THE TYPOLOGY AND DEVELOPMENT OF MOSQUE ARCHITECTURE, DESIGN AND REGIONAL DIFFERENTIATION THROUGHOUT HISTORY

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ABSTRACT: *This article attempts to make a modest and humble contribution to our understanding of what is entailed in the idea of a traditional mosque. Distilling, highlighting, or synthesizing the most distinctive features of what are generally considered to be the most prominent or salient traditions in mosque architecture and enables us to better understand how far we have come, where we have come from, and by extension, at least to some extent, where we are going. In other words, to begin to understand the basis for the future of the traditional mosque, it has been necessary to trace its past, to better understand the present, that on which the future must necessarily be based. Islam is a boom into a world of its own. Grounded in fixed geographical space, its identity is firmly linked to its origins. Islam in its history, in a very fundamental way, perhaps even more than is the case with its sister religious traditions in the West. What follows here, is an attempt to account for or summarize the way in which that tradition is fundamental to Islamic identity with the obvious deduction that fidelity to tradition in architecture, therefore, is imperative to the survival of Islam itself at least Islam as we know it today. However, an exact or 'definitive' sense of the term 'traditional' as it is applied to mosque architecture is not followed here, its chased to make an important contribution in the literature insofar to clarify or reify our understanding of what can appropriately be 'traditional' in mosque architecture, the typology and development of mosque architecture, design and regional differentiation throughout the history. It is highlighted how mosque architecture is a blessed architecture that duplicates the principles of consolidation and harmony within Muslim culture. It is strongly felt that the design of a mosque is appropriately a religious experience of the highest order, an exercise of one's faith, and a testimony to one's religious devotion. It serves as an expression of one's innermost and most profound spiritual activities. For this reason, it also focuses the most controversial issue, raised in this article is the question of the propriety or desirability of non-Muslim architects designing mosques. The interpretation of Islamic architecture, 'mosque architecture', and the development of an understanding of what this entails can only proceed in a truly meaningful way if it is done against the backdrop of Islam as a cultural, religious, and political phenomenon of vital importance to this article is the way in which the core elements of Islamic society, including its architecture, have remained unchanged since the early days of Islam.*

Keywords: *Mosque Architecture, Mosque design, Muslims, Islamic world*

INTRODUCTION

The mosque remains the most important building in the Muslim world, it's where Muslims worship and get a social and political way and direction. Mosques have served as a central model for an expression of Muslim culture throughout the centuries. Mosques are the primary focal points of Muslim cities and represent the physical centres of Islamic society in general. Their singular importance is seen most clearly within the context of other buildings, especially through the styles and architectural demands that are prevalent in the vicinities that surround those. It is strategically placed in relation to other sectors, professional guilds, the markets, the governor's offices, schools, and other secular buildings, weather commercial or residential. The architecture of all other buildings is developed in harmony with the architecture of the mosque [1, 2, 3].

The mosque represents the heart or the central core of Islamic architecture. It serves as a primary material symbol of the faith. Robert Hillenbrand [4], accurately highlights the way in which the mosque occupies the centre of Islamic physical space:

"The symbolic role of the Mosque was understood by Muslims at a very early stage and played its part in the creation of suitable visual markers for the building; dome, minaret, mihrab and minbar among others. Yet it is, even more, the practical significance of the mosque in Muslim society that explains its pre-eminence. Alone among Islamic buildings, the mosque can gather to itself the functions of all the architectural types discussed in detail in this book. Naturally, if every mosque did this in practice, Islamic architecture would have come to a full stop with the invention of the mosque. The all-embracing importance of the mosque makes it quite natural that this should be the medieval building type preserved in the greatest number." [4].

Hand in hand with the spread of Islam and the political and economic growth of Muslim countries and their governments, activities in mosques have continued to concentrate on the worship of God and religious education based on the Holy Qur'an, and Sunnah, customs, habits, and a way of life exemplified by the Prophet Mohammed (peace be upon him) who is extolled by the Qur'an as a beautiful role model.

Mosques built during the initial stages of the development of Islam are of simple architectural structure and style. They contained only very limited decorations. Quranic calligraphy, arabesque, and floral and geometric forms. Muslim art is non-figurative; it is an art of ornamentation only, spiritual three-dimension sculptures, as well as pictorial representations, have never been welcoming in Muslim art; reproductions of human or animal figures are not allowed in Muslim art. It is much more homogeneous than Christian art and its artwork must be recognized and can only be understood as the product of a distinct and religiously homogenous civilization. While the technological sophistication of Islamic monumental architecture has progressed over time, to such an extent that it is unsurpassed by the monumental architecture of any other religion, its artistic simplicity remains much the same [5, 6].

Mosque architecture is the basis or foundation of Islamic architecture; and at its peak, its highest form of expression. Perhaps the central achievement of Islamic civilisation, that which most fully expresses its spiritual inspiration, and

practical worldview, is the way in which mosque architecture syndicates technology and art. This integration of art and technology is especially prominent in the great masterpieces of Islamic architecture: the great mosques of Makkah and Madinah, the Umayyad mosque in Damascus, the Dome of the Rock in Jerusalem, the great mosque in Cordoba, and the Fez mosques in Morocco, all of which show a deeply skilful synchronism of Islamic artistic principles, on the one hand, and extraordinary technological ability on the other. Some Medieval architecture of the Christian West is obviously obligated to the methods of Islamic architecture. Supernatural arches, as well as the interior courtyards of numerous Medieval and Rebirth European structures, remind the spectator of the Islamic architectural instances from which they were originally drawn [7, 8, 9].

Mosque design and construction, regionally differentiated throughout history, have been affected in contemporary society by an overlap of crucial factors: the expression of place (or region); the emergence of a paw Islamic' viewpoint based essentially on a political view of the world of 'us' (Muslims) and 'them' (others); the imposition from without of a form of modernity as desirable internationalism; and the individual aspirations of client/groups and designers. The manifestation of modernism and internationalism is the outcome of the views of client groups, hence some indication of the nature of contemporary clients is of assistance in understanding the changes which mosque design is undergoing.

Enormous Architecture and the Politics of Islam

There is no doubt that contemporary developments and innovations in architecture, innovative ideas and methods as well as the development of greater competence with respect to building technology have played and are expected to continue to play key roles in the development of mosque architecture in the future. Nevertheless, these innovations that accompany the general advancement of human civilisation are always based, to some extent, on tradition: in this case, the proud and colourful past of Islamic mosque architecture. The interplay between historical tradition and contemporary innovation is a complicated dialectical process, the future of which is difficult to foresee. It is immediately clear, however, that to understand contemporary developments in mosque architecture, one must begin with an overview of the tradition upon which these events are based, to be able to critically analyse the extent to which these developments represent a loyalty to or a departure from tradition, or, as is generally the case with modem mosques, a mixture of the two.

As argued here, both client and designer need to understand the importance of integrating contemporary and traditional architectural techniques into the development and implementation of architectural technology in a way that preserves the dignity and identity of the Islamic architectural tradition. This is the overriding concern and driving force of this article: that Islamic identity and dignity be preserved while new and ever more sophisticated forms of architectural expression are developed and employed.

The tension that surrounds today's debates concerning modern verses traditional architecture is of special importance to monumental architecture, especially that of a religious character. The line between secular and religious monumental architecture, however, has often been a fine one. As noted by Eliade (1985): "In the early kingdoms and empires of the Middle East, such as Mesopotamia and Egypt, the palace and the temple were the only Monumental buildings and they were often not separate". It is important to note the way in which all architectural creation is ultimately indebted to an architecture of antiquity. According to Hilberseimer [4], Gottfried Semper, for example, the third great theoretician of the nineteenth century, saw in medieval architecture, a principle of limitation which made it in-adaptable to the needs of our age. Hilberseimer [4] reported " In classical architecture, on the contrary, he found all the qualities he sought. He believed that a creative architect will always be able to construct a new whole out of the mutilated fragments of antiquity and that architecture so derived will always be inspired by antiquity, making possible its transformation".

The case remains much the same today as in antiquity with respect to the mixture or blends of the secular and the religious in monumental architecture. This is especially notable in certain contexts. The Grand National Assembly Mosque in Ankara Turkey, for example, was constructed as an integral part of the Parliament complex (Figure 14), a central architectural symbol of national identity and aspiration. 'National' mosques such as this one, and the King Faisal mosque in Islamabad (Figure I), are of especially profound significance for gauging the directions of contemporary trends in the development of Islamic religious architecture [11, 12].

Virtually all mosques share a standardized assembly of component parts that are suitable to an Islamic community of worship. These mechanisms are characterised by minor variations, however, contingent, for example, on the size of the mosque, which is determined by the size of the community, especially the number of male worshippers, who stand shoulder to shoulder in rows facing the qiblah. Female worshipers are generally expected to pray in their homes, but, if they choose to attend prayers at the mosque, there is always a separate space designed for this purpose. In short, women do not mix with male worshippers during prayers, whether the mosque is a large one, hosting five daily congregational prayers plus the Friday prayer, or a small community mosque this is an excellent example of a common architectural characteristic present in all mosques on a global level [13, 14].

Mosques have also historically been the primary focal points of Muslim cities and have almost always represented the physical centres of Islamic society in general. Their singular importance is seen most clearly within the context of other buildings, styles and architectural demands that are prevalent around them. Urban planning and architectural design of an Islamic city or community typically have the mosque at its centre; it is strategically placed in relation to other sectors, the professional guilds, the market, the governor's office, schools, and other secular buildings. The architecture of all other buildings is developed in harmony with the architecture of the mosque [3].

Robert Hillenbrand [4] accurately highlights the way in which the mosque occupies the centre of Islamic physical space:

"*The mosque lies at the very heart of Islamic architecture. It is an apt symbol of the faith it serves. That symbolic role was understood by Muslims at a very early stage and played its part in the creation of suitable visual markers for*

the building: dome, minaret, mihrab and minbar among others. Yet it is, even more, the practical significance of the mosque in Muslim society that explains its pre-eminence. Alone among Islamic buildings, the mosque can gather to itself the functions of all the architectural types discussed in detail in this book. Naturally, if every mosque did this in practice, Islamic architecture would have come to a full stop with the invention of the mosque. The all-embracing importance of the mosque makes it quite natural that this should be the medieval building type preserved in the greatest number" [15].

Hand in hand with the spread of Islam and the political and economic growth of Muslim countries and their governments, activities in mosques have continued to concentrate on the worship of Allah and religious education based on the Qur'an and Sunnah.

I was once asked if there is, in fact, such a thing as "Islamic architecture." Is it, for example, limited to the architecture produced by Muslims to serve Islam's religious functions? If so, then, perhaps, not only mosques but possibly Islamic schools (madrasah) as well would qualify as quintessential Islamic architecture. Another response might define Islamic architecture as all architecture produced in Muslim lands. These are open questions of individual interpretation and evaluation. Whatever the position is adopted in this regard; however, Islamic architecture is distinctly different from non-Islamic architecture and must clearly be one of many expressions of the spirit of Islam, and of vital importance.

The functional and artistic dimensions of mosques are bonded together as one. In addition to being appropriate for worship in agreement with the ritual of Islam, prayer halls say to those who use them, if an inspiring, spiritual involvement and serving as an anchor for the individuality of the community that they serve. And, it is extremely important to observe the way in which that identity is always community-specific, unique to the context from which it springs forth. As suggested by Serageldin [16], "The way in which the building communicates to the community is dependent on the particular 'code' forged by the evaluation of the society in that specific region." Regional variations result in distinct architectural languages, "vocal dialects that have a common ancestry." Even though these architectural languages have evolved to the point where they are "natural contributively elements" to the society in question, however, as Serageldin [16] suggests, they may not be immediately recognizable to those from outside the community. To state this in a more fully accurate fashion, however, we might speak of a double-blind situation, one in which 'insiders' are the privy to a vision or understanding that outsiders' are not, whereas, by contrast, outsiders may often bring an analytical capability of comparative vision to any given context which insiders lack. The issue of contemporary verses traditional mosque design and its relationship to the political power structure of Islamic communities is of special importance with respect to the issue of 'state' or national mosques, where the fusion between Islamic religious faith and politics rises to its ultimate pinnacle or expression. In some cases, as is the case in Turkey where most of the population is Islamic, and the government is controlled by a secular elite backed up by a secular military establishment this fusion is highly controversial. In other cases, such as that of Pakistan, where the complete dominance of Islam is clearly undisputed, this fusion raises little or with no controversy.

As noted by Holod and Khan [17] , national or state mosques, as distinct from their traditional predecessors, are often located in a prominent location on the edge of the city and are a point of destination rather than "as a centrally integrated feature of the urban fabric." The state mosque in Islamabad, King Faisal "Masjid" Mosque, for example (figure I), is set against the backdrop of large hills in such a way as the mosque itself "resembles a small foothill or a huge white tent enclosed by four slender grooved minarets, one at each comer." As suggested by Holod and Khan [17], clearly, the physical environment is the main contextual characteristic of the Islamabad mosque. The scale of the mosque is enormous.

"The grandiose scale of the project can be more easily appreciated if one considers the following breakdown: a main prayer hall for 10,000 men; a women's prayer gallery for 1,500 worshippers placed directly above the main entrance; additional spaces in a courtyard for 40,000, a podium with a north platform for 27,000 and porticos which can accommodate 22.000; and green areas which can be used as open-air prayer areas by up to 200,000 people. A large fountain precedes the entrance to the mosque which stands on a raised platform reached by stairways" Holod, et. Al., [17].

The walls of the mosque are of Malaysian granite, the floors of local marble; the coloured glass was produced in the USA, the chandeliers imported from Germany, the wood latticework imported from Korea and the carpet from Belgium. No expense was spared in the effort to produce the highest-quality structure possible [13, 18].

Figure 1: King Faisal Mosque, Islamabad, Pakistan (Source: Yaqub 2017).

The King Faisal Mosque (figure 1), also introduced a novel, radical, and highly creative reinterpretation of the mosque dome, one that is, nevertheless, linked to or descended from traditional motifs. Designed by Turkish architect Vedat Dalokay, the tent-like, concrete structure echoes its hillside backdrop, while the placement and the frame of the tall minarets reveal their Ottoman antecedents. It represents a virtuoso-like display of the very latest in contemporary structural techniques, especially in the folded concrete plates. There is a notable absence of more readily available local materials, such as stone and brick. For Holod and Khan [17], "the most striking aspect" of the mosque is the vertical emphasis inside the main prayer hall (figure 2). The vertical axis, a feature usually equated with Ottoman architecture, is thus favoured in preference to the horizontal extension of the space inherent in the orientation towards Makkah. "The sheer size of the interior all but overpowers the mihrab and mmbar" The dramatic volume of the prayer hall with its central chandelier reminds one of Sinan's sixteenth-century Ottoman mosques in Istanbul. Focus. In conclusion of, this discussion of state mosques in general, however, it is important to note the role of Saudi Arabia in the realization of the national mosque in Islamabad. As the premier Islamic nation by it is the birthplace of Islam, it plays an especially significant role on, a global scale in, the determination of directions in mosque architecture [17, 18].

Figure 2: Main prayer hall (Source: Yaqub 2017).

Karachi was originally the capital of Pakistan following independence and partition from India in 1947. In time, however, a military regime decided to move the seat of government to a location from which the country could be more effectively controlled. The site for the new capital, Islamabad, was chosen in 1959 by a Commission headed by General Mohammad Yahiya Khan, then Chief of Staff of the Army. The idea of and location for a national mosque had been projected as early as 1960 but the building was only completed in 1986. The close relationship between Pakistan and Saudi Arabia was of vital importance to the development of the Islamabad mosque. According to Holod and Khan [17]: "The impetus to begin the mosque came in 1966, when King Faisal of Saudi Arabia completed an official visit to Pakistan and decided to finance the plan. Because of the king's role in financing and encouraging the building of the mosque and the Pakistani government's close draws to the Kingdom of Saudi Arabia, the mosque was given the name King Faisal Masjid and is usually not referred to as the national or state mosque" [19].

The era of the construction of national mosques may or may not have already passed, Here, it is important to underscore the way in which ultimate (official or national) contemporary expressions of Islamic devotion symbolized most clearly perhaps in King Faisal Mosque retain fidelity to Islamic tradition while they exceed or transcend traditional limitations: serving for the ever-greater glory of Allah.

ARCHITECTURAL CREATIVITY

Architecture is the art and technique of designing the enclosure of space for human use, as distinguished from the skills that are associated with construction rather than design. As with many other arts, the practice of architecture embraces both aesthetic and utilitarian ends; these goals may be distinguished but not separated, and the relative weight assigned to each can vary widely from one work to another. Architecture represents a social act, with respect to both method and purpose. It is almost always the outcome of a teamwork and collaboration. The results of architectural endeavours are for the use of groups of people, as small as the family or as large as an entire nation. Architecture is an inherently social phenomenon, both with respect to its process and its product. Architecture is usually a costly activity, however, as it generally requires the engagement of specialized talent and the harnessing of appropriate technology.

The main purpose of architecture is to modify the physical environment so that certain human activities can be carried out conveniently and in comfort. Given the way in which human activity serves as the foundation or reason of architectural endeavour, one can build a powerful case that the decision-making process entailed in architectural design in its most creative forms could never be fully automated. It is a thoroughly human activity in its essence, a reflection of innermost human emotions, and, in the religious realm, of spiritual aspirations.

The distinction to be made here is one between material (as opposed to spiritual) human activities, on the one hand, and fully automated human activities on the other. As conceded by Hilberseimer [4]; "Architecture, even in its highest expressions, is determined by material factors." Yet, he goes on to declare that: "Only the creative ability of the architect and his mastery of material means, and requirements can make us forget this basic fact. The architecture seems to be an expression of creative freedom,

of pure spirit" Hilberseimer [4]. Hence, in its most creative form, architecture struggles to The computer may have become a champion of the world of chess, but it is most difficult envision how it could ever contend, on its own the realm of architectural inspiration. The will to form tries to overcome their resistance. As accurately and expressively noted by Hilberseimer [4]: This will to form is, however, not to be confused with "the whimsicalities of an individual; it is super-individual, super-personal. It expresses the age-spirit and it is essentially irrational" [4].

We consider it to be highly doubtful whether design in any field that can truly be said to be artistic could ever be fully automated, totally removed from the unique moments of human inspiration, the flashes of creativity that sustain the artist. Some, however, argue that this could be the case. They point to the range of techniques that have now become available in our age of increasingly sophisticated technology and artificial intelligence, such as ergonomics, operational research, systems analysis, information theory, and other disciplines that generally depend on the extensive use of computers. It is true that these technological advances offer powerful tools for a decision making when one has data in quantifiable form and the advocates of unbridled technological advantage are quick to point out many fields in which design has become an extremely automated process, from the original atomic bomb to undersea housing and manned lunar vehicles, all of which would have been quite impossible without the profound advances that have been made with respect to technological development. As a relatively conservative religious force, however, Islam is bound to its tradition of inspiration in ways that respectfully limit the extent to which technology can take over the process of artistic creation, especially as it relates to the worship of God, who is the sustaining force behind all creative genius. Especially for Islamic designers, therefore, the resources that have come about because of technological advances must remain mere tools, irrespective of their level of sophistication, tools which facilitate but do not replace the creative genius of the artist, especially insofar as his work is motivated by religious devotion.

Architectural design involves the resolution of the specific and general demands of those for whom the project in question is directed their needs and requirements are projected in an image of the three-dimensional form. The design of a building is a creative rather than a calculable process; but, more so than with perhaps any other art form, architecture is concerned with concrete solutions and outcomes, with tangible realities that have both utilitarian and functional, as well as aesthetic, appeal. Every design consists of an effort to reconcile a form with its context. It is the context, in dialectical relation to the architect's wealth of experience, which usually prompts the initial architectural inspiration. This is especially true with respect to Islamic architecture, where the rapid expansion of Islam over vast areas of the globe presented especially novel challenges to Islamic architects.

There are many special and often highly complicated issues involved in approaching the problems of designing a mosque for a contemporary Muslim community. The continuity and parity of key symbolic elements, such as the minaret, mihrab, dome, and a gateway can be transformed with high degrees of latitude without eliminating or even diminishing their deeply inherent imagery. It is the level of skill and creativity of the architect and his/her degree of affinity with and a sense of responsibility towards the community in which a mosque is to be built that creates or accounts for the difference between tasteless and creativity.

There are many ways of providing better mosques and additional areas for congregational activities which respond more effectively to the needs of specific Muslim societies, facilitating the ability of the worshipers in question to anchor their unique self and group-identities in the contemporary structures that are being built with the assistance of today's technology, structures which speak to these devotees of the modern age as expressively as earlier symbols have to past generations. Architects need to be allowed and to learn how to free their imagination so that rapidly evolving Muslim cultures become increasingly capable of integrating the novel inspirations that the most creative of architects can contribute. Architects need to struggle to avoid becoming trapped in or limited by specific examples or models of mosques and to avoid the temptation of limiting themselves to a straightforward process of cataloguing and/or synthesizing the many interesting contemporary mosques which have been and continue to be built.

Architecture is a physical process that is based on many practical factors. It must be useful, efficient, and, most importantly, meet the requirements of those for whom it is designed to serve. It is important that the purpose of an architectural structure be thoroughly understood as well as articulate. Nevertheless, the practical and the aesthetic must be united as an integral whole; indeed, this is the heart of the art of architecture. Both traditional and contemporary architectural firms have long been and continue to be characterized and evaluated according to criteria concerning their objectives, directness, complexity/simplicity and novelty. Their majesty, or the lack thereof, like beauty, exists in the eye of the beholder.

The major centrally identifiable trend of twentieth-century architecture, contemporary architecture has been in the direction of architectural autonomy: characterized by the quest for greater levels of autonomous self-determination and freedom from traditional influences, as well as the utilization of modern technologies and novel architectural forms which incorporate the use of both natural and manufactured materials. It has generally been accepted as a given that architect should utilize the cutting-edge of advancing technologies, harnessing them to the service of their creative abilities, maximizing the potential contributions of developments in the physical and technological sciences to the enhancement of creative directions in modem architecture. This work fully supports this line of contemporary architectural reasoning. However, this article departs from the thinkers who take this trend to the radical extreme of suggesting that technological advancement is utilized in such a way as to facilitate or empower a complete divorce from traditional architectural values and identities.

This work seeks the enhancement through increasing levels of technological sophistication rather than the abandonment or rejection of traditional aesthetic architectural principles, at least as they relate to mosque architecture. This is clearly a question of religious loyalty and spiritual integrity. It is also a question of respect, esteem, and appreciation for the inspirational source or foundation upon which all

continuing progress is, at least to some extent, necessarily based.

This connection between loyalty to familiar social purposes, on the one hand, and the festivity of the fervent drama of original forms of creative energy unchecked in original ways, on the other, is recognized as a long and time-honoured tradition. It is celebrated, for example, in the writings of Le Corbusier, who suggests that: "The purpose of architecture is to be found animated relationships by means of supplementary resources. Architecture goes beyond practical needs. Architecture is a soft object. The soul of order, an agreement of intention, the intelligence of relationships. Architecture deals with quantities. Passion can create drama out of inert stone," Hilberseimer [4]. Passion for architecture, as we see it, is as with passion in authentic love; it seeks ever-greater fruition never desertion or rejection. It is loyal, yet it always grows, in ways that can never be foreseen.

TRADITIONAL MOSQUE ARCHITECTURE

Most if not all aspects of Islamic culture began to flourish with breath-taking speed within a few short decades of their beginnings. Unlike Christian culture, which evolved relatively slowly, the development of Islam was extremely rapid. Islam's expansion after the Prophet Mohammed's {Peace Be Upon Him} death in 632 AD, and during the Muslim caliphs, was quite different from the spread of other major religions, which usually remain highly provincial for prolonged periods of their history, then expanded slowly although steadily.

By the year 750 AD, during the Umayyad caliph, the first Islamic dynasty, Muslim armies, not only occupied a great portion of the Iberian Peninsula but also penetrated southern France to the west and as far as China to the east. From these conquests, numerous new and important cities emerged that would later have a most profound impact on the future cultural developments of their surrounding areas. The great mosques being built throughout the new Islamic Empire soon came to symbolize political, spiritual, and social unification. Especially prominent was the Umayyad mosque in Damascus, the Dome of the Rock in Jerusalem, the enlargement of the Holy Mosque in Makkah, the Prophet Mohammed's mosque in Medinah, the Great Mosque in Cordoba, and the Alhambra palaces in Granada, Spain. Also, of special importance were the Al-Qayrawan mosque in Tunisia, the Al-Azhar mosque in Cairo, Ottoman architecture in Turkey, and the great mosques of Marrakesh and Fez in Morocco [22].

These structures, which came to represent the quintessential, traditional Islamic architecture were all created from locally available building materials and human resources, providing each its own distinct regional flavour. These architectural achievements spurt out as suddenly as the new faith and the new nation-states that they represented. The construction of these early Islamic monuments was, of course, controlled or managed by Muslims, but the skills of a non-Muslim craftsman were also utilized, which served to create unique Islamic environments in each region, representing something vastly different from what had previously existed in each local [22]. Islamic architecture, insofar as it can be defined, is not the product of one geographical region or one people. Rather, it is the product of rapid conquests of diverse territories of a people with little previous architectural tradition, and the consequent synthesis of styles that occurred under one religious philosophy yet transpired in different regions and under diverse sets of circumstances. The uniquely Islamic combination of ideological unity and respect and appreciation for diversity has characterized Islam from very early on and therein lies one of the greatest strengths of its tradition [23].

Traditional Islamic architecture has developed throughout different chronological periods and widely distinct geographical areas. In the initial determinative stage of Islamic architecture, the original mosque form was a 'hypostyle' form, a flat or pitched roof prayer hall, a masjid, with an open courtyard surrounded by colonnaded walls (Figure 3). The hypostyle form was the basic architectural form of mosque architecture initiated in Medinah by the Prophet Mohammed {Peace Be upon Him} and his followers. It developed through the Umayyad's dynasties up to the Abbasid period, throughout the Arabian heartland, North and West Africa and Spain, (Figures 5 and 6). Several other distinct architectural styles developed in distinct parts of the Islamic world, however, characterized using available building materials, and the impact of indigenous traditions and culture, heavily influenced by the regionalism of the Muslim inhabitants in question. All these styles can equally be referred to as 'monumental' styles.

Figure 3: Hypostyle: a section of a hypostyle mosque showing the fiat roof and half circle arches (Khan Academy 2018).

The basic hypostyle plan for the prayer hall is a rectangular, flat, or gabled roof resting on double/tiered arcades, supported by stone, marble, or reinforced concrete columns. Some large mosques have a central nave covered by a single dome, as is the case, for example, with the Aqsa mosque in Jerusalem, the Umayyad's great mosque in Damascus, the great Qairawan mosque in Tunisia, and many others. The nave and the dome were added to the hypostyle form in the tenth and eleventh centuries. The dome over the first few aisles, the central nave perpendicular to the qiblah wall of the prayer hall, and covering the mihrab, is the first spatial elaboration of the idea of a large square in front of the mihrab and the minbar. It is one of the most durable and versatile aspects of medieval Islamic architecture, and it became an essential part of the interior formulation of the traditional mosque. The dome and the minaret continue to represent (Figure 4) centrally important parts of the exterior formulation of mosques and serve to distinguish the identity not only of traditional mosques but contemporary ones as well.

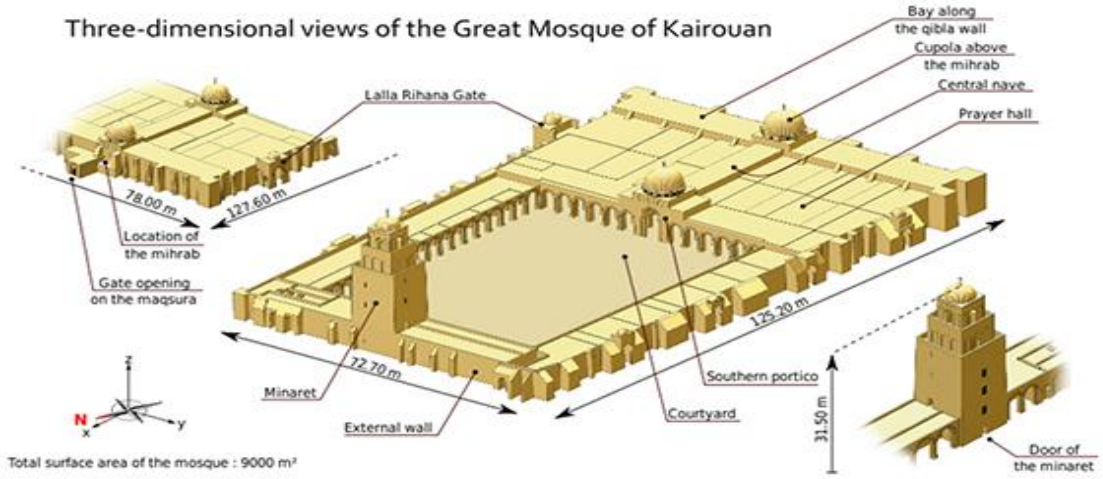

Figure 4: Three-dimensional views of the Great Mosque of Kairouan (Source: The Great Mosque of Cordoba (article) Khan Academy 2018).

Figure 5: Spain map showing the principle sites of the hypostyle plans mosques, like the great mosque of Cordoba, the Fez mosque and Marrakesh mosque (Source: Khan Academy 2018).

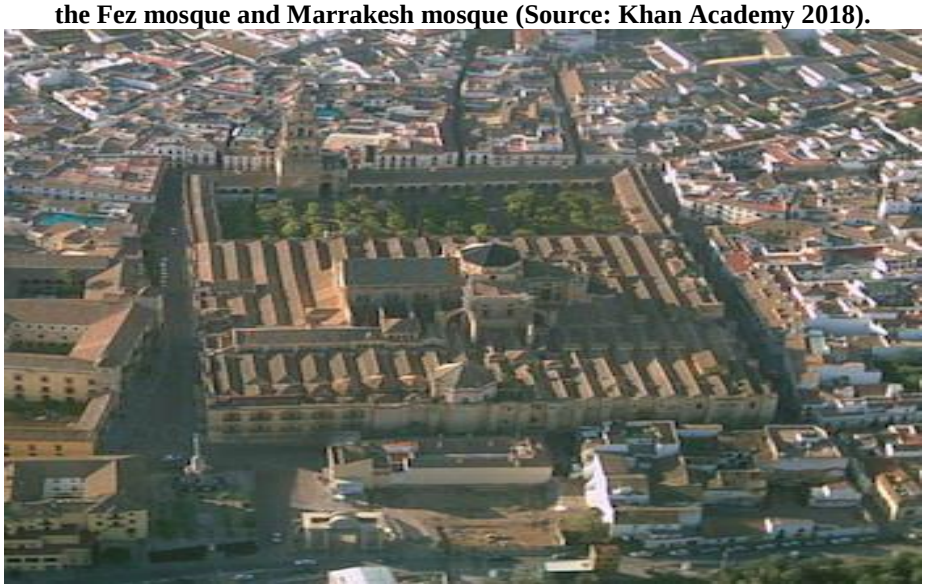

Figure 6: An aerial view of the Great Mosque, Cordoba, shows its remarkable roof structure of gables as an example of the hypostyle structure (Source: The Great Mosque of Cordoba (article) Khan Academy 2018).

This monumental style developed in five distinct geographical areas. Because of local traditions, culture, weather conditions and building materials, each style has its own distinctive shape and characteristics. These five basic categories of mosque design are a result of four chronological developments: the development of Ottoman Anatolia after 1453 AD, the flourishing of the Central Asian, Timurid Empire in the fourteenth and fifteenth centuries and in Iran after 1550 AD, and the return of Humayun to Mughal India in 1555 AD The central pyramidal style of roof construction in Southeast Asia and the detached pavilions within walled garden enclosures in China are also architectural legacies of imperial powers that spread throughout broad regions of the globe [24].

Anatolian architectural elegances and style after 1453 AD characterise the effect of the Seljuk mosque architectural style that established in the central Anatolian peninsula (Figure 7 and 8). These buildings share the chief significant characteristic of a huge semi-domes enclosed and supported by two three, or four half-domes forming a pyramid-shaped roof structure. The central and semi domes are reinforced by pendentives on top of square frames formed by four massive pillars at the comers of the square frame, serving to mix a large, square, central prayer hall. The roof structure is strengthened by protections at each side of the square to stop the weight of the roof structure from putting pressure on the walls of the prayer hall, stopping a possible structural collapse. The architectural style that developed in central Asia and Iran during the fourteenth and fifteenth centuries is known as the 'bi/axial four/iwan' style. The bi/axial plan has a characteristic character that obliged to greatly enrich the hypostyle form that has its origin in pre-Islamic, Iranian architecture.

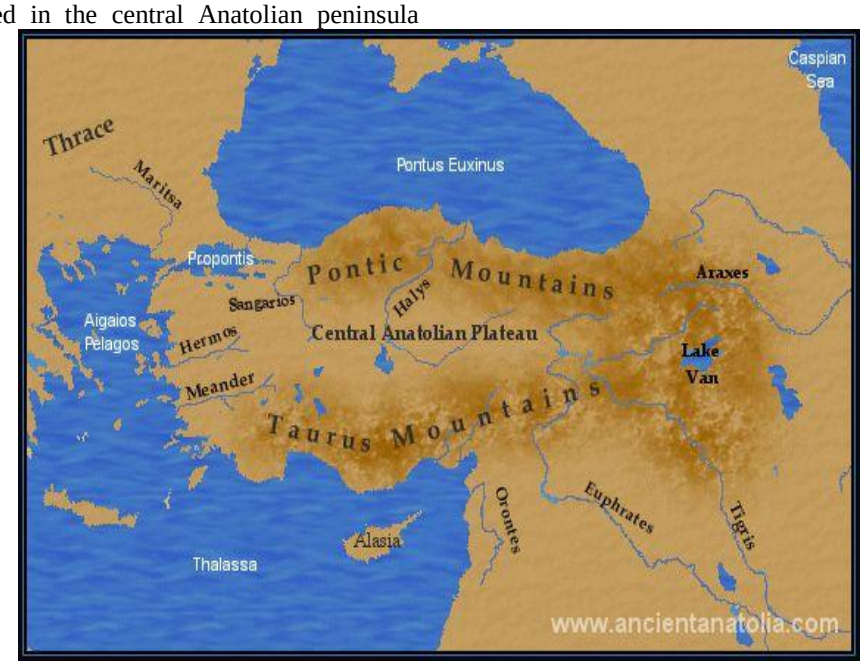

Figure 7: Anatolia map showing the principle sites of the Ottoman and Seljuk architectural style that developed in central Anatolian Peninsula, defining characteristic of a massive central dome (Source: www.ancientanatolia.com).

Figure 8: The Suleymaniye Mosque, Istanbul, one of many splendid examples of massive central dome surrounded and supported by two half domes, rests on four pillars. It is one of the most ambitious work of architect Sinan (Source: Numan and Santosa 2018).

The hypostyle form that has its origin in pre-Islamic, Iranian architecture [25]. Iwan is a Persian word for a chamber with an arched masonry dome and a rectangular arched facade that opens Iwan is a Persian word onto the mosque courtyard or to the prayer hall. The 'four axial iwans' form was ideally suited to serve as a monumental

entrance to the mosque. As noted by Bernard O'Kane: "The idea of a four-iwan courtyard is one of some antiquity it is known from Parthian and Ghaznavid palaces but there is a significant difference in terms of spatial qualities between the enclosed rooms adjacent to iwans in palaces and the open arcades of hypostyle mosques" [26].

The Muslim Mughals of Northern India are the descendants of Chingiz Khan. They established innumerable mosques, castles, and tombs using native building materials, especially red sandstone and white marble, which made Mughal architecture quite distinctive and easily recognizable throughout the subcontinent. Shah Jahan, the Great Mughal, erected one of the most splendid monuments in the orient for his dead queen and favourite wife, the Taj Mahal at Agra. The architecture that developed under the rule of Shah Jahan (1628-58 AD) is especially noted for its symmetry and uniformity of shape. Subsequently known as the Shahjahani style, the columns are multi-faceted and tapering, with cusped arches, a foliated base, and a vegetal capital. The arches are, in fact, multi-cusped, and the domes achieved a full bulbous form with a constricted neck, which came to be called the 'Lodhi' [27]. The typical Mughal Friday mosque floor plan includes a narrow rectangular prayer hall its width is about three times its length with a prominent central portal and three Lodhi domes. Usually, the central dome over the mihrab and the arched portal is larger than the other two domes over the right and left wings of the prayer hall. The arched portal opens onto a very large courtyard arcade, which is approached from the outside by flights of stairs leading to entrances on three sides. Two or four minarets are standard features of Mughal mosque architecture [27].

Although Islam is predominant in a few Southeast Asian countries, religious communities through the mainland and archipelagos of the area also follow to numerous features of Hinduism, Buddhism, Confucianism, Taoism, and Christianity, as well as celebrating autochthonous traditions and rituals. This diversity of religious expression on the part of even more diverse ethnic communities has resulted in remarkably rich architectural forms. The distinctive structural methods used by Muslim builders in different regions of Southeast Asia have been refined into techniques where tensile curves and light, stressed, roof membranes depend upon the use of a wide range of timbers and fibres. Southeast Asian mosque structures lie within the powerful Java-centred tradition of tall, multi-roofed, open halls with timber columns as structural supports. These types of structures are especially notable insofar as they reflect the region's abundant diversity of natural resources [28, 29].

Building codes in East and Southeast Asia prescribe roof designs, (figure 9, 10) in accordance with a hierarchy that indicates the purpose of a building, the activities or rituals that are carried on there, and the social roles of its occupants. These relationships mirror what is seen as the natural order of things. It comes as no surprise that a building with an open-ended gable would entail a low level of specificity in terms of the use to which it is put. On the other hand, it seems highly appropriate that a building with a centralized, hipped roof would be reserved for functions associated with religious ritual or functions of the state. The emphasis that accompanies a centralized roof form that is vertically multiplied seems

Figure 9: South East Asia map locating the principle sites of the South-eastern architectural styles (Source: Google maps @2017).

Figure 10: Masjid (mosque) Sultan of Ternate Mosque (Indonesian Masjid Sultan Ternate), also known as the Old Mosque of Ternate, is an old mosque in Ternate City, Indonesia is an example of the typical pyramidal multi-roofed timber structure (Source: Darmayanti and Bahauddin 2015).

Even more appropriate to the loftier symbolic functions. The original square plan of the prayer hall roofed with a central pyramidal three, four, or five-tiered roof structure remains the most significant defining characteristic of East and Southeast Asian mosque architecture [29, 30].

Islam was introduced into China in the early days of Islam, by the Prophet Mohammed's companions who travelled from Medinah to China in 632 A.D in the capacity of preachers, envoys, and representatives of the new Islamic state [31]. Mosque architecture in China (Figure 11) was heavily influenced by, in fact, based on, traditional Chinese architecture, adapted to Islamic beliefs and requirements as well as the needs of local Muslim communities. The traditional orientation of Chinese monumental buildings was adhered to, with mosques oriented on a north/south axis, with open spaces in the middle. Mosques built in large Chinese cities were usually oriented with the main entrance facing south, and the qiblah wall facing west. Both the main entrance hall of the mosque and the prayer hall stand independently on this axis [32]. The principal features of Chinese mosque architecture are domes with hipped hexagonal roofs, (Figure 12) which represent a particularly clear example of the combination of Chinese and traditional Islamic motifs, the minaret-entrance portal, the moon pavilion, and the prayer hall decorated with calligraphic inscriptions of the Holy Qur'an in Chinese characters [32, 33].

Figure 11: China map showing the principle sites of the Muslim Chines architectural style (Source: 0pen Street Map @2017).

Figure 12: The main entrance at the Moon Pavilion of the NiuJie mosque in Beijing, an example of the Chines architectural style (Source: Stroup 2017).

Traditional forms of Islamic religious architecture have been partly ignored or neglected over the last few centuries in many parts of the world due to economic recessions, lack of professional craftsmanship, and/or the influx of innovative technologies and building materials. Over the last few decades, in many Muslim and non-Muslim countries alike, modem architectural developments and innovations have largely been derived from non-Islamic architectural philosophies, yet, in some cases, these innovations have been implemented in the building of mosques. Many contemporary mosques designed and built since the 1950s throughout the Islamic world and within Muslim communities in other countries have made profoundly positive contributions to Islamic architecture, as is the case, for example, with the great expansion of the Holy mosque in Makkah, (Figure I3), the Prophet Mohammed's {Peace Be Upon Him} mosque in Medinah, (Figure 14), the King Hassan II mosque in Casablanca, (Figure 15), the Qasr Al-Hokm mosque in Riyadh, Saudi Arabia and the Great mosque in Kuwait, to name a few of the most distinguished. All these mosques have been built in the most beautiful of contemporary designs, utilizing the latest and most advanced building technologies and building materials, yet, for the most part, still managing to preserve what are the principal elements of traditional Islamic architecture.

Some contemporary mosques, however, while boasting breathtakingly beautiful architectural forms, have shown little regard for the preservation of traditional Islamic architectural identity, especially with respect to the traditional features of principal importance, the minaret, minber and mihrab, which represent the central transcendent aspects of the mosque's symbolic personality. Contemporary mosques built, for example, in New York, Tokyo, Islamabad, Ankara, and other places, feature many contrasting styles which make it difficult to clearly identify whether the structures are religious or secular buildings, especially because of the way in which the cornerstone features of the mosque, the minaret, minber and mihrab have been generously abstracted. The Parliament mosque in Ankara, (Figure 16) is an especially good example of this tendency [34, 35, 36].

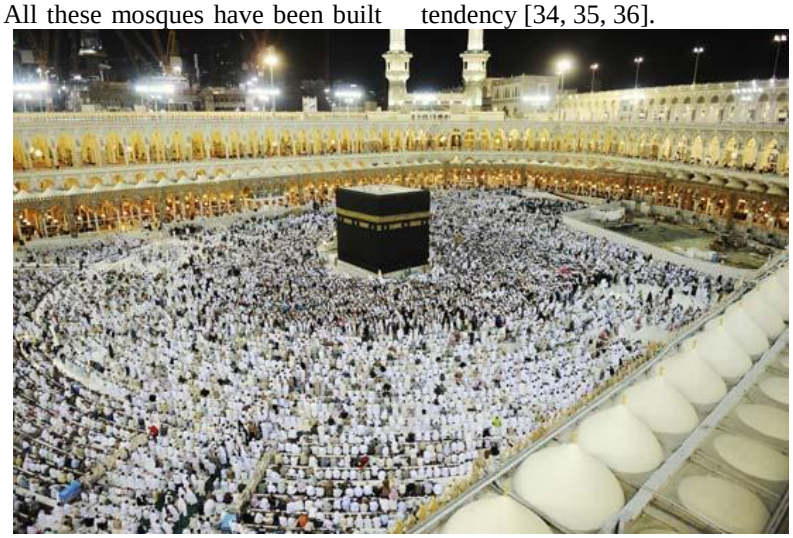

Figure 13: The Holy mosque at Makkah. The Holy Kab'abh is in the centre of the courtyard (Source: Elbelkasy et.al 2015).

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Figure 14: The Prophet Mohammed's (Peace be upon Him) mosque in Madinah (Source: Omer 2017).

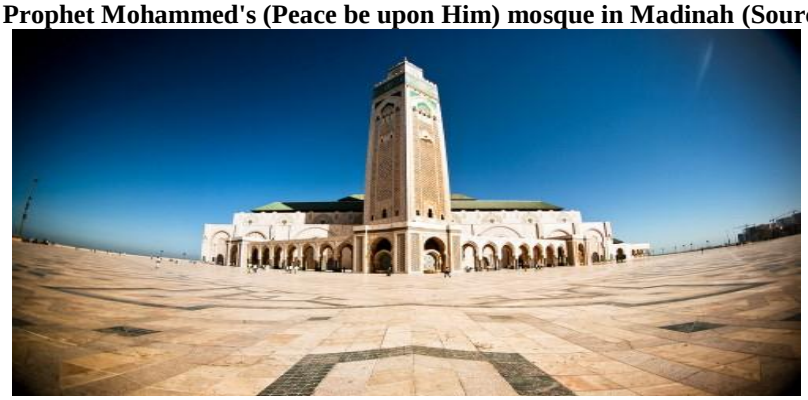

Figure 15: King Hassan II mosque in Casablanca, Morocco (Source: El Guabli 2018).

Figure 16: The Parliament mosque, Ankara, Turkey (Source: Batuman 2016).

In a few limited cases such as those mentioned above, competing for architectural philosophies have served to erode, to a limited extent, the singular uniqueness of traditional Islamic architecture in some regions, at least with respect to the homogeneity that has served to characterize Islam and distinguish it from other religions over the centuries. On the other hand, some Muslim countries have begun to restore and further preserve existing traditional buildings. Many Muslim architects are seeking to reincorporate traditional Islamic architectural details into their new project designs and to preserve the traditional heritage and identity of Islamic architecture along with the use of new and improved designs, materials, and technology.

The complex interplay of technological, economic, theological, and political factors in some contemporary Islamic cultural contexts has influenced the modernization of architecture in such a way that it has arguably led, at least to some extent, to the diminution of the architectural unity of Islam. The utilization of modem building materials and the cutting edge of advancing technology in architectural design are virtually unanimously accepted as both a necessity and an obligation today. Nevertheless, many others in this field feel strongly that their implementation should be in a form which preserves the unique authenticity and singular grandeur of Islamic architectural identity.

Contemporary trends in mosque design and construction that utilize the latest technological advances in both material development and construction techniques are a double-edged sword. They can result in either a resounding success or a dismal failure, depending on the chief architect's understanding of the project and the way in which it accurately reflects, or fails to reflect, the identity and aspirations of the clients, or the community which it is designed to serve. When an architect undertakes the task of designing a house of worship whether the architect in question a believer in the religious faith in question is it is of critical importance that this architect effectively maintains open lines of communication and dialogue between the design process and the tenets and traditions of the faith in question. Regarding the question of fidelity to traditional forms of religious conviction that find their concrete expression in the creation of monumental religious architecture, it appears to me that the bias should be in the direction of maintaining rather than breaching that fidelity,

unless there are extremely convincing reasons to do otherwise, and I think that this general principle would hold with respect to any religious tradition.

The design of a mosque represents something qualitatively different from the design of a commercial building, a monumental building of a secular nature, or one that is to be devoted to religious purposes outside of Islam. As both an architect and a member of the Islamic faith, I feel very strongly that the design of a mosque is appropriately a religious experience of the highest order, an exercise of one's faith, and a testimony to one's religious devotion. It serves as an expression of one's innermost and most profound spiritual sensitivities. For this reason, I now enter upon what the most controversial issue is perhaps raised in this article the question of the propriety or desirability of non-Muslim architects designing mosques.

This issue is of the utmost importance to this discussion since, quite understandably, those contemporary mosques the design and construction of which have taken the most liberties with respect to deviation from the time-honoured traditions of Islamic architecture, are precisely those mosques that have been designed by non-Muslim architects. Although several mosques that have been designed by non-Muslim architects have exceptionally beautiful architectural forms, in my opinion, they sometimes fail to inspire the level of spiritual feeling in the worshipper that is the case with mosques that follow our time-honoured traditions with respect to architectural style. And, we are very far from the respect to the strength of our sentiment in this regard.

CONCLUSION

Hillenbrand [4] suggests that another approach to the categorization of architectural traditions, "which might be termed typological," cuts across regional and temporal boundaries to isolate the significant variants of mosque design and trace their development. Yet, as he suggests, this approach tends to minimize the significance of regional schools and fashions "precisely because it ignores such boundaries." He charges that these theoretical categories and sub-species, "tend to have a somewhat academic flavour," which, as he sees it, "while technically defensible, they somehow miss the point." A third approach, according to Hillenbrand [4], "might be to rely on statistics and, by reporting all known mosques of pre-modem date, to discover the types and distribution of the most popular varieties." however, developed a focus on the 'pre-modem', since, as we see it, this distinction is somewhat arbitrary as well, at least with respect to the traditional mosque. This study, therefore, is best seen as a blend of the first two approaches traced (and criticized) by Hillenbrand [4]. We have clearly "cut across regional and temporal boundaries" in my quest to more fully articulate what we mean when we refer to the concept of the traditional mosque. We concede, of course, that this article does "tend to have a somewhat academic flavour."

We would like to suggest, strong impulses towards fidelity to tradition, those creative developments in religious architecture at least, or especially, in the Islamic tradition must necessarily correspond to certain fundamental architectural principles which are basic to the religious tradition. In Islam, for example, the Kaa'ba is necessarily seen as the centre of the universe. Inviolate architectural imperatives are a natural result of this fundamental reality. As Burckhardt describes it, the Kaa'ba represents a cube that is linked to the idea of the centre.

Creativity is also the element of crucial importance to the process of gradually assimilating a traditional culture to new conditions, new materials, and new techniques. Herein lies the dialectic of creativity. Islam is a living entity, growing, breathing; its parts are equal to its whole, which is ever-changing, in constant adaptation to its environment. Local traditions fuse with or into Islam in most creative ways. Strength spiritual, artistic, even technical flows in two directions. It is a dialectical or mutual reinforcement, even're-formation', of 'tradition'. Tradition is the present, and it is the future as well. It is the surge of creativity that serves to link architecture to itself: uniting past, present, and future in a dynamic chain that is encountered in the here and now. Our creativity, however, along with our time, is limited. Ultimately, for me, creativity is a gift from Allah, it is unpredictable, undeserved, open-ended, and entirely impulsive it opens as part of the fabric of Islamic life itself.

Islamic architectural styles in the Muslim world differ from region to region from China to Spain according to regional traditions, cultures, and the availability of building materials. We believe, however, that the Mghribi in Morocco, the Andalusian in Spain (what is commonly referred to as "the Moorish style") and the Ottoman style in Turkey represent mosque architectural styles that have especially unique architectural characteristics and distinguished identities that spring from pre-eminently significant forms of religious inspiration. Their architectural styles are especially illustrative of the most brilliant chapters in mosque architectural history. They represent repositories of centuries of culture, in fact, collective layers of cultural treasures resulting from the historical superimposition of cultures in Northern Africa, the Iberian Peninsula, and Anatolia. They also represent the ultimate expression of medieval architectural styles and are especially illustrative of the glory of Islamic architectural heritage. Muslim builders, craftsmen, and artists of every kind created architectural styles that we still see reflected in many areas of traditional Moroccan, Islamic Spanish, and Turkish architecture. Islamic medieval arts, even today, continue to be representative of the most significant components of Islamic culture

There is no doubt that contemporary developments and innovations in architecture innovative ideas and methods as well as the development of greater competence with respect to building technology have played and undoubtedly will continue to play key roles in the development of mosque architecture in the future. It is crucially important, therefore, as we see it, that the client and the designer understand the importance of integrating contemporary and traditional architectural motifs and techniques into the development and implementation of architectural technology in a way that preserves the dignity and identity of the Islamic architectural tradition. This is the overriding concern of this article: that Islamic identity and dignity be preserved while new and ever more sophisticated forms of architectural expression are developed and employed.

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