

Islamic Architecture:

An Architecture of the Ephemeral

Mahbub Rashid, PhD

1465 Jayhawk Boulevard, Lawrence, KS 66045, USA, mrashid@ku.edu

© 2020 Mahbub Rashid



Except where noted, this work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/). 3rd party content belongs to the original sources as indicated and is not governed by the CC license. Their terms of use may vary.

3rd party content belongs to the original sources as indicated and is not governed by the CC license. Their terms of use may vary.

Abstract

Written as an introduction to the Architecture of the Muslim world, this paper discusses the underlying similarities of different regional architectural styles developed by Muslims over a vast geographical area during a period between the late seventh century and the early twentieth century. After briefly describing regional variations, the paper describes the basic building types, both religious and non-religious, that Muslims built in different regions. Among the important building types briefly described are mosques, tombs, caravansary, and urban dwellings. Following this, the paper describes gardens built by Muslims and their design principles and symbolism. An important feature of architecture and landscape architecture of the Muslim World, gardens represented the Qur'ānic promise of a heavenly garden in paradise as a reward for faith and purity. With water and trees, these gardens created places of respite and calmness in mostly hot arid zones of the Muslim world. After gardens, the paper describes the guiding principles of decorations in the architecture of the Muslim world. Rich in their symbolism, decorations were among the most important unifying aspects of architecture and fine arts in the Muslim world. They were often used for imparting a sense of impermanence to the material world, and for providing a visual demonstration of the infinite extensiveness of Allah. The paper also describes the basic elements of decorations in art and architecture, which include calligraphy, architectonic elements, vegetal elements and arabesque, human and animal figures, color, light and geometry. After decorations, the paper describes the underlying principles of the architecture of the Muslim world. Often used unconsciously, these principles helped establish a connection between the symbolic aspects and the formal aspects of the architecture of the Muslim world. They include a perpetual relationship between the sacred and the secular, a search for harmony between verticality and horizontality, a search for unity in the interior, and a search for expressiveness on the exterior. Finally, the paper describes many unifying forces, such as religion, language, and migration, which might have helped produce the hidden similarities underneath the apparent differences seen in the architecture of the Muslim world.

Keywords: Islamic Architecture; Islamic Building Types; Islamic Gardens; Islamic Decoration; Principles of Islamic Architecture

Suggested Citation: Rashid, M. (2020). Islamic Architecture: An Architecture of the Ephemeral. Downloaded from: <http://hdl.handle.net/1808/30156>

Islamic Architecture: An Architecture of the Ephemeral

Mahbub Rashid, PhD

At its zenith Islamic rule spread over a vast geographical region, extending from Morocco in the west to Indonesia in the east, from Central Asia in the north to Central Africa in the south (fig.1). The spread of Islamic rule began in the early seventh century, soon after the prophet Muhammad founded Islam as a religion. It continued until the collapse of the Ottoman empire, the last surviving Islamic ruling dynasty, in the early twentieth century. Within the vast geographical region ruled by Muslims, there were significantly different architectural traditions. Syria had the classical architectural tradition for a millennium. North Africa had the architectural traditions of the Berbers that came from antiquity. Egypt had a mixture of ancient Pharaonic and Coptic architectural traditions. Iran had rich Persian and Sasanian architectural traditions. The Byzantine architectural tradition was remarkably strong in the Near East, with Constantinople at its center. In Central Asia, a fine tradition of abstract, inanimate pattern work existed. India had vibrant Hindu and Buddhist architectural traditions. The architectural traditions of Indonesia in Southeast Asia, and China in the Far East were already thousands of years old. Each of these traditions helped shape Islamic architecture.

Climates and building materials of different regions also influenced Islamic architecture. In India the primary building material was always stone, particularly red sandstone and white marble. Brick was the primary building material in some eastern Islamic regions. Because little timber was available for scaffolding, ingenious techniques of vaulting in brick were developed in these regions. Mud brick, with or without paint, was cheap and remarkably serviceable in regions with little rain.

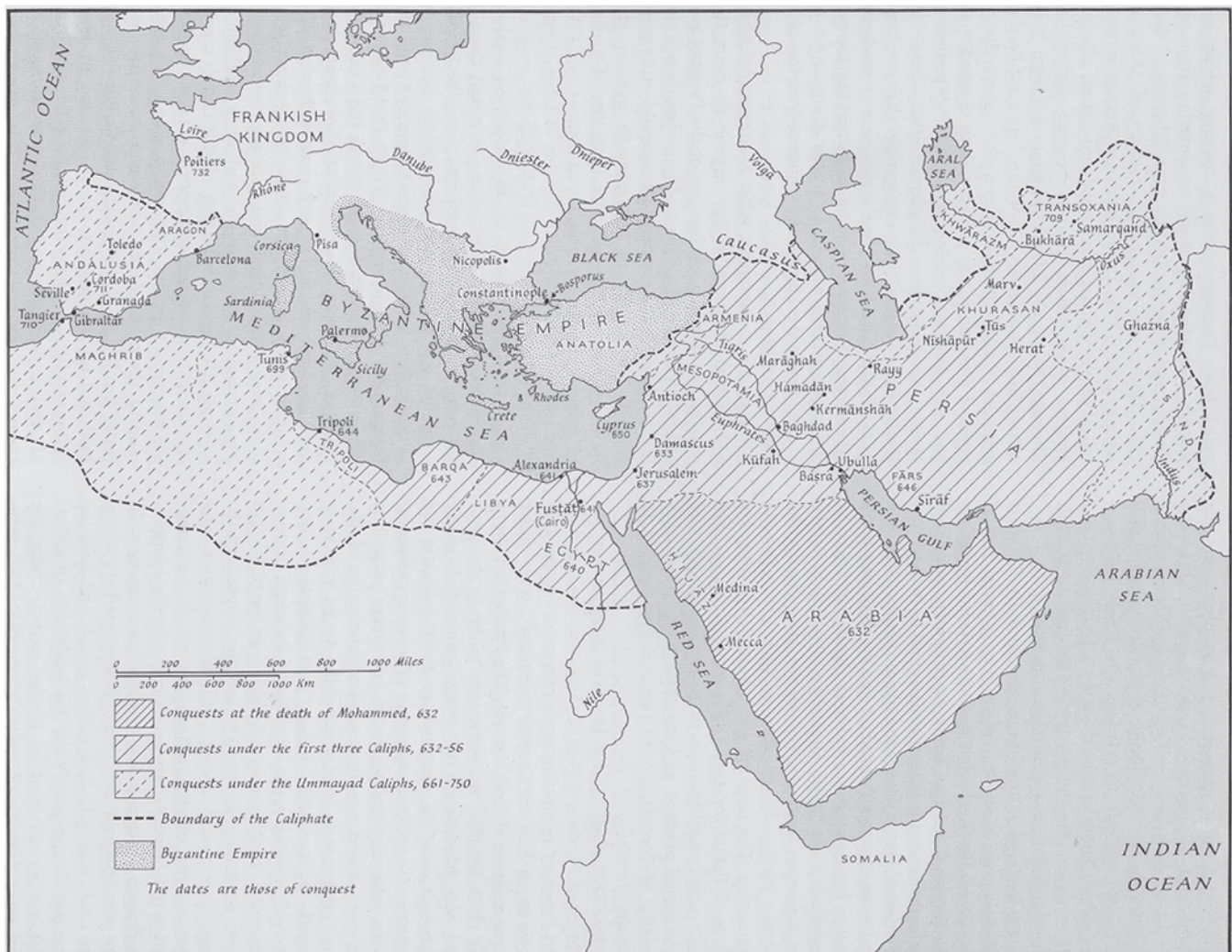


Figure 1. The caliphate at its greatest extent. (Map from R. M. Savory. [ed.], *Introduction to Islamic Civilization*, [Cambridge 1976], p. 17)

Plaster and stucco revetments, exposed or painted, were often used to protect the fragile mud-brick surface and to enlivened its drabness. Sometimes more expensive fired or baked bricks, alleviated with terra-cotta and glazed materials, were used as well. Fine stone masonry and carving were characteristic of much architecture in Anatolia, Syria, Egypt, Tunisia, and Morocco, as classical and Byzantine spolia were available in virtually unlimited quantities. The ready availability of large quantities of timber from Anatolia, western North Africa, and parts of Persia led to an extensive use of wood in Islamic architecture of the Near East.

Because of regional variations, several distinct architectural styles developed throughout the Muslim world. Despite their differences, these regional styles shared some common qualities that evolved over thousand years, defining Islamic architecture.

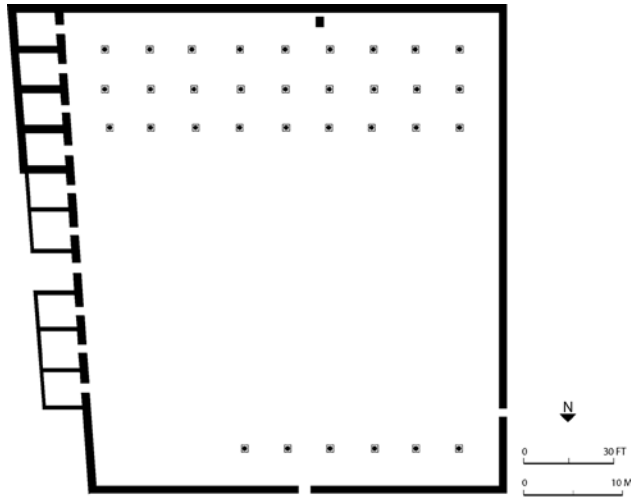


Fig.10-2

Figure 2. Conjectural reconstruction of the plan of the Prophet's house in Medina. (Drawing after Richard Ettinghausen and Oleg Grabar, *The Art and Architecture of Islam 650–1250*, [Hammondsworth 1987], p. 21)

These qualities, however, could rarely be found in the architecture of the earliest era of Islam, primarily because the prophet Muhammad and the four orthodox caliphs, Abū Bakr (632–34), ‘Umar (634–44), ‘Uthman ibn Affān (644–56) and ‘Alī (656–61), were unwilling to express religious ideals through architecture. They erected modest buildings that merely met functional needs. For example, the first mosque in Islam, built after the Prophet's migration to Medina in 622, was no more than a courtyard surrounded by mud-brick walls (fig. 2). A series of small rooms for him and his wives was attached to the east wall of the enclosure on the outside. Palm trunks were used as columns to support the palm-thatched roofs of the covered spaces at the edge of the courtyard (Ettinghausen and Grabar 1987).

Many scholars have wrongly suggested that the reason Muslims were unable to develop an architectural style of their own during the earliest years of Islam was because Arabs did not have a rich architectural tradition. They argue that the great majority of Arabs were nomads, and only a few “lived as traders in cities” (Ettinghausen 1994). In fact, archeologists are increasingly revealing more evidence for a sophisticated pre-Islamic Arabian

architecture (Saudi Arabia 1975). Even before the advent of Islam, Mecca was on the trade route between the rich incense lands of southeast Arabia, where architecture was highly developed, and the Hellenic-Roman cultures of Syria and Egypt. As a result, the city was constantly subject to external architectural influences (Gibb and Kramers 1953; Torrey 1933). The Ka’ba, located in the center of the Mosque of al-Haram in Mecca, is one of many examples of foreign architectural influences in Arabia (fig. 3). Evidence suggests that Byzantine craftsmen might have executed the surface mosaic inside this building when it was built in 608 (Creswell 1958).

While the early successors of the Prophet had remained in Medina, the Umayyads, the first Muslim dynasty of rulers (661–750), shifted the seat of the caliphate to Damascus in 661. They then felt the need to build impressive architecture to rival the existing pagan temples and Christian churches. They used late-classical, Byzantine, Sasanian, and Coptic elements generously in their architecture to achieve their goals. When the ‘Abbāsids (750–900) assumed power from the Umayyads in 750, they shifted the caliphate from Syria to Mesopotamia (modern Iraq). Here a new architectural style was developed using elements of Persian, Turkic, and Central Asian architecture. However, the Umayyad style of architecture continued to survive in the Islamic West (Maghreb: northwest Africa and Spain) until the eleventh century. In Maghreb, an Islamic dynasty was founded by a surviving member of the Umayyad house in 756, with Córdoba as its capital.

In the tenth century, the architectural style of the ‘Abbāsids met considerable resistance from the Persian princes, the Sāmānids, Ziyarids, and the Būyids. These local rulers focused their interest particularly on the Sasanian tradition. In Egypt, Syria, and Sicily, the Fātimids (990–1171), who ousted the ‘Abbāsids, showed a particular interest in urban architecture in cities such as Cairo. In the Maghreb proper, in the last years of the eleventh century, Fātimid rule was ended by the Almoravids and Berbers and their successors, the Almohads. Under the Almoravids and Almohads, the Umayyad architectural style gave way to a more sober Moorish style, found in Marrakech and Seville. In the thirteenth century, the Mamlūks took control of Syria, Egypt, and western Arabia. Their architecture possessed unprecedented proclamatory, political, and urbanistic

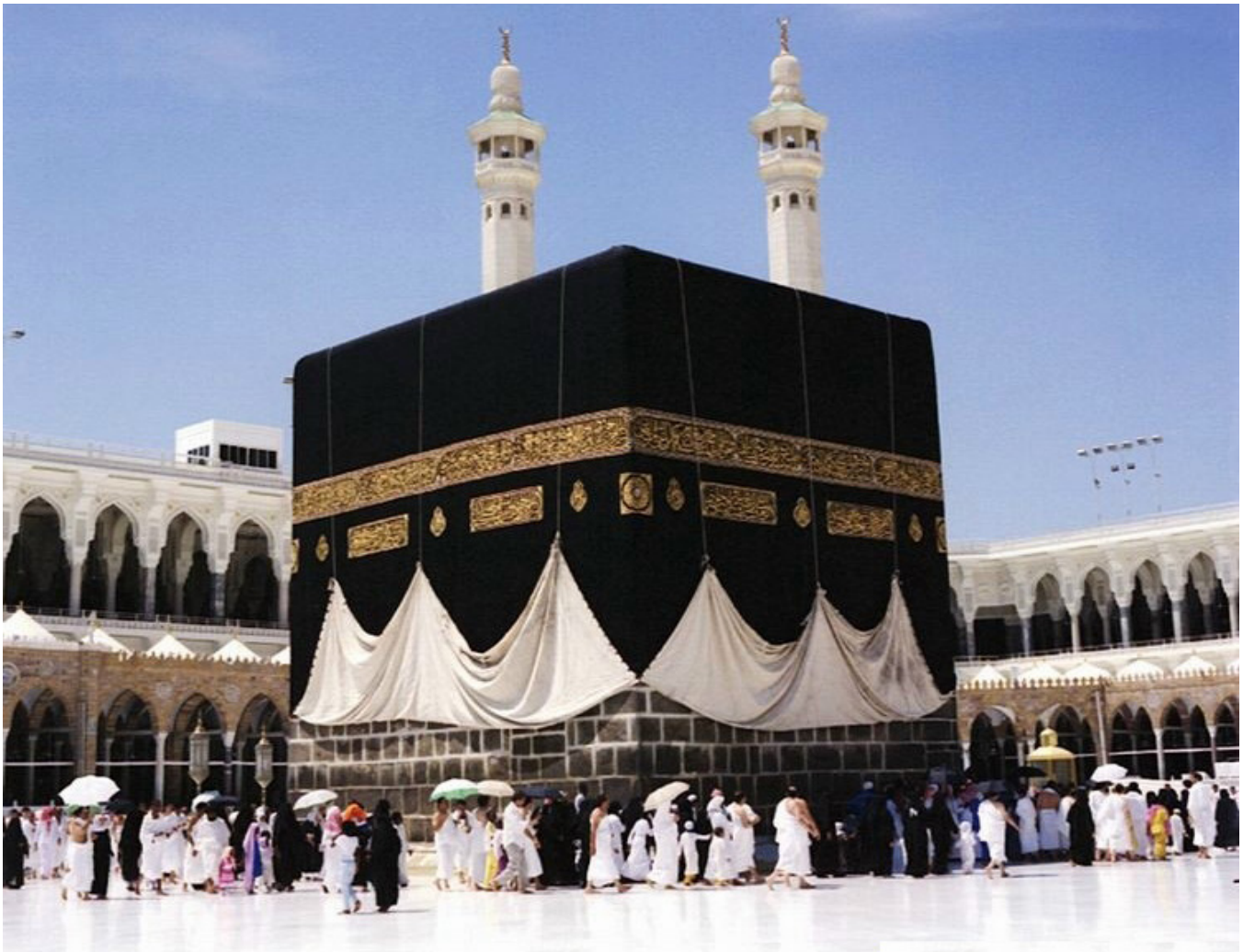


Figure 3. Even before Islam, the site of the Ka'ba was sacred as a pantheon of gods, and Arabs believed that Abraham had built the Ka'ba. Despite its religious importance, the Ka'ba was only a roofless enclosure during the early life of the prophet Muhammad. It was replaced in 608 by a covered building that was 36 by 39 by 49 feet (11 by 12 by 16m), with its walls built in alternate layers of wood and stone, and a roof supported on six pillars arranged in two rows. After Muslims took control of the Ka'ba and Mecca in 630, the Prophet converted the site into the Mosque of al-Haram. Since then, the stone-built Ka'ba has been reconstructed several times, preserving its ancient form. The Mosque of al-Haram had many later additions and modifications, most recently by the Saudis in the twentieth century. (Photo from <http://www.picturesofislam.com>, downloaded on 21 September 2006)

qualities. They had achieved these qualities through an ingenious design of huge building complexes with impressive street façades defined by minarets and *iwans* in tight urban situations.

The Seljuqs in Persia (modern Iran) and western central Asia (1038–1194) made extensive use of pre-Islamic Persian elements. They used fine-quality baked brick for construction and glazed tile for exterior decoration. In contrast, the Seljuqs of Rum in Anatolia (1077–1307) made use of Roman, Byzantine, Armenian, Persian, Mesopotamian, and Central Asian elements. They used stone, brick, and wood as primary building materials for their plain and conservative structures. The Ottomans in Anatolia (about 1300–1450), who ruled after the Seljuqs, fused Anatolian, Roman, and Byzantine elements in their architecture. They preferred brick and stone for construction and glazed ceramic tiles and marble fretwork for decoration. During the classical Ottoman period in the fifteenth and sixteenth centuries, stone was used for more important buildings and brick with stone for less important buildings. By the eighteenth century, European influences were evident in Ottoman architecture as well.

The Mongols in Central Asia (about 1250–1500) actively exchanged artistic techniques and motifs with China, leading to a great enrichment of the resources commonly available to Muslims. This artistic tradition of the Mongols reached its zenith with the Il-khanids and Timurids in the fourteenth and fifteenth centuries. The Safavids of Persia (1501–1706) combined ar-

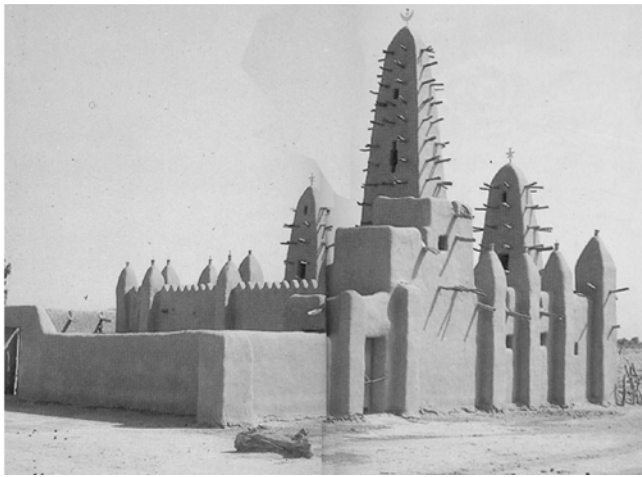
chitectural elements of the Mongols with those of the Persians. Their primary material was brick, with glazed tile on the interior and exterior as decoration. The Mughals in India (1561–1857) fused elements of Mongol and Persian architecture with those of Hindu architecture. Their primary building materials were red sandstone and marble. The Islamic garden reached perfection in the hands of the Safavids and Mughals in the sixteenth and seventeenth centuries.

Islamic Building Types

The mosque was by far the most common type of building erected by Muslims. It was also their most ingenious architectural invention. The mosque originated simply as a place set aside for prayer. The direction of prayer was indicated by the wall nearest Mecca, the *qibla* wall. Quite early it became the custom to identify this wall by placing in it a small semicircular niche, called the *mihrab*, which might have had its origin in Arabian pre-Islamic religious buildings (Serjeant 1959). Another element that became associated with mosques very early was the dome. In important mosques, it was placed on the axis of the mihrab, in front of it. It has been argued by some scholars that this dome was used to honor the importance of the caliph and his representative, who read *khutba* from a raised podium called *minbar*. The precedent here would have been the dome over the throne room of Persian kings. During the Prophet's lifetime, the call for prayer, the *adhān*, was made from the rooftop of a house. Later the minaret was used for this purpose when the community had grown larger. The minaret also served as a visual marker for locating the mosque from a distance and, after dark, for orienting travelers (when a lantern or other source of light was hung at its top). In addition to the mihrab, minbar, and minaret, a number of mosques provided a *maqsūra* (an open enclosure which provided a praying niche, made usually of an openwork screen) for the caliph or his representative.

Beyond minor regional and dynastic variation, many different formal types of mosques can be found throughout the Islamic world (fig. 4). The more predominant types are listed below:

1. A hypostyle hall type, with a flat roof, with the possible additions of one or more domes, approached from an axially placed front courtyard (believed by many scholars to have been derived during the early Islamic period from the Persian royal hall, the *apadana*), as seen in both Arabia and Africa. Some of the largest and most splendid early mosques—known as the Great Mosques—are hypostyle hall types. Examples include the Great Mosque at Samarra in Mesopotamia (modern Iraq) built in 847, the Great Mosque of Kairouan in Tunisia, built in 670 with many later modifications (see fig. 27), and the Great Mosque of Mahdiā, also in Tunisia, built in the early tenth century.
2. A prayer hall, with mud-brick or rammed-earth piers, arches, and walls, structurally strengthened on the outside by closely spaced buttresses, as seen in sub-Saharan Africa. Examples of this type include the Great Mosque of Djénné, the Great Mosque of Tombouctou, and the Sankore mosque in Tombouctou, all in Mali. All of them were built in the fourteenth century with many later modifications. (Also see fig. 4a.)
3. A large courtyard surrounded by a prayer hall, with multiple domes, on one side and by shade galleries on the other three sides, as seen in Arabia, North Africa, Egypt, and India. Examples of this type include the Great Mosque of Hama in Syria built in eighth century with many later modifications, and the Bādshāhī mosque in Lahore, Pakistan (1673–4).
4. A prayer hall with a sloping roof or superimposed roof in a pyramidal form, set within a walled area, as seen in the Southeast Asia. Examples of this type include the Great Mosque of Sumenep, the mosque in Sendangduwur, and the mosque in the Lake Singkarak area of West Sumatra, all in Indonesia (fig. 4d).
5. A four-*īwān* courtyard structure, mostly seen in Central Asia and Iran but not limited to these regions. Examples include the Masjid-i Jami in Isfahan, Iran, built in the eighth century with many later modifications, the Bibī Kānum mosque in Samarkand (begun 1399), and the Masjid-i Shāh in Isfahan (1612–37).
6. A prayer hall with its central area covered by a large dome, approached from an axially placed courtyard, characteristic of early mosques in Anatolia and Timurid mosques in Central Asia and Iran. Examples of this type include Yesil Cami (Green Mosque) in Iznik (1378–'91) and Üç Şerefeli Mosque in Edirne (1438–47), both in Turkey.



4a



4b



4c



4d

Figure 4. In addition to more well-known types, mosques throughout the Islamic world exhibit different forms, often derived from local building vernaculars. (a) This mosque in Tombouctou, Mali, with its pinnacled, buttressed, and trabeated construction, is typical of mosques built of clay. Known as the Dyula style, it was spread widely by the Dyula trading community as they moved around West Africa. (b) A thatched Friday mosque at Mamou in the Fautta Dallon highlands of Guinea, where the Muslim Fulani came to power in the sixteenth century. This design was adopted to mitigate the high rainfall of the region. (c) Many Chinese mosques are barely distinguishable from Buddhist or Confucian pagodas, with their elaborate systems of corbels and gabled tiled roofs characteristically sloping upward at the corners, like this mosque in Beijing. Minarets, which might have been a distinguishing feature, were forbidden, the call to prayer being made from behind the entrance. (d) This mosque in the Lake Singkarak area of West Sumatra, Indonesia, combines superbly exaggerated gables typical of the region with the tiered roof found in much Southeast Asian architecture. (Photos [a], [b], and [d] from Martin Frishman and Hasan-Uddin Khan. [ed.], *The Mosque: History, Architectural Development & Regional Diversity* [New York c1994]; photo [c] by Ronald B. Lewcock)

7. A prayer hall covered by a very large central dome supported by a series of half-domes and often approached from an axially placed frontal courtyard, as seen in the mosques of the later Ottoman empire. Examples include the mosque at the Şehzade Mehmet in Istanbul (mid-sixteenth century), the mosque at the Sülemaniye complex in Istanbul (1550–‘57), and the mosque at the Selîmiye complex in Edirne, all in Turkey (1569–75). (See fig. 33.)
8. A series of pavilions set within a walled area, as seen in China. An example of this type is shown in fig. 4c.

The *madrassa*—the college for the reading of theology and law—was another important religious building. It evolved in the central Islamic lands as a specialized building type so that teaching could be done outside of the mosques. The form of building was therefore closely related to that of the mosques in the region. The first madrassas are thought to have existed as

early as the year 1000 in Ghaznī (in modern Afghanistan). During the early eleventh century, the four-*īwān* plan was adopted for madrassas in Persia. Here the *īwāns* could serve as prayer halls and were connected to each other by dormitories of one or more stories. In especially large establishments of this type, such as al-Muntasiriya, the *īwāns*, with their residential complexes, were divided between the four legal schools of Orthodox Sunni Islam. This type of madrassa was adopted more or less unchanged in Mesopotamia (modern Iraq), Syria, Egypt, and Anatolia. In the Maghreb, it was altered to fit Moorish traditions, as in the Bū-Ināniyya madrassa.

The tomb was another common type of religious building built throughout the Muslim world. Although the Prophet disapproved of any commemorative architecture on graves and the Islamic orthodox tradition consequently frowned on it as well, a strong tradition of funerary architecture nonetheless developed. At first, tombs were designed as simple structures, but gradually they became more elaborate. They were often used as formal adjuncts of educational and charitable ensembles, such as the Sultan Hasan Complex in Cairo (fig. 5). The monumental tombs of late-Islamic periods, such as the Taj Mahal in Agra, India, have become some of the most famous examples of Islamic architecture.

Other Muslim religious building types included the *khānaqāh*, which were monasteries for Sufi Dervishes; *māristan*, or hospitals; Turkish *imarets*, or charity-kitchen; and *sabīl-kuttāb*, or drinking-water dispensaries, traditionally associated with elementary religious schools.



Figure 5. A view of the courtyard of the Sultan Hasan complex in Cairo, Egypt. This building complex, built between 1356 and 1363, included a madrassa, congregational mosque, and mausoleum. (Photo by Ronald B. Lewcock)

Muslims initially built their military buildings, including fortresses and citadels, known as, for example, *burj*, *qasr*, *ribat*, and *qala'a*, along the frontiers. But after the breakup of centralized power in the tenth century, cities were given defensive walls, and powerful citadels were built for protection. During and after the Crusades, citadels and fortifications became increasingly important in the Muslim world.

Residential structures built by Muslims included palace administration complexes, palaces, and private residential dwellings, with or without gardens. Few early palaces have survived in the Islamic world, because they were designed for display rather than for durability. Although they varied enormously in plan and scale over time, they tended to be agglomerations of units arranged around interior courts, such as the Jawsaqal-Khāqāni in Samarra, Mesopotamia (modern Iraq), and Fatehpur Sikri in India. In contrast, the urban dwellings of ordinary citizens in traditional Islamic cities, such as Fès and Tunis, Cairo and Damascus, Istanbul and Isfahan, Delhi and Lahore have often survived and exemplify some of the

The caravansary, an inn for the safe storage of goods and the accommodation of merchants and drivers of camel caravans, was one of the most important types of Muslim secular buildings. Caravansaries were built along the main trade routes. Often such a building had a four-*īwān* plan, in which the *īwāns* were connected by two-story passages—the lower story was used as stables and warehouses and the upper story sheltered guests. Other types of secular structures included public baths (fig. 6), warehouses, markets, shopping streets, and bridges, all of which testify to the continuous importance of overland trade in the Muslim world. At times they were simple structures, but often they were massive in scale, reflecting the power and wealth of their patrons.

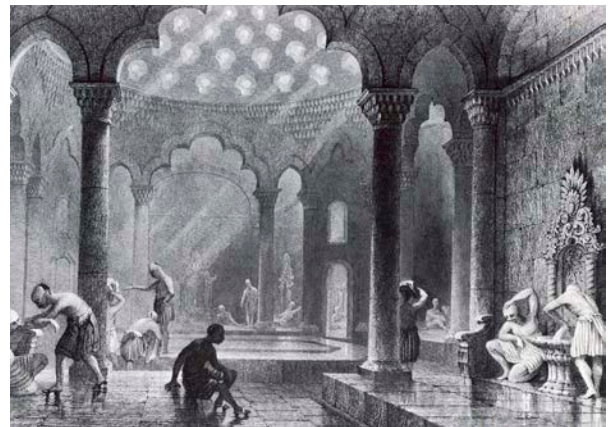


Figure 6. The warm room of a public bath in Istanbul. This nineteenth-century engraving shows the reservoir of warm water in the center and washing basins with piped hot water at the side, typical of dozens of public baths throughout the Islamic world. Note the pattern of fenestration that allows daylight to enter, and notice the rich ornament. The use of such baths was an important aspect of social life in Islamic regions. (Drawing from George Michell [ed.], *Architecture of the Islamic World* [New York 1978], p. 95)

richest and most ecologically adaptive building forms of Islamic architecture. The layouts, forms, materials, and decoration of these dwellings often show a remarkable degree of historical continuity despite the frequently changing sociopolitical and socioeconomic scenarios of Islamic cities.

The most prevalent form of dwelling in Islamic cities was the interior-courtyard type of house (fig. 7). The courtyard or courtyards of these dwellings provided both light and morning air. Each courtyard was either square or rectangular, and it often contained a garden with a pool or fountain, plants, and pavements. An urban dwelling with an interior rectangular courtyard open to the dome of the sky might have symbolized a microcosmic image of the order of the universe, or a paradise in its garden setting, as described in the Qur'ān.

In the traditional Muslim urban dwelling, decoration of the interior elements, such as the courtyard façade, was emphasized, and the street façades were usually left plain with a single portal as the main entrance. The main entrance did not give immediate access to the domestic quarters but led into a vestibule or a passage with a right-angle turn, so that a visitor could

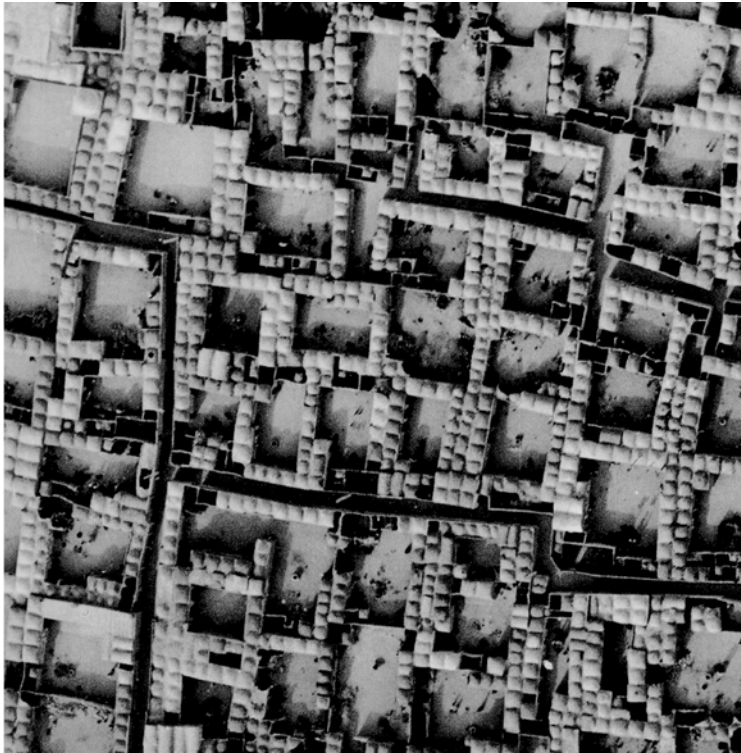


Figure 7. The urban dwellings of traditional Islamic cities present some of the richest and most ecologically adaptive building types in Islamic architecture. Most frequently organized around courtyards, these houses rarely have elaborate exterior façades, except for a single fine doorway. In this aerial photo of one quarter in El Oued, Algeria, a maze of narrow streets binds the separate properties into a distinct community. (Photo from Bernard Lewis [ed.], *Islam and the Arab World* [New York 1976], p. 109)

not see into the courtyard of the dwelling. Sometimes a house had a second entrance used exclusively by the women. Houses were frequently divided into two zones. The first, which responded to the injunctions in the Qur'ān encouraging hospitality, was exclusively for the reception of guests (men only, but women might use the same accommodation for the reception of their visitors when the men in the family were not in the house). The second, the *harem*, was closed to visitors except close relatives and was used for family living. In larger houses each zone might focus on a separate courtyard. In an urban setting, screened balconies allowed women to view the outside world without being seen. It also performed the important function of modifying the climate in the hot, arid areas of the Islamic world. In the interiors screens often separated the family living quarters from the reception rooms, so that men's gatherings and festivities could be observed by the women while they remained unseen.

An alternative type of dwelling, originally associated with mountain life, can also be found in the Islamic world. Here sloping sites and the relative insecurity due to the separation of villages from each other led to the adoption of tower houses without courtyards. This type of dwelling existed in pre-Islamic times in the fertile western mountain areas of

Arabia, including Mecca and Medina, and seems to have spread during the Muslim conquests to other mountainous areas, from Morocco to Afghanistan. It also appeared on the Red Sea coast, in town houses that were adapted to the high humidity with the addition of central air shafts. These town houses tended to have a usable roof terraces, sometimes associated with rooftop reception areas.

Islamic Gardens

Though the earliest of the extant Islamic gardens date back only to the tenth century, the history of Islamic gardens extends further, to the first decades of the seventh century, based on historical and archeological sources. The 'Abbāsids caliphal palace the *Jawsaqal-Khāqāni*, in the ninth-century capital of Samarra on the Tigris, contained 172 acres (70 ha) of gardens with pavilions, basins, and halls, on a property of 432 acres (175 ha). In 917 two ambassadors sent by the Byzantine emperor Constantine VII Porphyrogenitus to the caliph al-Muqtadir admired these gardens profusely (Creswell 1940, 232). Their report describes a high-



8a



8b

Figure 8. The garden was one of the most expressive of Islamic art forms. Carefully planned miniature gardens with trees, bushes, flowers, and central water basins or fountains were common in numerous houses, even those of people with limited means, in Muslim cities. (a) A town house in Isfahan, Iran. (b) A Mamlūk town house in Cairo. (Photo [a] from George Michell [ed.], *Architecture of the Islamic World* [New York 1978], p. 184; photo [b] by Ronald B. Lewcock)

ly sophisticated state of landscape architecture that combined an intricate geometrical layout with startlingly contrived features.

The well-known Islamic gardens that survive today are often associated with palaces. However, numerous houses of people with limited means in the early Muslim cities had carefully planned enclosed gardens with trees, bushes, flowers, and central water basins or fountains as well (fig. 8). These small gardens provide ample proof that the inclusion of a garden was widespread, indeed universal, in Islamic architecture. Moreover, gardens were important features not only to homes but also to mosques and mausoleums throughout the Muslim world.

The importance of gardens in Islam is confirmed by their use as themes in different media. The earliest pictorial depiction of plants in gardens occurred in the mosaics of the Dome of the Rock, completed in 691, and of the Great Mosque in Damascus, completed in 714–715 (fig. 9). Gardens appeared time and again in Persian and Mughal miniatures from the fourteenth century onward. Persian and Mughal carpets gave a more realistic representation of the garden, with blooming vegetation. These “garden” carpets managed to bring gardens indoors, and thus made the beauty of gardens perpetually available to their users (fig. 10).

Of the gardens themselves, the type in longest use was the *chahār bagh*, a rectangular garden or garden unit quartered by two water channels that intersected at right angles, or by four water channels meeting perpendicularly at a pool at the center (fig. 11). These reflect the Qur’ānic description of the four kinds of rivers: “Therein are rivers of water that does not alter, and rivers of milk the taste whereof does not change, and rivers of drink delicious to those who drink, and rivers of honey clarified and for them therein are all fruits and protection from their Lord” (47:15). Not only is the *chahār bagh* the basic garden throughout the Islamic world, but it has also served as an important motif in Islamic art.

Malik-Shāh was apparently the first person to use the *chahār bagh* in his city, Isfahan, after he ascended the throne in 1073. It was in Isfahan that the *chahār bagh* also achieved perfection under the Safavid rulers. Another place where it would attain its finest expression was in Mughal India. The first Mughal emperor, *Zahīr ud-Din Muhammad* (Bābur), brought *chahār bagh* to India from Central Asia, where he grew up during the Timurid period. It was probably known in Central Asia since the time of the Sāmānid rulers (Pinder-Wilson 1976).

The most important reason for the ubiquity of gardens in the Muslim world was, of course, the Qur’ānic promise of a heavenly garden in paradise as a reward for faith and purity: “Those who believe and do good deeds, We will make them enter gardens beneath which rivers flow, to abide in them for ever; they shall have therein pure mates, and We shall make them enter a dense shade” (4:57). The Qur’ānic promise had received further impetus from the Prophet himself, who after his night journey to the heavens and hells (known as *mi’raj*), made many specific statements as to the garden’s topography, its nature, and its inhabitants. It was these Qur’ānic and prophetic visions that Muslims were re-creating in their architecture, as is exemplified by the inscription on the audience hall in Delhi’s Red Fort, built by the Mughal emperor Shāh Jahān: “If

there is a paradise on earth, it is here, it is here, it is here.” Some sources suggest that these gardens were cosmological as well, representing celestial order (Schimmel 1976).

Islamic gardens were also used for recreation and pleasure, a tradition that had existed in the pre-Islamic Near East. Three of the most important elements of Islamic gardens—the close association of palace or pavilion and garden, the use of an ornamental pool or canal, and an emphasis on formal geometric composition—were already included in the palace complex of the Achaemenid king Cyrus the Great in the sixth century B.C. at Pasargadae (Brookes 1989). Yet another reason for the ubiquitous use of gardens was, of course, the geography of the Islamic world, which was located mostly in hot, arid zones. In such a hot climate, each garden easily represented a small paradise, with its water and shade trees.

Islamic Decoration

After the construction of the Dome of the Rock, decoration, particularly the decoration of interior surfaces, became an important aspect of Islamic architecture. Already in 714–15, the Great Mosque of Damascus was given one of the greatest surfaces of mosaic decoration in the known world. It is notable

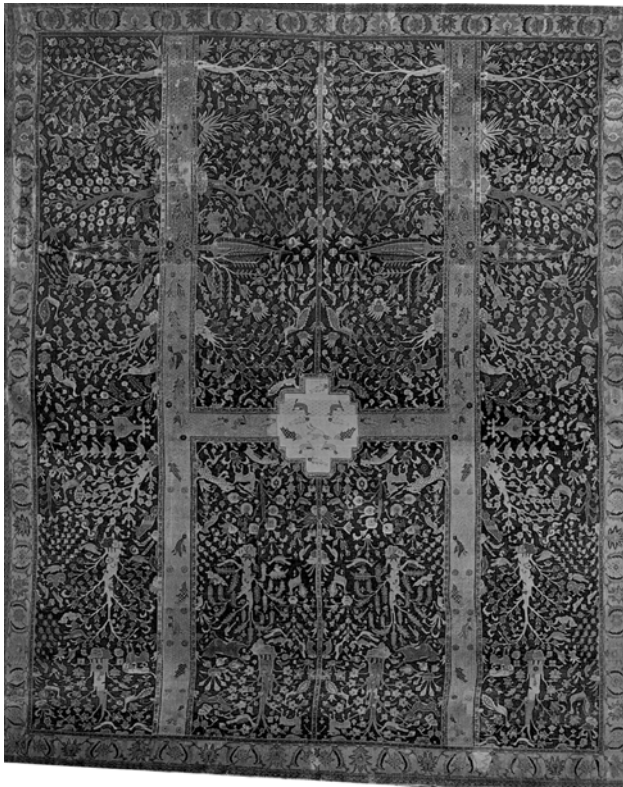


Figure 10. Persian and Mughal carpets gave a conventional representation of gardens with blooming vegetation. In this example, a Persian Safavid carpet woven in the seventeenth century, a garden is crossed by an H-shaped water channel swarming with fish. At the center of the garden is a pool in which ducks swim. A variety of trees, shrubs and flowers can be seen on the banks, and birds and animals can be seen in the undergrowth. (Photo from Bernard Lewis [ed.], *Islam and the Arab World* [New York 1976], p. 87)

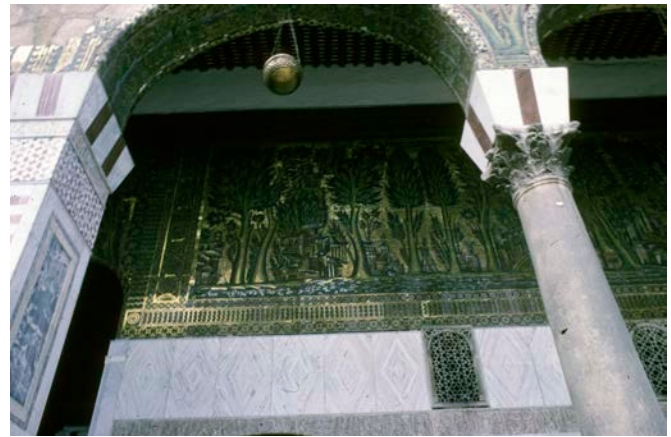


Figure 9. Among the earliest pictorial depictions of gardens in buildings are those in the mosaics of the Great Mosque in Damascus, completed in 714–715. The polychrome mosaics of the mosque show a continuation of late-classical traditions into Umayyad times. (Photo by Ronald B. Lewcock)

that this decoration covered the façades of the courtyards as well as the interiors. The slightly earlier Dome of the Rock provided some of the principles and elements of Islamic decoration to be used for the next thousand years (fig. 12). Among these principles of decoration were the use of regulating lines, or grids, to guide and control the decoration, the repetitious use of motifs, and the covering of entire surfaces with decoration. Among the decorative elements were inscriptions executed in various styles of calligraphy, an astonishing variety of vegetal motifs, the use of color, and of course, and the exploitation of natural light. However, one important element of later Islamic decoration that did not find its place in the decoration of the Dome of Rock was that of strong geometrical order. Though the layout and physical form of this building were strongly geometrical, no geometric order underlies its surface decoration, other than that ordained by the architectural elements. Presently the only place in this building where strong geometrical decoration can be found is in the dome, which was from a much later period (Grabar and Nusseibeh 1996).

Principles of Islamic Decoration

One significant aspect of Islamic decoration was that its organizing principles were seldom primarily dependent on the objects to which it was applied. The objects would naturally differ in form, scale, and material, and so would the techniques of decoration, which were never the same when the media were different. But Muslim artists did not consider these aspects to be limitations. They had used the same principles of surface decoration in architecture, textiles, books, ceramics, pottery, metalwork, woodwork, and any other medium of expression in Islamic art. Consequent-

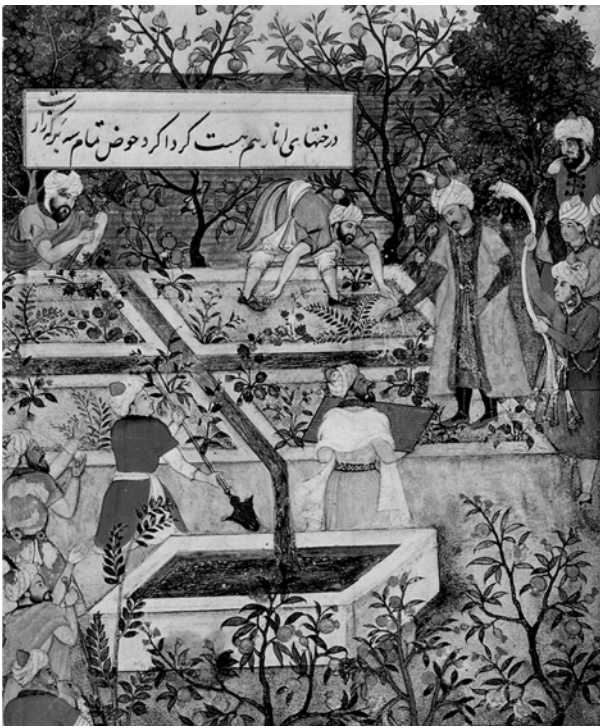


Figure 11. The most persistent of the Islamic garden types was the *chahār bagh*. In this Mughal miniature painting the emperor Babūr is supervising the laying out of a *chahār bagh*. (Illustration from Bernard Lewis [ed.], *Islam and the Arab World* [New York 1976], p. 86)

ly, the principles of decoration became the most important unifying aspects of Islamic art.

The available evidence suggests that Islamic surface decoration was perfected as an intricate overlay veiling the objects to which it was applied. When applied to architecture, the decorative overlay could make the demarcation between the permanent and the temporary, the structural and the nonstructural elements, disappear. The surfaces of walls, roofs, and structural elements could acquire the qualities of textiles such as curtains and carpets. The feeling achieved was that of a weightless form covered with expensive draperies (fig. 13).

The patterns of decoration in Islamic art and architecture were always controlled by regulating lines or grids. These grids tied different components of the decoration together into a consistent whole (fig. 14). Sometimes they allowed components to be removed from the surface without causing the whole to disintegrate. For example, a curtain or a carpet, which had formed an integral part of the surface decoration, could easily be removed when not needed without destroying the organization of the decoration. The primary grids of a decoration determined the composition of the whole; the secondary grids, the parts. Sometimes tertiary grids controlled parts within parts. The contours of a surface generally defined the primary grid; at other times, when the surface was very large, as in the case of the Great Mosque of Damascus, primary

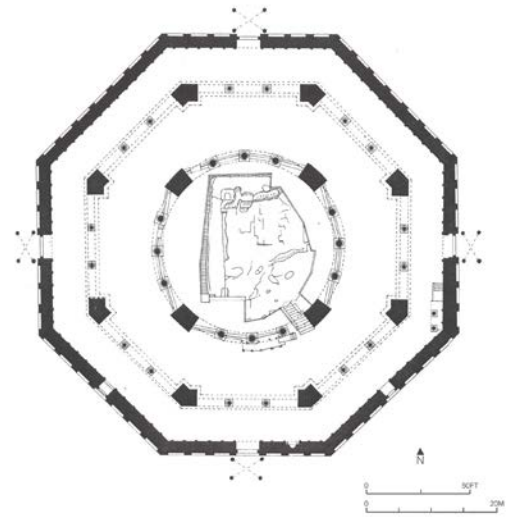


Figure 12. The Dome of the Rock in Jerusalem, one of the most important shrines of Islam, was built by the Umayyad caliph ‘Abd al-Malik. The Sacred Rock, or the Sakhra, underneath the building is associated both with Abraham’s sacrifice of his son and the prophet Muhammad’s night ascent to heaven. The octagonal building, about 157 feet (48m) in diameter, contains two ambulatories around a circular arcade with the Sacred Rock. The dome is placed on this circular arcade, and rises about 98 feet over the platform. The building can be entered through four doors placed on the cardinal points. Originally, decorated with colorful mosaics, the exterior of the building was redecorated with carved marble plaques below and colored tiles above in 1545–46. The interior of the building, sheathed primarily in mosaics with vegetal designs, is much closer to the original scheme. The geometric pattern on the inner surface of the dome is a reproduction of an original done by the Crusaders in the twelfth century. Inscriptions are an important part of the mosaics of the building. Except for one or two changes in the names of the patrons, these inscriptions are original. Architectural elements and construction techniques used in the building were derived mostly from a late-ancient-classical vocabulary. Building materials were taken from the spolia available in the city, modified in various ways before being used in the building. (Photo from <http://www.sce.carleton.ca>, downloaded on 21 September 2006; plan from Richard Ettinghausen and Oleg Grabar, *The Architecture of Islam* [Hammondsworth 1987])

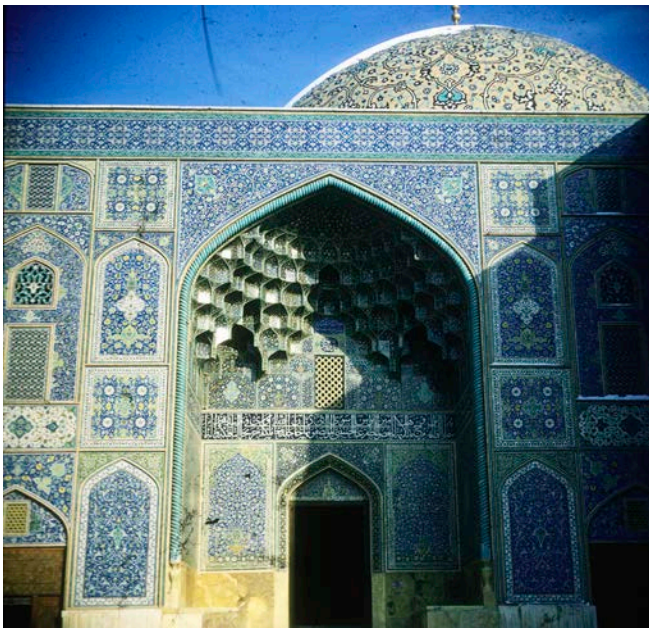


Figure 13. Islamic decoration was perfected as an intricate overlay to mask the substantial qualities of the objects it covered. The Masjid-i Shāh in Isfahan, Iran, built in the early seventeenth century, demonstrates the contrast between the undecorated and the highly ornate characteristic of late Safavid architecture. (Photo by Ronald B. Lewcock)

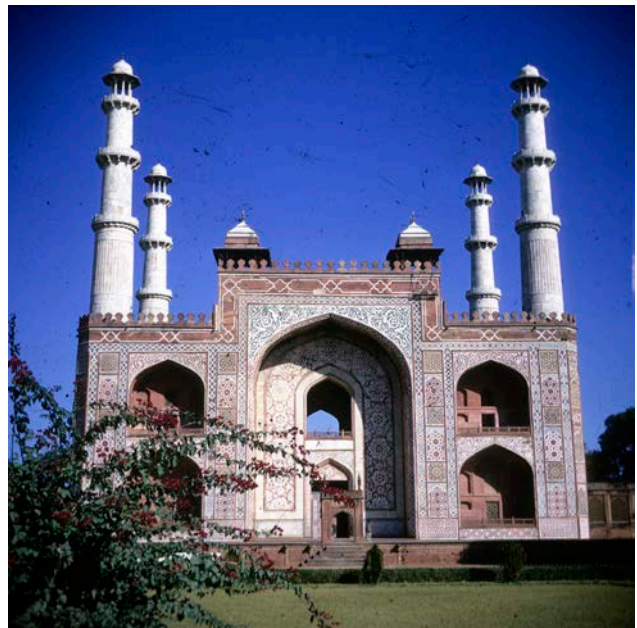
the physical materiality of the world. It has been argued that in the Islamic context this infinitely extensible design might be interpreted as a visual demonstration of the infinite extensiveness of Allah’s singularity. It represents the balance and proportionality of his creation, an indivisible unity that exists behind the multiplicity of manifested forms in physical reality. At the same time it could be read as a simple metaphor for eternity.

bands were used to define the grid on the surface (fig. 15). These bands could be of different material. For example, in Humāyūn’s tomb, these bands were defined by white marble strips on a red sandstone surface; in the Taj Mahal, they were defined by the moldings of the same material of the surface; in some Timurid and Ottoman examples, they were defined by bands of inscriptions or decorative patterns. Secondary grids controlled the patterns of the parts defined by the primary grid. They could contain the same element repeated several times, or they could contain several motifs, patterns, colors, materials, or inscriptions defined by the tertiary grids. In essence, the regulating grids of the decoration allowed Muslims to manipulate their decoration easily, while still integrating it with the overall design of the buildings.

In the decoration of Islamic art and architecture, particular attention was paid to the principles of repetition, permutation, and combination. Very frequently, a motif or a shape would be repeated numerous times, or it would first be transformed in different ways and then repeated, or it would first be transformed and combined in different ways and then repeated. In the end, any sense of materiality attached to the motif or to the shape would tend to be lost. Its appearance in a pattern so generated would only be a fleeting one, as only a part of a design that could be extended infinitely—and by implication beyond



14a



14b

Figure 14. The patterns of decoration in Islamic art and architecture were controlled by regulating lines or grids, as in for example, (a) the Shaykh LutfAllāh Mosque in Isfahan, Iran, and (b) the entrance gateway to the tomb of Akbar in Sikandra, India. (Photos by Ronald B. Lewcock)

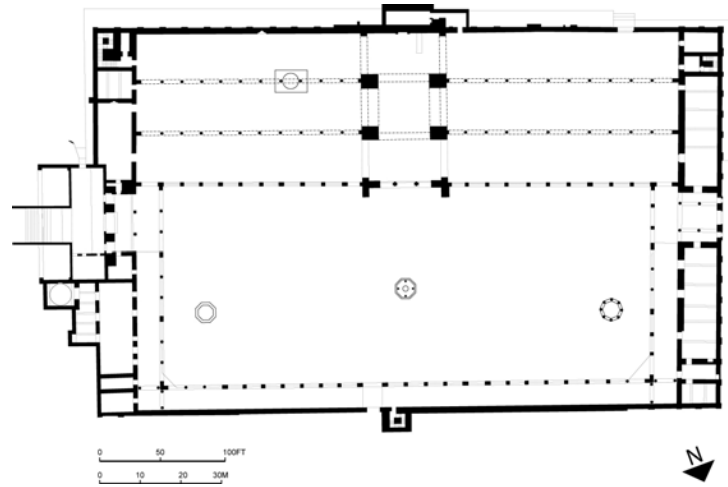


Figure 15. The Great Mosque of Damascus was built on the temenos of a pagan temple of the first century. It followed the walls of the temple, with the square towers at the corners of the temple serving as the minarets of the mosque—the first minarets in Islamic architecture. Only the southwestern tower remains, now surmounted by a minaret built in the 1480s. The north, east, and west sides of the court of the mosque have aisles covered with wooden roofs sloping toward the court. Three arcades running parallel to the south wall form the covered prayer area of the mosque. A broad transept, running from north to south, bisects these arcades. The floor of the mosque was paved with marble. A band of marble panel, with pilasters and marble grilles at intervals, ran all around the wall at a height of 16 feet (5m) from the ground. The frieze above the marble panel was decorated with long undulating vine-stem gilt, alternating with an acanthus scroll and grapes after the Dome of the Rock. A large section of the surface mosaic above the frieze, containing trees and little pavilions on a golden background, has been preserved in good condition. However, the most splendid piece of mosaic, showing the panorama of the Barada River, is on the back wall of the west portico. The origin of the regular pattern of hexagon groups used in some window grilles of the mosque can be traced back to the Roman period. (Photo of the courtyard by Ronald B. Lewcock; plan after Richard Ettinghausen and Oleg Grabar, *The Architecture of Islam* [Hammondsworth 1987])

The Basic Elements of Islamic Decoration

Calligraphy

Islamic architecture used inscription as a major form of decoration. Lines of literary inscription frequently encircle Muslim buildings, often at several levels. So important to Muslims were the words of Allah as enshrined in the Qur’ān that they integrated Arabic calligraphic inscriptions of verses from the Qur’ān in every sort of decorative scheme (fig. 16). There were two main scripts in early Islamic calligraphy: the angular *Kūfīc* and the cursive *Naskhī*. *Kūfīc*, the earliest form of calligraphy, was used extensively in architecture during the first five centuries of Islam. There were eight different types of *Kūfīc*,

among which were simple *Kūfīc*, foliated *Kūfīc*, floriated *Kūfīc*, and eastern *Kūfīc*. From the eleventh century onward, *Naskhī*, a cursive style, gradually replaced *Kūfīc*. *Thuluth* or *Thulth* closely followed *Naskhī* in its style, but in it certain elements, like vertical strokes and horizontal lines, were exaggerated. Among other cursive styles, *Taliq* was important. Out of *Taliq* developed *Nasta’līq*, a more beautiful, elegant cursive form of writing (Grube 1967).



Figure 16. Arabic calligraphy played a dominant role in Islamic architectural decoration. Examples of different types of calligraphy include: (a) simple *Kūfīc* from an Egyptian tombstone (790); (b) foliated *Kūfīc* from a tombstone at Kairouan in Tunisia (952), in which the vertical strokes end in leaves and half-palmettes; (c) floriated *Kūfīc* from an Egyptian tombstone (848), in which the endings of the letters are enhanced by the floral designs and half-palmettes, while the round forms are rendered as rosettes; (d) *Naskhī Kūfīc* from an Egyptian tombstone (1285), the cursive form of Arabic writing; (e) *Thuluth*, from the drum of the mausoleum of Princess Tughai in Cairo (died 1348), is more cursive, elegant than *Naskhī*; and (f) *Nasta’līq*, from the front page of the Persian poet Sadī’s *Gulistān* (1543), an elegant form of writing in which the horizontal lines and round forms are exaggerated, dots are casually placed, and lines are not always straight. (Illustration from Ernst Grube, *The World of Islam* [London 1967], p. 12)

Qur'anic inscriptions function as both representation and abstraction in Islamic art. As a part of Islamic decorative schemes, they provide powerful visual signs conveying specific religious messages and talismans protecting the whole building. For example, the inscription on the inner side of the octagonal arcade of the Dome of the Rock not only unites the decoration visually but also gives a consistent meaning to the building by sending messages to the Christian population concerning political authority. Similarly the decoration of al-Aqmar Mosque in Cairo is better understood when one realizes that the inscriptions on the exterior wall and on the *qibla* wall inside the mosque, which speak of Allah as a lamp in a niche, are taken from the "Light" chapter of the Qur'an. By implication, the role of the *qibla* wall in relation to the people inside the mosque thus is conceived to be similar to that of the exterior walls in relation to the people on the street. In the Mughal emperor Akbar's tomb in Sikandra, India, the inscription on the entrance, "These are the Gardens of Eden: enter them to dwell therein eternally," suggests that this mausoleum with its beautiful garden may represent paradise.

Architectonic Elements

In the decoration of Islamic architecture, a considerable number of elements that originally had a structural purpose were transformed into purely decorative devices and were incorporated into vast decorative schemes. A curious ambiguity remains at times with regard as to whether certain combinations of forms were meant to be decorative or structural or both.

The single most common architectonic element used in the decoration of Islamic architecture is the *muqarnas*: the stalactite or honeycomb construction. Basically, it is composed of units, each of which is a section of vault, arranged in rows corbeled on top of each other (fig. 17). The units of *muqarnas* could be made of wood, stone, ceramics, or stucco. The *muqarnas* provided a flexible way to articulate surfaces and to create three-dimensional ornamental effects that would tend to dematerialize the solidity of forms. In addition, it could be scaled to any need, from vast niches, entrances, or domes to the smallest details of construction or decoration. Some examples of the *muqarnas* from the eleventh or twelfth centuries indicate their original structural significance, but quite soon their decorative function at intersecting angles of surfaces became predominant.

Vegetal Elements and Arabesque

Vegetal ornament from various sources was taken to new heights of expressiveness in the decoration of Islamic architecture. The classical world provided the motifs of the acanthus and the acanthus scroll inhabited by human and/or animal figures, while Sasanian Persia and Mesopotamia contributed the palmette, the winged palmette, and the rosette. Vegetal elements, natural and abstract, were never static in Islamic decoration. Muslim builders gave them an expression of constant movement, either by relating them to the flow of calligraphy or by developing them in a kind of whirl of moving tendrils and leaves. The tendrils would frequently seem more striking than the leaves and flowers, giving a great sense of energy to the ornaments in Islamic decoration.

In arabesque decoration similar vegetal motifs were used in more stylized and complicated patterns (fig. 18). This type of decoration suggests a limitless, rhythmical alternation of movement in several directions, conveyed by the repeated and interlaced curved lines or tendrils. Despite the suggestion of movement, arabesque decoration generally produced a well-balanced design. The development of the arabesque, from the classical vine tendril to extreme stylized forms, happened quite early in the history of Islamic architecture. The stone carvings on the

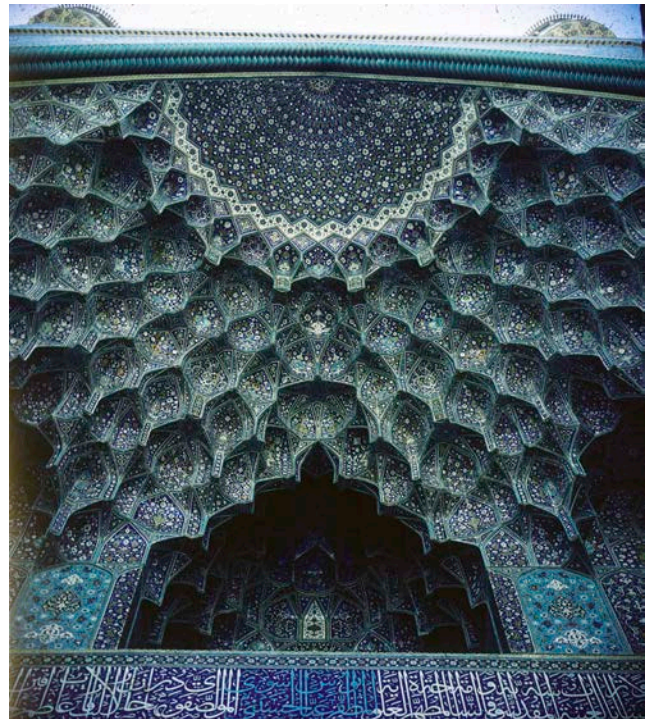


Figure 17. The dome became increasingly important in Islamic architecture after Seljuq times. Though a structurally stable form in itself, it was difficult to place it over the square base that usually resulted from rectilinear planning. By the tenth century, Islamic architects had developed a technique for bridging the corners between the walls using tiers of superimposed arches and so converting the square successively into eight-, sixteen-, and even thirty-two-sided polygons. Eventually these arches were organized according to a complex interlocking geometry to produce the *muqarnas*. Shown here is the *muqarnas* at the entrance to Masjid-i Shāh in Isfahan. (Photo by Ronald B. Lewcock)

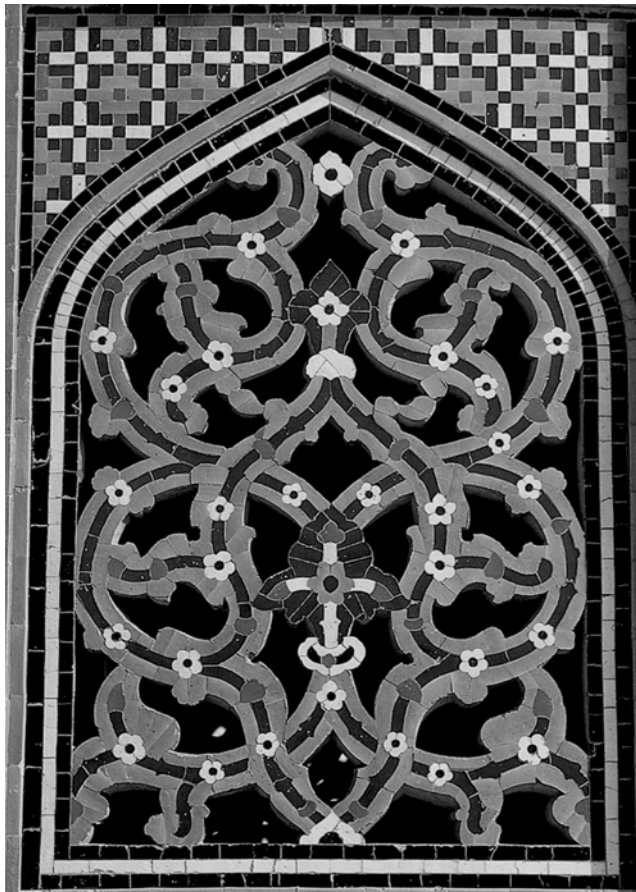


Figure 18. The drum of the LutfAllāh mosque in Isfahan has a classic arabesque of stylized plant stems, twining upon each other to form a beautiful fretted mosaic. (Photo from Francis Robinson, *Atlas of the Islamic World since 1500* [Oxford 1982] p. 204)

Human and Animal Figures

Muslims believe that the representation of human or any other living beings in religious buildings is prohibited, although the Qur’ān contains no such direct prohibition. Some Qur’ānic verses, however, forbid idolatry. One Hadith (of somewhat dubious authenticity) states that “no angel enters in a house where there are images”; this might be interpreted as a prohibition against the representation of living forms, at least in religious buildings (Grube 1967). On the other hand, it is possible that, by images, the Prophet had meant idols. Some scholars believe that the Islamic attitude toward imagery may have been a political stance taken by Muslim rulers to differentiate their visual art and culture from that of their Christian counterparts, which already had an immensely rich and sophisticated visual culture heavily dependent on the iconography of figurative representation (Grabar 1973).

Human and animal forms, however, were used in the decoration of Islamic secular architecture even during the early period of Islam. The Umayyad desert palaces built from the late seventh century onward contained human forms represented in various ways. In practically no period of Islamic culture were figurative representation and painting suppressed, except in the religious sphere, in which idolatry was feared. Mosques and mausoleums were without figurative representation, but elsewhere imagery seemed to have been an important element, and many other pictorial traditions were assimilated in Islamic art during its long history. However, because imagery was not used in the religious sphere, a primary domain of Islamic culture, Muslims inevitably looked to other forms of decoration.

façade of the eighth-century Mshattā palace consist of repeated triangular units enclosing curving vegetal scrolls. The motif here already has the great intricacies, the dense ingrown qualities, and the symmetrical arrangements associated with the arabesque proper rather than with its antecedents in Coptic Egypt, classical Syria, and Sasanian Mesopotamia. By the fourteenth century, arabesque decoration was used on a large scale as monumental ornamentation for building surfaces, especially in Persia and Central Asia. In these regions, Chinese motifs were introduced as well, perhaps copied from pottery and textile originals. As a result, cloud bands, lotuses, and peonies were inserted, and masks and animal forms were combined with arabesques.

Vegetal motifs and arabesque had many uses in the decoration of Islamic architecture. In some cases they formed a discreet background for more significant decoration, such as calligraphy. In other cases their use as a foil played a role as important as the decorative elements they supported, as in the vegetal interlace that constitutes the infill for polygonal patterning on carved woodwork. In still other cases, they were used as borders to separate one field of ornament from another. The use of color, based on the internal logic of a vegetal scroll, enhanced the coherence of the decorative scheme as well.

Muslim artists’ use of vegetal motifs suggested in general terms the abundance of Allah’s creation. Sometimes vegetal motifs were also used to evoke the image of a paradisiacal garden with its dense vegetation, as described in the Qur’ān (78:16; 80:30). These motifs may have also suggested the celebration of fertility to Muslims living in a predominantly harsh desert or semidesert environment.

Color

Without the judicious use of color, Muslim builders could hardly have achieved the ephemeral qualities of their architecture. Color schemes, whether monochromatic or polychromatic, were used in a complementary manner with other available means of decoration to achieve desired effects. Colors were applied on both the exterior and interior surfaces of Islamic buildings. In general, Muslim builders used colors to avoid giving any undue prominence to any single element in the decoration of their buildings. Colors were also used to create a relaxing and tranquil effect as opposed to a restless and disquieting effect. Even when vividly contrasting colors were used, a sense of conflict rarely existed in Islamic decoration.

In earlier Islamic buildings of the seventh and eighth centuries, colors were used primarily to connect buildings to nature (fig. 19). Early builders did not intend their colors to suggest any particular Islamic ideas: In the Dome of the Rock in Jerusalem (687–691) or the Great Mosque of Damascus (705–715), a great deal of color was used but only to add to what might have been the general theme of the decoration of the building. In later buildings, however, colors embodied meaning. For example, throughout the eastern Islamic world, the seven colors of the traditional palette of the tile workers, known as *haft rang*, corresponded with the sanctified seven heavenly bodies. According to the twelfth-century Persian poet Nezâmî, the colors of the seven heavenly bodies were black, yellow (or gold), green, red, blue, sandalwood (or brown), and white (or silver) (Michaud and Michaud 1996).

The two most important techniques used by Muslim builders to add color to their buildings were mosaic and tiling. In some cases, wall painting and stained glass were also used to achieve colored effects. In the earliest known examples of Islamic architecture, such as the Dome of the Rock at Jerusalem and the Great Mosque of Damascus, mosaics were used to lend colors. In these early buildings, glass tesserae were applied on walls and stone tesserae on floors. The last major program of mosaic decoration in Islamic architecture was probably the restoration of the Aqsâ Mosque in Jerusalem during the reign of the Fâtimid caliph al-Zahir (1021–36). Mosaic was thereafter replaced by glazing on bricks and tiles.

In the ninth century, Muslim potters in Baghdad invented faience in their efforts to imitate Chinese porcelains. Although not used immediately in architecture, faience coloring became increasingly popular in the eastern Islamic world from the eleventh to the fifteenth century. It was practiced with great skill by the Persians and Central Asians and later by the craftsmen of Anatolia. Under the Il-khans, Timurids, and Safavids, the use of ceramic mosaic in architectural decoration reached an unprecedented level of quality. Flat surfaces as well as curved vaults, *iwāns*, domes, and minarets were often covered with uninterrupted faience mosaic, with a predominance of cobalt blue, sometimes completely hiding the masonry both internally and externally.

By the fourteenth century, tile mosaic or cut-tile decoration was also being used in the western Islamic world by the Marīnids (1196–1549) in Morocco. Unlike the eastern Islamic world, where blue predominated, the main colors in the west were green and light brown, usually on a white background. The floors often had glazed highlights or were completely covered in tile, unlike those in the east. In the western Islamic world, even the piers and columns in courtyards were covered in tile, as in the ‘Attārīn madrassa in Fès (1323–25) and the Bū ‘Ināniyya madrassas in Salé (1341–42) and Fès (1350–55).

Cut-faience began to be replaced by a simpler method using mainly square tiles in Turkistan during the fifteenth century and in Persia at the end of the sixteenth century. Because the style and color range of the earlier period were retained, the change in technique was not apparent except at close quarters. A certain loss of surface quality was inevitable, but the great

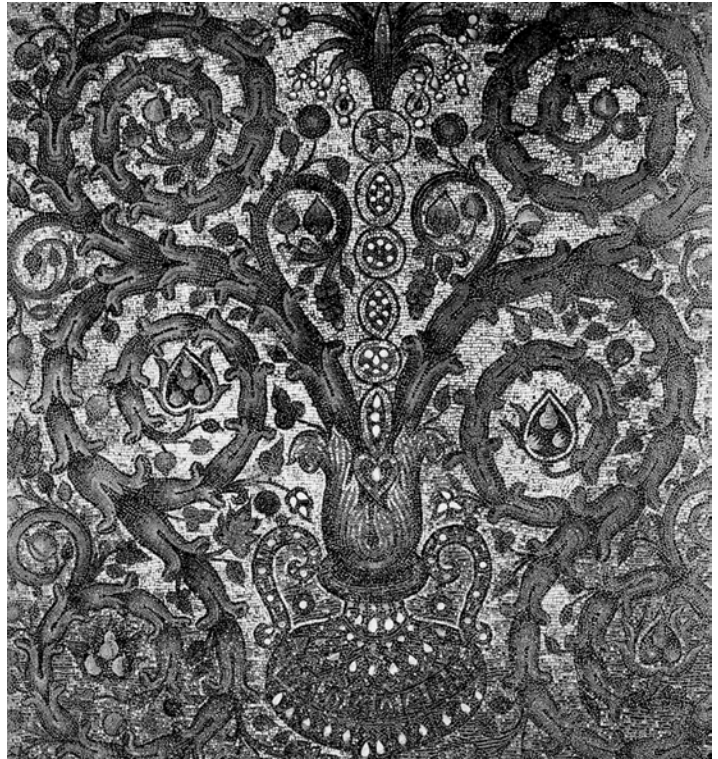


Figure 19. A colorful mosaic panel from the circular arcade of the Dome of the Rock, the earliest Muslim monument. The colors were selected to enhance the naturalistic effects of the vegetal motif. (Photo from Said Nu-seibeh and Oleg Grabar, *The Dome of the Rock* [New York 1996], p. 118)



Figure 20. Glazed tiles used as veneer over a brick core, like those used in this Baghdad mosque, were common in the Islamic world from ‘Abbāsīd times onward. Their use reached its zenith in Iran and Turkey during the sixteenth and seventeenth centuries. (Photo by Ronald B. Lewcock)

miniature paintings, written documents, and in other art forms, so much so that many scholars attributed the Muslim builders’ enthusiasm for color to the “obsession with textiles” of Islamic societies in the Middle Ages (Ettinghausen 1976; Golombek 1988).

Light

Light is the central trope of the Qur’ān. It refers not only to Allah, but also to the holy book, the religion, the believer, and the path to be followed by a believer (Qur’ān 2:257, 24:40, 33:45–46, 42:52, 64:8). The most important use of the term *light* in the Qur’ān is probably that in the following verse: “Allah is the light of the heavens and the earth; a likeness of His light is as a niche in which is a lamp, the lamp is in a glass, [and] the glass is as it were a brightly shining star, lit from a blessed olive-tree, neither eastern nor western, the oil whereof almost gives light though fire touch it not—light upon light—Allah guides to His light whom He pleases, and Allah sets forth parables for men” (24:35).

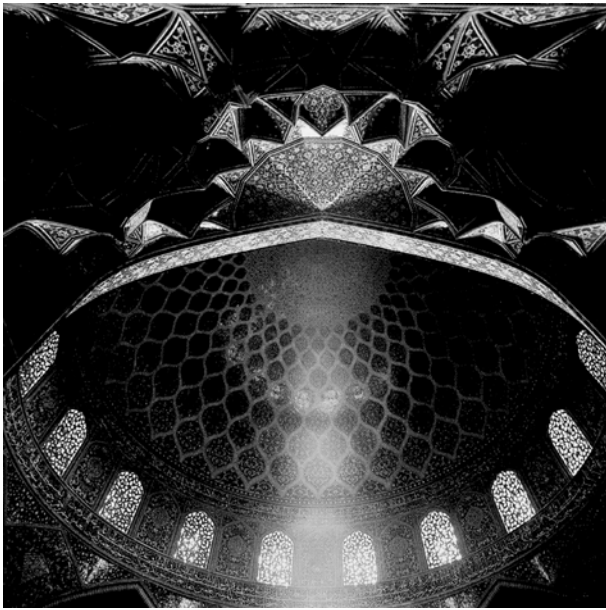
Since light is the only experiential element used in the Qur’ān as an analogy for Allah, Muslim builders naturally used it as a primary experiential dimension of their architecture. That Muslim builders were preoccupied with the use of light in their structures from the very beginning of the history of Islamic architecture is demonstrated by the careful use of the effects of natural light in the Dome of the Rock. The importance of light is also evident in the enormous amount of attention given to the decoration of screens in window openings in Islamic architecture from the earliest times.

Two-dimensional or three-dimensional surface articulation would certainly be sterile in Islamic architecture without the careful use of light. Similarly, a sense of weightlessness or ephemerality simply would not exist in Islamic architecture if light did not play its part. Light highlights the rhythms through its variation across the *muqarnas*. It separates the dome from the body on which it was physically and structurally dependent. It reflects on surfaces carefully articulated with different colors, patterns, and shapes. It filters through screens meticulously perforated with intricate patterns (fig. 21). Light also adds a time dimension to Islamic architecture, frequently producing different effects at different times of the day. The ribbed dome appears to rotate with changes in daylight. Sometimes the luminosity of a surface changes with light. And, as the same form assumes different levels of complexity due to changes in lighting conditions, the observer becomes aware, through direct experience, of multiplicity in unity.

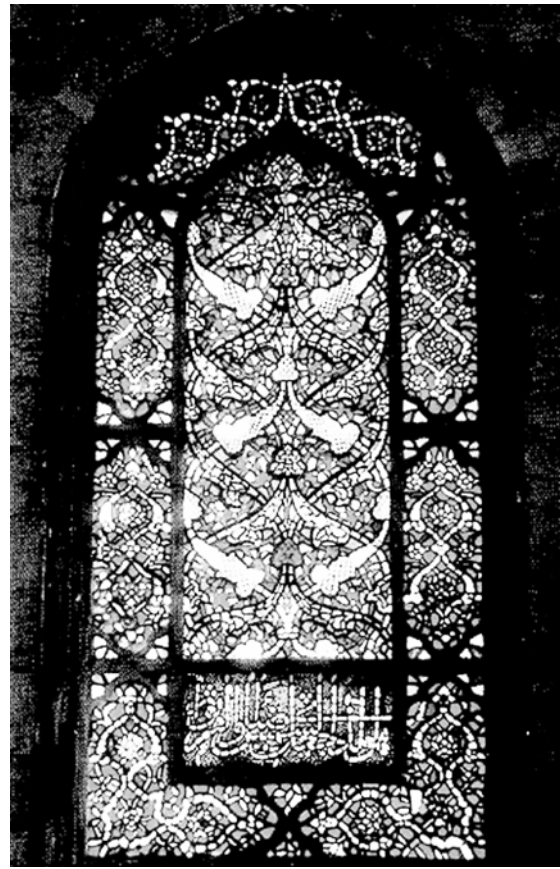
savings in time, labor, and cost were thought to justify this trade-off. The buildings of the Registan complex of Isfahan were decorated with figural compositions consisting of small, individually designed square tiles covering the surfaces of entire walls (fig. 20). This practice was followed in many ‘Abbāsīd buildings of the time. The same technique was used by the Turks, who employed huge quantities of faience tiles made in Iznik in western Turkey to decorate palaces and mosques. One trademark of the Ottoman builders was to add large panels in particular shade of red to this type of ceramic mosaic.

Colored transparent glass was used throughout the Islamic world for the windows of both religious and secular buildings. This tradition is as old as Islam and was adopted from Byzantine art. It was employed in eighth-century Umayyad desert palaces and the ninth-century Abbāsīd palace at Samarra. Fragments of colored glass were also found in such North African excavation sites as al-Mansuriyya (tenth century) near Kairouan and Qal’at at the Bani Hammād (eleventh century) in Algeria. Stained glass became more common in later periods, when distinct regional trends emerged.

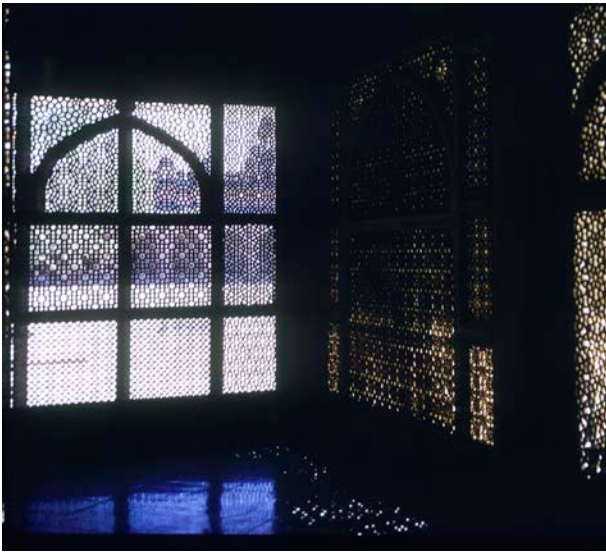
Textiles were another important medium used to provide color in Islamic architecture. Doorways were often hung with curtains; hangings made an open colonnade a private place; the bare floors, sometimes of dirt, were often covered with carpets and mats. In gardens, spaces for royal receptions were created by spreading colorful cloths and rugs inside tents. Ample evidence for all these is found in



21a



21b



21c

Figure 21. To enhance the effects of natural light, shining mosaic faience, ceramic tiles, and stained glass were often used in Islamic architecture. (a) At Shaykh Lutfallah Mosque in Isfahan, Iran, colorful glazed tiles enhance the effects of light. (b) A colorful glass window from the Süleymaniye mosque in Istanbul. (c) Meticulously perforated screens often produce beautiful shadow patterns and give interior spaces a sense of softness, as well as a sense of mystery, as at the tomb of Salim Chisti in Fatehpur Sikri, India. (Photos [a], [b] from George Michell [ed.], *Architecture of the Islamic World* [New York 1978], p. 117, 152; photo [c] by Ronald B. Lewcock)

Geometry

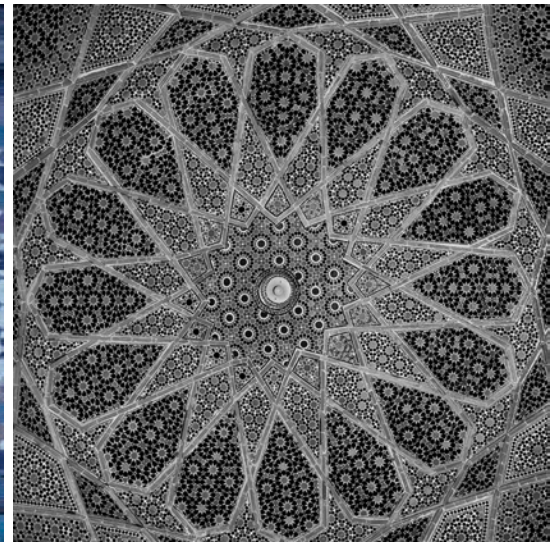
In the absence of figural representation, geometry played a particularly important role as an abstract means of representation in the religious art and architecture of Islam (fig. 22). But its use was not limited to the religious sphere. Through the practical art of geometry, Islamic architecture established a direct connection not only with mathematics and science, but also with the other forms of Islamic art, such as music, poetry, books, textiles, and woodwork.

That the relationship between architecture, mathematics, and geometry was quite strong in the Islamic world is attested to by the fact that the Arabic word *handasa* (of Persian origin) means both “geometry” and “architecture-engineering.” A number of well-known Muslim geometers and mathematicians were involved in building design as well. The mathematician Ahmad ibn Muhammad al-Hasib was responsible for the restoration of the Nilometer at Roda in Egypt in 861–62. Shaykh ‘Alam ad-Din Qaysar was both an architect and a famous astronomer and mathematician (Lewcock 1978). The renowned fifteenth-century Timurid architect-engineer Ustad Qawam al-Din Shirazi was skilled in engineering, geometry, architecture, and drawing (Thackston 1989).

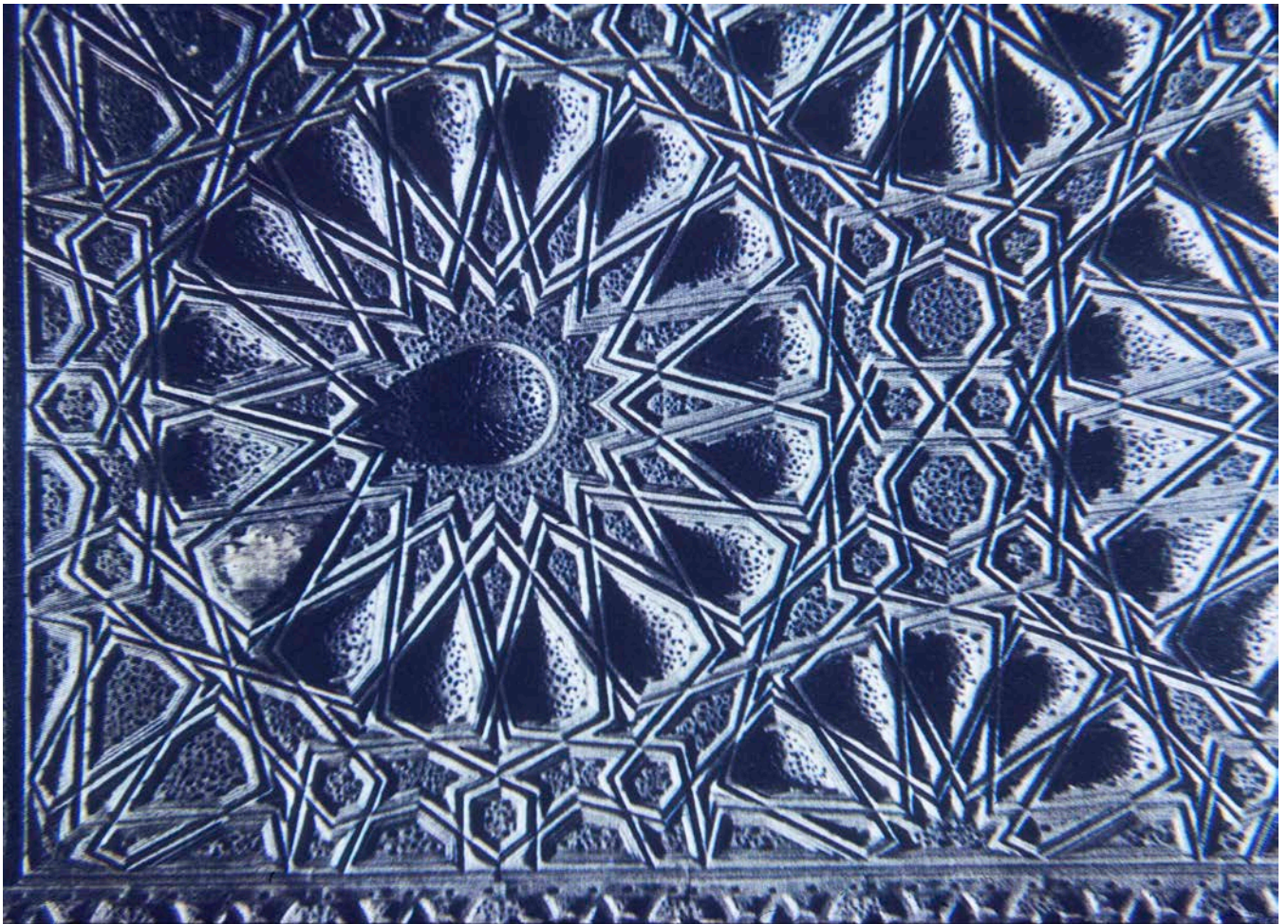
Geometric patterns were used in conjunction with vegetal and animal motifs during the early period of Islam. After the tenth and eleventh centuries when restrictions against animal forms became explicit in Islamic art, mostly due to Sunni ortho-



22a



22b



22c

Figure 22. Geometry was an important means of representation in Islamic architecture. Geometric patterns of decoration, such as the star, with six, eight, sixteen, or more points, can be seen in all sorts of buildings in the Muslim world. They were particularly important in Islamic religious architecture, where figural representation was discouraged. (a) Tile mosaic dado, like that in the Sa'dian tombs at Marrakesh, Morocco, are typical of the Maghreb. (b) The radiating geometric pattern based on interlaced stars in the dome of the tomb of the poet Hāfez at Shīrāz, Iran. (c) Complex geometric patterns were common on all surfaces, including doors as found at the madrasa of Sultan Hasan in Cairo. (Photos [a], [c] by Ronald B. Lewcock; photo [b] from George Michell [ed.], *Architecture of the Islamic World* [New York 1978], p. 149)

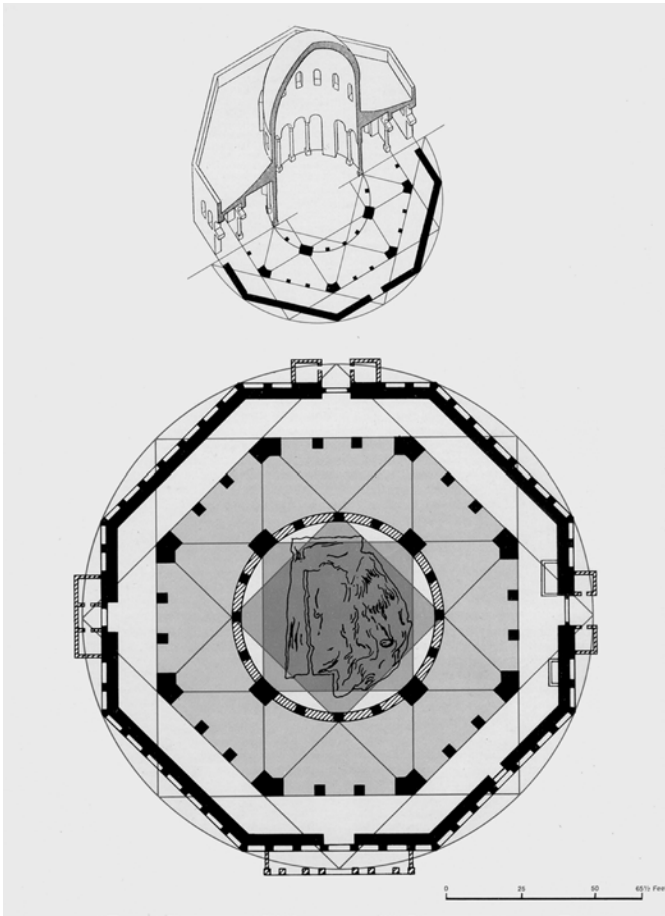


Figure 23. In the layout of the Dome of the Rock in Jerusalem, builders followed a very simple geometrical order based on rotated squares placed in the circle that circumscribes the exposed part of the Sacred Rock. (Drawing from K. A. C. Creswell, *A Short Account of Early Muslim Architecture* [Hammondsworth 1958], p. 19)

and the radii (Allawi 1988). Numerous monuments in Central Asia, Syria, Turkey, Iran, and India adhere to a strict geometrical order (Golombek and Wilber 1988; Goodwin 1987; Grabar 1990; Holod 1988; Kuran 1988; Necipoglu 1986, 1995; Qasir 1988; Tabbaa 1988). Islamic gardens, especially the *chahār bagh*, also demonstrate the use of geometry in their layout. In fact, for some Islamic architectural styles, geometry worked as the unifying force at all levels of building design (fig. 24). For example, of Timurid architecture in Central Asia and Persia, Golombek and Wilber have observed: “What supplies the unifying force to Timurid architecture . . . is the geometrization of design, structure, ornament, and space. Geometry in Timurid architecture is not merely a means to an end, but an end in itself—an underlying theme, an aesthetic principle. A building must not only have a geometric skeleton, but in the final analysis it must look ‘geometric.’ Geometry is as much a theme of architecture as it is of decoration” (Golombek and Wilber 1988, I: 216).

Despite the ubiquitous use of geometry, very little is known about the possible meaning the architect might have attached to its use in Islamic architecture. Muslim mathematicians such as al-Buzjani (d. 998) and Giyath al-Din Jamshid Mas’ud al-Kashi (d. 1429) wrote manuals explaining basic geometric principles and their applications in architecture. These manuals, however, were not written to propose some kind of normative theory of an architecture based on geometry, such as those found in Renaissance treatises. Instead, they were intended to simplify and popularize mathematical knowledge for the mathematically untutored. (For more information on these manuals, see Necipoglu 1995.)

Without any surviving text by Muslim builders on the meanings of geometry in their work, our knowledge remains incomplete. Some writers have proposed a mystical interpretation of geometry, suggesting it is a visual manifestation of certain Islamic ideas using symbolism (Al-Faruqi 1970a, 1970b, 1973; Ardalan and Bakhtiar 1973; Burckhardt 1954, 1967; Critchlow 1976; El Said and Parman 1976). But these scholars have provided no contextual historical proof to support their

doxy, the emphasis in decoration shifted markedly to geometric patterns, making them a major decorative art form. During the Ottoman, Safavid, and Mughal periods, vegetal motifs were favored, although geometric patterns were still in extensive use.

Little research has been done on the use of geometry in the volume, height, shape, size, and layout of buildings. However, available evidence leads to a reasonable conclusion that Muslims were keen to use geometry in every aspect of building design and that they used geometry both as a regulating device (that is, as a means to control the disposition of different elements of a building on the basis of some underlying geometric schema), as well as a generating device (that is, as a means to generate different elements of a building on the basis of some basic geometric rules). For example, in the layout of the Dome of the Rock in Jerusalem, Muslim builders followed a very simple geometrical order based on rotated squares placed in the circle that circumscribes the exposed part of the Sacred Rock, as shown in figure 23 (Creswell 1958). This method, known as squaring the circle, was used by Muslim builders to solve some of the most complicated problems of practical geometry, such as the design of the *muqarnas*.

Less known buildings from the early periods also showed strong adherence to geometrical order in their layouts. The Umayyad palaces at Minya and Mshattā followed a curious system of successive symmetrical subdivision of the interior into three sections (Creswell 1958, 84, 127). The layout of Baghdad, started in 762 by Caliph al-Mansūr, followed a rigid geometric scheme based on concentric circles

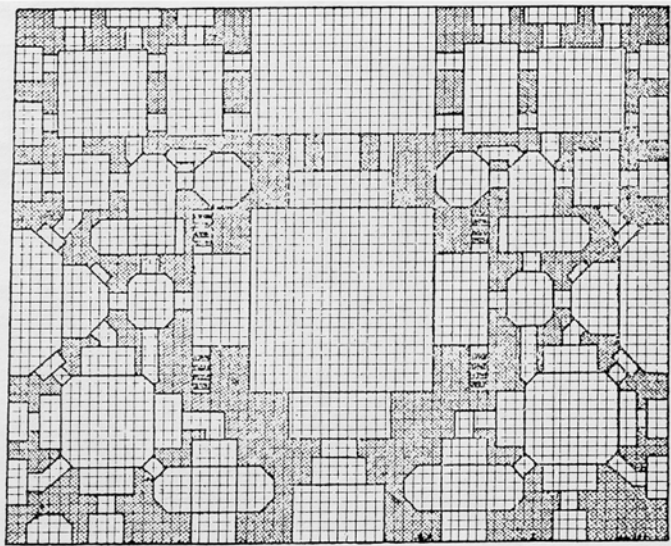


Figure 24. This redrawn version of one of the sixteenth-century plan from Uzbekistan is based on the originals on paper made in Samarkand. The design is executed on a grid that represents the *dirha*, or cubit, while the grid of smaller squares establishes the size of the brick module for the builder. (Illustration from Margaret Bentley Ševečenko [ed.], *Theories and Principles of Design in the Architecture of Islamic Societies: A Symposium Held by the Aga Khan Program for Islamic Architecture at Harvard University and the Massachusetts Institute of Technology* [Cambridge 1987] p. 7)

arguments. Their views are based on Sufi mystical belief in prayer through meditation and experience of visual, auditory, or physical rhythmic repetitions. Related to these views is the suggestion that geometric patterns are conducive to contemplation. A more puritanical approach might argue that such patterns would distract the individual from concentrating on the inner self. Geometric patterns in Islamic decoration have also been interpreted as symbolically neutral systems acquiring their meanings from their contexts (Grabar 1992). However, such an interpretation fails to explain the continuous Islamic fascination with geometric patterns for almost a millennium.

The Underlying Principles of Islamic Architecture

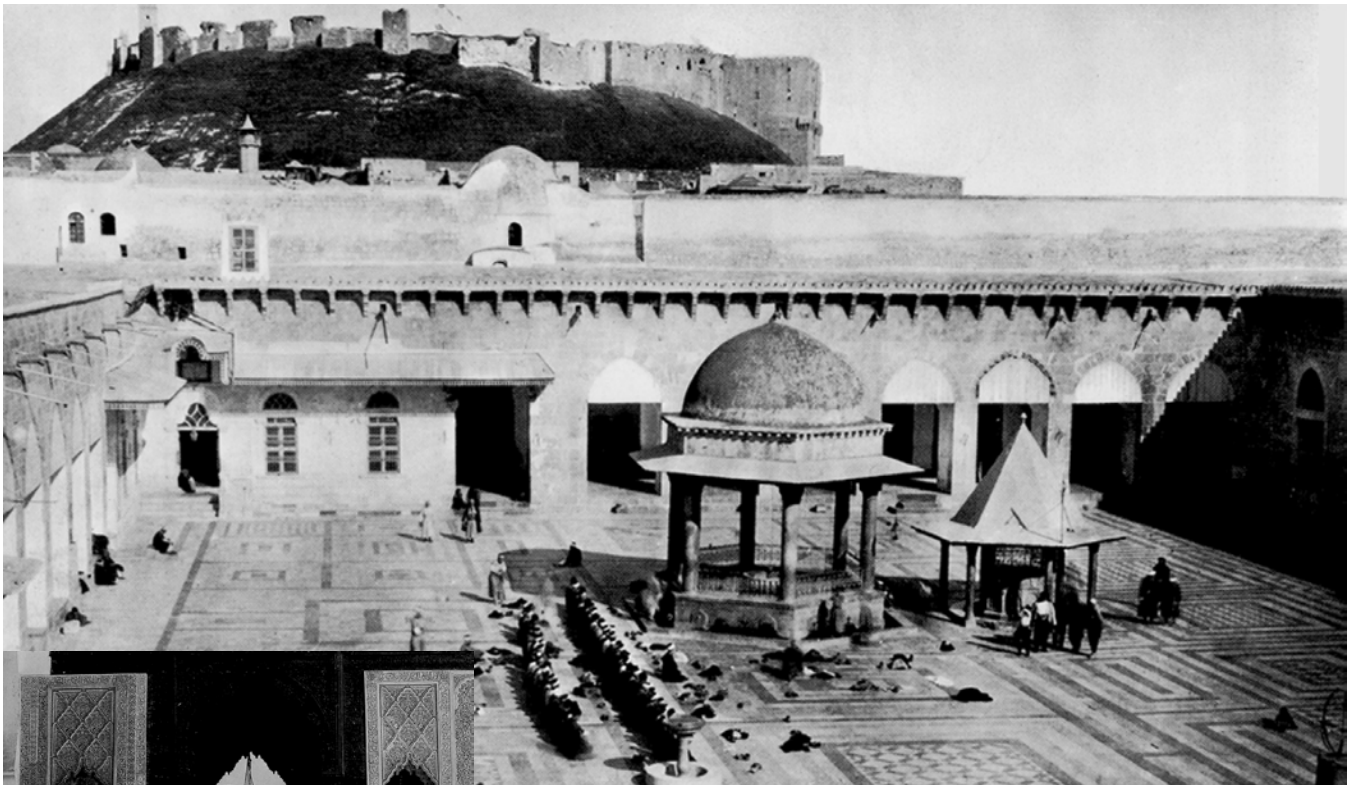
Surviving buildings suggest that Muslims often interpreted religious ideas and requirements in different ways, as exemplified in the architecture of mosques. The formal variations found in the architecture of mosques, as described earlier in this chapter, suggest that the underlying principles of Islamic architecture may not exist at the level of the physical form. They must be sought instead in those concepts that help establish a connection between the purely religious aspects and the strictly formal aspects of Islamic architecture.

The Perpetual Relationship between the Sacred and the Secular

One striking feature of Islamic architecture is that it has no clearly defined boundary between the sacred and the secular. Consider the ritual of ablution, the obligatory act of cleaning (with running water, or with dust on certain occasions) before prayer, as an example. Muslims may pray only if they are both mentally and physically ready to say their prayer after ablution. However, occupying the mosque space for purposes other than prayer without performing ablution is neither forbidden nor restricted. In other words, the idea of when and where the secular should cease and the sacred begin depends on the individual's awareness and comprehension; it is not a quality of the space itself. Thus, in Islam the distinction between the sacred and the secular must be considered a notional act, which is not to be confused with the boundary defined by physical form. Hence, ablution areas may be located within or outside mosques (fig. 25). This diffusion of the sacred and the secular, in spatial terms, is also confirmed by the fact that prayer may be performed anywhere—outside as well inside the mosque—as long as the space for prayer and its immediate vicinity are clean and the act of ablution is performed by the worshiper.

Mosques embody the theoretical doctrine that the sacred and secular in Islam are inseparable. The congregational mosque plays a significant political role in Muslim societies. From the time of the Prophet, the sermon delivered from the minbar of a mosque by an imam traditionally conveyed political messages from the caliph or the head of state, as well as fulfilling its religious role. A number of architectural forms adopted in the mosque had a long political history in other cultures: the *maqsura* in a mosque, built to protect princes, recalls the Byzantine imperial box in the hippodrome; the domes in mosques had already ancient associations with honoring the ruler; and so on.

The perpetual relationship between the sacred and the secular is also evident in the use of the same architectural form for both sacred and secular architecture in the Muslim world. "An Islamic building does not automatically reveal, by its form, the function it serves. It need not be designed to serve a particular purpose, but is, in most cases, an abstract and 'perfect' scheme that can be used for a variety of functions without any difficulties," wrote Grube (1978,13). Indeed, in general terms, there is little relationship between form and function in Islamic architecture. Certain formal types in Islamic architecture persist irrespective of functions and site conditions. Among other more specific formal types of Islamic architecture, the four-*iwān* courtyard structure became the most important as well as the most persistent. This formal type had been used in mosques,



25a



25b

Figure 25. Purification in Islam, the ritual washing of face, arms, head, and feet, is a personal act before prayer. It takes place in close proximity to prayer without offense to the worshipers. (a) At the Congregational Mosque in Aleppo, Syria, the congregation is praying next to the ablution facilities. (b) At the mosque in Fès, ablution facilities are provided under a finely decorated pavilion within the main body of the mosque. (Photo [a] from Bernard Lewis [ed.], *Islam and the Arab World* [New York 1976], p. 42; photo [b] from George Michell [ed.], *Architecture of the Islamic World* [New York 1978], p. 20)

palaces, madrassas, caravansaries, public baths, tomb complexes, monasteries, infirmaries, and private dwellings in different contexts throughout the Islamic world. Doubtless, the strong symmetry and balance of the composition of four-*ṭwān* explain why it appealed to Muslims as a formal compositional type. This structure, by its very nature, echoed the Qur’ānic proclamation that Allah creates in balance and proportion: “Surely We have created everything according to a measure” (54:49). In mosques, it also allowed the establishment of a visual communion among the worshipers in each of the four segments of the prayer hall.

Only in the use of human and animal forms in decoration was a clear distinction made between the sacred and the secular in Islamic architecture, as discussed earlier. Religious architecture generally had no animal forms in their decoration. However, there are exceptions, such as the Çifte Minerali Madrassa at Erzurum, Turkey, where animals and figures are shown together with fruiting trees.

Harmony between Verticality and Horizontality

For Muslims, verticality refers to the heavens, which lie beyond the visible stars in the sky, whereas horizontality refers to the direction of prayer, that is, the *qibla*. The Qur’an asserts: “Indeed We see the turning of your face to heaven, so We shall surely turn you to a *qibla* which you shall like; turn then your face towards the Sacred Mosque, and wherever you are, turn

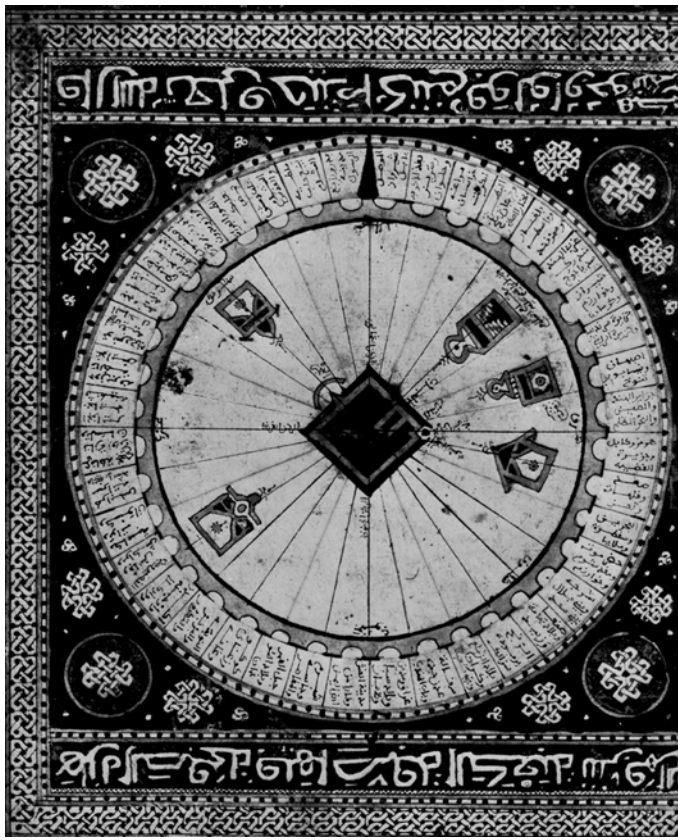


Figure 26. In this frontispiece of an Arabic atlas of 1551, the Ka'ba is shown at the center of the world, surrounded by the Islamic countries. The lines show the relative orientation of these countries to the Ka'ba. (Illustration from Bernard Lewis [ed.], *Islam and the Arab World* [New York 1976], p. 17)

your face towards it, and those who have been given the Book most surely know that it is the truth from their Lord; and Allah is not at all heedless of what they do" (2:144). The Ka'ba in Mecca, which is the *qibla* of Muslims' prayers and the destination of their pilgrimage (the hajj), is the point where the vertical and horizontal axes of the Muslim universe intersect (fig. 26). The cubic mass of the Ka'ba, placed in a void-like open space, defines the vertical axis pointing to the "inhabited house" in the heavens located above. Its diagonals form the horizontal axes by pointing to the cardinal and geographic directions. However, none of the cardinal directions is particularly important to Muslims. The physical world of Muslims is like a uniform force field around the Ka'ba. Muslims must respond symbolically to this unifying force, which acts equally powerfully on all Muslims, regardless of their physical distance from the Ka'ba. They submit to this force symbolically by facing toward it when they pray and literally when they converge upon it during the pilgrimage. At least once a year, the force field manifests itself in the form of an immense whirlpool formed by the pilgrims rotating and crying out to Allah: "O Allah I am present," as if bidding their spirits to merge with Allah. The diagonal orientation of the Ka'ba, then, helps establish this communion by accepting the forces created by Muslims praying facing toward it and by encouraging Muslims to circumambulate it.

A mosque may now be explained as a material form given to a segment of the force field of the religious-spiritual world of Muslims.

As explained earlier, for Muslims the idea of the sacred is a notional act. They can activate it at any place and time when they say their prayer. In this sense, a house can acquire a status equally sacred to that of a mosque, but only temporarily. In its essence, a mosque is then a space permanently set aside for prayers. It is not necessary that a mosque must be oriented toward the Ka'ba. However, it is helpful if the direction of the *qibla* is somehow permanently expressed in a mosque, so that Muslims do not have to determine it every time they pray. As result, directionality becomes an important issue in a mosque.

For Muslims, the mihrab, a recess in the center of the *qibla* wall, was not sufficient to express the directionality of a mosque. The spatial and formal effects of mihrab on a huge mosque were usually negligible due to its small size. In order to overcome the problem, a transept was often used in the center of the prayer hall, perpendicular to the *qibla* wall. The earliest example is al-Walid's Great Mosque of Damascus. In some cases, as in the Great Mosque of Samarra, the transept and the aisle along the *qibla* wall were made wider, and thus the so-called T-shape hypostyle mosques were invented. In other cases, the roof of the *qibla* aisle was elevated and a clerestory was added, as can be seen in the Great Mosque of Kairouan (fig. 27).

Early mosques did not possess a great sense of verticality. To be sure, domes and minarets, such as the ones used in the Great Mosques of Damascus and of Kairouan, had introduced some verticality, but their impact was very limited. The position of the early minaret was not fixed in relation to the mosque proper. In some cases minarets were connected to the mosque, as in Damascus or Kairouan; in other cases, they were freestanding, in close proximity to the building, as in Samarra in Mesopotamia and Al-Fustāt in Egypt. The quest for harmony between verticality and horizontality also seems to have found its expression in the peculiar contrast between the flat roof and the upward swing of the supporting arcades, as in the Mosque of Ahmad ibn Tūlūn in Cairo (fig. 28) and in the 'Amr Mosque, also in Cairo. The central court (or *sahn*) of the mosque allowed a connection to be made to the world above but did not sufficiently convey the harmony between the earthly and the divine.

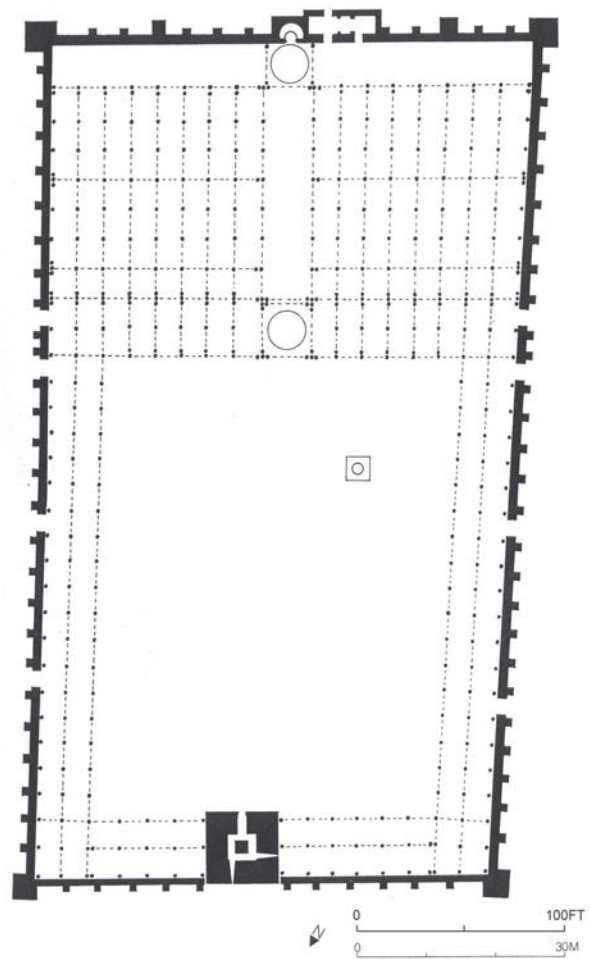


Figure 27. The Great Mosque of Kairouan was the first major Muslim monument in North Africa. It was built in 670 by Uqba ibn Nafi, the original founder of Kairouan, and rebuilt in 703 and again in 774. In 836 and 863, rulers of the Aghlabid dynasty enlarged the mosque to its current size and proportions. However, the mosque underwent numerous renovations and ornamentations in the following centuries. This rectangular mosque, with sides of 242, 229, 410, and 406 feet (74, 70, 125, and 124 m), is defined by a huge buttressed wall. There are nine doorways into the mosque. The three sides of its marble-paved courtyard are defined by porticoes. The roofs of these porticoes are supported by marble columns taken from ancient Roman and Byzantine sites. The main prayer hall, 123 feet deep and 230 feet wide (37m by 70m), is a T-type hypostyle hall with both axial and *qibla* aisles elevated. The square minaret of the mosque is 103 feet (31m) high and 34 feet (10m) wide. Built between 724 and 728, it is one of the oldest standing minarets in the world. (Photo by Ronald B Lewcock; plan from Richard Ettinghausen and Oleg Grabar, *The Architecture of Islam* [Hammondsworth 1987])

The quest for a balance between verticality and horizontality in architecture was clearly a preoccupation of Muslim architects. This may be seen, for example, in the Persian four-*īwān* mosque. This form was developed during the Seljuq period, when a high *īwān* was added to the center of each of the four sides of the central courtyard of a mosque. Much later, the appearance of this four-*īwān* mosque changed remarkably to acquire a more vertical accent when minarets were added to the *īwāns*. The largest and most imposing building of this type is the Masjid-i Jami in Isfahan, Iran (fig. 29). Other examples of the type are found in Mashhad, Isfahan, and elsewhere, up to the nineteenth century.

In contrast to the architecture of the early periods, when the formal composition of Islamic architecture was dominated primarily by a sense of horizontality, by the fourteenth, fifteenth, and sixteenth centuries in Persia and Central Asia, a sense of verticality dominated the form. This change was facilitated by new building techniques, especially innovations in the art of vaulting. Cupolas, single, double, or triple, were frequently used in the architecture. The outer shells of these cupolas were usually of different shapes, often raised on cylindrical drums, while the inner shells were of a gently curving elliptical form. Cupolas were supported by pendentives of various sorts. The most novel invention of Timurid architecture, however, was the so-called double dome, which consisted of an inner dome and an outer dome. The inner dome allowed the interior ceiling

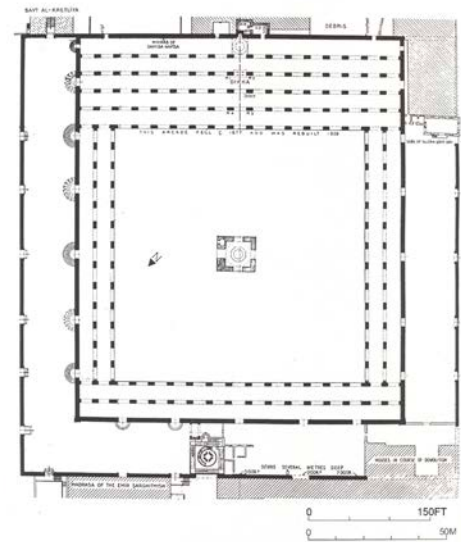


Figure 28. The ‘Abbāsīd governor Ahmad Ibn Tūlūn built this hypostyle-type mosque from 876–879. The mosque proper forms a 400 feet by 459 feet (122m by 140m) rectangle but the three narrow enclosed wings called *ziyadas* bring the outer dimensions of the building to an almost perfect square of 1744 feet (531.5m). The northwest ziyada, once the principle façade, has an entrance portal about 16 feet (5m) higher than the outer walls. Arcades on brick piers support the flat wooden roof of the mosque. The present stone minaret, a reconstruction by Mamlūk Sulatn Lajin in 1296, is placed off-axis. The stucco moldings and the marble columns with Byzantine capitals of the central mihrāb, the carved stucco ornament of the soffits of the arches, the stucco window grilles, and the decoration of the wooden lintels, all strongly influenced by styles of Samarra, are from the period of Ibn Tūlūn. The typical vine leaves and palmettes and the window grilles of the mosque follow the principles of the marble grilles of the Great Mosque of Damascus. (Photo by Ronald B Lewcock; plan after Richard Ettinghausen and Oleg Grabar, *The Architecture of Islam* [Hammondsworth 1987])

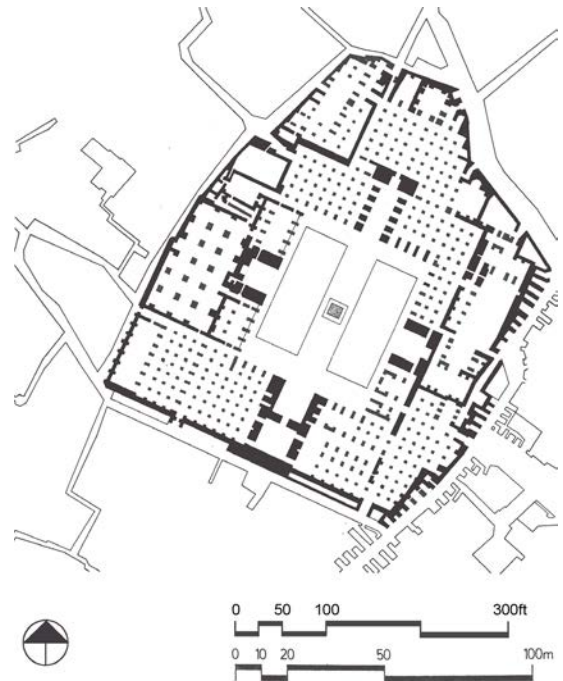


Figure 29. The Masjid-i Jami of Isfahan is an irregularly shaped great mosque set apart by high outer walls with few openings in the old part of the city. Its shape is the result of numerous constructions, additions, and modifications made to an original hypostyle-type mosque built in the late eight century with baked bricks. Earlier, the cylindrical piers of the mosque supported its flat wooden roof, instead of a dome. Between 1072 and 1075, the great brick dome was raised on the old supports. The screen near the mihrab was probably built in the 10th century. In 1088–89, the north chamber was added on the mihrab axis. The flat old wooden roof of the mosque was destroyed in a fire of 1121 or 1122, when the first brick vaults were erected on the old supports. The four *īwān* of the mosque were also built in the early twelfth century. The double arcades around the courtyard were added in about 1447, concealing the earlier one-story structure. The large winter hall was added in 1448 by Timurid princes. The Safavids completed the facings and decoration in the interior and added the two minarets to the main *īwān*. (Photo by Ronald B Lewcock; plan after Jonas Benzion Lehrman, *Earthly Paradise: Garden and Courtyard in Islam* [Berkeley 1980])

height to be in proportion with the chamber below. At the same time, the inner dome played a structural role in assisting the drum in supporting a ring of radial buttresses that were needed to strengthen the swelling curve of the outer dome.

In Mughal mosques in India, the balance between verticality and horizontality was achieved through ingenious manipulations of the four-*īwān* structure of the Persian mosque and the double dome of Timurid architecture. Instead of the single dome of the Persian mosque, the Mughals used multiple domes over the prayer hall of a mosque. In addition, the band of two-story cells around the sides of the rectangular courtyard that often connected the *īwāns* of the Persian mosque was reduced to a single-story band to further accentuate the *īwāns* in the Mughal mosque. For additional verticality, the Mughals also added minarets or cupolas at the corners of the prayer hall of the mosque. Thus, one could argue that a more distributed balance between horizontality and verticality was achieved in the Mughal mosque (fig. 30).

While the Ottomans achieved an accentuated sense of verticality on the exterior of their mosques with a tight symmetrical composition of minarets, semi-domes, and domes, a perfect sense of balance prevailed in the interiors of these monuments. They used innovative techniques of formal and structural compositions to achieve this balance, as discussed below.

Unity in the Interior

Muslim architects strove to provide a unified architectural experience inside their buildings. Very often they tried to achieve this unity by enhancing the sense of dissolution and of infinity within the limiting bounds of architecture. With the exception of the Dome of the Rock, which was completed in 691–92, Muslims were not able to achieve this unity until the sixteenth century, when appropriate structural and decorative techniques were perfected. Muslims achieved the experiential unity in the Dome of the Rock so early in the history of Islamic architecture, because the limitations of an early hypostyle mosque did not apply to this building. It is an octagonal building containing two concentric ambulatories defined by an octagonal arcade placed around a circular arcade, above which the dome is placed. The lustrous colors, the repetitious motifs of the decoration,

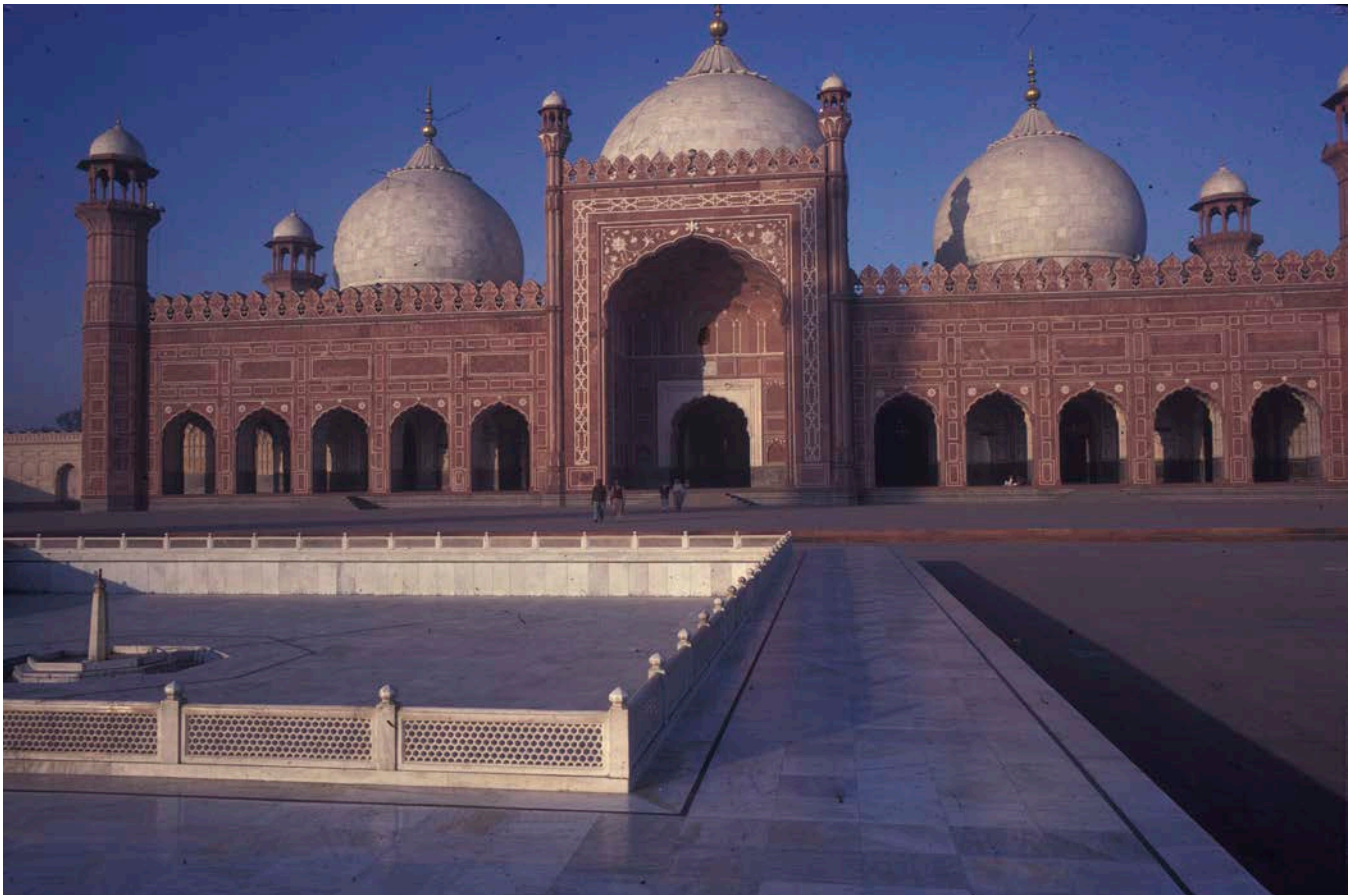


Figure 30. In Mughal mosques in India, the balance between verticality and horizontality was achieved through an ingenious manipulation of the four-*īwān* structure of the Persian mosque, as in the case of the Bādshāhī mosque in Lahore, Pakistan, built by the Mughal emperor Aurangzeb. (Photo by Ronald B. Lewcock)



Figure 31. The interior of the Dome of the Rock in Jerusalem. (Photo from Said Nuseibeh and Oleg Grabar, *The Dome of the Rock* [New York 1996], p.58)

and the profusion of light entering through the windows high on the exterior walls and on the drum beneath the dome, all give the interior of this building a feeling of unexpected vastness, of ephemerality, of lightness (fig. 31).

A more common way to provide a sense of infinity in Islamic architecture, however, was the repetition of structural elements. In early hypostyle-type mosques, a series of colonnades with multiple and unending vistas gave a feeling of infinity. In some cases, Muslims tried to enhance this feeling by increasing the height of the hypostyle halls. Very often, the dimly lit interiors of these mosques also added to this feeling (fig. 32). Additionally, Muslims tried to enhance the unity through color and a repetition of the same motifs in the decoration of surfaces of these early mosques. But they were not able to replicate the experiential qualities of the Dome of the Rock in their early architecture.

After the Dome of the Rock, a true sense of unity in mosques was achieved successfully only in the interiors of the sixteenth- and seventeenth-century Ottoman mosques. Employing structural ingenuity along with impeccable surface decoration, the Ottomans conveyed an impression of unity and harmony through spatial continuity. Instead of an interior with a series of columns supporting the roof, the classical Ottoman builders preferred to use domes, which allowed them to reduce the number of interior supports to a minimum. In the great buildings of their capital, Constantinople (modern Istanbul), the Ottomans continued to use a central dome, making it increasingly larger, and eventually distributing its weight uniformly to the ground through



32a



32b

Figure 32. (a) Multiple vistas of the colonnades of a hypostyle mosque may break up the unity of space at the level of experience, as in the prayer hall of the Great Mosque of Kairouan. (b) But in many other fine mosques, the rhythmic repetition of the columns and arcades seem to create a strongly unified interior, as at the Great Mosque of Tarim in Yemen. (Photos by Ronald B. Lewcock)

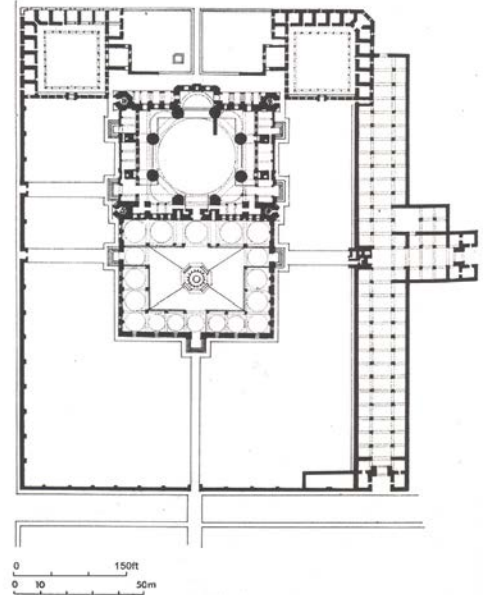


Figure 33. The Selimiye complex in Edirne, Turkey, is one of the finest examples of Ottoman architecture, designed and built by Mimar Sinan from 1569–75 for Sultan Selim II in commemoration of his taking of Cyprus. The mosque is the centerpiece of the building complex. Though the size of the mosque was inspired by the Hagia Sophia, Sinan used his own mosques as precedents for the Selimiye: Its organizational scheme follows the Şehzade Mehmet (1548), and the structural scheme the Rüstem Pasha Mosque (1562). In this mosque, the huge main dome, 102.5 feet (31m) in diameter, rises on a central octagon buttressed on all sides by smaller semidomes, with diameters less than half that of the big dome. Well-designed stalactite corbels form a successful transition between the dome and the octagon beneath. The eight arches of the octagon in turn descend by means of more stalactites onto eight piers forming a well-proportioned central pavilion. This pavilion is then set within a rectangular outer structure. On the exterior, the eight corners of the dome are marked by weight towers. The four corners of the rectangular outer structure are further reinforced by the four minarets, which look taller and more slender than they actually are because of vertical lines. The rhythmic sequence of solids and voids helps alleviate the bulk of masonry structure. (Photo by Ronald B Lewcock; plan from John D Hoag, *Islamic Architecture* [New York 1977])

a rhythmically arranged series of half domes, smaller domes, or both in a system revived from Byzantine practice (fig. 33). Ottoman mosques thus achieved a sense of unity that grew from the bottom, culminating at the top, without any disruption, almost like that of a pyramid (fig. 34). Because the drums beneath the domes or half domes were always punctuated with several openings, on the interior these domes would appear to be floating in the light that entered through such openings. And because vertical surfaces were also punctuated with several windows, in effect the whole building would appear to be floating in light (fig. 35). The apt metaphor for this effect could only be “the heavens without pillars” or “the heavens as a guarded canopy,” as found in the Qur’ān. (For other meanings associated with classic Ottoman mosques, see Necipoglu 1985.)

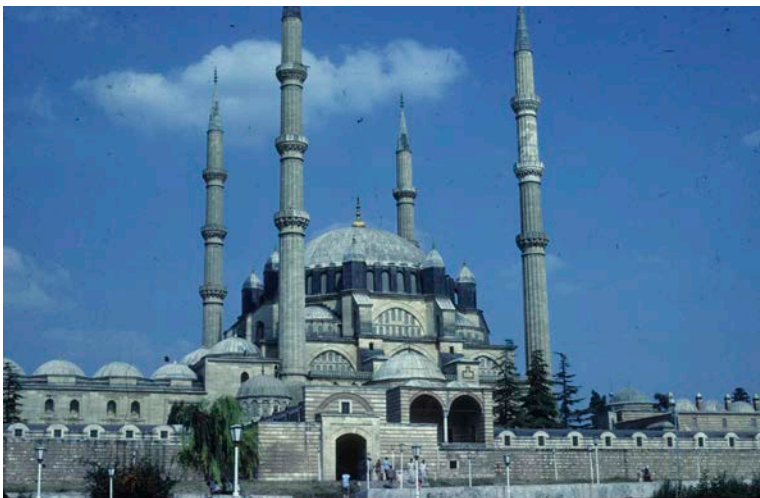


Figure 34. The Selimiye mosque complex in Edirne, Turkey, is an excellent example of a true balance between verticality and horizontality. (Photo by Ronald B. Lewcock)

The Expressiveness of the Exterior

In Islam, humanity and humility are prized more than power and ostentation. Muslims strive more to achieve purity of soul than to achieve material wealth. Several Qur’ānic verses discourage an excessive display of wealth: “O children of Adam! attend to your embellishments at every time of prayer, and eat and drink and be not extravagant; surely He does not love the extravagant” (7:31; also see 6:141). Consequently, Muslims may lack



Figure 35. The interior of the Selimiye mosque in Edirne, Turkey. (Photo from Francis Robinson, *Atlas of the Islamic World since 1500* [Oxford 1982], p. 87)

interest in decorating the exterior of a building. This characteristic is best exemplified by the house forms of traditional cities throughout the Islamic world. Often organized around courtyards, these houses have no architectural expression on the exterior. Great mosques throughout the Islamic world are often relatively hidden within the undifferentiated texture of the city fabric. This can be seen clearly in the Masjid-i Jami in Isfahan, Iran. This mosque, with its irregular geometric boundary, appears to be a part of the undifferentiated texture of the city fabric (fig. 29). Even some freestanding monumental mosques, such as the Great Mosque of Kairouan (fig. 27), have no expressive display on their exterior.

Conversely, in some regions of the Muslim world, tombs and mausoleums had rather elaborate exteriors, as exemplified by the tenth-century tomb of the Sāmānids in Bukhara or the seventeenth-century Mughal tombs and mausoleums in India. The most important reason for this display might have been a

desire to honor the achievements of certain Muslims deemed sufficiently worthy. The gracefulness of these buildings was perhaps meant to reflect the grace and holiness of the person buried within.

An alternative explanation of the symbolism of the elaborate richness of a mausoleum may be found in the Taj Mahal, built by the Mughal emperor Shāh Jahān (fig. 36). This funerary structure has equally exquisite interiors and exteriors. It is possible that apart from its commemorative purpose, it was also considered by its builders to represent the throne of Allah placed at the end of paradisiacal gardens on the day of the final judgment. Hence, the attention paid to the exterior was at least equal to that expended on the interior (Begley 1979).

The Unifying Forces of Islamic Architecture

The basic unifying force of Islam is always the fundamental religious belief system of Muslims. This belief system is firmly based on the Book of Allah, the Qur’ān, which was revealed to the prophet Muhammad through the archangel Gabriel (between 609 and 632). Another important unifying force is the sayings of the Prophet, who is suggested as the “beautiful model” for Muslims in the Qur’ān (33:21). Yet another force of Muslim unity is the general coordination of beliefs and practices throughout the Islamic world through the principle of *ijmaa’*. This principle helps establish the acceptable norms based on theological opinions. These unifying forces of Islam often bridge differences of region, race, and tradition and force the customs and manners of Islamic societies into an extraordinarily clear and uniform mold.

This clear Islamic identity is further enhanced by the Arabic language. Since the Qur’ān was revealed to the Prophet in Arabic, it became forever the most important of all languages to Muslims. Slowly, beginning in the centers of Arab settlements and spreading outward, Aramaeans, Copts, and Berbers adopted Arabic. Arabic supplanted the ancient Persian language as the sole written language, even though Persia kept its ancient language for everyday speech for some three centuries after the Arab conquest (from about 650 to 950). Eventually, Arabic became the preferred language of religion, law, natural sciences, and philosophy throughout the Islamic world, and thus played a unifying role similar to that of Latin in medieval and Renaissance Europe.

Apart from religious unity and the unity of language, the classical and Mediterranean intellectual and architectural traditions, which were inherited from the Byzantines by Muslims, could have also been responsible for the unity found in Islamic architecture. While India, Persia, and even southern Arabia were never directly under the Byzantine rule, the influence of the classical tradition was felt in these regions at least since the time of the Alexander the Great.

Another important factor in the unity of Islamic architecture had been the high mobility of the general population throughout the Islamic world even before the twentieth century. Apart from the spread of Arabs with the original conquests,

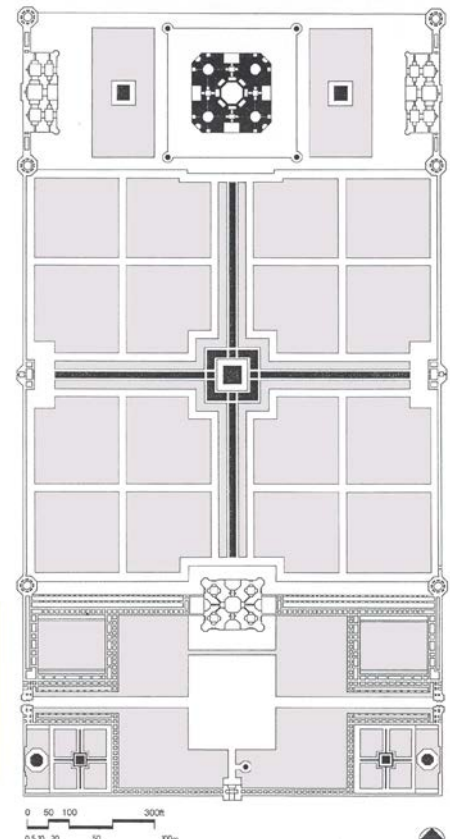
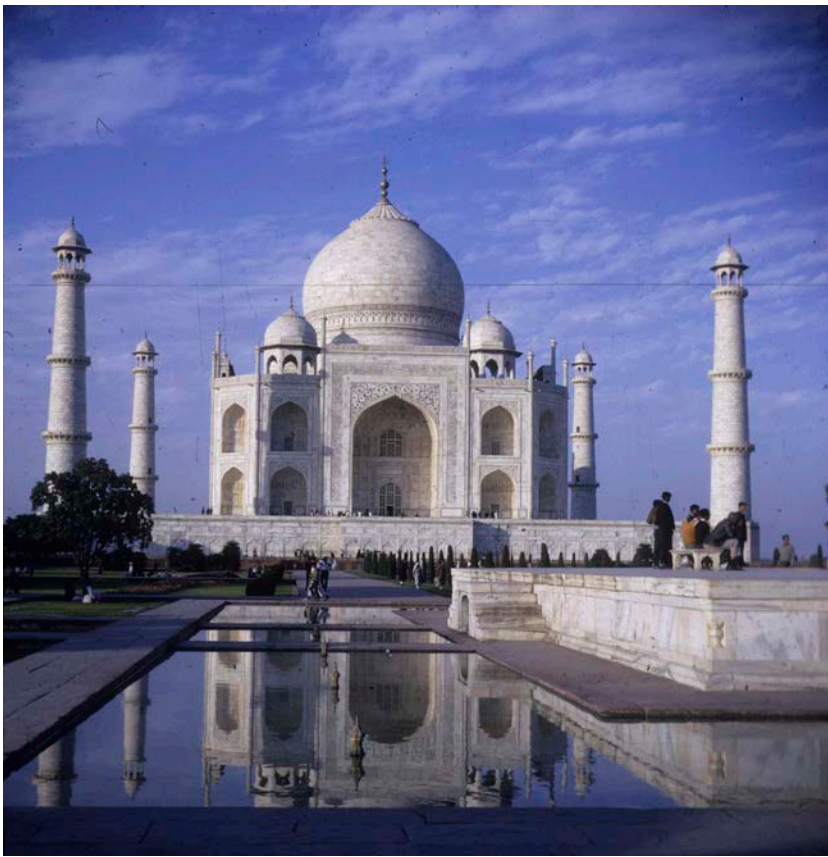


Figure 36. Shāh Jahān built the Taj Mahal in Agra, India, in about 1635, in memory of his favorite wife Mumtāz Mahal. It is the finest example of Mughal architecture, successfully blending the building traditions of Central Asia, Persia, and India. The tomb, a central domed chamber with an iwān on each of its four sides, is raised on a podium. The relationship between the tomb and the podium is framed and balanced by four detached minarets at the corners of the podium. The onion-shaped dome of the tomb has two shells, a bulbous external one and a shallow internal one. The internal shell of the dome helps reduce the scale of the interior space. The high drum of the dome gives a soaring effect to the building. The surfaces and low-relief moldings, inlaid with semiprecious stones in decorative themes, are superbly executed and integrated with the overall design. While the tomb is built in white marble, the flanking mosque, the reception hall on the opposite side of the mosque, the gateways, pavilions, and walkways of the tomb complex are built in red sandstone. At the center of the complex is a square chahār bagh subdivided into square sections by canals intersecting at the central pool. The builders of Taj Mahal took full advantage of perspective by placing the tomb at the north end of the central axis of the chahār bagh, instead of at the center. (Photo by Ronald B Lewcock; plan after Jonas Benzion Lehrman, *Earthly Paradise: Garden and Courtyard in Islam* [Berkeley 1980]).

the migration of the Seljuqs from Central Asia in the eleventh century significantly affected Persia and Mesopotamia. It also transformed Anatolia into a Muslim land with a very rich art and created the historical base for the future Ottoman empire. Other migrants included the Mongols from China and Central Asia and the Moroccan Almoravids and the Almohads. These people significantly affected the local artistic traditions where they settled.

In the Muslim world, the working class migrated quite frequently. Muslim architects and craftsmen were not organized into guilds as in medieval Europe. They were only loosely affiliated with others of the same profession and had more freedom to move from place to place. Because Muslim craftsmen and builders had a low status in Muslim society in the early period, they moved frequently from one place to another. They also traveled as war refugees; and, at times, conquerors would bring them by force from faraway conquered lands (Aga-Oglu 1954; Ettinghausen 1976; Lewcock 1978).

Muslim rulers themselves were frequently not native and brought with them foreign tastes unknown to the land they ruled. For example, the Syrian artistic tastes of the migrated Umayyad caliph ‘Abd ar-Rahmān I had a considerable effect on architecture in Spain after he gained power there in the eighth century. Similarly, Bābur, the first of the Mughal emperors, who grew up in Central Asia, combined Timurid and Indian artistic traditions. Sometimes rulers exiled to a foreign land developed a taste for its art, which they carried back to their own lands. Humāyūn, the second of the Mughal emperors, developed a fascination for Persian art during his exile there, with significant effects on Mughal art.

The urban middle class in Muslim cities were also geographically mobile. According to the Geniza documents, in the late ninth century a number of merchants from Persia, Mesopotamia, and Syria settled in Egypt and North Africa because of changes in economic and political conditions. Such middle-class migrations often resulted a change in economy by fostering supply of and demand for certain goods in place of others.

Migration, by choice or by force, of the working class, middle class, or the ruling class, contributed to the dissemination of knowledge and to the sharing of ideas across regions and cultures. This process of dissemination was also enhanced by the constant flow of pilgrims to Mecca. Trade added another dimension, allowing the Muslim states to maintain constant contact with one another throughout the Middle Ages. Of course, architecture could not be traded (although elements such as mihrabs were), but craftsmen and traded products (textiles, leather, metalwork, ceramics) exposed the aesthetic tastes of one region to another, influencing architectural tastes as well. The travel reports of great Arabic geographers reveal the richness of information that was exchanged. Therefore, it should not be surprising that technical advances and artistic ideas were disseminated rather quickly throughout the Muslim world, and the resulting stylistic affinities often bore little relation to the great distances between some of the artistic centers.

Bibliography

- Aga-Oglu, M. 1954. "Remarks on the Character of Islamic Art." *Art Bulletin* 36:175–202.
- Al-Faruqi, I. R. 1970a. "Misconceptions of the Nature of Islamic Art." *Islam and the Modern Age* 1 (1):29–49.
- . 1970b. "One the nature of the Work of Art in Islam." *Islam and the Modern Age* 1(2):68–81.
- . 1973. "Islam and Art." *Studia Islamica* 37:8–109.
- Allawi, I. 1988. "Some Evolutionary and Cosmological Aspects to Early Islamic Town Planning." In *Theories and Principles of Design in the Architecture of Islamic Societies: A Symposium Held by the Aga Khan Program for Islamic Architecture at Harvard University and the Massachusetts Institute of Technology*, Cambridge, Massachusetts, November 6–8, 1987, edited by Margaret Bentley Ševečenko. Cambridge, MA: The Aga Khan Program for Islamic Architecture.
- Ardalan, Nader and Laleh Bakhtiar. 1973. *The Sense of Unity: The Sufi Tradition in Persian Architecture*. Chicago: University of Chicago Press.
- Begley, W. E. 1979. "The Myth of the Taj Mahal and a New Theory of Its Symbolic Meaning." *Art Bulletin* 61:7–37.
- Blair, S. S. 1996. "Architecture: Iran, c. 1050–c. 1250." In *The Dictionary of Art*, edited by Jane Turner. New York: Grove.
- Brookes, John. 1989. *Gardens of Paradise: The History and Design of the Great Islamic Gardens*. London: Weidenfeld and Nicolson.
- Burckhardt, T. 1954. "The spirit of Islamic Art." *Islamic Quarterly* 1:212–18.
- . 1967. "Perennial values in Islamic Art." *Studies in Comparative Religion* 1:132–41.
- Creswell, K. A. C. 1940. *Early Muslim Architecture*. Part II. Oxford: Clarendon Press.
- . 1951. "The Ka'ba in AD 608." *Archaeologia* 94:97–102.
- . 1958. *A Short Account of Early Muslim Architecture*. Hammondsworth, Middlesex: Pelican Books.
- Critchlow, Keith. 1976. *Islamic Patterns: An Analytical and Cosmological Approach*. London: Thames and Hudson.
- El-Said Issam and Ayse Parman. 1976. *Geometric Concepts in Islamic Art*. London: World of Islam Festival Trust.
- Ettinghausen, Richard. 1944. "The character of Islamic Art." In *The Arab Heritage*, edited by Faris, Nahib Amin. Princeton: Princeton University Press, NJ. 251–267.
- . 1976. "The man-made setting." *The World of Islam: Faith, People, Culture*, edited by Bernard Lewis. London: Thames and Hudson.
- . 1979. "The Taming of the Horror Vacui in Islamic Art." *Proceedings of American Philosophical Society*: 15–28.
- Ettinghausen, Richard and Oleg Grabar. 1987. *The Art and Architecture of Islam 650–1250*. Hammondsworth, Middlesex: Pelican Books.
- Gibb, H. A. R. and Kramers J. H. eds. 1953. *Shorter Encyclopaedia of Islam*. Ithaca, NY: Cornell University Press.
- Golombek, Lisa. 1988. "The Draped Universe of Islam." In *Content and Context of Visual Arts in the Islamic World*. Monographs on the Fine Arts, 44. University Park, PA: The Pennsylvania State University Press.
- Golombek, Lisa and Donald Newton Wilber. 1988. *The Timurid Architecture of Iran and Turan*. Princeton Monographs on Art and Archeology, 46. Princeton, NJ: Princeton University Press.
- Goodwin, Godfrey. 1987. *A History of Ottoman Architecture*. New York: Thames and Hudson.

- Grabar, Oleg. 1973. *The Formation of Islamic Art*. New Haven, CT: Yale University press.
- . 1990. *The Great Mosque of Isfahan*. New York: New York University Press.
- . 1992. *The Meditation on Ornament*. Princeton, NJ: Princeton University Press.
- Grabar, Oleg and Said Nuseibeh. 1996. *The Dome of the Rock*. New York: Rizzoli.
- Grube, Ernst J. 1967. *The World of Islam*. London: Hamlyn.
- . 1978. "Introduction." In *Architecture of the Islamic World*, edited by George Michell. New York: William Morrow.
- Holod, R. 1988. "Text, Plan and Building: On the Transmission of Architectural Knowledge." In *Theories and Principles of Design in the Architecture of Islamic Societies: A Symposium Held by the Aga Khan Program for Islamic Architecture at Harvard University and the Massachusetts Institute of Technology*, Cambridge, Massachusetts, November 6–8, 1987, edited by Margaret Bentley Ševečenko. Cambridge, MA: The Aga Khan Program for Islamic Architecture.
- Kuran, A. 1988. "Ottoman Classical Mosques in Istanbul and in the Provinces." In *Theories and Principles of Design in the Architecture of Islamic Societies: A Symposium Held by the Aga Khan Program for Islamic Architecture at Harvard University and the Massachusetts Institute of Technology*, Cambridge, Massachusetts, November 6–8, 1987, edited by Margaret Bentley Ševečenko. Cambridge, MA: The Aga Khan Program for Islamic Architecture.
- Lewcock, Ronald. 1978. "Architects, Craftsmen and Builders: Materials and Techniques." In *Architecture of the Islamic World*, edited by George Michell. New York: William Morrow.
- MacDougall Elisabeth and Ettinghausen Richard, eds. 1976. *The Islamic Garden*. Washington, DC: Dumbarton Oaks Trustees for Harvard University.
- Michaud, R, Sabrina Michaud, and Michael A. Barryo. 1996. *Design and Color in Islamic Architecture: Eight Centuries of the Tile-Maker's Art*. New York: Vendome Press.
- Necipoglu, Gurlu. 1985. "The Suleymaniye Complex in Istanbul: An Interpretation." *Muqarnas* 3:92–117.
- . 1986. "Plans and Models in Fifteenth- and Sixteenth-Century Ottoman Architectural Practice." *The Journal of Architectural Historians* 45(3):224–43.
- Necipoglu, Gurlu and Mohammad Al-Assad. 1995. *The Topkapi Scroll: Geometry and Ornament in Islamic Architecture: Topkapi Palace Museum Library MS H. 1956. Sketchbooks and albums*. Santa Monica, CA: Getty Center for the History of Art and the Humanities.
- Pinder-Wilson, R. 1976. "The Persian Garden." In *The Islamic Garden*, edited by Elisabeth MacDougall and Richard Ettinghausen. Washington, DC: Dumbarton Oaks Trustees for Harvard University. 71–85.
- Qaisar, Ahsan Jano. 1988. *Building Construction in Mughal India: The Evidence from Painting*. Delhi: Oxford University Press.
- Saudi Arabia. 1975. *An Introduction to Saudi Arabian Antiquities*. Riyadh: Department of Antiquities and Museums, Ministry of Education, Kingdom of Saudi Arabia.
- Schimmel, A. 1976. "The Celestial Garden in Islam." In *The Islamic Garden*, edited by Elisabeth MacDougall and Richard Ettinghausen. Washington, DC: Dumbarton Oaks Trustees for Harvard University. 11–39.
- Serjeant, R. B. 1959. "Mihrāb." *Bulletin of the School of Oriental and African Studies* 22:439–453.
- Serjeant, R. B. and Ronald B. Lewcock. 1983. *San'a': An Arabian Islamic City*. London: World of Islam Festival Trust.
- Shakir, M. H. trans. 1999. *The Qur'ān*. 10th U.S. ed. New York: Tahrike Tarsile Qur'ān.
- Tabbaa, Y. 1988. "Geometry and Memory in the Design of Madrasat al-Firdows in Aleppo." In *Theories and Principles of Design in the Architecture of Islamic Societies: A Symposium Held by the Aga Khan Program for Islamic Architecture at Harvard University and the Massachusetts Institute of Technology*, Cambridge, Massachusetts, November 6–8, 1987, edited by Margaret Bentley Ševečenko. Cambridge, MA: The Aga Khan Program for Islamic Architecture.
- Thackston, W. M. 1989. *A Century of Princes: Sources on Timurid History and Art*. Cambridge, MA: Aga Khan Program for Islamic Architecture.
- Torrey, Charles Cutler. 1933. *The Jewish Foundation of Islam*. The Hilla Stich Strook Lectures. New York: Jewish Institute of Religion Press.