



### Verd-Antique in the United States.

MESSEES. EDITORS:—On page 369, of No. 24, Vol. XIII., SCIENTIFIC AMERICAN, under the head of "Latest Foreign Intelligence," you draw attention to the advantages of serpentine, introduced during the past few years in the buildings of London and other large cities.

Now it may interest some of your readers to know that the serpentine alluded to is what is generally known among marble masons as verd-antique marble, and that we have in America an article as good as any in the world, and that it could be delivered in New York, and our other large cities, at as cheap a rate, for building purposes, as the Vermont and other white and colored marbles, and yet we are using an imported article no better, and some of it not as good, for interior decorations, but on a very limited scale, owing to its high price.

We boast of our marble palaces in our large cities, and still we have not a building in the United States of verd-antique marble—nothing as good and certainly not as handsome.

Dana, in the "Manual of Mineralogy," page 147, says:—"Serpentine forms a handsome marble when polished, especially when mixed with limestone, constituting verd-antique marble. Its colors are often beautifully clouded, and it is much sought for as a material for tables, jambs for fire places and ornamental work. The quarries of Milford and New Haven, Conn., afford a beautiful verd-antique, and have been wrought; but the works are now suspended." On page 364:—"It occurs at Milford and New Haven, Conn., of fine quality, and also at Port Henry, Essex Co., on Lake Champlain. A marble of this kind occurs at Genoa and in Tuscany, and is much valued for its beauty. A variety is called *polzivera di Genoa*, and *vert de Egypt*."

Prof. Emmonds, Geologist of the Second District of the State of New York, so long ago as 1837, reported to His Excellency, W. L. Marcy, Governor of the State of New York, under the head "verd-antique," that he had discovered several localities of "this beautiful marble. The colors are green and white, arranged in the usual forms of clouded marble. The serpentine has a bright green color, and belongs to the variety usually called precious. The calcareous spar is white, or grayish white, and forms a handsome ground for the translucent serpentine. The quality of the rock is excellent. So sound is it that a mass rings like a piece of clinkstone. This variety of marble has always been esteemed in works of art, and if I mistake not, bears in market a higher price than any other. It might be introduced into the parlors of the rich for ornamental tables, to the exclusion of foreign articles. To effect this it is only requisite that it should be known, that the public may have an opportunity of judging of its qualities. Polished specimens may be seen in the collection, in the Museum at Albany."

On page 226 of the report before-mentioned, under the head "Geology of the County of Essex," he states:—"Besides the iron and limestone, I discovered a valuable bed of verd-antique marble, near Cedar Point, Port Henry. Its beauty is equal to any of the marbles of this description."

There is a quarry of verd-antique marble at Roxbury, Vt., of which Dr. Jackson, of Boston, says:—"It very closely resembles the European verd-antique, but where the latter has carbonate of lime, the former has carbonate of magnesia, and that this has a superior out-of-door durability, and longer resists decomposition from the atmosphere, from fire, and from acids. It offers no hold to moss."

Prof. Emmonds, in his admirable work, "American Geology," page 84, says of serpentine:—"In Middlefield and Chester, it forms a range of hills some five or six miles in length, and less than half-a-mile in breadth. The serpentine of the bare hills, near Baltimore, resembles that of Chester, and is probably more extensive."

Now, would any one believe, in the face of such evidence as this, that there is not at present a serpentine quarry being worked in the United States,

and that what we do use of it is imported. Yet such is the case. I believe the principal reason is, as stated by Mr. Booth in the work before quoted from, that there is still some prejudice in favor of an imported material on the part of the uninformed, to which dealers must cater. It is time we discontinued importing what we can obtain at home at our very doors.

I believe if men of means, acquainted with the marble business, would take hold of this, we could be supplied with a building material, for beauty and durability, equal to any in the world, and far superior to anything at present in use for that purpose. The Port Henry verd-antique could be purchased at a nominal sum; it lies on a plank road, within five hundred yards of a good dock, on the shore of Lake Champlain, where it could be put on board boats and freighted to New York, without transshipment, at \$3 per tun, and so to all parts of the United States and the Canadas.

But in Port Henry everybody appears to be getting rich out of magnetic iron ore. Within a radius of three miles are the mines of the Lake Champlain Iron Ore Co., Witherbees, Sherman & Co., proprietors; the Champlain Mining Co., the Port Henry Iron Ore Co., the Cheever Ore Bed Co., the Fisher Ore Bed Co., the Essex and Lake Champlain Iron Ore Co., the Essex and Lake Champlain Ore and Iron Co., and the Barton Hill Ore Bed Co. Thirty years ago, when Prof. Emmonds first drew attention to the iron ore of Essex County, in the report before-mentioned, there were not over five hundred tons a year shipped. Last year there were two hundred thousand tons shipped to all parts of the country, even so far away as to Pittsburgh, Pa. Witherbees, Sherman & Co., alone, shipped over one hundred and fourteen thousand tons.

To give you an idea of the value of these magnetic ores, I send you a cabinet specimen, taken from a vein known in the market as New Bed; it belongs to the latter company, and is said to contain more pure iron than the same weight of pig metal.

The verd-antique marble is now used for foundations for the engines, for underpinning barns, and for building stone fences.

Thirty years hence there will probably be as many tons of this serpentine marble shipped as there are now of iron ore, and as much money realized from it; for, as Prof. Emmonds said, thirty years ago:—"To effect this it is only necessary that it should be known that the public may have an opportunity to judge of its qualities."

My only object in writing you this letter is to assist you in making it known, as I believe it to be of national importance to use home manufactures.

T. G. MASSIE.

### Gunpowder—Lard Oil.

MESSEES. EDITORS:—If you think proper, please reply to the following questions in your "Notes and Queries":—

First, What is the estimated temperature of the gases resulting from the combustion of gunpowder just before the explosion, or when they are in their most compressed state?

Second, Suppose a cubic inch of lard oil, for instance, be converted by heat into permanent gases, and these gases, then compressed into a space of 25 cubic inches, would these gases, in expanding, perform work equal to one twenty-fifth of the amount of heat (if mechanically applied) consumed in converting the lard-oil into gas?

Hackettstown, N. J., Dec. 8, 1865.

[The temperature of the gases resulting from the combustion of gunpowder, at the instant of explosion, has been variously estimated—some good authorities computing it at 2,192°. It varies very greatly with the conditions under which the powder is burned, especially with the degree of confinement. Bunsen ascertained that when gunpowder is burned in the open air, the combustion is very imperfect, the quantity of heat generated being consequently less than is produced by perfect combustion. Even in the case of perfect combustion, though the quantity of heat would be in all cases the same, its intensity would be in inverse proportion to the space in which it was included.

Lard oil is decomposed at a temperature of about 600°, the oxygen and hydrogen being driven off in

the form of gas, and the carbon remaining behind; but to volatilize the carbon requires the heat of a powerful galvanic battery; it is even doubted by some whether carbon can be volatilized by any heat known. If, however, the carbon be brought in contact with oxygen at a red heat, the two combine chemically, forming either carbonic oxide or carbonic acid, and both of these compounds take the gaseous form at ordinary temperatures. Our correspondent will see from the complex character of the problem, the impossibility of making the computation desired.—Ers.

### The Pitch of Gears.

MESSEES. EDITORS:—The best thing I ever saw to get the size of the pitch line of wheels, is Mr. Sereno Newton's tables, now out of print. He gives the proportional radii for 5,640 wheels, for a pitch of one-fourth of an inch to three inches, from 10 teeth to 400, the true radii to set the trammel, and go to work. I have used these tables over thirty years without finding an error in them. I wish, for the good of mechanics, that some enterprising publisher would reissue them.

Your correspondent, on page 293, gives a good rule for those that understand algebra and surveying; but what do mechanics, generally, know about these things? Another one, on page 340 says, "That the pitch of gears is the distance between the centers of the teeth measured on the pitch line, not on a straight line between two adjacent teeth." I respectfully differ from him. I measure between two cogs, the same as between two dots, I always measure in a straight line. Mr. Newton, above referred to, says:—"The pitch of a wheel is the distance of the centers of two contiguous teeth, measured on their pitch line." I differ from the correspondent on one more point. He says that a wheel of 100 teeth is twice the diameter of a wheel that has 50 teeth. He assumes that calculating the circumference of a wheel is the way to find the pitch line. I think this erroneous in both science and practice. All that is necessary to come to the truth is to call the wheels polygons of 100 and 50 sides, and calculate their circumferences as such. Mr. Newton's tables are made on this principle. I copy from his table the proportional radii for two wheels of 10 and 20 teeth, of three inches pitch; pinion 4.854; wheel, 9.589. Now let us double the size of the pinion— $4.854 \times 2 = 9.708$ ; subtract and see the difference— $9.589$  from  $9.708$  leaves  $.119$  difference; radii  $.238$  in diameter, and  $.748$  in circumference, which is nearly three-fourths of an inch.

JARED W. SMITH.

New Haven, Conn., Dec. 12, 1865.

### Screw Cutting.

Mr. J. A. Whitmore, an attentive correspondent, sends us the following method of cutting threads in lathes:—

"Having noticed a number of communications in your valuable paper concerning screw cutting, and not having seen anything like the system I use, I thought some of your readers would like it better than their own. The rule is this:—Multiply the number of your screw and the number of threads you wish to cut by any number that will give a number or numbers of which you have gears to correspond. Thus, if you wish to cut a 12 thread and your lathe has a 3 thread, this multiplied by 8 gives 96 and 24, or an 11 thread. With a 6 screw, multiplied by 5, gives 55 and 30, or by 6, gives 66 and 36. It matters not what your multiplier is if it will give you one or two numbers which will correspond with gears which you have on hand; or, if you can get one gear, will only have to make one of the number.

It is equally as good for fractional threads, which every repair shop has to do with more or less. Take  $3\frac{1}{2}$  thread with a 5 screw; then  $7 \times 3\frac{1}{2} = 26\frac{1}{2}$ ,  $26\frac{1}{2} = 53$ . Where the thread is finer than the screw, place your small gear on the spindle; but where it is coarser than the screw, the large gear goes on the spindle. This rule applies only where the spindle and stud are gears of even."

REPORT OF LIEUT.-GENERAL GRANT.—Messrs. Appleton & Co., No. 443 Broadway, New York, have just issued a pamphlet edition of the masterly report of our great military chief. The report is accompanied by a portrait of the General, and embraces 77 pages, in bold clear type. Price 50 cents.