

A DESCRIPTION
of
TRINITY CHURCH



by
The Architect
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Description of the Church

AT the time of the burning of the old Trinity Church, on Summer Street, the project for a new building was well advanced. Land had been bought, competitive designs had been invited and received, and a selection made; and a considerable amount of work had been done on the drawings for the new structure.

In a modern Church, if the logical sequence of one part from another is not as close as in a mediaeval Cathedral, still it is true that every detail of the construction, from the front steps to the finish on the roof, must be thought over, viewed in the light of all probable contingencies, and fixed with tolerable distinctness, before the excavations can be safely begun.

Trinity Church was no exception to this rule: the character of the design, and the nature of the ground, on which the building was to stand, brought problems for the solution of which no familiar precedent existed, and which were to be worked out by accurate and anxious theoretical investigation.

On testing the ground at the site a compact stratum was found, overlaid by a quantity of alluvium, upon which a mass of gravel, about thirty feet deep, had been filled in. Upon such a foundation was to be built a structure, the main feature of which consisted in a tower weighing nearly nineteen million pounds, and supported on four piers. The first pile was driven April 21, 1873. Every pile was watched, numbered, its place marked on a plan at a large scale, and a record made of the weight of the hammer with which it was

driven, the distance that the pile sank at the last three blows, and the height from which the hammer fell. With these indications, a map of the bearing stratum was made, with contour lines, showing the surface of the clay bed.

Meanwhile, the preparation of the plans for the superstructure was going on, and the last of the four thousand five hundred piles which support the building had not been driven before the mason work was begun. On the 10th of October, 1873, the contract was made with Messrs. Norcross Brothers, of Worcester, Mass., for the masonry and carpenter work of the structure; the Building Committee, who had a large quantity of stone on the ground brought from the ruins of the Summer Street Church, undertaking to furnish all the foundation stone, except that for the great piers of the tower, which it was necessary to construct of special stones. Under the centre of the Church, a space ninety feet square had been reserved for the tower foundation, and this had been driven uniformly full of piles, as near together as practicable, over two thousand being contained within the area. This area, while the foundation walls for the other parts of the Church were building, was subjected to various processes, in preparation for its future duty.

The piles within these limits were cut off at "grade five," six inches lower than the piles under the other portions of the building, as an excess of precaution against any failure of water for keeping the wood saturated. The ground was then excavated around the heads of the piles to a depth of two feet, and replaced with concrete. The concrete was mixed on the ground, put into barrows, and wheeled on plank ways laid on the heads of the piles to its destination, and thrown into the excavation. Four successive layers, each six inches thick, were put in, and each thoroughly compacted with wooden rammers. The upper surface of the concrete was kept one inch below the heads of the

piles, on the theory that the piles being the true support of the structure, it was important that every stone should rest firmly upon them, without coming in contact with the concrete, which might some time sink, by the settlement of the gravel filling, and cause dislocation of any masonry which might rest partly upon it and partly on the unyielding piles. The concrete, however, had an important use in preventing the lateral motion of the piles, and to some extent connecting them together.

Before the close of this season, the first course of one of the four pyramids which form the foundation of the tower piers, had been laid on the piles, and as an experiment the outside joints were cemented up, and the whole then grouted with cement and sand till the joints and the space between the stone and concrete were flushed full. The pumping, which had been constantly kept up to free the excavation from the water which came in through the gravelly bottom, then ceased, and the water was allowed to enter the cavity, which it soon filled to the depth of about four feet, and the operations on the ground were suspended until the following spring. During the winter, however, extensive preparations were made for the following season. Choice had been made of the Dedham granite for the ashlar, and of Longmeadow freestone for the trimmings and cut stone work, and the contractors hired land and opened quarries of their own, both at Dedham and Longmeadow. The Dedham granite is a fined grained stone, of a beautiful color, rather resembling a sandstone in effect, and harmonizing very well with the brown freestone, but, like most red granite, being only found at the surface of the quarry, there was difficulty in procuring stones large enough for the water-table and some other portions, as the same atmospheric or other influences which had changed the upper part of the granite ledge from its natural gray to salmon color, had caused also frequent seams,

imperceptible at first, but which showed themselves by the falling to pieces of the largest stones while being dressed.

To meet this difficulty, search was made and a red granite found at Westerly, R. I., which, although also a surface stone, and less delicate in color than the Dedham, was of admirable quality, pieces twenty feet long or over being easily procured. The contractors, with praiseworthy enterprise, secured land here, and opened a third quarry, from which was taken all the ashlar below and including the water-table, as well as a portion of the largest foundation stones. At all these quarries work was prosecuted through the winter, and a large quantity of material accumulated, besides many hundred tons of dimension granite of ordinary kinds, for the foundation of the great piers, for which contracts had been previously made, and which was procured from various localities, partly from Rockport, Mass., part from Quincy, and some of the best stone from the coast of Maine. These were all large stones, weighing from one to four tons each, and as the work for which they were destined was the most important as well as the most trying, in the building, they were accepted only under severe restrictions, no stone being received of less height than twenty or more than twenty-four inches, or less than four feet long, and a certain proportion were required to be eight feet long, or even more.

On resuming operations in the spring of 1874, it was found that the tide water, coming in through the gravel, had affected the setting of the cement. The concrete was in a favorable condition, but the grouting of the masonry which had been started for the pier was still very soft, although made with a cement which, under ordinary circumstances, sets rapidly. In view of this unexplained difficulty, as well as the need of being able to proceed rapidly with the piers, without being obliged to wait for the setting of any doubtful

cement, it was thought best to reduce the matter to certainty by using Portland cement throughout the piers. A variety of English and French Portland cements was tried, but the result seemed equally good with all, some difference in the rapidity of setting being the principal variation. The stones already set were taken up and relaid, and with the substitution of the different cement, treated as before; the outer joints being packed close, and the inside grouted until completely full.

At first the Portland cement was handled like Rosendale in similar circumstances, the cement being mixed rather dry, and after being put into the joints with trowels, compressed as much as possible with rammers; but further experience, and careful trials, showed equally good results by first filling the larger joints with a trowel and the dryer mortar, and then mixing some rather rich cement, sufficiently liquid to pour into the smaller joints from a bucket, stirring it well with the thicker portion, until the whole was of a medium consistency, and had penetrated every interstice of the stone-work. Each course was levelled up to a uniform surface with cement, and chips where necessary, before the next course was begun, and the upper bed of the third course from the top, and all the vertical and horizontal joints of the two upper courses were taken out of wind and pointed, so as to form a perfectly close joint.

Toward the close of 1874, the four pyramids of solid granite, each thirty-five feet square at the base and seven feet square at the top, and seventeen feet high, were completed; the main walls of the Church being then well advanced, and the Chapel, which had been urged forward with great rapidity, nearly finished. In the construction of other foundations than those of the tower, the stones which had been brought from the ruins of the old Church after the fire, were utilized as far as possible; but the action of the heat

upon them had produced some curious results, very unfavorable to their use in a new building. The stones which were simply cracked through were easily managed, but many of the stones, which when delivered on the grounds were as square and neatly jointed as any one could wish, on being placed in the wall let fall large chips from the corners, concave on the side toward the interior of the stone. These would be followed by successive shells, separating like the coats of an onion, and apparently of indefinite number.

This scaling took place first at the corners, and as the concentric layers fell away, the stone was reduced to a round ball, completely useless for building purposes. The best and largest of the old stones, those from the tower, had been most exposed to the fire and were most subject to this defect. Even after a stone had been safely placed in the wall, and was apparently perfect, the imposition of the next course would sometimes cause shells to separate from the upper corners of the stones already laid, so that the stones above them rested on the summit of a convex surface, which it was impossible to wedge up, and both courses had to be removed. The only certain mode of testing the stones was by striking them with a hammer, when the clear ring of a sound stone could by a little experience be distinguished from the dull note of blocks which contained latent cracks. The defective stones were thus separated from the sound, and rejected.

In November, 1874, the Chapel building was finished, the transept, chancel and aisle walls, as well as the western front, being then high above the ground. During the winter, the stone for the remainder of the building was cut, the larger portion of the work being upon the granite for the upper part of the piers which carry the tower. These were built of blocks of Westerly granite, each five feet by two and one-half, and twenty inches high, with hammered vertical and horizontal joints. These were laid in cement, in pairs, forming

a pillar five feet square in section, the joints of alternate courses crossing. For laying these piers and the adjoining walls, as well as the arches between the piers, a massive scaffold was built, standing independently upon the four pyramids of the tower foundation. Four derricks stood upon this structure, and not only the pier stones, weighing two tons each, were easily handled, but the same stage served afterward to carry the centres for the great arches, and the whole superstructure of scaffolding, to the very top of the tower, no outside staging being used. This "great stage," as it was called, remained in place for more than two years.

In the construction of the great arches, and for tying the piers at their summit to the walls of the nave and transept, iron was used, but sparingly, and as a matter of precaution, rather than necessity, the weights and points of application of the adjoining walls having been calculated to furnish sufficient resistance to the thrust of the arches, without the aid of ties. In general, throughout the building, the use of iron was avoided as far as might be, and with the exception of the staircase turret, which is supported by a double set of iron beams over the vestibule below, no masonry in the Church is dependant on metal for support. In the Chapel, where the exigencies of convenient disposition demanded some wide spans, iron beams are used, and one or two of the stone lintels are reinforced by concealed girders.

Some changes in the design were made as the work went on, in compliance with real or fancied necessities of convenience or construction, and it is not out of place to say, that the modifications of outline required by the change in proportion of walls and tower thus made, can hardly yet be considered as fully carried out, so that the actual building at present lacks, perhaps, the unity of the original design, without attaining a new unity of its own. Especially is this the case with

regard to the western towers: a lowering of the Church walls, made in hope of affording an additional guarantee of good acoustic quality in the building, which was felt to be a paramount consideration, changed the proportion of walls and tower in a manner which should have been counteracted by increasing the height of the western front, including the towers which form a part of it, and the amended drawings comprehended this alteration as an aesthetic necessity, but the increase of height not being a constructional necessity, and the additional cost being of some importance, the full completion of the design was, to the regret of all parties, abandoned till some future time.

In modifying the internal form to meet the new requirements, the present shape of ceiling was adopted in place of that originally intended. In the modified form the tie-beams cross the Church at the level of the wall plate, coming at the cusps of the trefoil.

Although it was often suggested during the progress of the work, that the great piers, at least, should show the stone face apparent in the Church, this has, nevertheless, from the first conception of the design seemed in many ways undesirable, and propositions looking to that end have been, after careful consideration, always finally rejected. A rich effect of color in the interior was an essential element of the design, and this could not be obtained in any practicable material without painting. Brickwork, which might have been strong enough in color, would not have endured the strain upon it, and the use of granite was a necessity of construction. The cold, harsh effect of this stone in the midst of the color decoration, could not be tolerated, and as between painting directly on the stone, and plastering it to secure a smooth surface, it seemed decidedly preferable that there should be no difference in texture between the piers and the other walls, but that all should be plastered alike. The

commonplace criticism that plaster "conceals construction," can hardly be considered to apply here, for the piers and arches being simply portions of the wall, it would be difficult to show any reason for plastering the other walls which would not apply equally to the piers; and that the inner surface of the walls must in all cases be exposed, is a *dictum* from which the most conscientious would shrink.

In July, 1876, the last stone was laid in the tower. The body of the Church had already been roofed in, furred and plastered, and in the tower itself a bell deck had been built, with a hatchway for hoisting. It remained only to roof the tower, and give up the building to the joiners and the decorators. The design of the Church had always contemplated tile roofing, at least for the towers, but it was with some difficulty that an entirely suitable tile was found. English tiles were imported as samples, but were found too absorbent to be depended on in our trying climate. A glazed or semi-glazed surface seemed requisite, and this was at length found in an American tile, made in Akron, Ohio, and affording some advantages in closeness of cover, as well as in a vitrified texture, incapable of absorbing moisture. The color was also satisfactory in effect.

For the crockets, which relieved the dryness of the outline, it was found necessary to send to a distance also. Although not in themselves very large, they were beyond the size of articles usually undertaken by the Eastern potters, except the workers in fire-clay which was unsuitable by its color; and arrangements were made with the Chicago Terra Cotta Company for their manufacture. Together with the crockets were ordered hip rolls for the octagonal roof of the main tower, and the square roofs of the western towers. This commission was successfully executed, and the crockets proved satisfactory in color and effect. While this work was going on outside, the interior finishing

was pursued without interruption. The windows were glazed with common glass, bordered by patterns of colored glass, for temporary use only, it being hoped that most, if not all the windows, would ultimately be filled with memorial stained glass.

The Chapel room in the second story of the Chapel building, is 47 feet by 63 feet 8 inches, with a vestibule added at the north-east corner, 12 feet by 23, these two rooms occupying the whole superficial area of the building.

As soon as the building was enclosed, the negotiations for the decoration, which had been pending for some time, were concluded, and a definite contract was entered into with Mr. John La Farge, by which he not only undertook to design and supervise the work, but made himself responsible for the whole expenditure, purchasing the colors, employing all the subordinates, from the hardly less distinguished gentlemen who assisted him in his own special work, down to the little boy of all work, who ran the errands and stirred the barrels of color. This responsibility, formidable as it must seem to a professional man wholly unused to business affairs, was undertaken by Mr. La Farge, it is fair to say, much less from any hope of pecuniary profit, which he had little reason to expect, than from a true artistic enthusiasm for a work so novel, and affording such an opportunity for the highest exercise of a painter's talents; and the task, so undertaken, was pursued with great self devotion to a most successful completion.

After the preliminary arrangements were made, Mr. La Farge, preferring the completeness and thoroughness of the work to his own pecuniary interest, decided to paint all the better part of the decoration, including of course the figures, with an encaustic medium, consisting of wax, melted with turpentine, alcohol, and Venice turpentine, in certain proportions, instead of mixing the colors with an ordinary

distemper medium of water and size.

The encaustic process is much more costly, but once done the colors protected by the wax are indestructible. Even water flowing over them, which would utterly obliterate a distemper painting, scarcely affects the encaustic colors.

With the greatest exertion on the part of the artist, it was necessary to ask for an extension of the time allowed by the contract for finishing the decoration, and great as was the impatience of the parish to take possession of their Church, after having been for four years in a manner homeless, the desired extension was kindly granted, and at the same time a further appropriation of money was made, particularly for the decoration of the roof, and for gilding certain portions of the work, changes which the artist thought desirable, but which were not included in the original contract. These modifications were carried out, and at last the work, which had excited great interest among the public, was handed over to the Committee.

As soon as the decoration was finished, the scaffoldings were removed; and the pews and chancel furniture, which were all made and ready to set up, were rapidly put in place. Meanwhile the organ was being fixed in position and tuned.

About the middle of the forenoon of February 1, 1877, the first timbers of the great stage, which had been in place nearly two and a half years, were knocked away, and on the morning of Saturday, February 3, the whole had been removed. By the evening of February 8, everything was in readiness for the Consecration, which took place the following day.

In plan, the Church as it stands is a Latin cross, with a semicircular apse added to the eastern arm. The arms of the cross are short, in proportion to their width. In general, taking the square at the intersection of nave and transepts as a modulus, the total

length of the auditorium is three squares, of which the chancel, including the apse, forms one, the square at the intersection another, and the nave a third, the transepts being each half a square. Over the square at the intersection stands the tower. The aisles would be very narrow for a Gothic Church, but are in character for the Romanesque, and are much more serviceable when thus reduced to passage-ways, than when their width compels their being occupied by pews. The clear-story is carried by an arcade of two arches only. Above the aisles a gallery is carried across the arches, which, from its position, was distinguished by the names of the "triforium" gallery, and serves as a passage to connect the three main galleries, one across either transept, and one across the west-end of the nave, over the vestibule. Both the west gallery and the two triforium galleries connect with the staircases which occupy the western towers, and the transept galleries are also reached by special staircases, ascending, one from a north-eastern vestibule, which serves as entrance both from Huntington Avenue directly and from the cloister communicating with the Chapel, and the other from a south-eastern vestibule entered from St. James Avenue. The robing room opens from the north-east vestibule, as well as from the chancel. The main western vestibule is 52 feet long, the width of the nave, without counting the lower story of the western towers, which virtually form a part of it, and increase its length to upwards of 86 feet. In the middle of the west front is the main portal, and a secondary door opens into each of the towers, giving thus three entrances in the west front, and five double doors open from the western vestibule into the Church. The upper regions of the Church are reached by a winding stair in the north-eastern turret of the great tower, starting from the room over the north-east vestibule. This lands at the bell deck over the flat ceiling which closes the tower in the Church. The whole interior of the

Church and Chapel is finished in black walnut, and all the vestibules in ash and oak.

The style of the Church may be characterized as a free rendering of the French Romanesque, inclining particularly to the school that flourished in the eleventh century in Central France, — the ancient Aquitaine, — which, secure, politically, on the one hand from the Norman pirates, and on the other from the Moorish invasions, as well as architecturally emancipated from the influence of the classical traditions and examples which still ruled the southern provinces, developed in various forms a system of architecture of its own, differing from the classical manner in that, while it studied elegance, it was also constructional, and from the succeeding Gothic, in that, although constructional, it could sacrifice something of mechanical dexterity for the sake of grandeur and repose.

Among the branches of the Romanesque of Central France, nowhere were the peculiar characteristics of the style so strongly marked as in the peaceful, enlightened and isolated cities of Auvergne. The central tower, a reminiscence, perhaps, of the domes of Venice and Constantinople, was here fully developed, so that in many cases the tower became, as it were, the Church, and the composition took the outline of **a pyramid, the apse, transepts, nave and chapels forming only the base to the obelisk of the tower.**

In studying the problem presented by a building fronting on three streets, it appeared desirable that the tower should be central, thus belonging equally to each front, rather than putting it on any corner, where, from at least one side, it would be nearly out of **sight; and in carrying out this motive, it was plain that with the ordinary proportion of Church and tower, either the tower must be comparatively small, which would bring its supporting piers inconveniently into the midst of the congregation, or the tower being large, the rest of the Church must be magnified to inordinate**

proportions. For this dilemma the Auvergnat solution seemed perfectly adapted. Instead of the tower being an inconvenient and unnecessary addition to the Church, it was itself made the main feature. The struggle for precedence, which often takes place between a Church and its spire, was disposed of, by at once and completely subordinating nave, transepts, and apse, and grouping them about the tower as the central mass.

The two great figures on the western facade, the details of sculpture upon the transept ends, and the tympana of the doors and windows, still remain unfinished, and must be left for the future. But the distinguishing characteristics of a style are independent of details; especially is this the case in the Romanesque, which in its treatment of masses, affords an inexhaustible source of study quite independent of its merits as a school of sculpture.

The Dimensions of the Church are as follows:

	Feet	Inches
Extreme width across transepts to outside of walls	120	10
Width of west front	92	10
Width of nave from centre to centre of piers of arcade	53	10
Width of aisles, from the inside of walls to centre of piers of arcade	9	4
Extreme length of Church, outside to outside of walls	159	11
Depth of chancel, from front of chancel steps to the extremity of the apse, inside the walls	57	5
Width of chancel, inside the walls	52	2
Width of transepts	51	10
Interior dimensions of tower, 46 feet square; clear span of great arches	46	6
Height of great piers from Church floor to spring of arches	36	3

Height from floor to upper point of nave ceiling	63	3
Height from floor to ceiling of tower	103	2
Height of exterior walls from ground line to cornice	48	
Height from ground line to cornice of tower	121	5
Height from ground line to the highest stone in the building	149	7
Height from ground line to topmost point of finial	211	3

These were the dimensions of the church in 1877, before the Galilee, western, Porch was added, twenty years later.

