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A Connection Through Stucco Technique with Early Medieval Natural Lighting Systems in Rome and Emphasis on the Role of Light in Islamic Architecture Focusing on Khirbat al-Mafiar 7CE.

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Abstract

This article investigates how, since ancient times, building windows have had grids of stucco, stone, wood, or iron, as well as slabs of glass or other materials. They also appeared as simple apertures in the wall, the arrangement of which frequently served decorative functions. Following a classical tradition, the usage of shuttered windows with glass fixed on timber frames was known in late antiquity. The search for a peculiar architectural taste of the late antique and early mediaeval times is particularly appealing due to the light effects produced by shuttered windows made of translucent material, which provides a mystical and suggestive appearance. The light that transforms the decoration, using color combinations, sometimes occur in unexpected contexts or in an adjacent architectural form, such as the floor and vault of the royal apse in the bathroom of Khirbat al-Mafjar. The architectural element that includes the lozenges, closer to Khirbat al-Mafjar as a drawing and

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scheme, to create a particular visual effect, could be seen in three barriers of stucco windows found in situ in the windows of the central nave during the 1930 restorations to Bovino Cathedral. Presence of light during history and in various architectural oeuvres, in addition to functional aspect, as factor for illumination and life conferring to daily activities, it has been abundantly addressed from spiritual aspect and in doctrinal discussions of religions.

Keywords: light in Islamic architecture, the window in Islamic architecture; stucco; early medieval and medieval buildings in Rome; Khirbat al-Mafjar windows; luciferous windows, transennas.

Windows between art and science in Islamic buildings

The window is a symbol of freedom, a place of desire, an image of the divine, the meeting point between human space and external reality. Finally, the window is a confrontation between culture and nature, between measure and the infinite. Since ancient times, windows in buildings have featured grilles of stone, stucco, wood, or iron, but also panes of glass or other materials. They also appeared simply as openings in the wall, the arrangement of which often had decorative purposes. Since ancient times, there was the problem of directing and utilizing light, which was the subject of careful planning by architects. Various factors had to be considered, such as the variability of natural light sources, especially the shape and arrangement of window openings, doors, porticoes; the amount and color of artificial light, the interaction with natural light.[1] The focus

on these problems gave rise to the search for new materials to facilitate the passage of light, including glass.[2] The architecture of ancient Greece, compared to that of Rome, cautiously adopted fenestration. The façades of private as well as public buildings featured doors flanked by windows.[3] An example of the use of interior decoration with the participation or through the medium of natural light is the adoption of windows in the walls of the Parthenon (5th century BC).[4] As far as Roman architecture is concerned, it sought the security of interior lighting to develop the furnishings, using window screens, *opus sectile* wall coverings, floor, and wall mosaics, and finally glass.[5] This created an aesthetic of light, with Neo-Platonic origins, developed by early Christian thinkers.[6] One of the great architect-restorers of the modern era, Eugène Emanuel Vìollet-Le-Duc, in the entry *Fenêtre* of his great *Dictionnaire raisonné de l'architecture*, considers windows as elements of an organic system, the building, just as "*les archìtects grecs, les architects romains et ceux du moyen et ceux du moyen age*."[7] Thus, according to Viollet- Le-Duc, the study of windows should be in relation to their architecture,[8] thus arriving at their indication and position. The shape, number, inclination, and closure of windows have always evolved in close dependence on the technical and decorative requirements and the construction of the roofing system of a particular building.[9] Among the different types of roofing, the masonry vault is considered one of the masterpieces of Roman engineering, thanks to the extensive use of wooden arches that allowed for the radial arrangement of ashlars of tuff bricks, using a

kind of strong lime that acts as a binder.[10] Building vaults and harnessing the cohesive force of concrete allowed for the composition of new architectural forms and new lighting solutions. For example, the windowed passage contributes to the decoration of interiors such as pillars, mosaics, and plastics through fantastic and landscape effects, which Vitruvius found very "unpleasant" when reading architectural organisms; in this way, the prevalence of figurative painting could be avoided.[11] Lighting also played an important role in Roman architecture. Vitruvius, for example, suggested that winter triclinia should face west, so that they would have light until evening, while summer triclinia should face north for the opposite reason, and autumn and spring triclinia should face east so that they would be facing the warm light of the rising sun and not the scorching light of the afternoon sun. Vitruvius never mentions flat window glass, which at the time of his writing, the early Augustan age, was not yet widespread.[12] In fact, glass was used for the first time as a window screen to retain heat, especially in a thermally warm environment, as demonstrated by the finding at the Forum Baths, renovated between the earthquake of 62 AD and the eruption of 79 AD.[13] Roberta Flaminio and Federico Guidobaldi in *Il Sistema di Illuminazione naturale degli edifici Altomedievali e Medioevali a Roma: finestrati e transenne lucifere* (The Natural Lighting System of Early Medieval and Medieval Buildings in Rome) explain that a main element linked to the spaciousness and distribution of the windows is luminosity.[14] The use of closed

windows with glass mounted on wooden frames was known in Late Antiquity following a classical tradition (Fig.1). Recent investigations in the Mausoleum of Helena at Tor Pignattara have unearthed the glass of bronze metal gratings (Fig.2).

The discovery of glassblowing, the process that stressed the processing time of vitreous artefacts, grew rapidly during the 1st century B.C., thus developing the expansion of vitreous vessels as a new use of glass in the decorative-architectural field. More recent studies have shown that the technique of glassblowing was invented in Palestine but was also developed in the West.[15] The most common method for the manufacture of windowpanes derives from 'cylinder' blowing. Later, glass panes were made by pouring molten glass into wooden or metal trays, after which it was spread with a spatula or pulled with tongs. Often the color ranged from green and blue to almost colorless.[16] As an iconographic element, windows with glass are present in fourth- and fifth-century depictions, where they can be seen placed at the end of windows with a symbolic reference to the Holy Sepulchre in Jerusalem (Fig.3). The windows are placed in an agate made of gold tiles, probably similar to a bronze transenna.[17] The presence of windows, mainly glazed and made of the noblest materials, increases in early Christian and Byzantine churches: an example is St Sophia in Constantinople, whose construction began in 532 A.D. and where windows surrounded by elegant thick grids and marble frames can still be seen today.[18] One can see the stylistic rendering of wooden frames to mount the windows, as well as

orthogonal weave with marble grids, represented by a precise assembly system still visible today (Fig.4).[19]

Glass panes in windows were arranged in different ways. If the window was of limited size, e.g., small oculi, a single pane of glass could be inserted directly into the mortar. If, on the other hand, the windows were larger, as antique glass is translucent, it is very likely that the panels were mounted on opening sashes, to ventilate the rooms and, in the case of triclinia in rustic villas, to take part of the urban landscape. Depending on the size of the windows, the glass panes contained insertions of wooden or metal or stucco slats, which obviously decreased the amount of light that could enter the interior.[20] Examples of various types of screens that decreased the amount of light can be found in the bath complex of Bosra (Syria). They were also in use in the period between the Hadrianic age, Byzantine and Umayyad rule (2nd to 8th century AD). The large windows had the remains of different closing systems, the latter variant evolving between the 6th and 9th centuries into the stucco transenna with circular holes closed with glass discs, characteristic of Byzantine art.[21]

From the data preserved so far, it is assumed that stucco with *lapis specularis* is closing the fretwork was used in religious constructions, for which more could be invested economically, especially due to the cost of procuring and transporting plaster, such as the transennas with glass, including colored and painted glass.[22] The search for a distinctive architectural taste of the late antique and

early medieval period is to be considered particularly interesting for the light effects produced by closed windows with the translucent material, which creates a mystical and evocative effect.[23] This Byzantine technique was also passed on to mosque builders, who made the windows by inserting them inside a marble or stucco frame. The windows had small fragments of colored glass, instead of marble, and thus achieved freedom and richness in the design of the patterns.

We find a special attention to light in Islamic art and architecture, which primarily uses, like any other built space, windows, and doors.[24] According to Hillenbrand, there is no rule that the wall of the qibla must be more illuminated than the rest of the architecture, but as he assumes, this is often the case.[25] The example proposed is the *qibla* of the Sultanahmet mosque in Istanbul, the so-called 'blue mosque', built from 1609 and opened to the public in 1617 (Fig.5): in this case, there is a large opening on this wall with a greater number of windows, also arranged on various levels. We see this flood of light on the area around the *mihrab*, which makes it brighter than the rest of the interior of the mosque.[26] Glass production continued in Syria, with the main centers being Arraqua, Aleppo and Damascus. The famous alchemist Jabil ibn Hayyan created up to 46 recipes to produce coloured glass in the 8th century, describing the technique of cutting glass to obtain artificial gemstones.

The technique applied to 'colored light' stained glass, called *qamaryya* in Arabic, was transmitted to the Arab world through the Byzantine tradition, as well as from the Sasanian empire: it probably

derives from the elaboration of the tradition of gilded and enameled glass from Persia, Syria, Mesopotamia, and Egypt.[27] Laguillo Guiterrez states that stained glass in the Islamic world did not reach the splendor that we find in the Christian world, but from the 13th century onwards, intricate designs with geometric, calligraphic, figurative, plant or animal elements were produced. Marble or stucco always predominated among the materials used, along with pieces of colored glass.[28] Another more widespread technique produced another type of light, which could be described as 'fragmented'.[29] The term *mashrabiyya* is used to denote openings screened by a wooden grid, formed by small wooden balustrades, of circular section, arranged at regular intervals to form often minute decorations of typo geometric type where light and shadow play the same role; they were often used as screens.[30] Often used as shutters, in front of windows or other openings, they allowed those inside to see without being seen.[31] In this way, the *mashrabiyya* has a threefold function: firstly to reproduce the density of the weave of light as a dense external decoration, secondly as a device to ensure privacy and thirdly to filter and control the flow of air and strong sunlight. This element was made of small pieces of rectangular wooden weave and carved on the inside following inserts in larger designs, mostly of geometric pattern: star motifs were very common, giving the impression that the window was full of stars (Fig.6).[32] Always located on the second floor of the dwelling or at least on the upper floors, some are also found inside mosques. The golden age

of this architectural element continued in the Mamluk period in Egypt and Syria, where the workmanship of wooden grilles reached its peak (Fig.7).[33] The designs created on the floor by sunlight came from wooden screens that were used as partitions between the courtyard and the adjacent corridors or rooms, that type of *mashrabiyya* was used from Morocco to Iran.[34] The *mashrabiyya* can perform functions related to different types: controlling air flows, controlling the passage of light, controlling the temperature in the room and increasing the humidity in the air and above all ensuring privacy. According to Hillenbrand, similar designs in marble windows already existed in the early 8th century, as can be seen in the Great Mosque of Damascus and Cordoba.[35]

A theme with an infinite range of plant motifs, using the identical technique of *ajoure*,[36] executed in carved stucco, filled the claustra, the pierced wall above the lintels of the gates of Qasr al-Hayr in western Syria , at the beginning of the 8th century.[37] This is one of the most prominent architectural elements in the language of Islamic architecture, executed in stone or marble, creating geometric, plant-like designs; this type of *mashrabiyya* is known as a *jalis*.[38] Compared to wooden grilles, which were set inside window frames, *jalis* tend to be closer to the ground. They render extraordinary effects when the sunlight is strong, passing through well- defined spaces. The *jalis* often enclose patterns projected on to the floor. Sometimes, a magnification and perspective effect occur.[39] The world seen through a *jalis* becomes unreal: To the person looking out through a *jali* screen, the world takes on a fragmented, unreal

quality,as though one were seeing it at one remove, through a glass darkly. And lastly, there is something kaleidoscopic about the effects of multiple different jali designs as one moves through a building, in that the patterning on floors and walls changes from one moment to thenext. Stained glass set in a window of geometric or vegetal design could add the extra dimension of color to such patterns. Thus light is transformed into decoration.[40] The light that transforms the decoration, using color combinations, sometimes occurs in unexpected contexts or in an adjacent architectural form, such as the floor and vault of the royal apse in the bath hall of Khirbat al-Mafjar.[41] More recent studies of variations in the design of interior domes link the decorations to cosmic themes found in Qur'anic inscriptions, as Grabar surmises for the Great Mosque of Isfahan (Fig.8).[42]

The domes of the baths also often have star-shaped or circular openings that produce a particular effect of the sky offered to those inside, an effect intensified by the dimness inside and the strongly focused light filtered through the openings. The same effect is known in some Fatimid mausoleums, such as that of Qus (Fig.9). Worth highlighting is the intimate relationship with the minaret, whose very etymology proclaims its link with light (*nur*) and fire (*nar*), a strong Islamic tradition.[43] Another typology widespread in these regions is the *clastrum*, used to control the interior microclimate of the room, a screen made of unfired earth bricks, arranged in geometric patterns. It seems appropriate to conclude with an Islamic architectural element that manifests spectacular scenes of light, the *muqarnas*, which serve to capture the light and differentiate it with great

subtlety.[44] Norman monuments such as the Palatine Chapel, the Zisa, the Royal Palace and the Cuba in Palermo, each present a decorative feature particular stalactite structure known as *muqarnas*. This technique draws on structural models from both North Africa and Fatimid Egypt.[45]

It is a concrete application of geometry in important sites of Islamic architecture. On the perspective method of muqarnas Burckhard observes: Colours reveal the inner richness of light that, when viewed directly, blinds us. It is through the harmony of colours that we grasp the true nature that every visual phenomenon carries within itself... By analogy, we would say that Muslim architecture transforms stone into light which, in turn, is transformed into crystal.[46] According to Clevenot, the fragmentation of volumes brought about by muqarnas can be perceived as an architectural manifestation of an Islamic conception of the universe (Fig.10).[47] The play of light is presented in the case of the muqarnas under the spherical shape of the surfaces and the multiple angles of the corbels; on the other hand, the *mashrabiyya* reaches its apex through the gratings. In this way, the two architectural elements of Arab culture take on symbolic forms, representing the concept of perspective and the metaphor of the window. It is no coincidence that in Western culture the perspective painting reflects the gaze through the window. As a subject, the window is activated in the gaze, whereas in the specific case of the grille, the subject observes a great cosmic spectacle, where light is the protagonist of the scene.

The special case of Khirbat al-Mafjar.

As much as much of what was said in the previous section on windows and light is valid for Khirbat al-Mafjar, there are special features in the latter. Located near Jericho in the Jordan Valley, Khirbat al-Mafjar remains one of the most highly sophisticated Umayyad palaces in the region for its elaborate mosaics, stucco carvings and overall sculptural magnificence. Natural light is the most important source of illumination in the buildings, which is why we will analyze stucco- decorated windows with grilles as the last objects. Two groups of windows were recovered in Khirbat al-Mafjar.

The first group was found in various rooms of the palace, while the second group in the baths. The group in the baths had eight semicircular, round-arched windows. According to Hamilton, from this group of windows light was distributed from below the dome towards the reception room or the diwan, where a complete barred window and fragments of three others were also recovered.[48] Two types of windows were used in the palace: open, latticed windows and closed windows in which pieces of colored glass were inserted. This was the first-time stained glass was used in the windows (Figs. 11-12,13), all the windows having a circular or semi-circular shape in the upper part of the frame.

As we have already mentioned, this type of window was often used to create a decorative effect and to provide more light inside the room. Some of these windows, as Hamilton speculates, were

probably inserted above the lintels of the doors, such as the largest and best-preserved set of grilles from the western Qasr-al-Hayr.[49] The windows found in Khirbat al-Mafjar show linear geometric designs, while floral motifs are totally missing. The windows discovered in the palace may have been larger than those in the bath *diwan*. (Fig.13.1)[50]

The fragments from the palace can be distinguished by the fact that they were probably painted red and gold with brown contrasts on one side. The color was continuous on the front surface of the grilles and penetrated about 2 cm into the perforations.[51]

For example, (Fig.14) illustrates a selection of the best-preserved gratings. For the smaller fragments we possess only the drawings made by John Reid, from which we can see the style and geometry with which they were created (Fig.15). In the bath each of the grilles has a frame with the same border (Figs. 16-16.1,16.2), which in its wide opening included a semicircular head. In Figure 16 within this area was plaster, cut into an open lattice.

It can therefore be assumed that light did not enter perpendicular to the plane of the grating but slanted slightly to one side or the other. However, Hamilton speculates that the windows were too high for direct sunlight to enter and fall on the lower parts of the walls, so doubt arises as to whether this very slight lateral deviation had any real effect on the illumination of the room.[52] As shown in Reid's drawing (Fig.15), circles were described by centers at the points of the triangles and with radii separated by two-thirds of the sides of

the circles. In contrast, circle arches form stars in the center of the circles, their design starts from centers at the midpoint of the sides of the triangles and their radii automatically follow the intersections of the circles.[53] We find the same geometrically designed gratings in the western Qasr-al-Hayr, whose design scheme is summarized by Creswell: he found the same pattern in an ancient Roman floor preserved in the Domus Augustana on the Palatine Hill, which was partly built by Domitian (AD 81-96).[54] This pattern also corresponds in basic to that of Khirbat al-Mafjar (Fig.15), which, like that of Creswell (Fig.16-17,18), has a subdivision into sections of equal length, whereas at the points where they meet, the lines oblique. Moreover, the baseline in the two drawings often flanks the parallel lines, which we see in this passage as the intersections of the previous pattern.[55] This pattern with the grid of hexagons constitutes the basic pattern of the grating design in a window of the mosque of Ibn-Tulun (Fig.19),[56] in Fustat, Egypt, built by the emir of the same name between 876 and 879 AD. The main difficulty in analyzing this system consisted in finding the centers of the arcs forming the lozenges: they are probably located on the circumferences of the circles at points fixed by a compass and with a radius derived from small circles (Figs.20-21). This same radius was used to draw the arcs that form the lozenges themselves.[57] These windows forming the lozenges are often called 'lozenge-arched windows'. These are windows with a special design in which the upper arch of the window follows a lozenge shape instead of a traditional rectangular

or curved shape. This type of window is often used in Islamic art, as it provides a unique decorative touch. Lozenges can be made using various techniques, such as the use of colored glass and luciferous plastic material is remarkably well documented and continues until very recent times.[58] The architectural element that includes lozenges, which is closer to Khirbat al- Mafjar in design and pattern to create a particular visual effect, could be seen in three stucco window transennae found in situ in the windows of the nave during the 1930 restoration of Bovino Cathedral (Fig.27). Alongside the usual conclusions about the window as an architectural element, there is no denying that Islamic architects sometimes enjoyed using color and light on a large scale, to an extent that finds few parallels in world architecture. This is evident, for instance, in the back wall of the western *riwaq* of the Great Mosque of Damascus, which precisely recalls this desire to represent color in every material used, and to make the most of contrasts in color and texture. This practice was thus already fully developed in the first century of Islam (Figg.28-29,30). [59]Along with novel solutions, some elements inherited from the Byzantine tradition were used: for example, at plinth level, the wall is clad with thin slabs of colored marble cut in such a way that the veins run uninterruptedly from one slab to the next; above this, the polychrome marble is interrupted by regular window openings, where there is a grid of monochrome white marble perforated in each with an elaborate geometric design.[60] Using the same material, color is used to differentiate two decorative schemes. The decoration also operates on several levels in the

window grids; in fact, regardless of the interest in the geometric motif itself, these windows are each a separate study of the play of light and dark, of fullness and emptiness. Presenting the *ajoure* style of early Byzantine sculpture, they were most likely filled with stained glass (Figs. 23-24-25).[61] Fragments of this same material were found in the windows of the more or less contemporary Dome of the Rock.[62] This is a temple erected in 691 in Jerusalem in one of the nerve centres of the three religions of the Book (Islam, Christianity and Judaism). This building with a central, octagonal plan has an enormous dome in the center (20 meters in diameter and 25 meters high) resting on a drum in which sixteen windows open (Fig.31). These windows are shielded by a double grille, the outer one being part of the ceramic cladding, which probably dates back to the work carried out by Sultan Suleiman in 1552; and the interior one is of rare beauty.[63] This rich iconographic trove leads us to assert that the windows were shielded by glass, as described further by Ibn al-Faqih (903)[64]: "...in the walls and above, in the drum, there are fifty-six windows, and stained glass of various colors."[65]

In conclusion, one must also consider the peculiar architectural taste of the Umayyad period and the search for a particularly mystical and suggestive effect in the creation of light effects through windows closed with translucent material. The series of frames and their production were made by workers specialized in the execution and installation of this specific type of artefacts that we have analyzed. The organization of a construction site was linked to a high clientele.

Especially the realization of stucco transennas was linked to skilled workers, always adorned with refined decorated motifs.[66]

Light and color occupy a prominent place in Islamic imagery and art, also for spiritual and religious reasons. It seems likely that the Umayyad artist was able to give free rein to his ideas with shapes and colors, providing insight into form, the limits of bodies, movement, rest, size and substantial and accidental characteristics. The window is one of the components that play an important role in shaping the building in Islamic architecture. The window structure of traditional buildings in Umayyad art emphasizes the visual and sentimental connection between the building inside and the space outside.[67]

Fig.1 Depictions of ancient windows: a) in painting - Hypogeum of Via Dino Compagni, Samson slaying the Philistines (from Ferrua 1990)

Fig.2 Mausoleum of Helena at Tor Pignattara, detail of the model on display at the exhibition Constantine 313 A.D., reconstructed from archaeological evidence.

Fig.3 S. Maria Maggiore, mosaics of the triumphal arch, detail of the Hierusalem (from Gandolfo 1988).

Fig.4 Window transenna in the passage to the Baptistery (photo R. Flaminio)

Fig.5-Stained glass windows with qibla wall, Sultanahmet Mosque (17th century), Istanbul

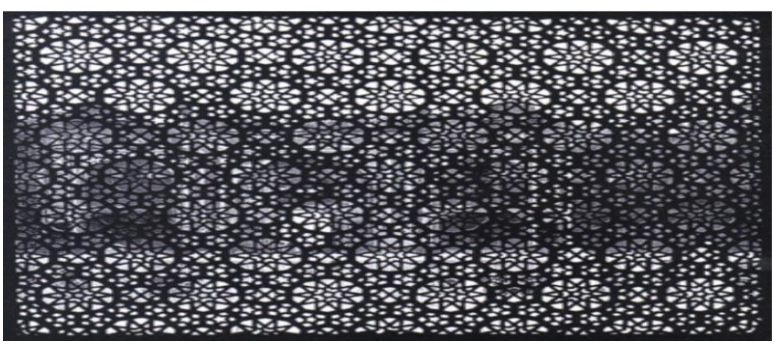


Fig.6 Example of grating. Tomb of I'timad al-Daula (11628), Agra. In "Belting, Hans, Florenz und Bagdad, 2008, Verlag, Munchen. Tr.it. I canoni dello sguardo, 2010, Bollati Boringhieri".

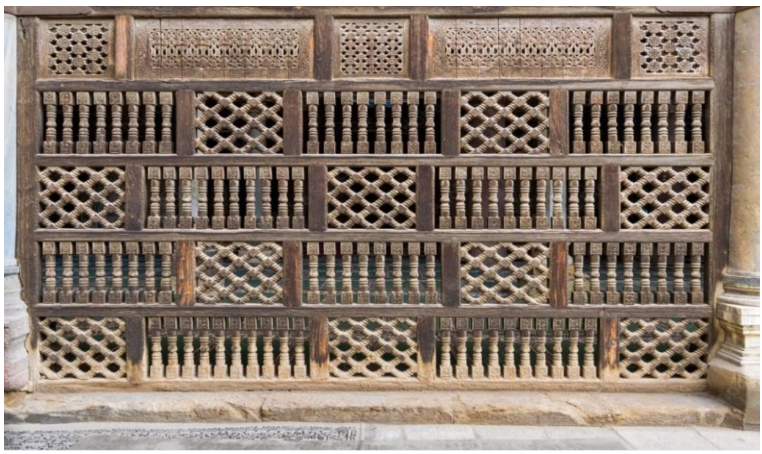


Fig. 7 Frontal view of the woven-wood arabesque wall - Mashrabiyya, façade of the historic mosque public mosque of Amir Al-Maridani, Cairo, Egypt,1340

Fig.8 Interior of the dome of the Lutfallah Mosque, Isfahan, 1601-1618. (Hillenbrand)

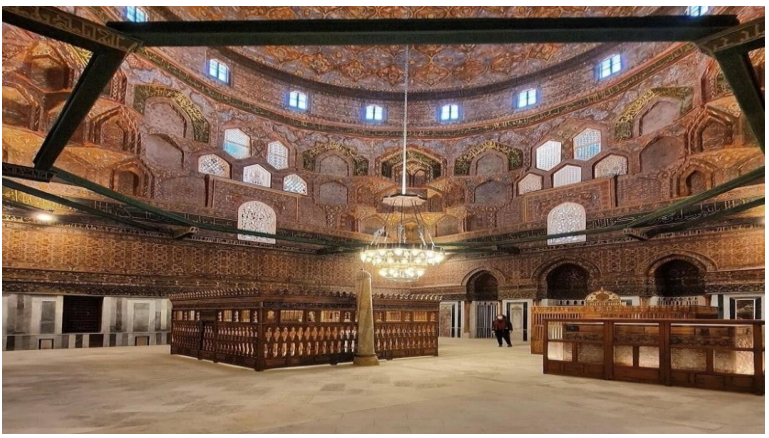


Fig.9 Mausoleum of Imam al-Shafi'i in Cairo, built in 1211 by Sultan al-Kamil (photo Dr. Stephennie Mulder)

Fig.10 Vaults of the Käshân bazaar (19th century). The geometric network, whose rhombic organization derives from the muqarnas system, is surprisingly close to the geodesic structures of contemporary architecture, see Clévenot Dominique, Degeorge Gérard, Décors d'Islam 2017, p.197.

Fig.11 Painted glass (original) and plaster Rockefeller Museum, Archaeology/Islamic Art & Archaeology, Jerusalem, Photo © Israel Museum, Jerusalem, by Margalit Slovin

Fig.12 Painted glass (original) and plaster Rockefeller Museum, Archaeology/Islamic Art & Archaeology, Jerusalem, Photo © Israel Museum, Jerusalem, by Margalit Slovin

Fig.13 Painted glass (original) and plaster Rockefeller Museum, Archaeology/Islamic Art & Archaeology, Jerusalem, Photo © Israel Museum, Jerusalem, by Margalit Slovin

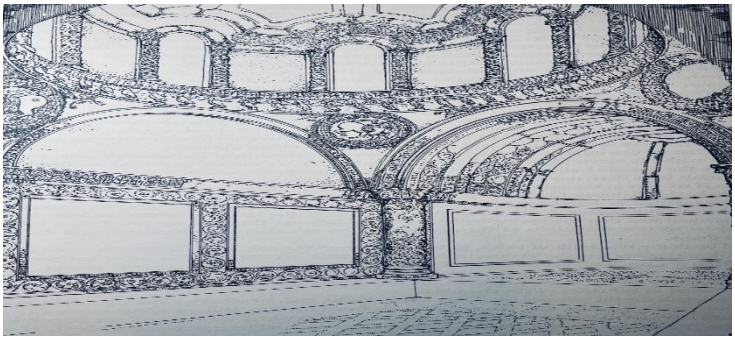


Fig.13.1Diwan; restored perspective view of the interior (from Hamilton, Khirbat al-Mafjar)

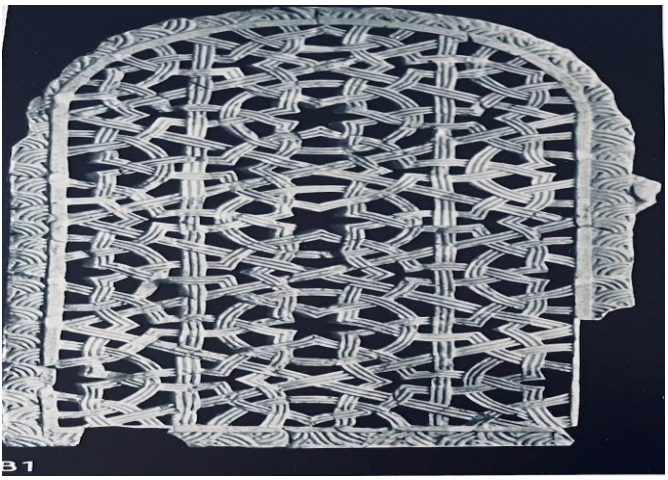


Fig.14 Plaster window grilles (from Hamilton, Khirbat al-Mafjar)

Fig.15 Window grid, drawing (from Hamilton, Khirbat al-Mafjar)

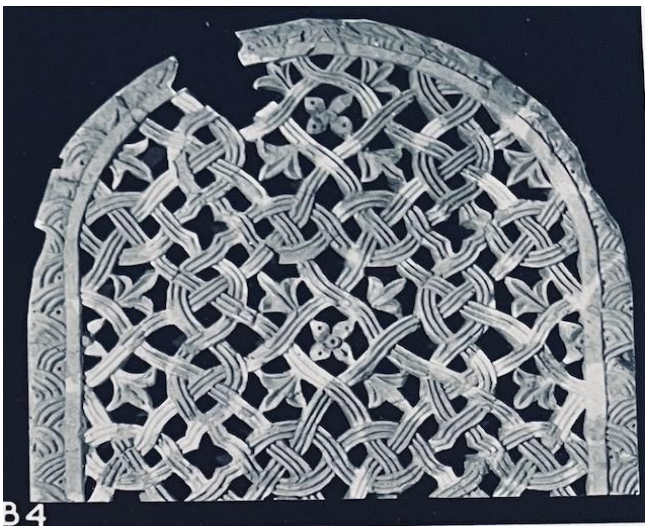


Fig.16 Plaster window grilles (from Hamilton, Khirbat al-Mafjar)

Fig.16.1

Fig.16.2

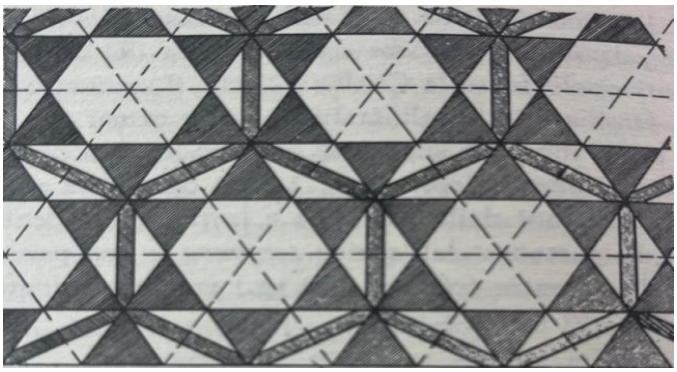


Fig.17 Rome, Domus Augustana: floor with geometric design (from Creswell, EMA)

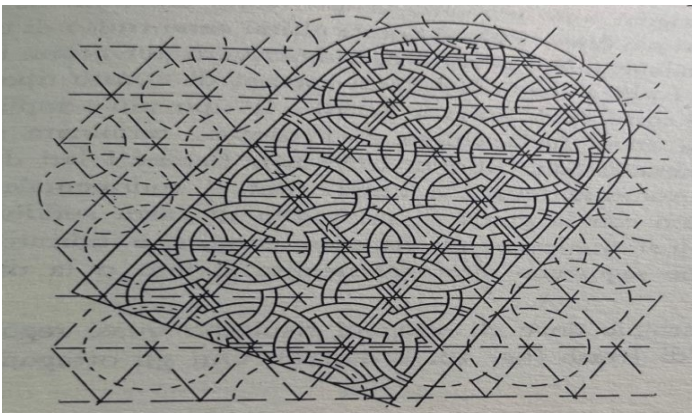


Fig.18 Damascus, Great Mosque: reconstruction of the geometric pattern of the marble window grilles, (from Creswell, EMA)

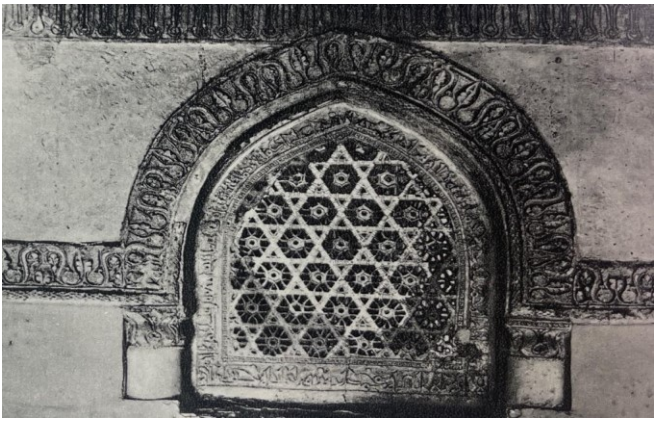
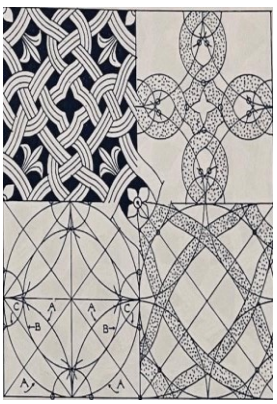


Fig.19 Ibn Tulun Mosque: the sixth window from the left on the south-east side, (from Creswell, EMA)



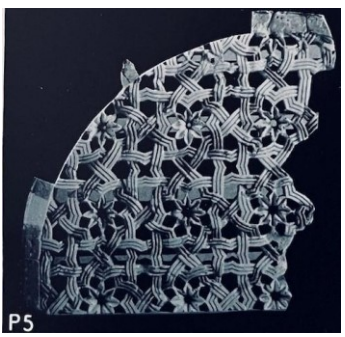


Fig. 20 Drawing (Hamilton, Khirbat al-Mafjar) Fig.21 Plaster grate (from Hamilton, Khirbat al-Mafjar)

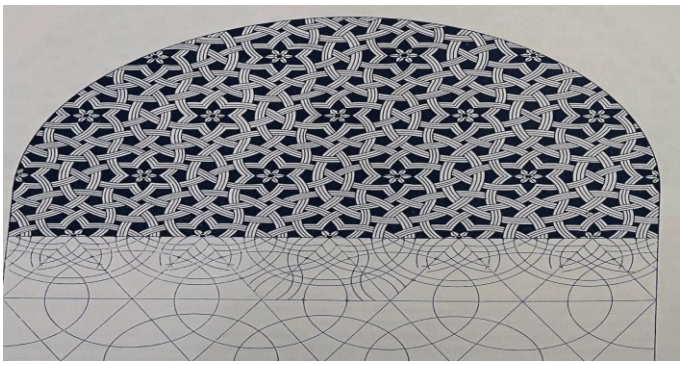
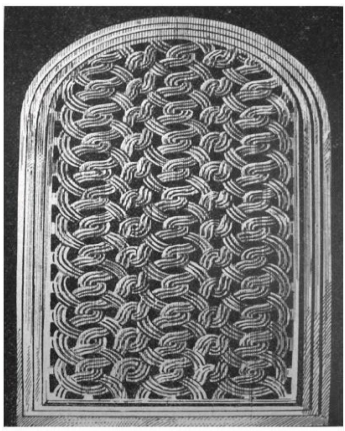


Fig.22 Drawing, geometric construction (from Hamilton, Khirbat al-Mafjar)

Fig.23 Capena (RM), S. Leone, window transenna in the south wall (photo R. Flaminio



).Fig.24 Window transenna with geometric motifs: a) Capena (RM), S. Leone, window transenna on façade (photo R. Flaminio);

Fig.25 Rome, window transenna from Via del Corso no. 271 (engraving from Leclercq 1922);

Fig.26 Rome. Basilica of San Lorenzo f.m., cloister, early medieval stucco window transitions (photo S. Pannuzi)

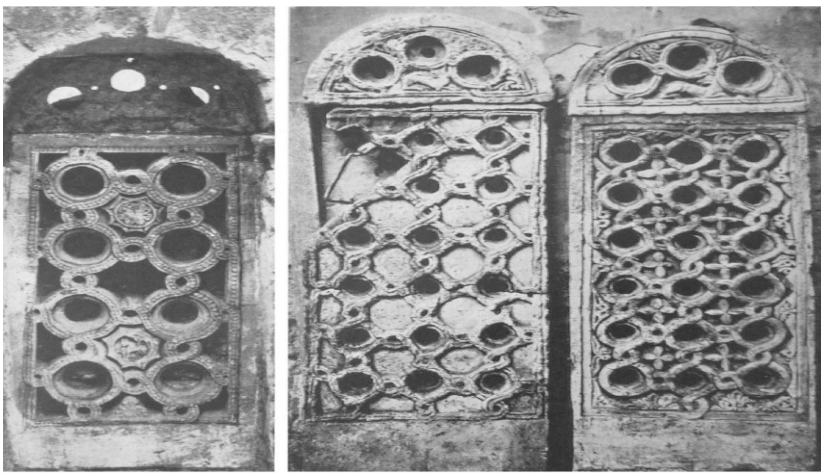


Fig.27 Bovino. Cathedral, stucco barriers (from Ceschi 1937, Figs. 12-13)

Fig.28 Damascus, Grand Mosque, 706, the western riwaq (portico)

Fig.29 The Great Mosque of Damascus, 8th century

Fig.30 The Great Mosque of Damascus, interior, 8th century

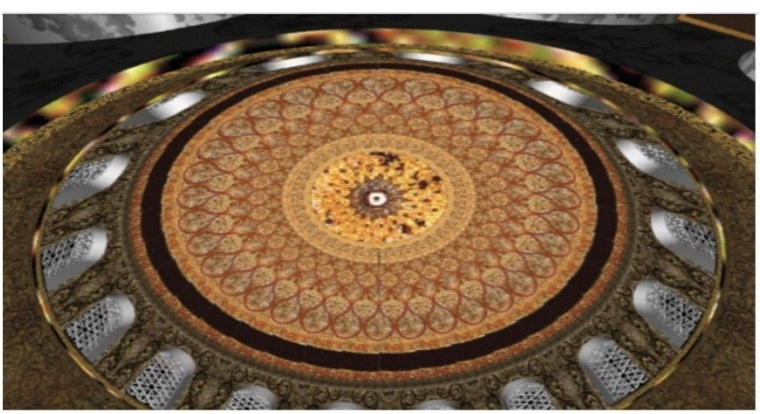


Fig.31 The Dome of the Rock, sixteen windows,691, Jerusalem

References

[1] Dell'acqua 2004, p.109.
[2] *Ibidem.*
[3] *Ibidem.*
[4] *Ibidem.*
[5] *Ibidem.*
[6] *Ibidem.*
[7] Violet-Le-Duc 1854 a 1868, p.370.
[8] *Ibidem.*
[9] Dell'acqua 2004, p.110.
[10] *Ibidem.*
[11] *Ibidem.*
[12] *Ibidem*.
[13] *Ivi.*
[14] Flaminio, Guidobaldi 2020, p.27.
[15] DELL'ACQUA 2004, p.110.
[16] *Ibidem.*
[17] Flaminio, Guidobaldi 2020, p.31.
[18] *Ivi, p.33.*
[19] *Ibidem.*
[20] Dell'acqua 2004, p.115.
[21] *Ibidem.*
[22] Pannuzi, Lugli 2019, p.256.
[23] *Ibidem.*
[24] Laguillo Guiterrez 2019, p.81.
[25] Hillenbrand 2015, p.92.
[26] *Ibidem.*
[27] Laguillo Guiterrez 2019, p.82.
[28] *Ibidem.*
[29] *Ibidem.*
[30] Hillenbrand 2015, p.109.

[31] *Ibidem.*

[32] *Ibidem.*

[33] *Ibidem.*

[34] *Ibidem.*

[35] *Ibidem.*

[36] Intaglio engraving technique, in which the decoration is formed by openings drawn in the plate. Arneudo G.I. Dizionario esegetico tecnico e storico per le arti grafiche, Torino, 1925

[37] Hillenbrand 2015, p.109.

[38] *Ivi, p.110.*

[39] *Ibidem.*

[40] *Ibidem.*

[41] *Ivi, p.113.*

[42] Grabar 1990, pp.39-40.

[43] Hillenbrand 2015, p.118.

[44] Burckhardt 2002, p.87.

[45] Eslami Naser 2010, p.201.

[46] *Ibidem.*

[47] Clevenot, Degeorge 2017, p.20.

[48] Hamilton 1959, pp.281-282. It is not clear to which room of the palace the windows found belonged.

[49] *Ibidem.*

[50] *Ibidem.*

[51] *Ibidem.*

[52] Hamilton 1959, p.282.

[53] *Ibidem.*

[54] Creswell 1958, p.88.

[55] *Ibidem.*

[56] *Ibidem.*

[57] Hamilton 1959, p.285.

[58] *Ibidem.*

[59] Hillenbrand 1995, p.15.

[60] *Ibidem.*

[61] Creswell 1966, p.33.

[62] *Ibidem.*

[63] *Ibidem.*

[64] Ibn Al-Faqih (903), Ibn al-Faqīh al-Hamadānī, was a Persian geographer and historian, also famous for his book Mukhtaṣar Kitāb al-buldān, https://iranicaonline.org/articles/ebn-al-faqih

[65] *Ibidem.*

[66] Pannuzi, Lugli 2018, p.256.

[67] De Bernardi, Marchis, Mansour 2016, Through colors occult beauty is manifested, as through writing revelation. "With the eye one perceives what one desires, "says Ibn Hazm,"and sight, in this sparkling of colors, assumes a central function and role, because of all the five senses, which are the gateway to the heart, sight is the most penetrating guide, the one that moves with the greatest clarity. Sight is the certain guide of the soul, it discerns the attributes and recognizes the sensible, so much so that it can say that what is told is not what is seen." For Sufis, light is a symbol of the unity of existence and experience: God is light in heaven and on earth. *Il colore come elemento delle geometrie decorative islamiche – Elettronico,* pp. 413-424.

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