

### *Hagia Sophia*

Hagia Sophia, İstanbul (532-7) with later partial reconstructions and additions was Justinian's principal commission. The dedication to Hagia Sophia was really a dedication to Christ. The church was also known simply as Megale Ecclesia (Great Church). It stood on the site of two earlier churches at one end of the ancient acropolis, alongside the principal square of the city - the Augusteion - and only a short distance from the imperial palace. The first church, founded by Constantius, was dedicated in 360 and burnt in 404. It was rebuilt under Theodosius II, rededicated in 415, and burnt in the Nika riot of January 532. These churches were similar plan layout with Martyrium Basilica in Jerusalem and S. Demetrius in Salonika which have double aisles and galleries. Hagia Sophia which was an eastern church is not the only cathedral but also the patrical church. In Fig 1 historical peninsula in İstanbul which were location of Hagia Sophia (Cruikshank, 1996).

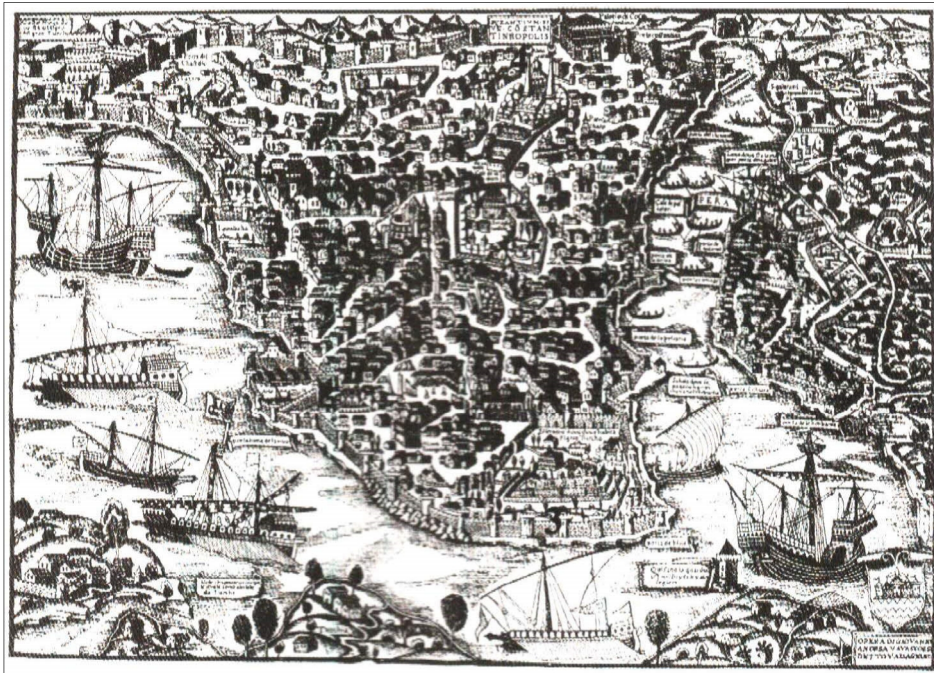


Fig A.1: Historical Peninsula İstanbul (Necipoglu, 2005)

Hagia Sophia was designed by Anthemius of Tralles and Isidorus of Miletus who had a deep knowledge of the mechanical science. That science was, however, more akin to the geometry of today than to the science of the modern engineer, and it is the masterly geometric ordering of the space and the vaults that cover it that is most apparent from a detailed study of the design. The dome of Hagia Sophia was partly collapsed barely 30 years after completion therefore the design of the church was not completely successful. After that destruction the dome of the church had to be rebuilt to a modified design. Anyway the design of the dome was resist unusual sequence of earthquakes in the intervening years. Also it is necessary to bear in mind that the design went far beyond previously proven practice. In Fig 2 the exterior image of Hagia Sophia is shown (Cruikshank, 1996).



Fig A.2: Hagia Sophia, İstanbul (Cruickshank, 1996)

Body of the church is enclosed within a rectangle 70m. wide and 75m long with projecting apse at the east end and double narthexes preceded by an atrium at the west end. Under dome, the square sides measure exactly 31.2m. The dome carried by pendentives which bridge between great semicircular arches carried on piers, standing just outside the square. Other piers face these piers across the aisles to help resist the outward thrusts of the dome to north and south. Hagia Sofia's east and west arrangement is different. Pendentives convert central square to a circle. The dome carried by transverse arches. The other two semidome diameter equal to dome itself which are carried partly by further piers set against the outer east and west walls. Below the semi domes are great hemicycles that double the east-west extent of the nave. These hemicycles open into semicircular exedrae similar to those in earlier tetraconch churches. Aisles run from end at each side and narrowed by the main masses of the piers. In Fig 3, 4 and 5, plan, section and elevation of Hagia Sophia are shown (Cruickshank, 1996).

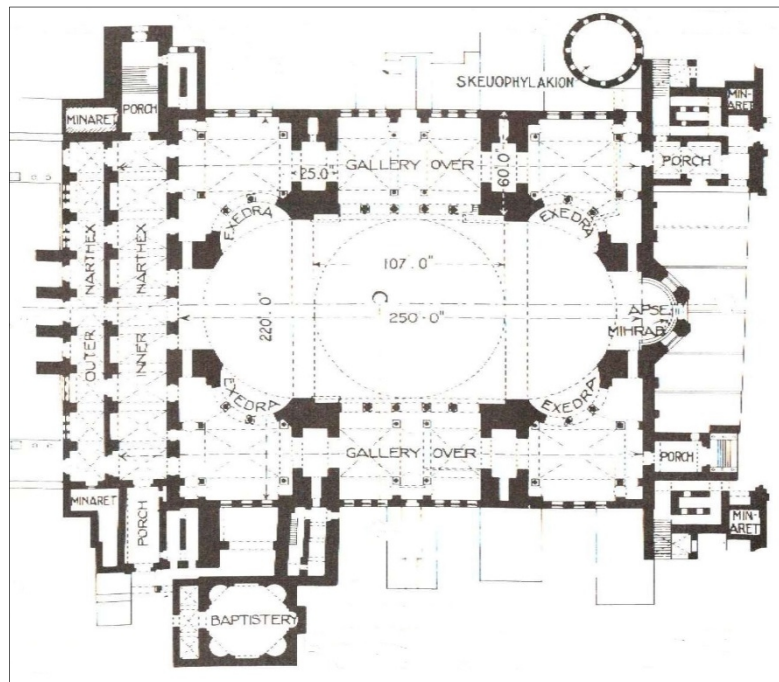


Fig A.3: Plan of Hagia Sophia, İstanbul (Cruickshank, 1996)

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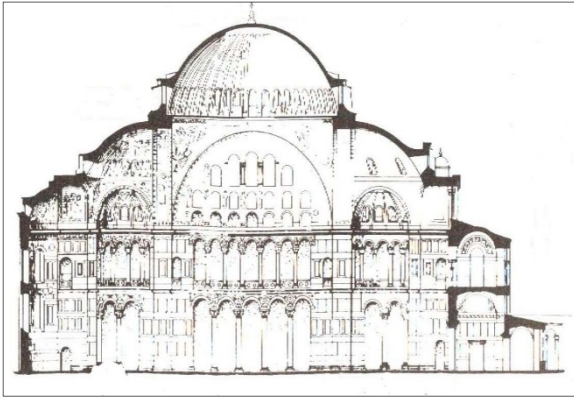


Fig A.4: Section of Hagia Sophia (Cruickshank, 1996)

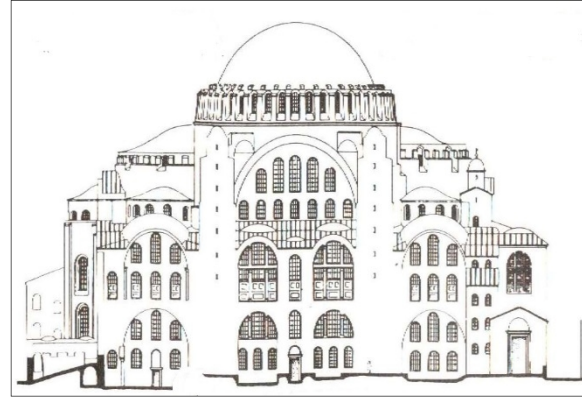


Fig A.5: Elevation of Hagia Sophia (Cruickshank, 1996)

Arched colonnades run between piers and carry aisle and gallery vaults. All have monolithic shafts, encircled at top and bottom by bronze collars where, in classical columns, there would have been integral projecting neckings. Proconnesian marble was used within aisles and galleries. Around the nave green Thessalian marble or red porphyry was used. There are superb capitals with different designs, all of which incorporate integral impost blocks (Fig 6). Capitals are carved cornices and they have similar features. All the carvings based on the purposes. The arrangements are similar at the two levels, except that the colonnades that run around the nave at gallery level - both the straight central colonnades and the curved ones around the exedrae are not only lower than those below, as might be expected, but have more columns and closer column spacings (Cruickshank, 1996).

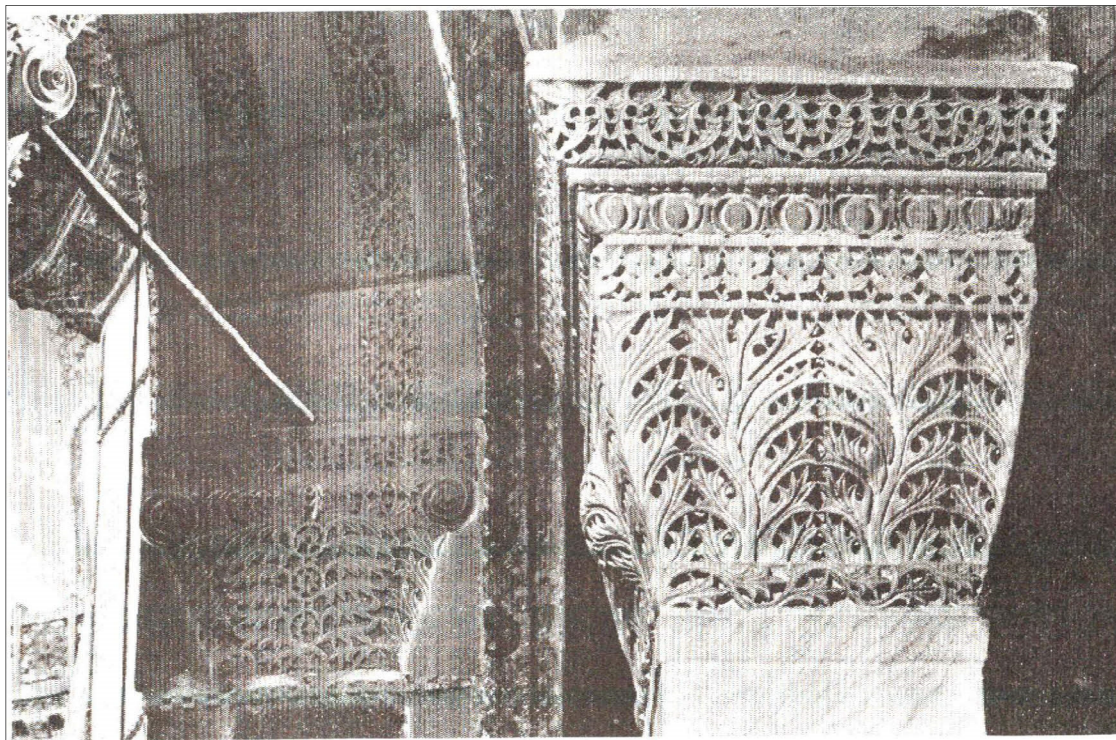


Fig A.6: Column capital pilaster (Cruickshank, 1996)

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Above the second cornice, which runs unbroken around the entire church, are the springings of the main semi domes, smaller semi domes over the exedrae, and the arches that carry the dome. Five windows openings are located on the semi-domes which were all originally quarter spheres. Below the main arches at north and south are window-filled walls known as tympana. These have been reconstructed, the window area originally having been greater- with a large single window in the upper part. Forty windows originally lit the dome, four of which are now blocked. Interior view of Hagia Sophia is shown in Fig 7 (*Cruickshank, 1996*).

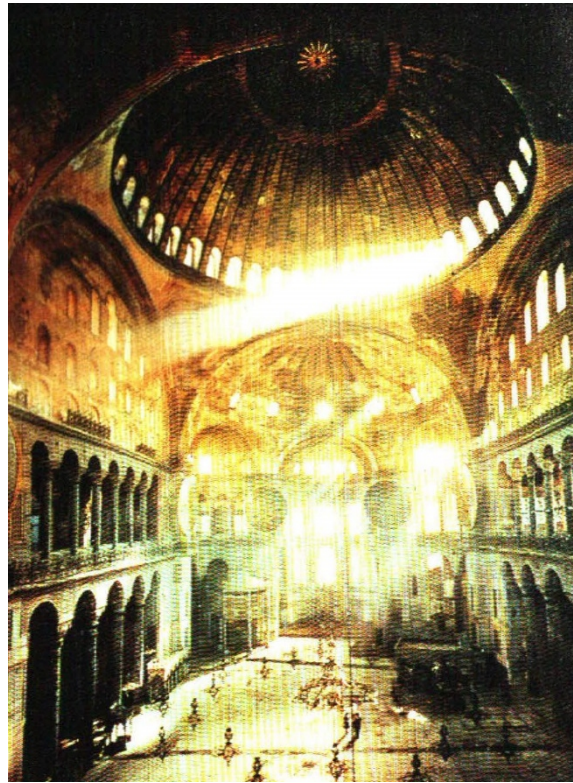


Fig A.7: Interior view of Hagia Sophia (*Necipoglu, 2005*)

The structure of Hagia Sophia was partly built of large well-fitted blocks or limestone and local granite, partly of brick. Lower part of the piers ashlar was used. Brick was used on the higher levels and all vaults even at ground level. Mortar joints were as thick as bricks. The thickness of the joints contributed greatly to the early large deformations and partial collapse of the dome (*Cruickshank, 1996*).

The plan of the Hagia Sophia is notable in longitudinal emphasis of a basilica which combined with the centralizing emphasis of the dome. Detailed study of the setting out shows how the two were brought together. In an exposing manner, correspondence between the colonnades at ground and gallery levels around the nave was also not originally intended (*Cruickshank, 1996*).

Hagia Sophia is a museum now but for nine centuries it served as church and five centuries it served as mosque. Marbles are multi-colored and they are undisturbed on most of the surfaces of the piers. These piers are visible from the nave and there are original gold mosaics on the aisle and narthex vaults. Natural light originally flooded the interior that are blocked by filling of window and construction of bulky buttresses against the outer walls. Original furnishings clad with gold, silver and precious stones which are spread light to the interior (*Cruickshank, 1996*).

Overall impression of interior side of Hagia Sofia comes from envelops walls, colonnades and vaults. The surface divide into two horizontal bands with colonnades and cornices, sometime, disappears from

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sight and is far from impenetrable, but barely hints at the great mass of the piers that actually sustain the dome. Aisles there are varied bay shapes, the juxtapositions of columns and varying types. These columns have varying types of colors and heights which changing the glimpses of the nave as one moves about and they provided contrast in light. The great ambiance set under the dome and connected to chancel by a screened passageway and the color, movement, singing and incense of the sacred liturgy (*Cruickshank, 1996*).

Over the south door of the inner narthex, over its central door into the nave, in the apse semi dome and in various positions on the walls of the galleries above, fine figurative mosaics added after the end of iconoclasm in the ninth century (*Cruickshank, 1996*).

Outside of Hagia Sophia, original form was changed. Large areas are filled with marble facings either some of the walls. Originally, the dome was lower than at present, and the square base on which it stands did not rise up quite as high. Both main semi domes were reconstructed in later centuries (the western in the tenth century and the eastern in the fourteenth, and the form of the western one was changed in the manner already noted (*Cruickshank, 1996*).

Notably additions to the exterior were additional buttressing to the dome and other vaults. In sixteenth century and later Hagia Sophia used as mosque. First additions of the building is patriarchal palace situated against the south-west corner of the church and alone its south side, and of flying buttresses set against the wall of the outer narthex and spanning over its roof to abut the wall of the west gallery. Their date has not been precisely established, but they were probably added in the ninth or tenth century, well before the use of similar forms in Gothic architecture in the West. When Hagia Sophia first built the upward continuations of the piers to the north and south of the dome as great buttressing arms above the gallery roofs are more noticeable than today (*Cruickshank, 1996*).

### ***Flying buttress of Hagia Sophia***

One structural curiosity of Late Byzantine architecture is the flying buttress. Flying buttresses make occasional appearances in the Late Byzantine architecture of Istanbul, apparently under the influence of Gothic forms, following the Latin Occupation in the thirteenth century. However, they were never fully understood, and they were never utilized as integrated parts of a structural system, as they had been in Western Europe. Flying buttresses were added western gallery of Hagia Sophia either during the Latin Occupation of the thirteenth century or possibly in a restoration of 1317. Of uneven construction, they may have been part of the same project that added a belfry to the west facade. The masonry in the large north and south buttresses is similar, and these may have originally been flying buttresses that were later blocked. Part of the process of shoring up the Great Church over time, the western buttresses are positioned at points where they are practically useless, without a proper relationship to the structural system of the building (*Ousterhout, 2008*).

A single flying buttress was added to the apse of the Chora as a part of a major reconstruction in the early fourteenth century, designed to brace the twelfth-century apse on unstable terrain. Like the buttresses at Hagia Sophia, this offered no more than the appearance of security; over the centuries it shifted away from the building, and the lower flyer collapsed. Before the restoration of the 1950's, scaffolding was necessary to support the remainder of the buttress. In Fig 8 Flying buttresses of Hagia Sophia is shown (*Ousterhout, 2008*).

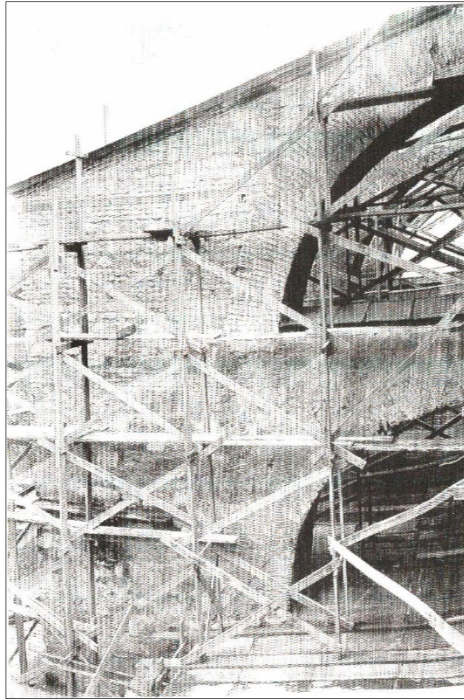


Fig A.8: View of the flying buttresses on the west façade of Hagia Sophia, İstanbul, looking north (Ousterhout, 2008)

### ***Domed Central-Plan Sanctuaries in the Ottoman Empire and Renaissance Italy***

The transfer of the Ottoman capital to Istanbul engendered a new imperial vision, the dream of reviving the ancient glory of the Roman Empire. The utopian project reuniting Constantinople with Rome, particularly upheld by Mehmed II and the young Süleyman, would trigger a special receptiveness to artistic developments in Renaissance Italy, until that project was abandoned around the time Sinan became chief architect, the sultans actively sponsored Italian artists and architects to promote a visual culture befitting their multicultural world empire. The so-called classical idiom of Sinan crystallized in the 1550's after a century of experimentation in the making the Ottoman imperial image. It proclaimed a distinctive dynastic identity that materialized with the hardening boundaries of the empire, which had reached the territorial limits of expansion. The codification of the classical idiom at a time when foreign artists and architects were no longer invited to the Ottoman court coincided with the consolidation of the corps of royal architects, corresponding to the empire's centralized administrative system (Necipoğlu, 2005).

Parallels between Italian Renaissance churches and Ottoman mosques with domed centralized plans have largely been obscured by the contemporary written discourses of these building traditions, each stressing an origin in a different historical past. The Italian humanist preoccupation with a pure classical pedigree and the Ottoman emphasis on an Islamic dynastic gave rise to exclusivist discourses on architecture that contain little hint of shared early modern sensibilities and cross-cultural exchanges. The discourse of humanist particularly accentuated this cultural divide. The monuments themselves, however, suggest a more connected universe of architectural culture in the eastern Mediterranean world during the fifteenth and sixteenth centuries (Necipoğlu, 2005).

The simultaneous emergence of centrally planned domed sanctuaries in Italy and Ottoman Empire can partly be attributed to the concurrent revival or a mutual Romano-Byzantine architectural heritage. But the knowledge each culture had of the 'other' should not be underestimated as a factor contributing to the appearance of similar plan types. The Ottoman receptiveness to Italian architectural innovations to architects from Italy, but imagining the possibility of architects from Italy, but imagining the possibility of a more fluid, two-way traffic in architecture concepts is doubly hindered by the lack of written

evidence and by the great divide in scholarship between ‘Islamic’ and ‘Western’ architecture (*Necipoğlu, 2005*).

The remodeling of Constantinople and Rome during the fifteenth centuries brought about intriguing parallels: the rehabilitation of ancient water systems and bridges, the creation of new urban axes to link major landmarks, and the selective preservation or demolition of ancient monuments, with which modern edifices attempted to compete in magnificence. In both cities, religious monuments commissioned by the sultans and popes shared an aspiration to merge the grandeur of the faith with the monumentality of the imperial past. They combined references to unsurpassed antique prototypes such as the Pantheon or Hagia Sophia. A series of mosques commissioned during the same period by individual sultans, on the other hand, represented steps in the development of architectural ideals that culminated with the Selimiye in Edirne. By interweaving the evolution of sultanic mosques with the protracted construction history of St Peter’s here, I hope to highlight some overlooked parallels and veiled cross-cultural dialogues (*Necipoğlu, 2005*).

Mehmet II’s aspiration to revive the fame of Constantinople, as it had been in the age of Constantine and Justinian, is a well-documented project that roughly coincided with the renewal of Rome between the papacies of Nicholas V (1447-55) and Sixtus IV (1471-84). According to his Greek historian Kritovoulos, it was the sultan’s plan to make the city in every way the best supplied and strongest city as it used to be long ago, in power and wealth and glory. To this end, ‘he was constructing great edifices, which were to be worth seeing and should in every respect vie with the greatest and the best of the past’ (*Necipoğlu, 2005*).

### ***Hagia Sophia, similar important buildings and Justinian's historian Procopius interpretation***

The Parthenon, the Pantheon and Hagia Sophia are amongst the three greatest buildings in the history of western architecture. The Pantheon stands mid-way both chronologically and stylistically between a building which is virtually all exterior, like the Parthenon, and one like Hagia Sophia where the exterior is merely the inside-out of the interior. The exterior of Hagia Sophia is composed of featureless cliff-like masses of plastered brick surmounted by domes of dull-grey lead. The gradual addition of massive buttresses and, following its adaptation as a mosque in 1453, of giant minarets, has not improved its architectural coherence (*Watkin, 1986*).

Hagia Sophia interpretation was written by Justinian's historian Procopius. His poetic interpretation:

“It abounds exceedingly in sunlight and in the reflection of the sun's rays from the marble. Indeed one might say that its interior is not illuminated from without by the sun, but that the radiance comes into being within it, such an abundance of light bathes this shrine ... [The dome is] marvelous in its grace, but by reason of the seeming insecurity of its composition altogether terrifying. For it seems somehow to float in the air on no firm basis, but to be poised aloft to the peril of those inside it ... On either side of this are columns arranged on the pavement; these likewise do not stand in a straight line, but they retreat inward in the pattern of the semicircle as if they were yielding to one another in a choral dance ... [The dome] seems not to rest upon solid masonry, but to cover the space with its golden dome suspended from Heaven. All these details, fitted together with incredible skill in mid-air and floating off from each other and resting only on the parts next to them, produce a single and most extraordinary harmony in the work, and yet do not permit the spectator to linger much over the study of anyone of them, but each detail attracts the eye and draws it on irresistibly to itself. So the vision constantly shifts suddenly, for the beholder is unable to select which particular detail he should admire more than all the others...

The whole ceiling is overlaid with pure gold, which adds glory to the beauty, yet the light reflected from the stones prevails, shining out in rivalry with the gold ... who could recount the beauty of the columns and the stones with which the church is adorned? One might imagine that he had come upon a meadow with its flowers in full bloom. For he would surely marvel at the purple of some, the green tint of others,

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and at those on which the crimson glows and those from which the white flashes, and again at those which Nature, like some painter, varies with the most contrasting colours. And whenever anyone enters this church to pray, he understands at once that it is not by any human power of skill, but by the influence of God, that this work has been so finely turned” (*Watkin, 1986*).