	Even, medium thick	Lower Silurian	Trenton	1860	31
Buff and drab	do	do	do	do	do	1850	32
Mottled drab	Semi-crystalline, vesicular, and porous.	Irregular	Even and thick	do	do	1869	33
Buff	do	do	Even, medium to thick	do	do	1876	34
do	Finely semi-crystalline	do	Even, medium thick	Upper Silurian	Niagara	1847	35
Buff	Semi-crystalline and porous.	Massive	Even, medium thick	Upper Silurian	Niagara	1870	36
do	do	do	Even, thick	do	do	1869	37
Light buff	Finely crystalline, vesicular.	Even and parallel	Even, thin to medium	do	do	1851	38
do	Porous and vesicular	Wavy	do	do	do	1855	39
do	do	do	do	do	do	1868	40
Light buff	Porous and vesicular	Wavy	Even, thin to medium	Upper Silurian	Niagara	1870	41
do	do	do	do	do	do	1872	42
do	Porous	Even and parallel	do	do	do	1863	43
Buff	Semi-crystalline and vesicular.	Fine, even, and parallel	Even, medium to thick	do	do	1879	44
Light drab	Fine, vesicular	Massive	Even, medium thick	do	do	1869	45
Light buff	Fine, homogeneous	Massive	Even, medium thick	Upper Silurian	Niagara	1869	46
Light buff and light drab	Semi-crystalline, vesicular	do	Even, thick	do	do	1869	47
Drab with pink spots	do	Irregular	Even, medium thick	do	do	1880	48
Buff	Fine, porous	Even and massive	Even, thick	do	do	1873	49
Drab	Variable	Irregular	Uneven, medium thick	Devonian	Hamilton	1860	50
Drab	Variable	Irregular	Uneven, thick to medium	Devonian	Hamilton	1872	51
Light gray or buff	Semi-crystalline, porous, and compact.	Irregular and massive	Even, medium thick	do	do	1861	52
do	do	do	Even, medium to thick	do	do	1853	53
Drab and mottled drab	Fine, compact, porphyritic.	Irregular	Even, medium thick	do	do	1868	54
do	Medium and fine	do	do	do	do	1872	55
Bluish gray	Semi-crystalline, partly oolitic.	Irregular	Even and thick	Sub-Carboniferous	Kinderhook	1866	56
Light drab and buff reddish brown.	Granular	Irregular and massive	Even, medium to heavy	do	do	1866	57
do	do	Massive	Even and thick	do	Keokuk	1876	58
Drab and buff	Fine, compact	do	Uneven, medium thick	do	Saint Louis	1862	59
Light drab	Semi-crystalline, fossiliferous.	do	Even, medium thick	Carboniferous	Upper Coal Measures.	1872	60
Plain and mottled drab	Semi-crystalline	Irregular	Heavy bedded	Devonian	Hamilton	1860	61
Light and dark drab	Compact and semi-crystalline.	Massive	do	do	do	1868	62
Pinkish gray	Semi-crystalline, porous	Irregular	do	do	do	1844	63
Light buff	Fine, finely porous	Even and massive	Even and thick	Upper Silurian	Niagara	1848	64
do	Vesicular	Even and parallel	Even, medium thickness	do	do	1865	65
Light buff	Vesicular	Even and parallel	Even, medium thick	Upper Silurian	Niagara	1868	66
do	do	do	Even, medium thickness	do	do	1875	67
do	do	do	do	do	do	1855	68
do	do	do	do	do	do	1853	69
Light buff and dark buff	Semi-crystalline and porous	Even and massive	Even, thin to medium	do	do	1840	70
Light buff and dark buff	Semi-crystalline and porous	Even and massive	Even, medium thickness	Upper Silurian	Niagara	1865	71
Deep buff	Finely semi-crystalline and vesicular.	Irregular	Even, medium to thick	do	do	1865	72
do	do	do	Even, medium thickness	do	do	1870	73
do	do	do	Even, medium to thick	do	do	1864	74
do	do	do	do	do	do	1858	75
Light buff	Finely semi-crystalline	Massive	Even, medium thickness	Upper Silurian	Niagara	1861	76
do	do	do	Even, variable thickness	do	do	1877	77
Drab	Vesicular, conchoidal fracture.	Wavy	Uneven, thick to medium	Devonian	Hamilton	1873	78
Mottled drab	Semi-crystalline, fossiliferous.	Irregular and massive	Uneven, thin to medium	do	do	1848	79
do	do	Massive	Uneven, medium thickness	do	do	1866	80
Light mottled drab	Semi crystalline, fossiliferous.	Massive	Uneven, thin to medium	Devonian	Hamilton	1871	81
Bluish-gray mottled	Porphyritic and fossiliferous.	Irregular	Uneven, medium thickness	do	do	1857	82
Drab	Semi-crystalline	do	Uneven, medium thick	do	do	1860	83
Light gray and buff	Granular and highly crystalline.	Massive	Even, thin to medium	Sub-Carboniferous	Saint Louis	1858	84
do	do	do	Irregular, thin to medium	do	do	1855	85

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS.

IOWA—MARBLE AND LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	Specific variety of stone.	
				Popular name.	Scientific name.
86	Near Brighton	Washington	Brighton Quarries	Limestone	Limestone
87	Sigourney	Keokuk	Rowland Pilkington	do	do
88	3 miles north of Sigourney	do	William S. Booton	do	do
89	1 mile south of Given	Mahaska	Francis Castles	do	Ferruginous and siliceous limestone
90	4 miles north-northeast of Pella	Marion	F. C. Mathes	do	Limestone
91	2½ miles northwest of Durham	Marion	C. C. Collins	Limestone	Bituminous limestone
92	1½ miles southwest of Tracy	do	Regan Brothers & McGorrisk	do	Limestone
93	3 miles northwest of Knoxville	do	J. Johnson	do	Siliceous limestone
94	½ mile south and southeast of Winterset.	Madison	G. W. Hetzler	do	Limestone
95	do	do	T. F. Mardis	do	do
96	Winterset	Madison	City of Winterset	Limestone	Limestone
97	6 miles southwest of Winterset	do	W. H. Lewis	do	do
98	2 miles east of Earlham	do	Regan Brothers & McGorrisk	do	do
99	2½ miles east of Earlham	do	Robertson & Willoughby	do	do
100	Carson	Pottawattamie	Charles Törneböhm	do	do
101	Macedonia	Pottawattamie	Miles Quarry	Limestone	Limestone
102	1 mile southwest of Macedonia	do	Sylvester Dye	do	do
103	Crescent City	do	Crescent City Quarry	do	
104	Stennett	Montgomery	Wayne Stennett	do	Limestone
105	Near Corning	Adams	Law & Oak (2 quarries)	do	Siliceous limestone
106	5 miles northwest of Osceola	Clarke	F. J. Dean	Limestone	
107	¼ mile south of Chillicothe	Wapello	Samuel Strawn	do	Limestone
108	4 miles northwest of Ottumwa	do	S. L. Wiley Construction Company	do	do
109	3 miles northwest of Ottumwa	do	Chilton & Kendall	do	do
110	3 miles west of Ottumwa	do	James Kelly	do	do
111	2½ miles west of Ottumwa	Wapello	B. W. Jeffries	Limestone	Limestone
112	Ottumwa	do	Thomas Rogers	do	do
113	do	do	John Pasnen	do	do
114	Dudley	do	Beckwith & Winters	do	do
115	5 miles west of Fairfield	Jefferson	Saul Stieber	do	Micaceous limestone
116	5 miles west of Fairfield	Jefferson	J. Ziegler	Limestone	Micaceous limestone
117	1½ miles south of Mount Pleasant	Henry	Beckwith & Winters	do	Limestone
118	do	do	John Rukgaber	do	do
119	2 miles south of Mount Pleasant	do	Patrick O'Connor	do	do
120	Burlington	Des Moines	—— Hüsling	do	do
121	Burlington	Des Moines	Hoppman Bros. (2 quarries)	Limestone	Limestone
122	Keokuk	Lee	Miscellaneous	do	Dolomite
123	do	do	Patrick Tigue	do	do
124	do	do	James McNamara	do	
125	4 miles northeast of Franklin	do	Charles Graner	do	Ferruginous dolomite; also limestone.
126	Bentonsport	Van Buren	G. W. Jack	Limestone	Limestone
127	6 miles west of Keosauqua	Van Buren	Jacob Creasy	do	do
128	Bedford	Taylor	H. W. Greenlee	do	do

IOWA—SANDSTONE.

1	4 miles northeast of Muscatine	Muscatine	John Starke	Sandstone	Sandstone
2	3 miles northeast of Muscatine	do	A. M. Hare	do	do
3	¾ mile southwest of Lewis	Cass	John Woodward	do	Ferruginous sandstone

MISSOURI—CRYSTALLINE SILICEOUS ROCKS.

1	Knob Lick	Saint François	Allen & Smith	Granite	Hornblende granite
2	4 miles west of Iron Mountain	Iron	Philip Schneider & Co	do	Granite

MISSOURI—MARBLE AND LIMESTONE.

1	City of Saint Louis	Saint Louis	Moran's Quarry	Limestone	Dolomite
2	do	do	Daniel Cavenagh	do	do
3	do	do	Tim Evans	do	do
4	do	do	Joseph Webber	do	Limestone
5	do	do	Michael Kinealy	do	Dolomite limestone
6	City of Saint Louis	Saint Louis	James McGrath	Limestone	Dolomite limestone
7	do	do	A. O. Engelmann & Co	do	Dolomite
8	do	do	Diederich Scharinghaus	do	Magnesian limestone and limestone
9	do	do	Jos. O'Meara & Brother	do	
10	do	do	William Gorman	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

IOWA—Marble and Limestone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Drab	Not homogeneous	Massive	Variable	Carboniferous	Lower Coal Measures.	1870	86
Light drab	Fine, compact, and porous.	Massive and irregular	Even and thin	Sub-Carboniferous	Saint Louis	1861	87
do	do	do	Even, thin to medium	do	do	1874	88
Buff	Porous	Massive	Even, medium thickness	do	do	1870	89
Light drab	Granular and porous	do	Even, thick to medium	do	do	1856	90
Light drab	Granular and porous	Massive	Even, medium thick	Sub-Carboniferous	Saint Louis	1880	91
Light and dark drab	Compact and porous	do	do	do	do	1880	92
Dark gray	Coarse, semi-crystalline	do	Uneven, thick to medium	do	do	1862	93
Light drab	Granular, fossiliferous	do	Uneven, medium thick	Carboniferous	Upper Coal Measures.	1860	94
do	do	do	do	do	do	1878	95
Light drab	Granular, fossiliferous	Massive	Even, thick to medium	Carboniferous	Upper Coal Measures.	1860	96
do	do	do	Even and thick	do	do	1876	97
Light and dark drab	Semi-crystalline	Irregular	Even, medium thick	do	do	1869	98
do	do	Massive	do	do	do	1873	99
Light drab	Semi-crystalline and porphyritic.	Irregular	do	do	do	1880	100
Light drab	Semi-crystalline and porphyritic.	Irregular	Even, medium thick	Carboniferous	Upper Coal Measures.	1878	101
do	do	do	Uneven, medium thick	do	do	1856	102
do	do	do	Even, medium thick	do	do	1879	103
do	Granular	Massive	Even and thick	do	do	1880	104
Light drab and buff	Semi-crystalline, fossiliferous.	do	Even and thin	do	do	1860	105
Gray	Fine, homogeneous	Massive	Even, thin	Carboniferous	Upper Coal Measures.	1874	106
Mottled drab	Semi-crystalline	Irregular	Even and thin	Sub-Carboniferous	Keokuk	1879	107
Drab	Granular	Massive	Even, thin to medium	do	do	1877	108
Mottled drab	Semi-crystalline	Irregular	Even and thin	do	do	1879	109
Drab	Granular	Massive	Even, medium thick	do	do	1863	110
Mottled drab	Semi-crystalline	Irregular	Even, thin to medium	Sub-Carboniferous	Keokuk	1871	111
do	do	do	Even and thin	do	do	1877	112
do	do	do	Even, medium thickness	do	do	1880	113
Light drab and mottled drab.	do	do	Uneven, medium thickness	do	do	1866	114
Bluish gray and reddish gray.	Coarse, compact	Massive	Medium thick	do	Saint Louis	1872	115
Bluish gray and reddish gray.	Coarse, compact	Massive	Medium thick	Sub-Carboniferous	Saint Louis	1878	116
Light drab and buff	Semi-crystalline, porous	do	Medium, even thickness	do	Keokuk	1855	117
do	do	do	Even, variable thickness	do	do	1866	118
do	Semi-crystalline	do	Medium thick	do	do	1877	119
Light drab and mottled gray.	Variable	do	Medium thickness	do	Burlington	1867	120
Light drab and mottled gray.	Granular	Massive	Heavily bedded	Sub-Carboniferous	Burlington	1867	121
Olive gray	Variable	do	Uneven, medium thick	do	Keokuk	1857	122
do	Porous and compact	Uneven	Even and thick	do	do	1866	123
Gray	Coarse, porous	Irregular	Uneven, medium thick	do	do	1857	124
Buff and light drab	Porous	Massive	Even, medium thick	do	do	1867	125
Light and dark gray	Semi-crystalline, fossiliferous.	Irregular	Even, medium to thick	Sub-Carboniferous	Keokuk	1856	126
Drab	Semi-crystalline, finely granular.	Even, oblique	Even and thick	do	Saint Louis	1850	127
Buff	Semi-crystalline	Massive	Even, thick	Carboniferous	Upper Coal Measures.	1857	128

IOWA—Sandstone.

Dark brown	Coarse, friable	Coarse, oblique	Thick	Carboniferous	Coal Measures	1860	1
do	do	do	do	do	do	1876	2
do	do	Massive	Medium, thick	Cretaceous		1871	3

MISSOURI—Crystalline Siliceous Rocks.

Gray and red	Medium	Massive	Parallel and vertical	Archæan		1872	1
Red	Coarse	do	do	do		1873	2

MISSOURI—Marble and Limestone.

Drab	Fine, fossiliferous	Massive	Even, medium to thick	Sub-Carboniferous	Saint Louis	1875	1
do	Fine, compact	Even and wavy	do	do	do	1866	2
do	Medium, fossiliferous	Massive	do	do	do	1879	3
do	Fine, compact	do	do	do	do	1875	4
do	Fine, fossiliferous	do	Medium thick	do	do	1875	5
Drab	Medium, semi-crystalline	Massive	Even, medium to thick	Sub-Carboniferous	Saint Louis	1845	6
do	Fine, fossiliferous	Irregular	do	do	do	1871	7
do	do	do	do	do	do	1875	8
do	do	do	do	do	do	1875	9
do	do	Massive	do	do	do	1872	10

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

MISSOURI—MARBLE AND LIMESTONE—Continued.

	Location of quarry.	County.	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
11	City of Saint Louis	Saint Louis	Hugh Carlin	Limestone	Limestone
12	....do	....do	Bowdern & Chs. Hogan	....do	....do
13	....do	....do	Bambrick & Morihan	....do	....do
14	....do	....do	Schrainka & Veiths	....do	....do
15	....do	....do	Philip F. Stifel	....do	Dolomite
16	City of Saint Louis	Saint Louis	Henry Perkinson	Limestone	Limestone
17	....do	....do	John McKenna	....do	....do
18	....do	....do	John Bowdern & Son	....do	....do
19	....do	....do	J. O'Meara	....do	....do
20	....do	....do	Gottlieb Eyermann	....do	Dolomite
21	Rosedale	Saint Louis	Nicholas Lamb	Limestone	Limestone
22	Jefferson City	Cole	H. W. Kolkmyer	....do	Siliceous dolomite and dolomite
23	Boonville	Cooper	Russell Quarry	....do	Limestone
24	Sedalia	Pettis	Richard Anderson, lessee of Smith's quarry	....do	Magnesian limestone; also dolomite
25	4 miles south of Clinton	Henry	C. B. Jordan	Flag-stone	Argillaceous limestone
26	East of Kansas City	Jackson	John Bauman	Limestone	Magnesian limestone
27	Bluffs of Kansas City	....do	James Dowling	....do	Limestone

MISSOURI—SANDSTONE.

1	Miami Station	Carroll	White Rock Quarry Company	Sandstone	Sandstone (calcareous)
2	Warrensburg	Johnson	Bruce & Veitch	....do	....do
3	....do	....do	Pickle Brothers	....do	
4	Clinton	Henry	Gebhardt Quarry	....do	
5	4 miles southwest of Sainte Genevieve.	Sainte Genevieve	Sainte Genevieve Sandstone and Granite Company.	....do	

KANSAS—SANDSTONE.

1	7 miles west of Fort Scott	Bourbon	Gilfillan Brothers	Sandstone	Sandstone (calcareous)
2	4 miles southwest of Pawnee	Crawford	Pawnee Flagstone Company	....do	....do

KANSAS—MARBLE AND LIMESTONE.

1	Bigelow	Marshall	H. F. Gallagher	Limestone	Limestone
2	Frankfort	....do	Joseph Wilson	....do	....do
3	Atchison	Atchison	Reddington & Co	....do	....do
4	Manhattan	Riley	Ulrich Brothers	....do	....do
5	Topeka	Shawnee	Mulvane & Higginbotham	....do	Dolomite and limestone
6	2 miles from Dunlap	Morris	Wolf, Pickens & Co	Limestone	Magnesian limestone
7	Lane	Franklin	Hanway Brothers	....do	Limestone
8	3 miles east of Cottonwood	Chase	L. W. Lewis	....do	....do
9	2 miles east of Cottonwood	....do	Tweeddale & Parker	....do	Magnesian limestone
10	Cottonwood	....do	Emslie & Rettiger	....do	....do
11	1 mile west of Cottonwood	Chase	Lantry & Burr	Limestone	Limestone
12	Marion Center	Marion	Great Brothers	....do	Dolomite
13	Florence	....do	A. F. Horner	....do	Magnesian limestone
14	Augusta	Butler	J. C. Haines	....do	Magnesian and siliceous limestone
15	Fort Scott	Bourbon	W. L. Wilkinson	....do	Magnesian limestone and limestone
16	2 miles east of Winfield	Cowley	Charles Schmidt	Limestone	Siliceous and bituminous limestone
17	2½ miles southeast of Winfield	....do	Hodges, Moore & Co	....do	Limestone

CALIFORNIA—CRYSTALLINE SILICEOUS ROCKS.

1	Penryn	Placer	Griffith Griffiths	Granite	Hornblende-biotite granite
2	Petaluma	Sonoma	John Codden & Bros. and others	Basalt	Basalt

WASHINGTON TERRITORY—CRYSTALLINE SILICEOUS ROCKS.

1	Wilkeson	Pierce	Northern Pacific Railroad Company	Granite	

WASHINGTON TERRITORY—SANDSTONE.

1	Belligham Bay	Whatcom	C. Seidel & Co	Sandstone	

NEBRASKA—MARBLE AND LIMESTONE.

1	Roca	Lancaster	Keys & Bullock	Limestone	Limestone

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

MISSOURI—Marble and Limestone—Continued.

Color.	Structure.			Geological age of formation.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Drab	Fine, semi-crystalline	Massive	Even, medium to thick	Sub-Carboniferous	Saint Louis	1864	11
do	Fine, fossiliferous	do	do	do	do	1860	12
do	Fine, compact	do	do	do	do	1878	13
do	Fine, semi-crystalline	do	do	do	do	1850	14
do	Fine, fossiliferous	Irregular	Even, thick	do	do	1873	15
Drab	Fine, semi-crystalline	Massive	Even, medium to thick	Sub-Carboniferous	Saint Louis	1860	16
do	Fine, fossiliferous	do	Medium, thick	do	do	1860	17
do	do	do	Even, medium thick	do	do	1875	18
do	Fine, semi-crystalline	do	do	do	do	1845	19
do	Fine, compact	Irregular	do	do	do	1850	20
Drab	Fine, fossiliferous	Irregular	Medium, thick	Sub-Carboniferous	Saint Louis	1878	21
Light drab	Fine, vesicular	Massive	Even, thin to medium thick	Lower Silurian	Potsdam	1870	22
Dark drab	Medium, fossiliferous	do	Even, medium thick	Sub-Carboniferous	Saint Louis	1856	23
Brown and drab	do	do	Even, thick	do	Burlington	1866	24
Dark drab	Fine, compact	Even and wavy	Even, thin to medium	Carboniferous	Lower Coal Measures.	1878	25
Gray	Granular, fossiliferous	Massive	Uneven, medium to thick	Carboniferous	Upper Coal Measures.	1869	26
Drab	Fine, fossiliferous	do	Thin to medium	do	do	1865	27

MISSOURI—Sandstone.

Light gray	Medium	Massive	Thick	Carboniferous	Lower Coal Measures.	1839	1
Gray	do	do	Even, thick	do	do	1871	2
do	do	do	do	do	do	1871	3
Light brown	do	do	Uneven, thick	do	do	1877	4
Light buff	Fine	do	Even, thick	Sub-Carboniferous	Chester	1869	5

KANSAS—Sandstone.

Light gray	Fine	Massive	Even, thin to medium	Carboniferous		1866	1
Greenish	Medium	do	Even, medium	do		1880	2

KANSAS—Marble and Limestone.

Light drab	Variable	Irregular	Even, medium	Permian		1870	1
do	Coarse, vesicular	Massive	do	do		1874	2
Drab	Fine	Irregular	do	Carboniferous		1870	3
Buff	Coarse, vesicular	Massive	Even, thick	Permian		1865	4
Drab	Fine, fossiliferous	do	Uneven, thick	Carboniferous		1870	5
Light drab	Medium, vesicular	Irregular	Even, thin to thick	Permian		1878	6
Gray and buff	Medium, oolitic, & vesicular	do	Uneven, thin to thick	Carboniferous		1878	7
Light drab	Medium, fossiliferous	Massive	Uneven, thick	Permian		1880	8
do	Fine, fossiliferous	do	Even, medium to thick	do		1870	9
do	Medium, fossiliferous	do	Even, thick	do		1873	10
Light drab	Coarse, vesicular	Massive	Even, thick	Permian		1878	11
do	Medium, vesicular	do	Even, thin to thick	do		1880	12
do	do	Irregular, wavy	do	do		1875	13
do	do	Massive	Even, medium to thick	do		1880	14
Dark drab	Fine, semi-crystalline	Irregular, wavy	Even, thin to medium	Carboniferous		1870	15
Light drab	Fine, vesicular	Even, parallel	Even, thin to medium	Permian		1880	16
do	do	Irregular, wavy	Even, thick	do		1877	17

CALIFORNIA—Crystalline Siliceous Rocks.

Black, dark gray, and white	Medium	Massive	Vertical	Archæan		1864	1
Dark gray	Fine	do	Irregular	do		1864	2

WASHINGTON TERRITORY—Crystalline Siliceous Rocks.

Dark gray	Fine	Massive	Irregular	Archæan		1870	1

WASHINGTON TERRITORY—Sandstone.

Greenish gray	Medium	Massive	Uneven, thick	Carboniferous		1872	1

NEBRASKA—Marble and Limestone.

Drab	Medium	Massive	Even, thick	Permian		1870	1

TABLE IV.—TABLES INDICATING THE AMOUNT AND KINDS

DAKOTA—SANDSTONE.

	Location of quarry.	County	Name of the corporation, company, or individual.	SPECIFIC VARIETY OF STONE.	
				Popular name.	Scientific name.
1	Sioux Falls	Minnehaha	George Boardman	Quartzite	Quartzite

COLORADO—VOLCANIC ROCKS.

1	Castle Rock	Douglas	B. Hammer	Eruptive rock	Rhyolite
2	2½ miles from Castle Rock	do	G. F. Girardot	do	do
3	Douglas	do	S. W. Madge	do	do

COLORADO—SANDSTONE.

1	7 miles southwest by west of Fort Collins.	Larimer	E. B. Yont	Sandstone	
2	Morrison	Jefferson	Garfield & Co	do	
3	2½ miles south of Morrison	do	A. H. Garfield & Co	do	

OF ROCKS QUARRIED IN THE DIFFERENT STATES.

DAKOTA—SANDSTONE.

Color.	STRUCTURE.			GEOLOGICAL AGE OF FORMATION.		Year in which opened.	
	Texture.	Stratification.	Jointing, bedding, or natural surface.	Period.	Epoch.		
Reddish purple	Fine, compact	Massive	Even, medium	Lower Silurian		1872	1

COLORADO—VOLCANIC ROCKS.

Gray	Vesicular	Massive	Irregular			1878	1
Drab	....do	....do	....do			1877	2
Gray	Fine	....do	....do			1875	3

COLORADO—SANDSTONE.

Gray	Medium	Even, parallel	Even, thin to medium	Cretaceous		1871	1
White	Fine	Massive	Even, thick	Jurassic			2
Red	....do	Irregular	Uneven, thin	....do			3

TABLE V.—SHOWING THE EXTENT OF STONE CONSTRUCTION IN

	City.	State.	Number of stone buildings.				Number of buildings of the different classes of stone, with location of quarries.					
			Total.	Entirely of stone.	With stone fronts only.	Percentage of all buildings.	Sandstone chiefly.		Marble or limestone chiefly.		Granite or crystalline siliceous rocks.	
							No.	Location of quarry.	No.	Location of quarry.	No.	Location of quarry.
1	Akron	Ohio	24	11	13	0.75	24	Akron and Berea				
2	Albany	N. Y	125	13	112	0.76	115	Connecticut brownstone	1	Trenton	4	Maine
3	Allegheny	Pa	45	15	30	5.34	40	Freeport, Pa., Massillon, Ohio.				
4	Allentown	Pa	15	12	3	0.37	1	Pennsylvania	14	Vicinity		
5	Altoona	Pa	10	3	7	0.30	10	Vicinity and Amherst, Ohio.				
6	Amsterdam	N. Y	22	20	2	1.83	17	Amsterdam	5			
7	Atlanta	Ga	8	3	5	0.11					8	Stone mountain and vicinity.
8	Auburn	N. Y	77	25	52	1.75	1	Connecticut	76	Vicinity		
9	Baltimore	Md	229	28	201	0.38	85	Connecticut, New Jersey, and Ohio.	178	Maryland and Virginia	31	Maryland, Virginia, and Maine.
10	Bangor	Me	10	3	7	0.42					10	Frankfort and Penobscot islands.
11	Binghamton	N. Y	5	5		0.13			5	Syracuse		
12	Boston	Mass	771	93	678	1.50	346	Connecticut valley, New Jersey, Ohio, and provinces.	68	Vermont	312	Concord, cape Ann, and Chelmsford.
13	Bridgeport	Conn	39	16	23	0.87	27	Portland			12	Greenwich
14	Buffalo	N. Y	86	51	35	0.33						
15	Burlington	Iowa	100	95	5	2.00	1	Amherst, Ohio	99	Burlington		
16	Cambridge	Mass	14	13	1	0.17	1	Nova Scotia	1	Roxbury	11	Quincy and Rockport.
17	Camden	N. J	35	20	15	0.40	10	Trenton and Connecticut	16	Vermont		
18	Canton	Ohio	35	4	31	1.33	35	Massillon				
19	Cedar Rapids	Iowa	7		7	0.28			7	Stone City		
20	Charleston	S. C	8	1	7	0.11	8	Connecticut				
21	Chattanooga	Tenn	4	1	3	0.14			3	Vicinity	1	Georgia
22	Chelsea	Mass	4	2	2	0.125	2	Vicinity			2	Cape Ann
23	Chester	Pa	30			1.00					30	Vicinity
24	Chicago	Ill	5,003	453	4,550	5.00	500	Ohio and Michigan	4,500	Cook county and Rutland, Vt.	2	Maine
25	Chillicothe	Ohio	8	7	1	0.40	8					
26	Cincinnati	Ohio	2,500	100	2,400	8.00	1,499	Portsmouth	1,000	Cincinnati, Dayton, and Indiana.	1	Maine and Missouri
27	Cleveland	Ohio	250	170	80	0.78	249	Amherst, Independence, and Euclid.	1	Sandusky		
28	Columbus	Ohio	40	10	30	0.43	34	Berea, Waverly, Black Lick, and Sugar Grove	6	4 miles west of Columbus		
29	Concord	N. H	6	6		0.24					6	Concord
30	Cumberland	Md	8	6	2	0.50	8	Vicinity				
31	Davenport	Iowa	50	30	20	1.14	2		48	Davenport, Buffalo, Le Claire, and Stone City.		
32	Dayton	Ohio	125	25	100	1.64	50	Portsmouth and Berea	75	Dayton		
33	Denver	Colo	50	12	38	0.83					8	Castle Rock
34	Derby	Conn	12	12		0.05					12	Ansonia and Birmingham.
35	Des Moines	Iowa	12	2	10	0.27			12	Earlham, Pella, and Tracy.	1	Sauk Rapids, Minn., Iron Mountain, Mo., Grundy and Buchanan counties.
36	Detroit	Mich	75	15	60	0.27	60	Amherstburg, Essex county, Ontario, and Berea, Ohio.	15	Trenton and Kelley's island, Ohio.		
37	Dubuque	Iowa	200	150	50	4.00			200	Dubuque and Farley, and Nauvoo, Ill.		
38	Easton	Pa	35	20	15	1.40	15	New Jersey and Pennsylvania.	10	Vicinity		
39	Elizabeth	N. J	15	3	12	0.27	15	Newark and Belleville				
40	Elmira	N. Y	15	3	12	0.37	2	Vicinity	1	Syracuse		
41	Erie	Pa	5	4	1	0.13	2	Medina and Amherst	3	Dorset, Vt		
42	Evansville	Ind	100	1	99	1.66			100	Ellettsville and Bedford		
43	Fall River	Mass	67	50	17	1.09					45	Fall River
44	Fitchburg	Mass	4	2	2	0.19					4	N. H. and Fitchburg
45	Fort Wayne	Ind	5	2	3	0.17	1	Amherst, Ohio	4	Joliet, Ill., Wabash		
46	Galveston	Tex	102		102	3.40					102	Conn
47	Gloucester	Mass	10	6	4	0.33					10	Gloucester
48	Grand Rapids	Mich	12	3	9	0.19	9	Buena Vista and Amherst, Ohio, and Ionia county, Mich.	3	Vicinity		
49	Hamilton	Ohio	8	3	5	0.25	5	Near Portsmouth, Ohio.	3	Hamilton		
50	Harrisburg	Pa	17	13	4	0.28	6	York and Lancaster counties and Hummelstown.	10	Texas, Maryland, and Cumberland county, Pa.	1	Bluehill, Me., and near Richmond, Va.
51	Hartford	Conn	136	36	100	1.94	112	Portland	9	East Canaan	15	Westerly, R. I., and Glastonbury.
52	Haverhill	Mass	16	1	15	0.64						
53	Indianapolis	Ind	234	9	225	1.59	7	Portsmouth, Ohio	227	Indiana		
54	Ithaca	N. Y	15	15		0.60	15	Vicinity				
55	Janesville	Wis	10	5	5	0.36			10	In city		

SOME OF THE PRINCIPAL CITIES OF THE UNITED STATES.

Stone employed for foundations.	STONE PAVEMENTS. Street. Extent used.	Street. Location of quarries.	Sidewalk. Extent used.	Sidewalk. Location of quarries.	Stone commonly used for curb.	
Sandstone	Little	Medina	Largely	Berea, Ohio	Sandstone	1
Limestone	Largely	New England	do	Hudson river	Blue-stone	2
Sandstone	do	(Cobble-stone) Allegheny river.	Considerable	Allegheny and Fayette counties.	Sandstone	3
Lime and mountain stone.	Little	(Cobble-stone) river	Little	Lehigh and Wyoming valleys and North river.	Limestone	4
Sandstone and conglomerate.	Largely	(Cobble-stone) streams	do	Eastern Pennsylvania	Sandstone	5
Limestone			Largely	Vicinity	Limestone	6
Granite and gneiss	10 miles	Stone mountain and vicinity (macadamized).	One-half	Stone mountain and vicinity	Granite	7
Limestone	Little	Medina	Largely	East bank Cayuga lake	Sandstone	8
Gneiss	About three-fourths	Baltimore county and Jones' falls and vicinity.	do	Rondout, N. Y	Gneiss	9
Slate and bowlders	Little	Mount Desert, islands of Penobscot.			Granite	10
Limestone			Largely	Pennsylvania		11
Granite, slate, and Roxbury stone.	67 miles	Quincy, Bergen Hill, N. J., Rockport, Me.	do	North river, Rockport, Bolton, Conn., and Quincy.	Granite and blue-stone	12
Gneiss	Little	New Haven	Considerable	North river	Blue-stone and gneiss	13
	Largely	Medina	Largely	Medina	Sandstone	14
Limestone	Little	Vicinity	Little	Sagetown, Ill., and Mount Pleasant.	Limestone, Sagetown, Ill., and Mt. Pleasant.	15
Slate, diabase, and granite.	100 miles	Quincy	do	Hudson river	Granite and blue flagstone.	16
Gneiss	Largely	Connecticut	do	Williamsport, Pa	Granite	17
Sandstone	Considerable	Vicinity	Considerable	Berea, Ohio	Sandstone	18
Limestone			Little	Stone City	Limestone, Stone City and Farley.	19
			Largely	New York	Blue-stone	20
Limestone	Largely macadamized.	Vicinity	Little	Vicinity	Limestone	21
Granite	Little	Cape Ann and Quincy			Granite	22
Gneiss	do	(Cobble-stone) Delaware river.	Little	North river	Gneiss	23
Limestone	2 miles paved, 25 miles macadamized.	Waterloo, Wis., Lockport, N. Y., and other parts of New York.	36 miles	Lemont, Cook county	Limestone, Lemont	24
Sandstone	Little	Vicinity			Sandstone	25
Limestone	Largely	(Cobble) vicinity	Largely	Vicinity of Portsmouth	Limestone	26
Sandstone	do	Medina	do	Euclid and Newburgh	Sandstone	27
Corniferous limestone	Considerable	Vicinity	do	Columbus, Berea, and Waverly.	Corniferous limestone	28
Granite	Little	Concord	Little		Granite	29
Sandstone	Largely	(Bowlders) Potomac river.	do	Southampton, Pa	Sandstone	30
Limestone	Largely macadamized.	Davenport	Little	Stone City and Joliet	Limestone and sandstone, Stone City and Joliet, Ill.	31
do	Largely	Dayton	Largely	Dayton	Limestone	32
Rhyolite and sandstone			Little	Fort Collins		33
Gneiss			do	North river	Blue-stone and gneiss	34
Limestone	Little macadamized	River gravel	do	Joliet, Ill	Limestone, Joliet, Ill., Earlham and Pella.	35
Limestone	Little	Medina	Largely	Cleveland and Euclid, Ohio, and Medina, Mich.	Limestone, Medina	36
do	5 % paved, balance macadamized.	Dubuque	Little	Stone City and Farley, and Joliet, Ill.	Limestone, Dubuque, Stone City, and Farley	37
do	Little	(Cobble-stone) Delaware river.	do	Meshoppen	Limestone	38
Brownstone	Largely	Hudson river and New England.	Largely	North river	Blue-stone	39
Sandstone	Two blocks	Medina	Little	Trumansburg	do	40
Sandstone	Largely	Medina	Little	Euclid, Ohio	Sandstone	41
Limestone	Little	Vanderburgh county	Largely	Bedford and North Vernon	do	42
Granite	do	Freetown	Little	North river, N. Y	Granite	43
do	do	Fitchburg			do	44
Limestone	do	Wabash	Little	Berea, Ohio, and Joliet, Ill	Limestone	45
Sandstone, limestone, and granite.	Little	Cobble, ship ballast	Little	Connecticut, England, and Germany.	Limestone, sandstone, and granite.	46
Syenite	do	Gloucester			Syenite	47
Bowlders and some limestone.	do		Little	Lemont and Joliet, Ill., and Cayuga county, N. Y.	Limestone, Joliet, Ill	48
Limestone	do	(Cobble) vicinity	do	Hamilton	Limestone	49
do	do	(Cobble) Susquehanna river.	do	Hoboken, N. J	Brownstone and granite	50
Sandstone	Largely	Southwest of Hartford	Largely	North river and Bolton	Gneiss and blue-stone	51
Granite	Little	Cape Ann			Granite	52
Limestone	do	(Bowlders) vicinity	Largely	Decatur county	Limestone	53
Sandstone			do	Vicinity	Blue-stone	54
Limestone	3 miles	In city	1½ miles	In city	Limestone	55

TABLE V.—SHOWING THE EXTENT OF STONE CONSTRUCTION IN

	City.	State.	Number of stone buildings.				Number of buildings of the different classes of stone, with location of quarries.					
			Total.	Entirely of stone.	With stone fronts only.	Percentage of all buildings.	Sandstone chiefly.		Marble or limestone chiefly.		Granite or crystalline siliceous rocks.	
							No.	Location of quarry.	No.	Location of quarry.	No.	Location of quarry.
56	Johnstown	Pa	10	2	8	0.27	9	Connecticut valley and vicinity of Johnstown.				
57	Joliet	Ill	500	300	200	10.00			500	Vicinity		
58	Kansas City	Mo	95	15	80	1.00	70	Warrensburg, Carroll county, and Barnard, Kans.	25	Junction City, Kans		
59	Keokuk	Iowa	18	12	6	0.75	3	Sonora, Ill	9	Vicinity		
60	Kingston	N. Y	54	50	4	1.47	1	Vicinity	35	do		
61	La Crosse	Wis	20	12	8	0.57			20	East of city		
62	La Fayette	Ind	7		7	0.33			7	Bedford, Ind		
63	Lancaster	Pa	21	15	6	0.41	2	Lancaster county	16	Vicinity and Montgomery county.		
64	Lawrence	Mass	5	5		0.10					4	Concord, N. H
65	Leavenworth	Kans	3	3		0.09			3	Leavenworth		
66	Lockport	N. Y	286	185	101	7.50	150	Vicinity	35	Vicinity		
67	Logansport	Ind	60	50	10	3.75			60	Logansport		
68	Louisville	Ky	400	25	375	1.02	40	Portsmouth, Ohio	360	Bowling Green, Ky., and Bedford, Ind.		
69	Lowell	Mass	46	43	3	0.51	34	Lowell	1	Rutland, Vt	11	Concord, N. H., and Westford.
70	Lynn	Mass	28	5	23	0.41					5	Cape Ann and Peabody
71	Madison	Wis	76	48	28	4.00	73	3 miles west of city and Indiana.	3	Bridgeport and Westport, Ind.		
72	Manchester	N. H	3	1	1	0.10						
73	Mansfield	Ohio	3	1	2	0.15	3					
74	Memphis	Tenn	10	2	8	0.30	2	Ohio and Alabama	7	Alabama and Kentucky.	1	
75	Middletown	Conn	21	14	7	1.05	20	Portland			1	Haddam
76	Minneapolis	Minn	242	224	18	3.18	1	Fond du Lac	241	Minneapolis and Lemont, Ill.		
77	Mobile	Ala	1	1		0.02					1	Massachusetts
78	Nashua	N. H	3	3		0.11						
79	Nashville	Tenn	97	7	90	1.24	4		93	Bowling Green, Ky	3	Nashua
80	New Albany	Ind	15	3	12	0.45	2	New Albany	13	Salem		
81	Newark	N. J	216	76	140	1.05	210	Newark and Ohio	6			
82	New Bedford	Mass	25	22	3	0.57					22	Rockport, Quincy, and vicinity.
83	New Brunswick	N. J	11	11		0.31	9	Newark and Connecticut			1	New York
84	Newburgh	N. Y	13	10	3	0.36	1	Kingston	12	Vicinity and Ulster county.		
85	Newburyport	Mass	2	2		0.10	1	Springfield			2	Cape Ann
86	New Haven	Conn	69	27	42	0.63	59	Portland, East Haven, and Ohio.	1		9	Long island, East and West Rocks.
87	New London	Conn	18	14	4	1.05	2	Portland	1		15	New London and Groton.
88	Newport	R. I	40	30	10	1.33	14				25	Newport
89	Newton	Mass	7	7		0.22	5	Ohio and Massachusetts.			2	Westford
90	Norristown	Pa	35	30	5	1.34	28	Pottstown and vicinity of Norristown.	7	Montgomery county	7	
91	North Adams	Mass	6	6		0.30	2		3	Adams		
92	Northampton	Mass	4	2	2	0.21	2	Longmeadow, Mass., and Portland, Conn.				
93	Norwich	Conn	14	6	8	0.42	10	Portland and Ohio			4	Massachusetts and vicinity.
94	Ogdensburg	N. Y	260	250	10	13.00	2	Ohio	258	Vicinity		
95	Orange	N. J	25	25		0.50	22	Orange			3	Orange
96	Oshkosh	Wis	5		5	0.14	1	Marquette	4	Vicinity		
97	Oswego	N. Y	55	51	4	1.28	46	Oswego and vicinity	2	Onondaga county	2	Vicinity
98	Paterson	N. J	50	50		0.68	50	Little Falls and Paterson				
99	Pawtucket	R. I	6	5	1	0.33	1	Nova Scotia			5	Vicinity
100	Petersburg	Va	3	1	2	0.05	2	Connecticut			1	Dinwiddie county
101	Philadelphia	Pa	10,518	6,000	4,518	6.25	3,518	Connecticut, Trenton, N. J., Ohio, and Hummelstown.	2,500	Montgomery county, Massachusetts, and Vermont.	3,500	Quincy, cape Ann, Mass., Fox island, Mo., New Hampshire, Rhode Island, Virginia, and Philadelphia, and Delaware county, Pa.
102	Pittsburgh	Pa	90	30	60	0.34	81	Pennsylvania, Massillon, Ohio, Baden, Homewood, and Freeport.	2	Lemont, Ill		
103	Pittsfield	Mass				0.25			3	New York state and Sheffield.	2	Longmeadow and Quincy.
104	Portland	Me	30	10	20	1.00	10	Nova Scotia	1	Vermont	19	Hallowell, Biddeford, vicinity of Portsmouth.
105	Portsmouth	N. H	4	4		0.13					4	

SOME OF THE PRINCIPAL CITIES OF THE UNITED STATES—Continued.

Stone employed for foundations.	STONE PAVEMENTS. Street. Extent used.	Street. Location of quarries.	Sidewalk. Extent used.	Sidewalk. Location of quarries.	Stone commonly used for curb.	
Sandstone	Largely	(Cobble-stone) streams			Sandstone	56
Limestone			Largely	Vicinity	Limestone in vicinity	57
do	Principal streets, also macadamized.	Medina, N. Y	Little	Winfield, Fort Scott, Florence, Kans., and Joliet, Ill.	Limestone, Kansas City	58
do			do	Vicinity	Limestone in vicinity	59
Flagging	Little		60 miles	Kingston, Ulster, and Hurley	Blue-stone	60
Limestone	2 miles	East of city	Little	East of city	Limestone	61
do	Little	(Bowlders) vicinity	do	Greensburg	do	62
do	Largely	Vicinity	Largely	Wyoming county	Dolerite	63
Granite	do	Cape Ann and Westford	Little	Cape Ann	Granite	64
Limestone	do	Vicinity	do	Fort Scott (near)		65
Limestone	Little	Medina	Little	Vicinity	Sandstone	66
do	do	(Bowlders) vicinity	Largely	Southern Indiana	Limestone	67
do	Largely	Louisville	Little	Bowling Green	do	68
Granite	do	Westford, Mass., and Concord, N. H.	do	Westford	Granite	69
do	Considerable	Cape Ann			do	70
Sandstone	Considerable	Vicinity	Little	Joliet, Ill., and Ohio	Sandstone	71
						72
Sandstone	Largely	Vicinity	Largely	Warren	Sandstone	73
	15 miles	Illinois, Kentucky, Alabama, and Tennessee.	Little	Alabama	Limestone	74
Sandstone			Largely	Haddam and Maromas	Gneiss	75
Limestone	Little	Cobble, from drift	Little	Joliet, Ill., and vicinity of Minneapolis.	Limestone, Minneapolis	76
	Business portion partly paved and macadamized.	Ballast, foreign vessels			Limestone	77
Granite	½ mile	Nashua	Little		Granite	78
Limestone	Largely macadamized	Vicinity	do	Vicinity	Limestone	79
Limestone	Largely	New Albany	Little	New Albany and North Vernon.	Limestone	80
Sandstone	do	Hudson river and New England.	Largely	Ulster county	Blue-stone	81
Granite	do	Vicinity	do	North river, N. Y	Granite	82
Sandstone	do	West Connecticut	do	do	Blue-stone	83
Limestone	2 miles	Cobble-stone, vicinity	do	Ulster county	do	84
Granite	Little	Maine			Granite	85
Trap and sandstone	Largely	East and West Rocks	Little	North river and Bolton	Blue-stone and granite	86
Bastard granite	Little	Groton	Principal streets	North river	Granite	87
Granite	do	Block island and Nova Scotia.	Little	Hudson river	do	88
Wallstone			do	Westford	do	89
Sandstone	Little	Quincy	Considerable	North river	Granite, gneiss	90
Limestone	Chiefly on Eagle street		One block		Blue-stone, limestone, and quartzite.	91
Sandstone	Little		Little	Smith's Ferry	Granite	92
Talcose	do		Largely	North river	Blue-stone	93
Limestone		Potsdam and Hammond	Little	Potsdam	Potsdam and limestone	94
Sandstone	Little	Vicinity	Largely	Ulster county	Blue-stone	95
Limestone			Less than ¼ mile	Fond du Lac, Joliet, Ill		96
Sandstone	Little	Vicinity	Little	Cayuga	Sandstone and limestone	97
do	Largely	do	25 miles	North river and Sullivan county.	Blue-stone	98
Blue and red slate	Little	Diamond Hill	Little	Hudson river	Granite and blue-stone	99
Granite	do	(Cobble) vicinity	do	Petersburg	Granite	100
Limestone and gneiss	Largely	(Cobble) Delaware river, (rubble) local, Richmond and eastern granite.	Main streets in old portion of city.	North river and Wyoming valley.	Granite	101
Sandstone	do	(Cobble) Allegheny river.	Considerable	Allegheny and Fayette counties.	Sandstone	102
			One-half of business streets.	Catskill	Blue flagging	103
Ledge stone	Largely	Yarmouth, Hallowell, Fox island, and east Maine.	Little	Hudson river	Granite	104
Granite	Little	Sea-shore			do	105

TABLE V.—SHOWING THE EXTENT OF STONE CONSTRUCTION IN

	City.	State.	Number of stone buildings.				Number of buildings of the different classes of stone, with location of quarries.					
			Total.	Entirely of stone.	With stone fronts only.	Percentage of all buildings.	Sandstone chiefly.		Marble or limestone chiefly.		Granite or crystalline siliceous rocks.	
							No.	Location of quarry.	No.	Location of quarry.	No.	Location of quarry.
106	Portsmouth	Ohio	5		5	0.24	5	Vicinity				
107	Pottsville	Pa	50	49	1	1.89	47	Trenton, N. J., Connecticut and vicinity.				
108	Poughkeepsie	N. Y	24	5	19	0.96	16	Ohio and Portland	3	Westchester county	5	Vicinity
109	Providence	R. I	100	65	35	0.64	35	Connecticut, Nova Scotia, and New Jersey.	2	Tuckahoe, N. Y	59	Smithfield, Quincy, Westerly, Cranston, and Providence.
110	Quincy	Ill	100	20	80	2.00	28	Cleveland and Berea, Ohio, Warrensburg, Mo.	72	Vicinity		
111	Quincy	Mass	7	7		0.40					7	Quincy
112	Racine	Wis	4	3	1	0.08	1	Lake Superior	3			
113	Reading	Pa	40	20	20	0.44	20	Vicinity				
114	Richmond	Ind	20		20	0.50	20	Berea, Ohio				
115	Richmond	Va	5	4	1	0.05					5	Vicinity and Massachusetts.
116	Rochester	N. Y	197	146	51	1.13	31	Ohio and Medina	100	Vicinity	2	
117	Rockford	Ill	100	100	10	1.66			160	do		
118	Rock Island	Ill	3	3		0.07			3	Rock Island		
119	Rome	N. Y	9	5	4	0.50	3	Verona, N. Y	3	Onondaga and Oneida counties.		
120	Saint Joseph	Mo	15		15	0.23	15	Warrensburg, Mo				
121	Saint Louis	Mo	1,525	105	1,420	3.22	903	Warrensburg and Sainte Genevieve, Mo., and Carroll county.	610	Saint Louis, Grafton, Joliet, and Chicago, Ill.	12	Missouri
122	Saint Paul	Minn	344	324	20	4.91	3	Kasota	336	Saint Paul and Frontenac.		
123	Salem	Mass	7	5	2	0.18	1	Springfield			4	Cape Ann and Peabody
124	Salt Lake	Utah	40	30	10	0.62	37	Red Buttes, Albany county, Wyoming Territory.			3	
125	Sandusky	Ohio	200	180	20	6.25	20	Amherst	180	City quarries		
126	San Francisco	Cal	29	4	25	0.08	4	New Castle island, B. C., and Angel island.			24	China and Placer county.
127	Saratoga Springs	N. Y	8	8		0.40			8	Vicinity		
128	Savannah	Ga	2	2		0.04					2	Massachusetts
129	Schenectady	N. Y	4	3	1	0.16	4	Vicinity				
130	Scranton	Pa	14	4	10	0.17	12	Catskill mountains and Luzerne county.	2	Syracuse, N. Y		
131	Springfield	Ill	16	5	11	0.27	5	Amherst, Ohio, and vicinity of Springfield.	10	Joliet and Springfield	1	Virginia
132	Springfield	Mass	12	8	4	0.19	6	Longmeadow			6	Monson
133	Springfield	Ohio	25	5	20	0.63	1	Near Portsmouth	24	Springfield and Dayton		
134	Steubenville	Ohio	12	2	10	0.50	12	Steubenville				
135	Taunton	Mass	10	8	2	0.33	5	Vicinity			3	Acushnet
136	Terre Haute	Ind	100		100	1.92			100	Ellettsville and Bedford		
137	Toledo	Ohio	12	4	8	0.12	10	Amherst and Berea	2	Sandusky		
138	Topeka	Kans	750	700	50	12.50	12	Warrensburg, Mo	738	Cottonwood, Junction City, Cowley county, and Topeka.		
139	Trenton	N. J	95	71	24	1.46	95	Greensburg and Ohio				
140	Troy	N. Y	738	8	730	9.71	716	Portland and Connecticut.			7	Niskayuna
141	Utica	N. Y	27	10	17	0.39			6	Utica and Trenton		
142	Waterbury	Conn	5	4	1	0.17	1	Portland			4	Plymouth granite, county and vicinity.
143	Watertown	N. Y	24	22	2	0.06			24	City		
144	Wheeling	W. Va	16	4	12	0.31	16	Vicinity				
145	Wilkesbarre	Pa	16	6	10	0.34	12	Luzerene county and Meshoppen.	4	Syracuse, N. Y		
146	Williamsport	Pa	12	10	2	0.32	12	Hummelstown and vicinity.				
147	Wilmington	Del	22	10	12	0.26	9	Connecticut, Ohio, and New Jersey.	5	Cockeysville and Texas, Md.	6	Brandywine creek
148	Winona	Minn	10	10		0.59			10	Winona		
149	Woonsocket	R. I	20		2	1.33	2			Woonsocket		
150	Worcester	Mass	24	10	14	0.33	5	Longmeadow			19	Fitzwilliam, N. H
151	Yonkers	N. Y	6	2	4	0.19	4	Ohio and Portland			2	Vicinity
152	York	Pa	8	3	5	0.29	6	York county and Connecticut valley.	2	York	1	Richmond, Va
153	Zanesville	Ohio	12	4	8	0.36	9	Zanesville	3	Zanesville		

1. Serpentine has been used for building stone to a limited extent in a few of the above cities, but its importance is not sufficient to warrant giving it a place in the table. It may be mentioned that in the cities of Baltimore, Md., Wilmington, Del., Camden, N. J., Pottsville and Lancaster, Pa., there are a few buildings of this material, while in Philadelphia the number is estimated at 1,000.

2. For cities of New York and Washington, see detailed tables in the text.

SOME OF THE PRINCIPAL CITIES OF THE UNITED STATES—Continued.

Stone employed for foundations.	STONE PAVEMENTS. Street. Extent used.	Street. Location of quarries.	Sidewalk. Extent used.	Sidewalk. Location of quarries.	Stone commonly used for curb.	
Sandstone	Little		Little	Vicinity	Freestone	106
Conglomerate			Considerable	do	Conglomerate	107
Limestone	Little		Largely	North river	Blue-stone	108
Cranstone stone and slate	16 miles	Diamond Hill, Westerly, Connecticut, and Maine.	Little	Hudson river and cape Ann.	Granite	109
Limestone	Largely	Vicinity	do	Lemont and Joliet	Limestone	110
Syenite					Syenite	111
Limestone	Little	Racine	Little	Joliet, Ill		112
Limestone and sandstone			do	Hudson river	Limestone and blue flag	113
Limestone			do	New Paris, Ohio	Limestone	114
Granite	Business streets	(Cobble) near Richmond	do	Lynchburg, and Rondout, N. Y.	Granite	115
Limestone	Largely	Albion	Largely	Albion	Blue-stone	116
do	do	Vicinity	Little	Vicinity	Limestone, Joliet	117
do	Macadamized	Rock Island	do	Joliet	Limestone, Rock Island	118
Limestone and sandstone	Little		Largely	Cayuga, Chenango, and Hudson river.		119
Limestone	Macadamized	4 miles north of city	Little	Cottonwood Falls, Kans	Limestone, 4 miles north of city.	120
Limestone	Largely macadamized	Saint Louis and southeast Missouri.	Little	Saint Louis and Joliet, Ill	Limestone, Saint Louis	121
do	Little		Considerable	Saint Paul	Limestone, Saint Paul	122
Granite	Considerable	Cape Ann and Maine			Granite	123
Sandstone and granite						124
Limestone	Little		Largely	City quarries	Limestone	125
Granite rubble	4½ miles	Sonora and Penryn	Little	Folsom and Vermont	Granite	126
Limestone	Largely		Business streets	North river and Vermont	Blue-stone and marble	127
	Business streets	Cobble, ballast from vessels, and New York.	Little	Hudson	Flag-stone	128
Sandstone	Largely	Glenville	Largely	Helderberg		129
Seral conglomerate	Little	(Cobble-stone) vicinity	Considerable	Lehigh and Susquehanna counties.	Sandstone	130
Limestone			Largely	Joliet	Limestone, Joliet and Alton.	131
Sandstone	Macadamized with trap	Westfield	Little	Hudson river and Monson	Sandstone and gneiss	132
Limestone	Little	Springfield	do	Springfield and Dayton	Limestone	133
Sandstone	do	(Cobble-stone) Ohio river	do	Steubenville	Sandstone	134
Wallstone	do	Fields in vicinity	do	Acushnet	Granite	135
	Largely	Spencer	Largely	Bedford and Ellettsville	Limestone	136
Limestone	Little	Medina	Little	Berea and Euclid	Sandstone and limestone	137
do			do	Osage county and near Fort Scott.	Limestone, Safford	138
Sandstone	Little	Lambertville	Considerable	North river	Blue-stone	139
Shale	Largely	Clark's island, Me	Largely	Hudson river	do	140
Sandstone	Largely	Medina and Hammond	Largely	Cayuga and Hudson river	Sandstone	141
Granitic rock			One-half of principal streets.	North river	Blue-stone, North river	142
Limestone			Little	Watertown	Limestone	143
Sandstone	Largely	(Cobble) Ohio river	do	Buena Vista	Sandstone	144
Red sandstone	Little	(Cobble) Susquehanna river.	Largely	Vicinity	Red sandstone	145
Sandstone	Little	Vicinity	Little	Meshoppen	Slaty and conglomerate	146
Granite	One-third of streets	do			Granite	147
Lime-rock			Little	Winona	Lime-rock, Winona	148
Granite and mica-schist	Little	Vicinity and Massachusetts.	do	Hudson river	Granite, gneiss	149
Gneissoid granite	Main business streets	Fitzwilliam, N. H	Business streets	Local and Fitzwilliam, N. H	Gneiss	150
Trap and gneiss	Little	Tomkins Cove	Largely	North river	Blue-stone	151
Limestone	Largely	Vicinity	Little	York county	Brown sandstone	152
Sandstone	do		Considerable	Berea	Blue limestone and sandstone.	153