Roxbury Verd-Antique Marble Company. Vt.

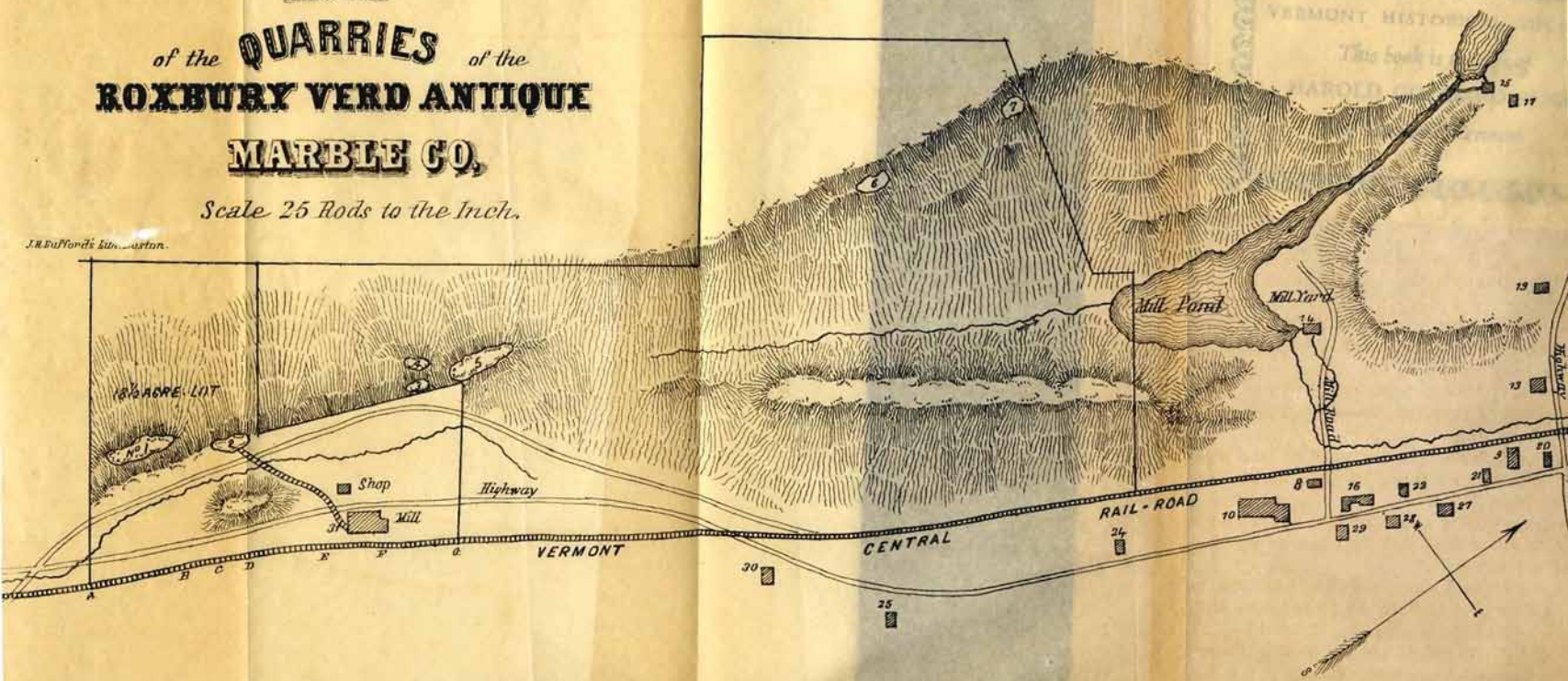
ORGANIZED APRIL 2, 1857.

MAP

of the QUARRIES of the

ROXBURY VERD ANTIQUE MARBLE CO.

Scale 25 Rods to the Inch.



SURVEY

OF THE COMPANY'S QUARRIES.

EXPLANATION.

Quarry No. 1.—Surface length, 260 feet; surface width, 65 feet; height above railroad at B, 107 feet; distance from railroad, 23 rods.

Quarry No. 2.—Surface length, 83 feet; surface width, 30 feet; height above railroad at D, 35 feet; distance from railroad, 25 rods.

Quarry No. 3.—Surface length, 65 feet; surface width, 12 feet; height above railroad at G, 10 feet; distance from railroad, 29 rods.

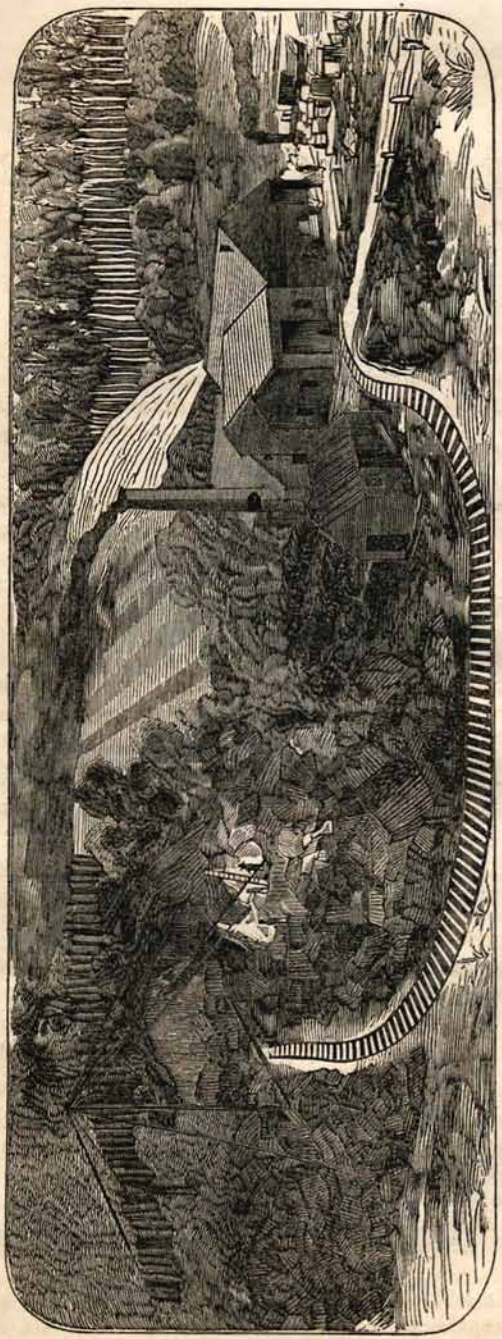
Quarry No. 4.—Surface length, 50 feet; surface width, 20 feet; height above railroad at G, 40 feet; distance from railroad, 34 rods.

Quarry No. 5.—Surface length, 247 feet; surface width, 60 feet; height above railroad at G, 83 feet; distance from railroad, 33 rods.

Quarry No. 6.—Surface length, 90 feet; surface width, 20 feet; height above railroad at the Depot, 187 feet; distance from railroad Depot, 70 rods.

Quarry No. 7.—Surface length, 66 feet; surface width 50 feet; height above railroad at Depot, 210 feet; distance from railroad Depot, 80 rods.

BUILDINGS.——No. 8, Depot; No. 9, Church; No. 10, Hotel; Nos. 12 and 16, Stores; No. 14, Mill; No. 15, Clapboard Mill; No. 27, Post Office; Nos. 11, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29 and 30, Dwelling Houses; No. 31, Company's Steam Marble Factory.



VIEW OF QUARRY NO. 2, AND WORKS OF THE ROXBURY VERD ANTIQUE MARBLE COMPANY, ROXBURY, VERMONT.

ROXBURY

VERD ANTIQUE MARBLE COMPANY.

THIS Company was organized on the second day of April, 1857, under a special Charter, granted by the Legislature of the State of Vermont, the object of the Incorporation, as stated in the Charter, was for the purpose of " quarrying and working marble and other mineral and stone, and preparing the same for market," in Roxbury, Washington County, Vermont.

Many of the stockholders of this Company, had prior to its incorporation, been associated for the purpose of quarrying and working Verd Antique Marble, under the name of the Verd Antique Marble Company, they had made such progress in developing and introducing the material, as to satisfy themselves it was destined to have an extensive sale in this country, and become a permanent article of export to Europe. It was not then, for the purpose of experimenting on the value of the interest, that the Roxbury Verd Antique Marble Company was organized. The individuals associated under the name of the Verd Antique Marble Company, were convinced that an incorporated company could more easily prosecute their operations with that energy and system that is ever essential to success, than a mere unincorporated association.

The Roxbury Verd Antique Marble Company, at its first meeting, voted to purchase of the Verd Antique Marble Company, all their property and assets, both real and personal, paying to each owner of stock in the Verd Antique Marble Company, ten dollars per share, in the stock of the Roxbury Verd Antique Marble Company, also assuming all the debts of said Company.

By this purchase, the present Company became the owners in fee, of eighteen acres of land, on which are located their Mill, Railway, Yards, &c., and the quarrying and mining rights over an area of about one hundred and twenty-five acres. The quarries of Marble owned by the Company, are seven in number, and located near the line of the Vermont Central Railroad, and distant from its track from 15 to 80 rods. The supply of material is inexhaustable, and the extent of the quarries amply sufficient to employ any desirable number of men in quarrying.

Their Mill for sawing and finishing, is situated beside the railroad, and connected with the quarry by a railway track, on which cars are loaded at the quarry, and blocks of stone run directly into the Mill, or to the road. The Mill is 102 feet in length, by 46 in width, to which has been added an ell 40 by 30 feet, and an Engine House. The machinery consists of six gangs of marble saws, five gangs carrying thirty-six saws to the gang, and one gang capable of running one hundred and fiifty-six saws, being

probably the largest gang of marble saws in New England. This gang is principally used for sawing columns, spiral shafts and large blocks, and under it might be sawed a ten foot cube of stone; also, a circular saw for sawing marble, and by shifting the saw, for sawing wood, or material for boxing finished work for transportation to market; a horizontal sawing machine, for sawing circular tables, arches to mantles, &c., also for drilling; an upright whip saw, for sawing serpentine tables and other irregular forms; a moulding machine, for moulding the edges of tables, and other work where a moulding on the edge is required; a rubbing bed, nine feet in diameter; a steam polishing machine, &c. This machinery is propelled by a forty horse power engine, of Tuft's manufacture, and the Mill is one of the best in the country. No expense has been spared in putting in the best machinery, and every improvement known in marble working has been adopted, any description of marble manufacture can now be done at their works, at a very low cost, the expenses for labor being much less than in the cities, and the expense of running machinery being only about one half as much.

One of the seven quarries of the Company has been fully opened, and extensively worked, and the others tested sufficiently to prove them equal in beauty and quality of material; several of these quarries are much larger than the one now open, and equally convenient to both the mill and the road, and will cost much less to open in proportion to their size, than the quarry at present worked. The quarry now worked will furnish any length columns or any size blocks transportable by railroad, while sound blocks, measuring fifty tons, could be quarried if desired.

These quarries were accidentally discovered in 1851, in 1853 a commencement was made to open the quarry now worked, but during that year little was accomplished towards furnishing a sound material; in 1854 the work was prosecuted with more energy, under the management of the American Verd Antique Marble Company, an ignorance of the geological formation of the quarry, and a fear of injuring the stone by a too free use of powder, made that season's operations unnecessarily expensive, and the same may be said of many of the needless experiments subsequently made. The Company commenced, presuming that their quarry once open, so they could furnish sound blocks of Marble, it would at once find a ready sale, without making the necessary provision for the expenses of introducing it, forgetting, that an article however valuable or beautiful for the purposes designed, must first be introduced and its value appreciated, before a demand can be created to any considerable extent. It then being a new American interest, and the European article with which it claimed identity being but comparatively little known in our markets, while the public were incredulous of the material, as an ornamental stone, on account of the inability of the Company to furnish a perfect material from the surface, it was found necessary not only to throughly open the quarry, but to erect a mill and machinery for introducing the sawed and finished work. This was subsequently done, but to accomplish it, and fill an order for a large amount of the stone, given to the Company by the United States Government, through their then Acting Agent, for the United States Capitol Extension, on his proposals offered them, the Company were involved in an unforseen expense and it finally resulted in the sale of their property, for the amount of its liabilities, in June, 1856. At that time, the property was purchased by an Association, under the name of the Verd Antique Marble Com-

pany, for the amount previously expended on the property, subsequently it was managed under that name, as a Joint Stock Association, until the organization of the present Company, April 2d, 1857, and purchase by them, of the property, for the amount of the liabilities, and receiving all the assets of the Verd Antique Marble Company. Thus placing the property in the hands of this Company, on the same terms of purchase, as if the property had come into their possession in June, 1856, and they had conducted its affairs since that time.

The Charter, under which this Corporation is organized, authorizes an issue of stock not to exceed Five Hundred Thousand Dollars, and provides for the sale and transfer thereof, in such manner as the Company may deem expedient. The par value of the shares has been fixed at Fifty Dollars each, and the capital of the Company at the actual amount of shares issued and paid for; their Treasurer is instructed in payment for the property purchased, to issue to each Shareholder in the Verd Antique Marble Company, one share of this Company's Stock, at a par value of fifty dollars, for every five shares of the Verd Antique Marble Company's Stock, at a par value of ten dollars, surrendered to the Company, and also to sell all amounts of Stock necessary to liquidate all liabilities of the Corporation, and furnish a working capital. Thus reserving in the Treasury of the Company, the entire amount of Stock, over and above what may be sold to meet the expenses of the purchase, and operations of the Company, for the benefit of the Corporation, or if sold, the proceeds to be divided as a cash dividend, whenever it shall be ordered.

Since the purchase of the property in June, 1856, more has been accomplished in developing, introducing, and establishing the value of the interest, than during its entire previous history; large and expensive additions have been made to the machinery, the quarry put in good working condition, the railway track graded and re-laid, a large amount of the marble quarried, sawed, manufactured and sold, a depot for the exhibition of the finished material, and for its sale, established at Boston, a large and expensive order from the United States Government, to be used in the interior ornamental work of the Capitol Extension, at Washington, completed and delivered, a large amount added to both the quarried and sawed stock on hand at the Company's Works, besides a large invoice of finished work on hand in Boston, and at the Works in Vermont, most of the latter being manufactured on orders. The marble has been introduced in greater or less amount, into all the principal cities of the United States and Canadas. Orders have also been received the past winter from France, for marble in the rough block, and the same has already been forwarded. A well known and responsible house in Paris, now acting as the Agents of the Company, are confident of being able to forward orders for several thousand feet of the marble, in the block, the present season; the same parties are the Agents of the Company in Germany, also. The Company are now filling an order at the present time, from a Marble Manufacturer in London; and to this interest is said to be due the credit of shipping the first block of marble ever delivered on the order of a European Manufacturer, from an American quarry.

This marble has been proved, and is now admitted to be identically the same material as the celebrated Verd Antique Marble of Southern Europe, both in style and composition, and although it has only been claimed to be *equal*, it can be proved that it is vastly superior, in all the necessary requi-

sites of fineness of material, brilliancy of color and finish, no marble known, whether American or European, taking a better surface or higher polish, while it will resist the action of frost, heat and acids, and is one of the most indestructable materials known. For beauty it may challenge a comparison with any marble ever quarried. To appreciate the value of this interest, something must be known of the high estimation, extreme scarcity and value of this ancient ornamental marble, in Europe. The ancient quarries, if quarries ever existed of this marble, are now lost, and whether they ever had an existence, has become a question with scientific men. Some suppose this marble, used so extensively for the interior ornamental architecture of the Palaces and public buildings of Southern Europe, in ancient times, was obtained from scattered boulders, and the supply exhausted, others, that the quarries have been filled up by the accumulating debris of centuries, and lost, and others still, that they were worked out; but whatever may be the conjectures, it is a fact well known, that at the present day, it can only be found in scattered blocks and broken columns, among the ruins of Roman and Etruscan Cities, "and so scarce has it become, that it sells in Paris," says Prof. C. U. Shephard, "at thirty-six dollars per cubic foot." From those ruins is now procured all the Verd Antique Marble used for ornamental purposes.

Such is the material of which the Company have an inexhaustable supply, and of which they possess the monopoly, inasmuch as these are the only quarries worked or known in this country, or the world, of this rare and beautiful marble.

Verd Antique Marble is found in various portions of this Country, in some form, but it invariably runs in very narrow broken veins through the various serpentine rocks, and will not furnish pieces sufficiently large to be of any mercantile value. The quarries of the Roxbury Verd Antique Marble Company, are the only quarries yet discovered in modern times, where this was not the case, and in the earlier history of the interest, this was the only question of its value raised by scientific men. Since then, this question has been fully answered by the operations of the Company; the size of blocks the quarries are capable of furnishing, are only limited by the means of transportation.

This interest is now held by comparatively few men, and by them the Company has been steadily operated for some ten months past, employing a force of from twenty-five to thirty men. The demand for the material both finished and in the block, has been steadily increasing every month, until it has become an absolute necessity to increase their labor on the quarry and at the works. To do this, it is proposed to sell sufficient stock to meet all the present liabilities of the Company, and furnish all the necessary means to increase their business to the extent the demand for the marble and the interests of the Company may require. To do this, and at the same time prevent speculation on the stock, they have put the property into the Company for the actual money expended upon it, and all monies received by the Treasurer for shares issued, becomes, after paying the liabilities of the Corporation, a fund in the Treasury, for future operations, if needed, or may be divided among the Stockholders, as a cash dividend, together with the earnings of the Company.

The Company are aware that the question may be asked, why sell the property at so low a price, if, as is claimed for it, (and proved by actual demonstration in the past year,) it may be made to pay in the full amount

authorised by the Charter? In answer to this, they have only to say, that they have an interest fully developed, its value proved as a permanent investment for money. No further experiments, on either the material or its commercial value, are necessary, and all the Company now need, is the means to prosecute their operations with energy, to insure success, and to accomplish this, it is no part of their object to make a speculation on the amount of stock they wish to dispose of. The policy of the Company will be to prosecute the quarrying and sawing business only, so soon as the article is as fully introduced as the best interests of the Company require. Marble Manufacturers and Dealers are now ordering the stone to work, and to them it is proposed to finally surrender that branch of the business, not because it does not pay large profits, but because the Company come in competition with their customers for blocks. Prices on finished work, have been kept fully up to the prices asked for the best European Marble work, and at the price asked for the stone in the rough block, the work pays much better.

This material can be quarried for as low prices as the common marbles of Vermont, the vein being from eighty to one hundred feet wide and no waste in the material when the vein is once stripped for quarrying. There is no selection made in the stone for working, each block quarried is worked as it comes from the quarry. The material becomes finer, and more brilliant in its colors, as the quarry is worked down, while the style of the marble remains essentially the same. The stone is being sold for every conceivable purpose for which an ornamental marble is ever used. It is being wrought into Columns, Pilasters, and other ornamental work of the United States Capitol Extension, at Washington; it forms the base of the Franklin Statue at Boston, it is also to be used for the pedestal of the marble statue of General Warren, about to be erected on Bunker Hill, and is being applied for by several other organizations erecting out door statuary, being for this purpose invaluable, as it resists all atmospheric action, and retains its beauty and polish, being the only ornamental marble that can be used for the purpose. It has been used for the desks and furniture of Churches, for pedestals for busts and statues, and for all the ordinary furniture purposes, such as tables, mantles, &c. The Salesroom and Office of the Company, is at No. 52 School Street, Boston, where the public will find the marble wrought into all the various forms to which it is usually applied, and where any necessary information regarding the interest will be cheerfully given.

Appended is an abstract of the cost of the property and assets of the Corporation, as purchased May 1st, 1857.

Cost of the property, May 1st, 1857, including an expenditure of $2,874 15, for repairs and additions to real estate, buildings, machinery and tools, also all liabilities of the Corporation, ...		$79,263 76
AVAILABLE ASSETS.		
Marble on hand, quarried, sawed and finished,	15,872 00	
CASH ASSETS.		
Notes receivable and cash on hand, . .	2,032 58	17,904 58
Leaving the amount of		$61,359 18

as the cost of the property purchased, above the available assets.

At the Annual Meeting of the Roxbury Verd Antique Marble Company, holden at Roxbury, Vermont, May 1st, 1857, the following gentlemen were elected Officers for the ensuing year :

DIRECTORS.

CALVIN AINSWORTH,	Williamstown,	Vermont.
B. P. CILLEY,	Manchester,	New Hampshire,
J. W. BUTLER,	Boston,	Mass.
S. G. DAVIS,	"	"
DAVID MCCAINE,	"	"
SALMA KENDALL,	Brighton,	"

E. P. WALTON, Montpelier, Vt., *Clerk.*

DAVID McCAINE, *Treasurer.*

An Act to incorporate the Roxbury Verd Antique Marble Company.

It is hereby enacted by the General Assembly of the State of Vermont, as follows:—

SECTION 1. J. C. Tasker, Franklin Munroe, Charles H. Brown, Chester Snow, Abijah Keith and Fernald F. Merrill, and their associates and successors, are constituted a Corporation by the name of the Roxbury Verd Antique Marble Company, and by that name may sue and be sued, may have a common seal, and may have and enjoy all the privileges incident to Corporations, for the purpose of quarrying and working Marble, Iron, Copper, and other metals, minerals and stone, and preparing the same for market, in the County of Washington; and may purchase, hold and convey such real and personal estate, as the business and transactions of said Company require.

SEC. 2. The two first named Corporators, or either of them, shall have power to call the first meeting of said Corporation, by giving each of the Corporators notice, in writing, at least five days before such meeting, of the time and place of holding the same.

SEC. 3. Said Corporation may, at their first meeting, and all other meetings legally notified, elect seven Directors, and such other Officers as may be required for the business of the Corporation, and may make such by-laws, rules and regulations, as may be deemed necessary for the government of said Corporation, and for conducting the affairs thereof, not repugnant to the Constitution and Laws of this, and of the United States.

SEC. 4. Said Corporation may divide the Capital Stock into as many shares, and provide for the sale and transfer thereof, in such manner as they may deem expedient; provided that no share shall be less than twenty-five dollars, but the amount of said Capital Stock shall never exceed Five Hundred Thousand Dollars, nor shall the indebtedness of said Corporation ever exceed three quarters of the amount of said Capital actually paid in; and if the indebtedness of said Corporation shall at any time exceed the amount aforesaid, the Directors of said Company assenting thereto, shall be personally holden for such excess to the creditors of said Company.

SEC. 5. The Said Corporation shall be subject to all the provisions of Chapter eighty-three of the Compiled Statutes, relating to Private Corporations, and also an Act in addition to Chapter eighty-three of the Compiled Statntes, approved November 14th, 1854, which are not inconsistent with the express provisions of this Act.

SEC. 6. This Act may be altered, amended or repealed by the Legislature, whenever the public good may require; and this Act shall be subject to any General Law passed at this or any future session of the Legislature, in relation to Private Corporations; and also to the provisions contained in Sections eight, nine, ten, eleven, twelve, thirteen, twenty and twenty-one, of an Act entitled, "An Act providing for the organization of Private Corporations," approved December 5th, 1853.

SEC. 7. This Act shall take effect from its passage.

Approved: November 2d, 1855.

STATE OF VERMONT, OFFICE OF SECRETARY OF STATE.
Montpelier, January 5, 1857.

I certify that the foregoing is a true copy of an Act, passed by the Legislature of this State, at its October session, A. D. 1855, as appears by the files and records in this Office.

Given under my hand, and the seal of this Office, this 5th day of January, A. D. 1857.

CHARLES W. WILLARD, *Secretary of State.*

BY-LAWS

OF THE

ROXBURY VERD ANTIQUE MARBLE CO.

ARTICLE 1. The annual meeting of this Corporation shall be holden on the first Tuesday in August, annually, and shall be notified the same as special meetings, the place and hour of meeting shall be fixed by the Directors.

ART. 2. Special meetings shall be holden whenever required by the Directors, or by three or more Stockholders owning not less than one hundred shares of stock, and shall be notified by advertisement in one or more newspapers published in the County of Washington, Vermont, at least seven days before the meeting, and also, by sending a printed or written notice to each Stockholder, signed by the President.

ART. 3. Any business of the Corporation may be transacted at an annual meeting, but at special meetings no business shall be in order but what is specified in the notification.

ART. 4. The seal of this Corporation shall have the words upon it "Roxbury Verd Antique Marble Company, Vermont, Nov. 2d, 1855," and the same shall be affixed by the Treasurer to all deeds and certificates of stock made in behalf of or issued by the Company.

ART. 5. The Officers of the Corporation shall consist of seven Directors, a Clerk and Treasurer, all of which shall be Stockholders during their term of office, and elected by ballot. The Directors shall appoint one of their number President, who shall also be President of the Corporation. If the Company fail to elect their Officers at an annual meeting, they may be elected at a special meeting, and if a vacancy occur between the annual meetings, it may be filled by the Directors.

ART. 6. It shall be the duty of the President to call meetings of the Directors and Stockholders, and preside at the same, to sign all certificates of stock and deeds of real estate, and superintend the affairs of the Corporation.

ART. 7. The Directors shall annually report to the stockholders the condition of the finances of the Corporation, embracing its receipts and expenditures, shall declare annual or semi-annual dividends when the affairs of the Company will permit, audit and approve all accounts, appoint all agents, fix the compensation of all Officers, and in general exercise all such powers and authority as may be necessary and proper for the management of the affairs of the Corporation.

ART. 8. The Clerk immediately upon his election shall be sworn to the faithful peformance of his duty. He shall, besides the duty assigned him by the Directors, keep accurate and true records of all proceedings had at all meetings of the Stockholders and Directors, and in his absence from any meeting, a Clerk *pro tempore* shall be chosen and sworn, and if the record book is not at the meeting, a record of the proceedings, together with a copy of his oath, shall forthwith be transmitted to the Clerk, to be by him entered on the record book.

ART. 9. The Treasurer shall give bonds in such sum as the Directors may require, with sureties to their satisfaction. He shall have an office accessible to all persons having business with the Company. He shall keep all deeds, notes and other valuable papers, and collect and receive all monies due the Corporation, and when duly authorized by the Directors, he shall execute conveyances and leases of real and personal estate, and pay all bills when approved by such person or persons as they may appoint. He shall keep a regular set of books containing the accounts of the Corporation, and make a complete settlement of the same annually, and as much oftener as the Directors may require. He shall issue certificates of stock to all persons entitled thereto, and keep suitable books showing the number of shares held

by them respectively. He shall render an account of his doings to the stockholders at their annual meeting, and shall perform such other duties as the Directors may require.

ART. 10. At any meeting of the Corporation absent Stockholders may vote by proxy, written authority therefor being produced and filed with the Clerk.

ART. 11. These By-Laws may be altered, amended or repealed, by a vote of two-thirds of the stock represented at any meeting of the the Corporation proper for the purpose.

The following are among the certificates that have been received from eminent scientific and practical men, and prove, by actual test, that the marble is not only the most beautiful but the most durable material quarried—being but slightly affected by heat, entirely impervious to acids, and sustaining to the square inch six thousand pounds more pressure than any other marble known.

CERTIFICATES.

SMITHSONIAN INSTITUTE, WASHINGTON D. C., *Sept.* 15, 1854.

As assistant to the commission for testing the durability of building materials, I have made experiments on the samples of your Verd Antique Marble, from Roxbury, Vermont, the result of which please find below.

The crushing force upon a square inch, avoirdupois :

On the first sample, was - - - - - -	24,444
On the second " " - - - - - -	24,888
On the third " " - - - - - -	29,955
Averaging - - - - - - - -	26,429

Which you will find compares very favorably with the experiments made on some of our American marbles, two year since by another commission, a copy of which experiment I herewith send you.

Very Truly,

W. SHIPPEN,
Assistant Commissioner on Building Material.

U. S. CAPITOL EXTENSION AND WASHINGTON AQUEDUCT OFFICE,
WASHINGTON, D. C., *Sept.* 15, 1854.

Dear Sir—The following is the result of some experiments upon the green and white veined marble, submitted by you as from the quarries of the American Verd Antique Marble Company, in Vermont.

The specimens were crushed in one of Wade's Proving Machines, by Mr. Wm. Shippen, assistant to the commission for testing marbles for the capital extension :

Number of Specimen.	Size of Cube.	Specific Gravity.	Crushing Weight.	Crushing Weight per square inch.
1	1 ½ inch.	28,290	55,000 lbs.	24,444
2	1 ½ "	28,114	56,000 "	24,888
3	1 ½ "	Not taken.	67,400 "	29,955

The average weight, per square inch, necessary to crush the following marbles, as determined by a commission, in 1851, when examining different specimens offered for the Capitol Extension, was :

East Chester, New York, - - - - - -	23,917 lbs.
Lee, Massachusetts, - - - - - - - -	22,702 "
Hastings, New York, - - - - - - - -	18,941 "
Baltimore, Small Crystal, - - - - - -	18,061 "
West Stockbridge, Mass., - - - - - -	10,382 "
Baltimore, Medium Crystal, - - - - - -	9,625 "
Egremont, Mass , - - - - - - - -	9,544 "
West Stockbridge, Mass., - - - - - -	9,071 "
Montgomery County, Penn., - - - - - -	8,950 "
Stockbridge, Mass., - - - - - - - -	8,812 "
Baltimore, Large Crystal, - - - - - -	8,057 "
Lenox, Mass., - - - - - - - - -	7,153 "
The average of your three specimens is - - - -	26,429 "

Very respectfully, your servant,

M. C. MEIGGS,
Captain of Engineers, in charge of U. S. Capitol Extension and of Washington Aqueduct.

31 Somerset Street, Boston, *December* 11, 1854.

I have made a chemical analysis and a series of experiments upon a slab of the Verd Antique Marble from your quarries in Roxbury, Vermont, and have the honor of presenting to you the results.

The specific Gravity of this marble is 2,743 (water being 1); hence a cubic foot of it will weigh 171 43-100 pounds. On chemical analysis of a sample drawn from fragments taken from different parts of the slab, I obtained the following results :

Silica (rock crystal or quartz,)	42,6
Magnesia (an oxide of the metal magnesium,)	35,5
Prot. oxide of iron and of chrymium,	8,3
Carbonate of Lime,	0,6
Water,	13,0
	100

I then, as requested, exposed the polished surface of a portion of the slab to the action of strong sulphuric acid, and to concentrated muriatic acid, for twenty-four hours ; and on washing off the acid not the slightest corrosion or change of color could be discovered in the marble.

I then took one quarter of the slab and threw it directly into a furnace fire, and covered it with ignited anthracite, and let it get red hot. I then withdrew it, and plunged while red hot into cold water. It did not crack to pieces nor fly in the least, but remained quite solid. No rock except soapstone would stand the above-named tests, both by acids and fire.

This marble is one of the most imperishable rocks known to geologists, and at the quarry its power of resisting the action of air, water and frost, from the foundation of the world, is sufficiently manifest to ensure a favorable opinion as to its durability. When polished it is a very beautiful marble, adapted to many ornamental applications.

Respectfully, your obedient servant,

CHARLES T. JACKSON, M. D.
Assayer to the State of Massachusetts, and to the City of Boston, Geologist and Chemist.

Commonwealth of Massachusetts }
Secretary's Office, Boston, *May* 4, 1855. }

I hereby certify that at the date of the attestations hereto annexed, Charles T. Jackson was Assayer to the State of Massachusetts in the said Commonwealth, duly commissioned and constituted, and that to his acts attestations as such full faith and credit are and ought to be given in and out of Court. In testimony whereof I have hereunto affixed the seal of the Commonwealth, the date above written.

E. M. WRIGHT,
Secretary of the Commonwealth.

David McCaine, Agent Verd Antique Marble Company.

Sir—I have submitted the slab of your marble, placed in my hands, to experimental tests of durability, and have the pleasure of reporting to you now the result.

The object of the trials being that of learning how far this material may suffer from exposure to frost, includes an examination of its texture as well as the influence of natural flaws or seams—cracks or fractures, resulting from blows in working excepted.

The safest test of resistance to moisture and frost is that proposed by Berard, and when modified for special application it leaves nothing further to be desired in that way.

Your slab has been exposed to this test, and its power of resistance examined at successive steps, from where bricks fail, to the point at which ordinary granite shows its imperfections. This exposure it has passed without failure, in the chief points of texture, natural flaws and veins of dissimular composition. A fracture left in the specimen was early seen, and indeed was obvious to the eye on the unpolished surface.

Failing in detecting any liability to absorb moisture, or to permit frost to enter flaws, I repeated the testing while the slab was exposed to a temperature above 212° F. for a long time. The expulsion of air under a fluid would have permitted the

tests to enter the most minute flaws if they existed ; and, as the application, in all the trials, has been made to the rough or natural surface, a measure of comparison was obtained.

Under this test granite fails. Syenite, porphyry, and some other hard rocks, resist ; and your mineral *showing not the slightest effects of the action*, must take place with these in point of durability, under the exposure to the heat of summer with its dampness, or to the frosts of winter with the consequent mechanical action.

Although called a marble, it is not strictly such, being truly a variegated serpentine of unequal texture, such as has come down to us in ornamental forms of the highest antiquity.

Congratulating you on the possession of this beautiful and enduring material, I will add that my impression, before commencing the experiments, was adverse to the supposition of the specimen resisting them in a perfect manner, and thereby ranking among the most durable material known.

Very respectfully,

A. A. HAYES,
Assayer to the State of Massachusetts.

16 Boylston St., Boston, Feb. 22, 1855.

COMMONWEALTH OF MASSACHUSETTS, }
SECRETARY'S OFFICE, BOSTON, *April* 26, 1855. }

I hereby certify that at the date of the attestations hereto annexed, A. A. Hayes was Assayer to the State of Massachusetts in the said Commonwealth, duly commissioned and constituted, and that to his acts attestations as such full faith and credit are and ought to be given in and out of Court In testimony whereof I have hereunto affixed the seal of the Commonwealth, the date above written.

E. M. WRIGHT,
Secretary of the Commonwealth.

BOSTON, April 27, 1855.

To whom it may concern :

This certifies that the undersigned were appointed a sub-committee on the Franklin Monument, to visit the Quarries of the Verd Antique Marble Company, in Roxbury, Vermont, for the purpose of ascertaining whether the Company were able to procure sound blocks of sufficient size to meet the requirements of the pedestal for the Franklin Statue, about to be erected in this city. In company with the Agent we visited the quarries on the 6th and 7th inst., and there found, as had been represented to the committee, that very large and sound blocks could be obtained ; and we are fully of opinion that blocks of any size transportable by railroad, can be furnished by this Company, and that the quantity that could be so furnished is apparently without limit.

JOHN COWDIN,
JOSEPH M. WIGHTMAN.

[From the Boston Atlas, March 7th, 1856]

VERD ANTIQUE MARBLE.

We have been favored by Dr. Charles T. Jackson, the well-known analytic chemist, with the following minute analysis of the beautiful Verd Antique Marble, recently discovered in Roxbury, Vermont. Dr. Jackson's investigations present some very curious and interesting facts in regard to the American variety of this rare and choice material. While it will be seen that the constituent elements of both the American and European marbles are identical, the proportions in which they occur presents a curious difference ; the carbonate of magnesia being the prevalent material in the American, and the carbonate of lime in the European. In all other respects the two marbles are the same. This variation, slight as it is, being confined to the white veins of the two stones, is yet of positive advantage in several respects to the American. While the color, markings and general appearance of both marbles are essentially the same, the American is decidedly the brighter and handsomer of the two, carbonate of magnesia being nearly imperishable, and preserving its lustre under all circumstances, while that of carbonate of lime is more readily dimmed, and suffers from atmospheric exposure. While, therefore, the beauty of the American stone is equal to, if not superior to the European, its durability is vastly superior. The Verd Antique Marble of Europe will not bear an out door exposure. The American has been found to resist any and every means of destruction, fire, frost and mineral acids have been shown to be equally unable to impair either its strength or its beauty.

The shafts or quarries from which the Verd Antique Marble of Europe was obtained are either exhausted, or all knowledge of them has been lost. The only means of supply of this precious material, have been the ruins of ancient buildings, and a few isolated blocks. It cannot, therefore, be obtained in any large quantity, and owing to its rarity is extremely costly. The marble of Roxbury, Vermont, occurs in exhaustless quarries, is well adapted for outdoor as well as indoor ornament, and promises to be an invaluable discovery to the architecture and fine arts of the country.

Chemical Analysis and Comparison of Serpentine Marbles, known under the name of Verd Antique.

By Charles T. Jackson, M. D., Assayer to the State of Massachusetts, &c.

Read before the Boston Society of Natural History, February 20th, 1856.

Having made the original geological surveys of the great masses of Serpentine Marbles, which occur in the northern part of the State of Vermont, and described such as would furnish a marble identical with the celebrated Verd Antique of Europe, I have since been requested to institute a mineralogical and chemical comparison of the European and Vermont varieties.

The results to which I have arrived possess some scientific as well as practical interest, for they not only show a curious replacement of carbonate of magnesia for carbonate of lime, the magnesite being most abundant in the Vermont marble, while calcite is the predominant spar in the European variety. It has also been ascertained, by experiments made by me some years since, that the Vermont Serpen-

tine marble and that mixture called Verd Antique, are uncommonly durable, resisting not only atmospheric agencies, but also the action of acids, and to a remarkable extent that of fire.

Dr. Hayes, in an interesting report on this marble, has confirmed these results, and I am happy in being able to verify his analysis of some of the magnesite veins, while I also add now some new analyses of other veins in the Vermont marble, and of the calcite of the European Verd Antique. I offer like analyses of the serpentine of the Verd Antique, both of Europe and of Vermont, showing their identity of composition, and also an analysis I made many years since of the softer serpentine of Lynnfield in this State.

Serpentine consists essentially of hydrous silicate of magnesia, and silicate of the protoxide of iron, with occasionally a litile oxide of chromium—these oxides giving the green color to the serpentine. The presence of water of composition in serpentine materially affects its hardness, the softer varieties containing the largest proportion of water. In some varieties I found as much as 15 per cent. while the lowest was 7 per cent. Both the Verd Antique Serpentines of Europe and of Roxbury, Vermont, contain between 12 and 13 per cent. of water. That from Proctorsville, Vermont, contains but 7 per cent., and of Roxbury 13, while that from Europe contains 12.5 per cent., and that of Lynnfield 15 per cent.

Verd Antique Marble may be defined to be serpentine mixed with or containing numerous veins of magnesian carbonate of lime. The relative proportions of these ingredients may vary considerably on account of the ismorphic, or rather the plesiomorphic characters of the two minerals. Carbonate of the protoxide of iron, in like manner being plesiomorphic with both carbonates of lime and of magnesia, replaces either of those minerals in all proportions, without changing the angles of the crystals more than one degree.

It will be observed on examination of the analyses I have made, that in the Vermont Serpentine the white spar veins are chiefly composed of magnesite, while there are also veins consisting of magnesian carbonate of lime and of carbonate of iron. The relative proportions of these magnesian and ferrous carbonates in the Vermont marble are nearly the reverse of those in the European variety, thus beautifully illustrating the law of isomorphous substitution of mineral ingredients.

Owing to the refractory nature of serpentine, and the difficult erosion of the magnesite, the Vermont Verd Antique is less liable to decomposition from atmospheric agencies and also has the property of resisting a high temperature, and even the action of minerals and other acids, far beyond the celebrated Verd Antique of Italy. When highly polished, it is a rich and beautiful green marble, veined with white, and sometimes is richly mottled with magnesite and dolomite spar. Its polished surface is not liable to erosion from atmospheric causes, and will offer no hold for lichens, mosses or other parasitic vegetation, which so frequently mar the beauty of our more open grained white monumental marbles.

1st. Chemical analysis of the white veins of European Verd Antique.

These veins, picked out with great care to avoid any mixture of particles of serpentine, yielded per cent.—

Carbonate of lime,	81.00
Carbonate of magnesia,	11.70
Carbonate of iron,	7.30
	100.00

2d. Chemical analysis of the white veins of Roxbury, Vermont, Verd Antique marble. These veins were quite common in the slabs examined by me. They were were picked out with care to avoid any admixture of serpentine. On analysis they yielded—

Carbonate of magnesia,	80 00
Carbonate of lime,	15 00
Carbonate of iron,	3 50
Silica and loss,	1 50
	100 00

It will be observed that the carbonate of lime, in the European marble, is represented by carbonate of magnesia in the Vermont variety, and the carbonate of magnesia by carbonate of lime, a reversal of these ingredients.

3d. Chemical analysis of the magnesite veins in Roxbury, Vt., Verd Antique.—These veins are probably like those analysed by Dr. Hayes. They yielded per cent—

Magnesia,	38.88
Carbonic Acid,	37.12
Protoxide of Iron,	9.00
Undecomposed Serpentine,	15.00
	100.00

The protoxide of iron was originally in combination with carbonic acid in the stone, forming carbonate of iron, an isomorph with carbonate of magnesia.

4th. Chemical analysis of the dolomite spar veins in Roxbury, Vt., Serpentine.—A cleavage crystal, with angles of 106.15°, was analysed and yielded—

Carbonic acid,	46.50
Lime,	30 52
Magnesia,	18.57
Protoxide of iron,	4 25
Silica,	15.00
	99.79

In this mineral the carbonic acid is combined with the lime, magnesia and protoxide of iron.

5th. Chemical analysis of the serpentine of the Verd Antique of Europe.—It was picked out clean as possible, reduced to small grains, and washed with very dilute muriatic acid, to cleanse it from adhering carbonate of lime. The attack was made by means of carbonate of soda, in the usual manner of rendering insoluble silicates soluble in acids.

The results obtained were :

Silica	42 40
Magnesia	31.20
Protoxide of iron	13.90
Water	12.50
	100.00

The Roxbury, Vermont, serpentine, analysed in the same manner, yielded :

Silica	42.60
Magnesia	35.50
Protoxide of iron and ox. Chromium	8.30
Carbonate of Lime	0.60
Water	13.00
	100.00

C. T. JACKSON.