

“The Granite Quarries of the New England Coast”

(in Maine and Massachusetts)

By S. G. W. Benjamin

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Peggy B. Perazzo

Email: pbperazzo@comcast.net

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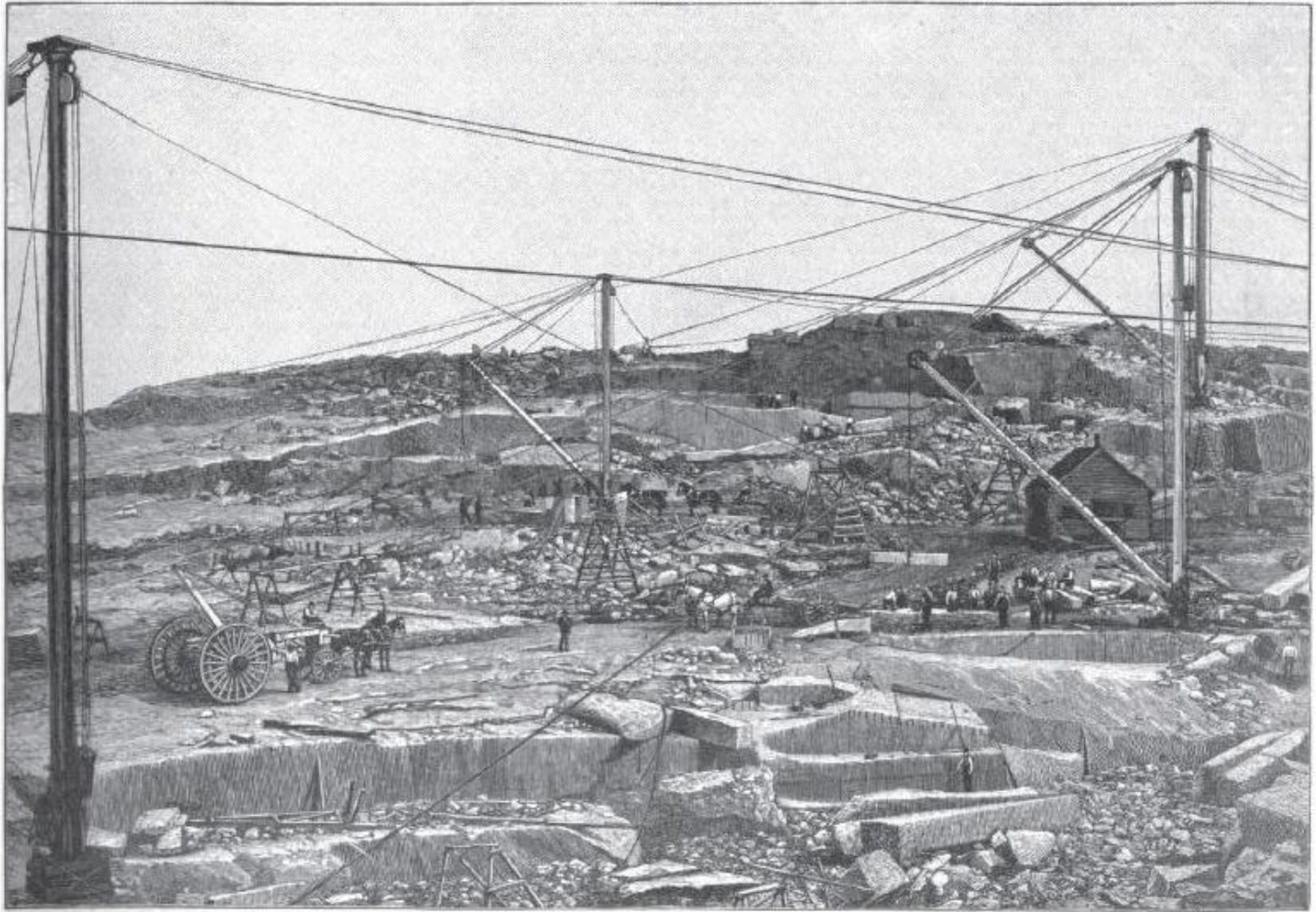
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“What granite was to ancient Egypt so it is to the United States. It has been of vast use in the construction of our monuments, and especially of our public buildings. Whether we have yet produced any structure destined or able to last as long as those of Egypt may be reasonably doubted, for aside from our methods of construction, our climate seems uncongenial to such durability as we see exhibited in the dry atmosphere on the banks of the Nile, where 3000 years appear to produce not the slightest effect on the sharp edges cut by the chisel. The recent style of construction now followed in our cities for large buildings, making the frame of iron enclosed by a thin casing of stone, especially granite, would seem likely to decrease the demand for that durable material, while the many inventions intended as a substitute for paving stones also threaten eventually to decrease the value of the quarries of New England.

“But as yet there is no more evidence that the demand for granite is falling off than that the supply is decreasing. In fact, the supply and demand continue inexhaustible, and the granite industry is one of the most vigorous and healthy in New England. The crop of stone was garnered there by a beneficent Providence untold ages ago, for granite is by many geologists supposed to be the oldest of mineral formations; and all that is now required is to go ahead and gather it for the building up and beautifying of great cities all over this land.

“Quarries of granite may be and are exploited in many parts of New England. New Hampshire goes by the grim sobriquet of the Old Granite State. One may find much to interest and instruct by wandering through the granite regions from Connecticut to Maine. Below there is one group of quarries which, yielding in importance to no other quarries in the world, possess picturesque features that render it especially fascinating. We refer to the quarries following the coast-line from Eastport to Boston Bay, whose converging points are Penobscot Bay, Cape Ann, and the Quincy region.

“Never was there a place more appropriately named than Rockland, Maine, near the western entrance of Penobscot Bay, guarded by the bold, aggressive head-land called Owl's Head. On every hand are quarries. The place itself, a flourishing city of 10,000 people, is almost a quarry, for the water-front is faced by lime-kilns and a trestle-work for the trains bringing limestone from the vast quarries a mile out from the city, while the (sic) wharves are thronged with coasters freighted with wood for burning the lime. The lime quarries are exceedingly interesting, presenting vast excavations 100 feet deep, great picturesque chasms, which the famous New-Zealander of the future may perhaps consider as freaks of nature. The Cobb Lime Company is the chief agency for exporting the Rockland lime, of which the annual shipments average 1,250,000 barrels, or 125,000 tons.



AN EAST SHORE GRANITE QUARRY.—FROM A PHOTOGRAPH.

“Thomaston and South Thomaston, Spruce Head and St. George, immediately adjoining Rockland on the south and Waldoborough on the west, contain an abundant supply of granite, which is being excavated at several quarries, that of Waldoborough being valuable for paving-stones; but it is on the islands of Penobscot Bay that one finds the most interesting quarries of that region, and perhaps of the United States. The quarries of Dix, Hurricane, and Fox islands are the most important. They are right out at sea, beaten by the gales of winter, and bathed by the almost Italian sunlight of summer.

“The Dix Island quarry furnished the stone of which the New York city Post-office was built, and hence possesses a certain historic interest. But it is not worked at present, as its granite is found in irregular masses having no certain cleavage, and hence involving great waste of effort and material, while even at its best it is liable to be disfigured by dark blotches that impair its beauty when used for architectural purposes.

“Hurricane Island has a wild name that suggests tempests and pirates. In reality it appears to be a focus for the squalls of Penobscot Bay, and many a passing schooner has bent low to the furious blasts sweeping down from its precipitous crags. It is a mere rock, and yet holds untold wealth within its narrow limits, for it presents a solid mass of most valuable granite, fit both for building and for monumental purposes. One quarry represents at least 100 acres of clear granite, reaching more than 150 feet above the sea, and as far below, were it necessary to quarry so deep.

“For quarrying purposes the granite of Hurricane Island is of mixed value. Some of it is in boulder form, and not altogether to be depended upon for cutting into regular blocks of any size, while some, and that the larger proportion, is in layers that can be cut with the ordinary methods to almost any desired size and shape. The largest monoliths of Egypt, or of the Druidic menbirs (sic) of Brittany – and some of them have been from 80 to 90 feet long – have been far surpassed by blocks cut at Hurricane Island. As a matter of curiosity, one block was cut out of its quarries no less than 200 feet long and 19 feet square. As there was no demand for such a monolith at that time, it was cut up into small sections. We beg to submit, however, that if the committee of the Grant Monument could secure such a monolith of New England granite, and transport and set it up in Riverside Park, they could fairly rival the feats of the ancients, and present the most remarkable monument of the ages. It is worthy of note that there is a derrick at these quarries, invented by the proprietor, which is able to hoist a block weighing 25 tons and move it in any direction.

“Hurricane Island is owned by Mr. David Tillson, who until recently has worked the quarries himself. But they are now leased to the Booth Brothers, of New York, who also own granite quarries at South Thomaston. Of course all the stone quarried there must be shipped to market by coasters. The St. Louis Post-office was built by Mr. Tillson, besides numerous other important structures.

“Almost within hailing distance from Hurricane Island is South Fox Island, whose landing-place and anchorage are at the southern end, and are known as Vinal Haven and Carver’s Harbor. Fox Island is a long and somewhat lofty islet, more or less covered with

scrub forests, and presenting many picturesque bits attractive to the artistic eye. But it must be admitted that the importance of this island is due rather to its granite than to its æsthetic aspects. It is a little singular that the formation of the island seems to suggest two distinct geologic epochs, divided as it is by a line running across it east and west. On the south of that line the granite is found almost to the exclusion of any other stone, while on the north of it there is not the least sign of whatever of the existence of granite.

“There is quite a little town at Vinal Haven, including several hotels, one or two of which are for summer visitors. But the business of the place is granite. There are several quarries, and two harbors, with docks and derricks for shipping the stone. One also sees there an artificial lake with floodgates, and supplied by the tides, which are censurably higher on that coast than south of Cape Cod. The water of this lake was used for power in running the machinery, and although largely superseded now by steam-power, it is still of use sometimes.

“The quarries and plant of Vinal Haven are owned by the Bodwell Granite Company, whose president is Mr. George M. Brainerd. If not the largest and most important granite company in the United States, it undoubtedly has no superior, either in extent, the quality of its stone, the character of its plant, or the amount of the finished work shipped from its docs. The company is capitalized at \$500,000, and besides its works at Vinal Haven owns valuable quarries of granite at Spruce Head and St. George, south of Rockland, and a very important quarry of red or sienite granite of a beautiful grain and that at Jonesborough, near Machias, which is taken to Vinal Haven to be cut and polished.

The quarries of Vinal Haven have furnished the stone for the State, War, and Navy departments Building at Washington; the Harlem River Bridge; the Pilgrims’ Monument at Plymouth, Massachusetts; the Carnegie Free Library, Allegheny City; the Pennsylvania Passenger Station, Philadelphia; the new Methodist Book Concern Building, New York; the Havenmeyer residence; the polished granite for the Statehouse at Indianapolis; the new Federal Building, Brooklyn; and many other prominent buildings. Among the numerous monuments finished at Vinal Haven may be mentioned the Laden mausoleum, Woodlawn Cemetery, and the noble monument for General Wool at Troy, New York, composed of a single shaft of granite sixty-five feet long.

“The company owns a fleet of schooners, in which it ships its granite, which another fleet is constantly employed bringing coal to Carver’s Harbor for the use of the steam engines and of the people residing there, or lumber for boxing the finished granite, a demand which alone consumes a very large quantity of wood. Hard as granite may appear, yet when cut and polished it requires to be protected from abrasion almost as carefully as wood.

“Great experience and dexterity are required in packing the granite on board the ships, and the hazard of navigating them with such a cargo across the stormy waters from Maine to New York is by no means trifling. To transport the Wool Monument it was necessary to cut a large hole in the bow of the vessel, and lay it carefully on a bed of cross timbers in line with the keel. The Bodwell Company

ships some 40,000 tons of granite annually, both finished and unfinished. This really represents an enormous output, for a very large proportion of its shipment is cut, polished, and boxed, ready to be set up immediately on reaching its destination.

“The company is exploiting two large quarries at Vinal Haven, and has a most extensive plant. The granite thus far quarried has been in layers or sheets, rendering it highly tractable. The formation of granite is such – being, as its name indicates the aggregation of separate and independent granites – that one would suppose it to be always an amorphous mass liable to break off capriciously in any direction. Such it often is, as at Dix Island. But quite as often it seems to have solidified in layers or strata, and by taking advantage of these straight cleavage can be obtained, the blocks varying in thickness according to the width of the stratum. Such is the case at Vinal Haven. The results is to minimize the necessity for using powder or dynamite, and to reduce the waste of material.

“One of the most common methods of splitting off the rock from its bed, which is still used at Vinal Haven, although less valued elsewhere, is with a drill that makes what is called the Lewis hole. The drill has a triangular face perhaps an inch and a quarter wide. When one hole has been drilled, and another is made about an inch and a half from it. The core between the two holes is then cut out, producing a diamond-shaped hole. Which is filled with powder tamped in with sand. The points of the lozenge follow the intended line of cleavage, and for this reason they can be very far apart, even twenty to forty feet. Care is taken that at each end of the proposed block the stone has been completely separated. Thus, when the blasts are sprung simultaneously, a straight separation is made from end to end, and a complete mass is secured. Of course such a satisfactory result can only be depended on when the granite formation is regular, as at Fox Island.

“Horses are now used instead of oxen to draw the granite from the quarries to the works. The drays are very powerful and furnished with derricks. They move on wheels of immense diameter provided with double felloes. The largest truck at Vinal Haven is called Jumbo; the wheels have a diameter of twelve feet.

“There is a Corliss steam-engine of seventy-five horse-power, by which most of the heavy work at Vinal Haven is done, such as planning, modeling shafts, and the like. The turning lathe is similar to the one used at marble quarries, and eats into the granite with a tooth of steel that laughs to scorn the mighty tusks of antediluvian monsters. Held by clamps strong as fate the uncouth block of granite reluctantly comes forth from the tremendous ordeal a shapely, handsome shaft, ready for the emery polish that shall make it shine like a mirror, and bring out all the concealed beauty of vein and tint which was hidden while it remained in the rough. Granite, like human nature, needs discipline to develop the worth of which it is capable.

“The process by which granite is cut down or smoothed differs somewhat from the rubbing bed used in shaping marble. In the latter case the bed of metal, covered with sand or steel dust, whirls under the marble. But in planing granite the process is reversed. The block of granite is firmly fixed with the face to be smoothed upward. A horizontal revolving iron disk then passes over it, cutting it

down with sand or chilled iron dust and water. By two long levers the disk may be turned by the workman in any direction. The disk is really a wheel composed of a series of rings joined together. It is formed thus in order that the material that is thrown off may pass away instead of clogging the planing machine.

“Perhaps the most remarkable feature of the great works at Vinal Haven is the cutting shop, where blocks are shaped and finished by hand in every form required for architectural and monumental objects. This is the largest establishment of the sort in the United States, and hundreds of carvers may be seen there busily plying mallet and chisel. The number of men employed at the Fox Island quarries, of course, varies from year to year according to the demands of the business, but it now averages about six hundred. Formerly, before the employment of labor-saving machines, the number was sometimes as high as twelve hundred. A large proportion of these men are Americans, while at most of our other quarries foreigners are largely employed – Irish, French, Italians, and largely many Finns and Swedes.

“There is a novel contrivance used at the cutting shop at Vinal Haven for facilitating the handling of granite. An elevated railway begins outside of it, and runs the entire length of the interior of the shop. A frame on wheels runs on the rails, from which are suspended chains and clamps, reaching to a short distance from the ground. The truck, carrying a block of granite, is brought under the railway and the stone is attached to the clamps and chains and being lifted off the truck, hangs from the rolling frame on the railway, which can be easily moved by one or two men, and thus the block of granite can be pushed to any part of the shop and deposited there.

“Thomaston, South Thomaston, St. George, and Spruce Point, at the southwest entrance of Penobscot Bay, also have granite quarries, turning out an abundance of the gray stone of that region, but calling for no special mention beyond the fact that they form part of the great system of the coast quarries of Maine.

“The next distinct system of granite quarried on the New England coast is found at Cape Ann, which may be said to be literally a solid block of granite capable of supplying the world with paving-stones for a thousand years. Cape Ann is a small peninsula projecting from the coast of Massachusetts. Most people suppose that it reaches to the extreme eastern end; but the outer part of the promontory is in reality an island two or three miles square, separated by a narrow strait from the main-land, and small vessels can entirely circumnavigate it. This has been a fortunate circumstance for our fishermen caught in heavy weather off one of the most inhospitable parts of our coast; for if north of the cape on a lee shore, they could sometimes run for shelter into Squam, which is at the northern entrance of the Cape Ann Inlet. This gave rise to the old story of the Marblehead parson who was preaching a vivid sermon on the terrors of the last day, illustrating it to suit the life of the rough fisher folk whom he was addressing.

“‘In that day,’ said he, ‘when the sky is black with scud, and the wind is howling, and the sea is rising enough to founder your ship, what then will you do for a refuge, my friends?’

“‘Put up your helm, and make for Squam!’ spoke up a weather-beaten skipper in the audience.

“Advantage has been taken of several small rocky points to construct a number of miniature harbors around the cape capable of sheltering half a dozen schooners each. These quaint little ports form a peculiar feature of Cape Ann scenery. They are protected by high walls of granite built with much labor and expense, and are reached by narrow entrances wide enough for the passage of a schooner, and easily missed in the dark. The harbor of Rockport consists of several slips of this sort. Pigeon Cove is perhaps the most picturesque, with its little beach left dry at low tide, while the ports of Lanesville and Bay View are the most elaborately constructed. As one rides over the winding hilly roads of Cape Ann he experiences a sense of humor as here and there he perceives a line of masts rising among the rocks where he would least expect to find a safe anchorage.

“But for these made harbors it would be exceedingly difficult to export the granite of Cape Ann by sea, for loading stone on a ship is a ticklish business, and can only be done in a secure haven. When the government finishes the great breakwater which it is now building parallel with the coast of Cape Ann, it will not only afford a harbor of refuge for ships in heavy easterly weather, but also facilitate the shipment of granite. The breakwater is to be 9000 feet long, and to contain 1,000,000 tons of stone up to within 22 feet of the surface. Already 350,000 tons of granite have been deposited, covering a distance of about 3000 feet. The last 22 feet of depth, and the part above the water, may be either of hewn granite or of concrete. The latter is generally considered the cheapest and most enduring material yet discovered for such a purpose when mixed with the ashes of sugar-cane, as it hardens by exposure to the elements. The cost of this immense work is estimated at \$5,000,000, but the experience of the people, gathered from similar public enterprises, makes it doubtful whether this breakwater will be completed for any such trifling sum as that. The possibilities for a permanent income achieved in the New York Capitol at Albany may well stimulate other contractors engaged in public enterprises requiring years to complete. Shall the breakwater of Cape Ann prove a similar instance? Let us hope not.

“The quarries of the cape form a continuous line from Rockport to Bay View. At least a dozen different companies are engaged in getting out granite on the cape, the stone being almost entirely coarse gray quality suitable for foundation pieces or for paving.

“One of the most important of these companies, and the first to which one comes on leaving the station, is the Rockport Granite Company. The office is in the back part of a little country grocery store. All these cape companies have agencies or main offices in Boston, chiefly in the building of the Association of United Builders, in Devonshire Street. But on the cape the offices are generally in the rear of the way-side groceries, and when one of these is seen, one is pretty sure to strike the office of a granite quarry.

“Passing through files of flour-barrels and under beams hung with sea boots, slates, fishing-lines, hatchets, hams, brooms, cheap hand-mirrors, oil jackets, school-books, marlin-spikes, sounding-leads, and pickaxes, and through an atmosphere perfumed with plug tobacco, kerosene oil, molasses, and codfish, one reaches the small office where the secretary of the quarry holds lofty sway.

According to the mood of the hour or the demands of business, he is found perched on a high stool at a desk wielding a quill over bulky ledgers, or seated on a box whittling, or in a rickety office chair tilted back so that he may rest his heels on the sill of the window, through which the ocean is seen, and the schooners in the little harbor below loading with stone. Around him are gathered the magnates of the neighborhood discussing the gossip of the cape, or mariners, encased in oil jackets and picturesque sou’westers, taking their orders and talking over the prospect of getting a slant across the bay with a load of granite before the quatering of the moon.

“The granite of Cape Ann is taken to Boston in old sloops, and to New York and Philadelphia in schooners of some size. In any case a hazardous cargo, it is especially so for the sloops, which go loaded down to the decks. They are absolutely dependent on a fair wind and a smooth sea, and are often obliged to run for Salem when the weather looks threatening. Sometimes one of them springs aleak (sic), and goes down so suddenly that the crew has barely time to scramble into the boat which is carefully towed astern.

“The Rockport Granite Company is said to be capitalized at \$200,000. I doubt the amount, and only give it as I heard it, being unable to obtain precise facts at the office, where, for the first and only time, a singular reserve was, for unknown reasons, apparent in giving information.

“The Rockport Granite Company has a small harbor of its own, owns a number of vessles, and runs two large quarries at present, one of them of unusual magnitude. But it has no machinery beyond steam-drills and an engine for hoising the granite. It ships the stone in undressed condition, chiefly for paving, excepting that some of the stone is squared or bevelled for foundations. I saw some large blocks in the sheds by the wharves that were being cut for the Mount Hecla Copper Mines, on Lake Superior, to serve as beds for support of machinery.

“The Pigeon Hills quarries are near Pigeon Cove. The company is capitalized at \$50,000, and owns a made harbor, from which it ships annually about 40,000 tons of granite, chiefly paving-stones, to New York and Philadelphia. It also ships some cut stone, for mounmental purposes, to be polished elsewhere. It employs about 130 men.

“The Lanesville Granite Company is capitalized at \$50,000, and pays for the use of the excellent made harbor which adjoins its quarries. This company gives employment to about 140 men, including sailors, and ships an annual average of 35,000 tons of undressed stone to Boston, New York, and Philadelphia. The granite is quarried at all seasons of the year, although less is taken out in

winter than in summer. The worst time to cut granite is just after a severely cold spell, when the surface is warming to the soft air of a thaw, while the core continues rigid with cold. If attacked then the stone cleaves irregularly, resulting in much waste.

“Among the other quarries of Cape Ann may be mentioned that of Mr. Charles Guidet, of New York, and that of Mr. Bartlett, who is in partnership with the Barkers, of Quincy. All these quarries turn out the ordinary gray New England granite.

“The most interesting and probably the most important company on the cape is the Cape Ann Granite Company, whose quarries and works are at Bay View. It is capitalized at \$100,000, and also owns quarries at East Conway, New Hampshire, and at Jonesport, Maine; the richly colored, variegated granites of these quarries are taken to Bay View to be finished. The president of the company is Colonel Jonas French; General B. F. Butler is said to be interested in these quarries, but we do not vouch for the fact. Both of those gentlemen have elegant summer residences at Bay View.

“The company has constructed the largest and best harbor on Cape Ann, exclusive, of course, of the port of Gloucester, and owns some of the ships in which its stone is exported. The number of men employed varies with circumstances, but averages at present about 800. A steam railway conveys the granite from the quarries to the cutting works and the docks. This is the only company on the cape having a complete plant for cutting and polishing stone, and a very large proportion of the 50,000 tons it annually ships is finished and ready to put in place. There is a comfortable business office near the works, and everything about the company’s premises indicates thorough system and means generously managed for profitable results.

“The granite of these quarries has a straight cleavage, and is generally separated by the well-known Ingersoll steam drill, which can carry holes to a depth of fifteen to eighteen feet. Groups of these holes are drilled some feet apart, and filled with powder; a cartridge is placed in each, attached by a wire to a common battery, and all the charges are exploded by one electric shock.

“Another method is also common when a clean separation is desired. Small round holes are drilled three to six inches in depth and several inches apart. Two slips of iron called half-rounds, and sometimes feathers or buckings, wedge shaped, but round on the outside, and thickening at the bottom, are then inserted into each hole; a small steel wedge is then placed between the two half-rounds. When all the holes have been thus supplied, a man goes down the line of wedges, beginning at one end, and gives each wedge one smart blow with a hammer. With the last blow, if not before, the entire mass cleaves from the bed-rock with a thin straight fissure reaching down several times the depth of the holes. This is apparently a simple process, and yet it could only occur to one who had long experience in the quarrying of stone.

“The Cape Ann Granite Company has furnished stone for many public buildings and important monuments; recently it has supplied some of the granite in the new courthouse at Boston. But perhaps its most remarkable success was exhibited in the cutting and

moving of the stones for the pedestal of the Scott Monument at Washington. Few people realize the size of those colossal blocks. They are five in all. The four smaller ones measure respectively 20 feet 3 inches in length, 17 feet 3 inches, 17 feet 4 inches, and 15 feet 8 inches. Above them comes the platform, the largest single piece of granite yet cut and put in place in the United States, so far as known. When in the rough it measured 28 feet 2 inches in length, 18 feet 5 inches in breadth, and 3 feet 3 inches in thickness, and its weight was 150 ¼ tons. When cut and finished the measurements were 26 feet 9 inches length, 17 feet 4 inches width, and 2 feet 10 inches thickness, or 1316 cubic feet, and the weight was 119 ½ (?) tons.

“This enormous mass was taken to Washington by sea. It first had to be turned over in the quarry in order to trim the lower side. This was done by powerful derricks and shoring. It was then laid on a car especially prepared for the purpose, and drawn to the wharf by hydraulic power. But the ends and sides projected beyond the car, and were finished in that position. Supports, cabhouse fashion, were then placed under the ends, the car was removed, and the finishing touches were given to the part which had rested on the car. When it was complete it was lifted by hydraulic force and rolled upon a platform prepared for it on the deck of the ship. The two men employed in moving this block at Bay View were sent to Washington to place it in position there. Thirty-one men were sometimes employed on this stone each month, although the average was seventeen, representing the work of one man for 2441 consecutive days, or nearly seven years, if indeed one man could have ever accomplished such an undertaking alone.

“The next great system of the New England coast granite quarries is found in the Quincy district, Norfolk County, a short twenty minutes from Boston by rail.

“The conditions here are altogether different from those described at Penobscot Bay and Cape Ann quarries. Instead of a few large companies excavating the stone, and finishing and shipping it themselves, we find no end of small companies gathered at Quincy, Quincy Adams, and West Quincy, or scattered about the outlying districts. Quincy Adams has perhaps the largest collection of establishments, and as in a city, there is a subdivision of the labor, one part falling to one company, another to still another association. Thus one company exploits the granite, another cuts and shapes the stone, another planes and turns it, while another furnishes the boxing or the tools. Instead, therefore, of half a dozen great concerns, we see a hundred or more all over the neighborhood, and the entire region rings with the click of the chisel and the hammer. The largest quarrying company is at West Quincy, called the Railway Granite Company. It is capitized at \$25,000, and furnishes the beautiful blue granite so desirable for mortuary monuments. But most of the companies are organized on a smaller financial basis.

“By far the largest proportion of the output of the Quincy quarries is finished on the spot, and thus employment is given there to many skilled artisans, at such establishments as McGilvary & Jones, Craig & Richards, or the Merry Mount Granite Company. It is difficult to say how many men find employment in the Norfolk County granite business, but the number at Quincy Adams and West Quincy is

in the neighborhood of 2500 men. This gives one some idea of the magnitude of the operations in that district. One of the chief points of shipment is at Quincy Point, although much of the Quincy granite also reaches the markets by railway.

“A visit to the Quincy quarries will give one a clear idea of the methods for getting out and finishing the New England granite, and of the extent of the business. But at Cape Ann, and especially at Vinal Haven, one sees the work performed in the most picturesque and telling manner, showing a centralized combination of effort amid attractive surroundings that give one an imposing impression of skill, enterprise, and vast pecuniary possibilities and results.

“S. G. W. Benjamin.”