Historical Factors and Their Impact on The Formation of Architect Sinan's Mosques

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العوامل التاريخية وأثرها على تشكيل مساجد المعمار سنان

ناصر ثابت المغربي، قسم التصميم الداخلي، كلية العمارة والتصميم، جامعة البترا، الأردن

الملخص

لعب تاريخ العمارة دورًا مؤثرًا عندما قرر المعمار سنان جعل العمارة العثمانية واحدة من أفضل المدارس في تاريخ العمارة العالمية بشكل عام والعمارة الإسلامية بشكل خاص. لذلك تنبع أهمية دراسة عمارة المعمار سنان، من منظور تاريخي، من تعقيد الخلفية التاريخية لمبانيه، وأيضًا من تنوع العوامل التاريخية التي ساهمت في صياغة شكل وأبعاد الشكل الخارجي والفضاء الداخلي في عمارة المساجد العثمانية. الموقع الجغرافي لمدينة اسطنبول، على حدود القارتين آسيا وأوروبا، له عمق بيزنطي تاريخي تمثله آيا صوفيا والعديد من المباني التاريخية الأخرى التي ما زالت قائمة في المدينة. من ناحية أخرى، يجب فهم المدرسة المعمارية العثمانية على أنها استمرار طبيعي للعمارة الإسلامية التي تم تمثيلها في العديد من العواصم الإسلامية الكبيرة حول العالم، والتي احتوت على الكثير من المعالم في تاريخ العمارة العالمية. كما يتم تسليط الضوء على روح العصر التي تفرض المنافسة مع الدول الغربية التي لديها منتجات معمارية قادرة على مواكبة العمارة العثمانية في عصرها الذهبي، في الواقع كان هناك دور كبير لعمارة ومهندسي روما في عصر النهضة في إشعال المنافسة مع العمارة العثمانية مما جعل المهندس المعماري سنان يعطي كل ما لديه من إبداع وقدرة على الأداء.

في هذا البحث، تم اقتراح مجموعة من النقاط لشرح كيفية استفادة المعمار سنان من العوامل التاريخية والنماذج المعمارية القديمة لكتابة روايته المعمارية العثمانية الشخصية في القرن السادس عشر. كما قد يمنح الباحثين والمعماريين في الوقت الحاضر المعرفة من أجل تطوير المهارات الفكرية لديهم في التعامل مع العمارة المعاصرة، بالإضافة إلى المساهمة في إمكانية وجود رؤية لما ينبغي أن يكون عليه مستقبل العمارة المعاصرة، وخاصة عمارة المساجد.

كلمات مفتاحية: المعمار سنان، مسجد شاهزادة، مسجد السليمانية، مسجد السليمية.

Abstract

The history of architecture has played an influential role when architect Sinan decided to make the Ottoman architecture one of the top schools in the history of world architecture in general and Islamic architecture in particular. The importance of studying the architecture of architect Sinan, from a historical perspective, stems from the complexity of the historical background to his buildings, and also from the diversity of the historical factors that contributed to the drafting of the form and dimensions of the exterior form and the interior space in Ottoman mosque architecture. The geographical location of the city of Istanbul, on the borders of the two continents, Asia and Europe, has a historical Byzantium depth represented by Hagia Sophia and many other historical buildings. On the other hand, the Ottoman architectural school must be understood as a continuation of the Islamic architecture that was represented in many large Islamic capitals around the world, which contain a lot of landmarks in the history of world architecture. And also it should be highlighted that the zeitgeist imposed competition with the Western countries that have architectural products able to cope with Ottoman architecture in its golden age. In fact there was a major role of the architecture and architects of Rome in the Renaissance in igniting competition with architect Sinan, which made him give all of his creativity and ability to perform.

In this research, a set of points are proposed to explain how architect Sinan took advantage of historical factors and old models of architecture to write his 16th century Ottoman architectural novel. It may also give researchers and present day architects knowledge in order to develop intellectual skills in dealing with contemporary architecture, in addition to contributing to the possibility of having a vision of what should be the future of architecture, especially mosque architecture.

Keywords: Architect Sinan, Sehzade Mosque, Suleymaniye Mosque, Selimiye Mosque.

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1. Introduction

"History contains much, if not all, of what still concerns us today. Without history we can never understand the present. Many don't like 'history' – they are wrong" (Hielkje 2009: 1). History is the never-ending process whereby people seek to understand the past and its many meanings. We study History because it offers a storehouse of information about how people and societies behave. It is among our most fundamental tools for understanding ourselves and the world around us. Without studying history we cannot interpret the past, understand the present, and imagine the future.

Architecture history is a cultural product inherited through generations, through the ages. It can be described as a set of interlocking rings related and complementary to each other. All human civilizations have immortal records of the architectural achievements, starting from the pyramids of Egypt and Ziggurats of Mesopotamia, going on through Greek temples and Roman theaters, Byzantine churches and Islamic mosques, and ending with the high towers of global cities such as Dubai and New York. It is quite clear that these architectural products did not come out of nowhere, but based on past landmarks and on what is available on the ground from the science and technology of construction. In addition to what can be granted by the spirit of the age and the inevitability of architectural confrontations with the achievements of other contemporary countries or civilizations.

Architecture historians strive constantly to improve our collective understanding of the past through a complex process of critical dialogue. Even if we did not study the history of architecture the work of architects - as a part of history - will reflect the basic theories that history already created. But to what extent is it important to historians to interpret and narrate the history of architecture and architects? Which kinds of achievement are worthy of study? In other words, why do we study the history of architecture?

1.1 Problem of the Research

Studying the history of architecture and the arts does not mean merely getting acquainted with the historical facts and events; rather, it means delving into the study and analysis of these events in an attempt to come up with results that benefit and enlighten present day architects and designers.

The Ottoman school of architecture and design is considered one of the profoundest schools in the artistic and cultural production for six centuries. Since the beginning of the fourteenth century until the early twentieth century, this school gave a lot of civilizational achievements and architectural monuments, especially in mosque architecture and design. The golden age of Art and architecture in the history of the Ottoman state was in the sixteen century, especially in the reign of Sultan Suleiman "The Magnificent" (r. 1520 – 1566), who adorned the capital city of Istanbul with flourished milestones. Ottoman architecture found its way to glory in this period and was distinguished by the existence of the genius Architect Sinan (1489 – 1588) (Figure 1), who started his career as an engineer in the Ottoman Army 1514, where he got an excellent opportunity to learn about different styles of architecture and to study many architectural landmarks in Arabic and European Ottoman provinces during the

military campaigns led by Sultan Selim I and Sultan Suleiman I. His life in Istanbul later on enabled him to have a good knowledge about the biggest and most important edifices in Istanbul like Hagia Sofia, Fatih Mosque, and Beyazied II Mosque, etc. (Saoud, 2007: 2-6)

Figure 1: Architect Sinan, Portrait (From Biyografya)

At the age of fifty, he was appointed as chief royal architect, applying the technical skills he had acquired in the army to the creation of fine religious buildings. Architect Sinan built three major Sultanic mosques in the European parts from the Ottoman State, in the middle of the sixteenth century. These mosques have had many major architectural and structural developments, interiorly and exteriorly. Historically, these grand Sultanic mosques marked three stages in Architect Sinan's career. In his book, The Age of Sinan, Gulru Necipoglu clarifies these three consecutive stages; the first mosque, which was built for the deceased Crown Prince Mohammad, Shehzade mosque (1543 - 1548), marked the formative Period, from 1539 to 1548. The second mosque, which was built for the world-famous Islamic Caliph, Sultan Suleiman I, Suleymaniye mosque (1550 - 1557), marked the Classical or the Mature Period, from 1549 to 1568. The third mosque, which was built for Sultan Selim II, Selimiye mosque (1570 - 1575), marked the Post-Classical Period, from 1569 to 1588. (Necipoglu 2005: 104-109)

Establishing a new design typology in the Islamic architecture started to come into sight in the skyline of the city of Istanbul since the beginning of the sixteenth century. Ottoman architecture has to be shaped and to demonstrate excellence under the sovereignty of the most brilliant Ottoman Caliph, Sultan Suleiman "The Magnificent", and it was the responsibility of architect Sinan, the chief architect, to write the new vocabularies of Ottoman mosque architecture. Therefore, the researcher wants to raise the following questions: 1) how can architect Sinan imagine the future of Islamic architecture during the golden era of the Ottoman Empire, which included the majority of the former Islamic great capitals? 2) Will the new style be a continuation of the old Islamic architecture models, like the Umayyad style, Umayyad Andalusian style, Abbasid style, and the Mamluki style? 3) Or the new style has to be different from the earliest Sultanic mosques built in the early history of Ottoman architecture? 4) Or can it be considered as a normal formalistic improvement of mosque design in the Early Ottoman style? 5) What is the role of the geographical location of Istanbul and its historical and architectural heritage, especially the influence of Hagia Sophia, the Byzantium model, on the Ottoman architecture?

In other words, what are the historical factors that have helped architect Sinan to formulate the Ottoman style in mosque architecture?

1.2 Objectives of the Research

A. Show the importance of the complexity and diversity in the historical geographical background of Ottoman architecture, and the options that were available in the hands

of architect Sinan in the sixteenth century.

B. Demonstrate the skills and intelligence of architect Sinan in dealing with the historical dimension of architecture, showing his ability to take advantage of implementing this dimension in favor of the development of Ottoman architecture and enabling it to compete with Renaissance architecture.

1.3 Research Limits

Multiple limits to this study can be illustrated through: a) Time limits: The research investigates the historical factors of mosques built during the sixteenth century by architect Sinan, b) Geographical Limits: This research deals with three samples of the important and large mosques of architect Sinan, which were built in Istanbul and Edirne cities, c) Objective Limits: This research aims to clarify the historical factor affecting the shape of the Ottoman Mosque in the sixteenth century.

1.4 Research Hypothesis

There is a set of historical factors that have had great influence on the architecture and mosques of architect Sinan. Understanding these factors will help in understanding the nature of the strong rise of Ottoman architecture in the sixteenth century, and can also probably help in drawing a clear vision of Islamic architecture of the future.

1.5 Significance of the Research

Conducting an evaluation of the architect Sinan's experience and investigating the influence of the historical factors on his architectural decisions reveals the secrets of his artistic creation designs in the sixteenth century in Istanbul, and may also contribute to solving some of the problems of Islamic architecture in the present time, especially with regard to mosque architecture.

1.6 Methodology of the Research

This study follows the historical research method as a main methodology with the benefit of the descriptive and analytical research method, in an attempt by the researcher to systematically restore the complex nuances, meanings and even ideas of the past that influenced and shaped the features of Ottoman architecture in the sixteenth century. (Berg & Lure, 2012: p. 305)

This research is structured along seven parts, the first part is the introduction that highlights the research problem and clarifies the objectives and limits in addition to the hypothesis and methodology. The second part talks about change and development in design and architecture throughout history. The third part describes the skills of reasoning, analysis, and ability to make appropriate architectural decisions. The fourth part shows the creativity and maturity architect Sinan reached in the Formation of the Ottoman Mosque. The fifth part evaluates the achievements of architect Sinan and his role in shaping the future features of Ottoman architecture. The sixth part summarizes architect Sinan's architectural innovations. The seventh part draws the conclusion of this study.

2. Understanding Change and How Architecture Developed Through History

Change is one of the natural features of history, and there’s nothing that starts out of nowhere. Civilizations have evolved with time and peoples take science and knowledge from the generations that precede them. Architecture also changes with time, and the Ottoman architects had to learn from the architectural products of old civilizations, whether from the West or the East.

2.1 Appreciating the Architecture of the Western Civilizations

In the ancient civilizations of Europe, the great religious buildings represented many values and meanings, whether for the ruling class or for the general public. By virtue of the geographical location and the proximity of the distance to the neighboring countries in the heart of Europe, architect Sinan was certainly well acquainted with the styles of Roman architecture, especially the great domed temple of the Pantheon, now a Catholic church in Rome, Italy (Figure 2). It was constructed by Emperor Hadrian during the period from 118 to 128 A.D. The building is cylindrical in shape with a portico of large granite Corinthian columns under a pediment. A rectangular vestibule connects the balcony to the rotunda, which is located under a covered concrete spacious dome, with a central opening to the sky. The flat dome is raised and supported by the continuous and circular walls of the temple. About a thousand and five hundred years from the date of construction, at the time of Sinan, the Pantheon's dome is still the largest unreinforced concrete dome in the world. The height of the dome and the diameter of the inner circle are the same, 43 meters. (Fletcher, 1975 p. 130-135).

Figure 2: Pantheon of Rome, Plan & Interior View (www.pantheonrome.com)

The enormous building of Pantheon consisting of a single space unit is similar to the single unit in Ottoman mosques that were built in the fourteenth and fifteenth century within a reasonable scale like Bali Pasha Mosque1505 (Figure 3). It is natural that the Pantheon constitutes a catalyst for architect Sinan to build a great mosque that has a global and ceremonial style. (https://archnet.org/sites/1970)

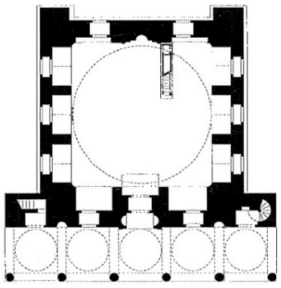

Figure 3: Bali Pasha Mosque, 1505, Single Unit Plan (www. archnet.com)

Architect Sinan showed best judgment on the colossal spatial construction of Hagia Sophia, the structural wonder in the history of Byzantium architecture (Figure 4). The construction of Hagia Sophia preceded the era of architect Sinan by about a thousand years and, in his time, still had the highest and widest baldachin dome in the world, up to 56 m. diameter extends to 31.5 m.

(Necipoglu, 2005: p. 81-84) Thus, it seems that architect Sinan may have better evaluated the possibilities of the Ottoman architecture in the sixteenth century, and determined the goals that can be achieved in the light of this great challenge of the Byzantium architecture represented by Hagia Sophia.

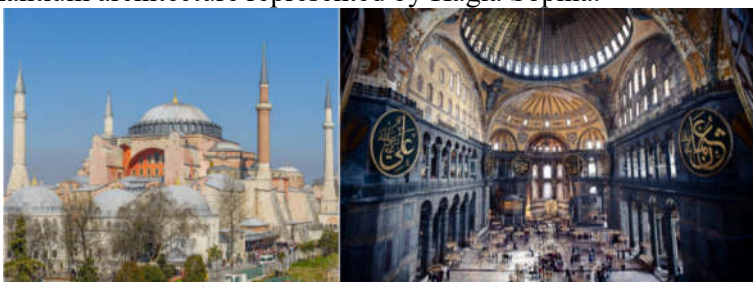

Figure 4: Hagia Sophia, Exterior & Interior (www.hagiasophia.com)

2.2 Inspiration from Unique Examples of Past Islamic Architecture

It is well known that Muslims love applied art, architecture, urbanization and building cities. From an Islamic point of view, man is a subordinate of the land and is responsible for its architecture and rehabilitation to be fit for human life. And there are many historical Islamic great cities rich with famous architectural monuments such as Cairo, Damascus, Cordoba, Kairouan, Jerusalem, Aleppo, Marrakesh, Fez, Baghdad, etc. All of them were having big names of senior architects and stories of mosque architectural success throughout Islamic history. The case of the architecture of the Cordoba Mosque (Figure 5), reflects the history of the city and its development, hand in hand with the developments of the mosque building and the subsequent expansions until it became one of the largest and greatest mosques in Islamic history. It was constructed on the orders of Abd ar-Rahman I in 785, when Cordoba was the capital of the Muslim-controlled region of Al-Andalus in the Iberian Peninsula, Western Europe. The construction of the mosque took place through several stages, the second mosque plan was of Abd ar-Rahman II 833, the third mosque plan was of Al-Hakam II 966, and the fourth and last mosque plan was of Al-Mansur 979. (M. Bloom, Jonathan: 2009).

Figure 5: Mosque and City of Cordoba, Exterior & Interior (https://www.flickr.com)

Architecture documents the history of cities, states, kings and sultans, and the great architectural landmarks in Islamic history constituted another historical challenge for architect Sinan: they may have prompted him to make his best efforts to build great and exalted Sultanic mosques in the city of Istanbul during the reign of Sultan Suleiman the Magnificent, especially the mosques of Shehzade and Suleymaniye (Figure 6).

Figure 6: Istanbul City (www.istanbulcity.com)

Architect Sinan would not accept that the great capital of the Islamic world of Istanbul in the sixteenth century be inferior to other Islamic capitals and cities. He wanted his city to be the brightest and most constructive in the east of Europe. In order to achieve his desire of having Istanbul documented architecturally in the history of Islamic art and architecture, Architect Sinan had to write new pages of success and architectural stories on the ground of this Islamic city of Istanbul. Certainly the Islamic historical cities filled with the glory of architecture and the beauty of arts inspired architect Sinan and were the catalyst for his imagination to create many diverse projects with a lot of monumental mosques.

3. Developing Essential Thinking Skills to Make Sensible Design Decisions

Architect Sinan is considered one of the most visible and successful architects in the world history of architecture. It is not possible to study the history of architecture without going over the buildings and mosques of Mimar Sinan. Perhaps this success is due to the complexity and overlapping historical influences that contributed to making his architecture unique in a geographical position at the borders of the two old continents of Asia and Europe, combining East and West, ancient and contemporary, and inherited and acquired.

Architect Sinan was fully aware that he was representing the Islamic school of religious architecture that had started with one of the largest and oldest mosques in the world located in the old city of Damascus, the Umayyad mosque (Figure 7). The sixth Umayyad caliph, al-Walid I (r. 705–715), commissioned the construction of a mosque in 706, and it was completed in 714/15 (Grafman, 1999: p. 7). The Umayyad mosque occupies a huge square measuring 157 x 100 meters, and it has a large open courtyard surrounded by a portico of arches supported by slender columns. The prayer hall is divided into three long aisles with rows of columns and arches. The pavilion, which has a central octagonal dome, cuts across the aisles at its center. (Finbarr, 2001: p. 261)

Analyzing the planning scheme of the Umayyad Mosque shows that it contains a set of architectural characteristics that have benefited the mosque architecture in later ages of Islamic history, like: 1) It has a singular dome in the center of the wide prayer hall, and it works as an expressive element, 2) The spacious prayer hall and the interior corridors is rectangular and transversal parallel to the qibla wall 3) The qibla axis and intersecting corridor are emphasized by the dome in the center of the mosque, 4) It has three lofted and glorious minarets, 5) The pretty wide and open courtyard and shaded porticos were dedicated for social life, while the basic and main function of the interior spaces of the mosque was worshipping.

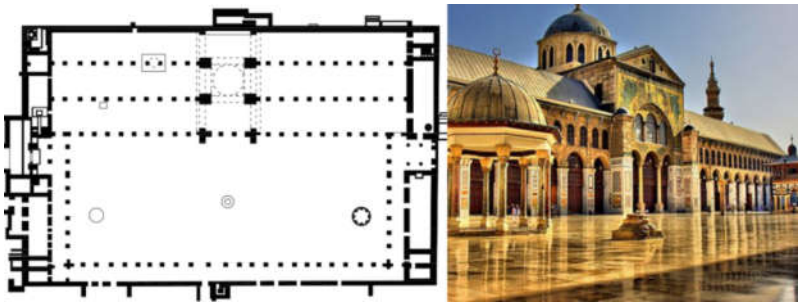

Figure 7: The Umayyad Mosque, Plan & Interior (www.umayyadmosque.com)

In spite of the fact that there was no custom shape or specific traditional design for mosque construction for him to use, architect Sinan knew that his architecture had to constitute a normal and smooth addition to the Islamic architectural heritage and principles of mosque design. But the question for Sinan was how to preserve this eastern Islamic heritage, while his capital, Istanbul, is standing over European territories that embrace the Western heritage in the architectural thought. He could not ignore the obvious presence of the huge construction of the Hagia Sophia and other Byzantium churches that carried connotations representing another school in the history of religious architecture (Figure 8).

Without the slightest doubt, architect Sinan could not overlook the shape and size of Hagia Sophia, especially the distinctive structural system that raises the pretty wide dome within a series of pillars, columns, buttresses, arches and semi-domes, reaching the central dome at the top of the architectural pyramid.

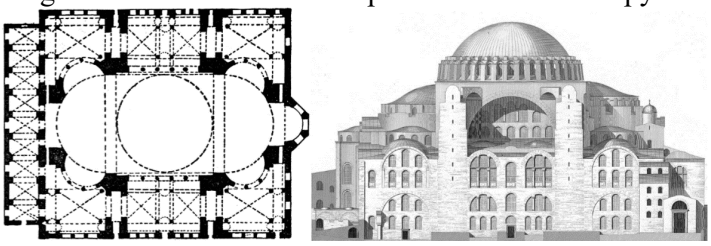

Figure 8: Hagia Sophia, Plan & Elevation (www.hagiasophia.com)

Cultural complexities and contradictions of thought and design increased difficulty of the task of architect Sinan while trying to create a new style in Ottoman mosque architecture befitting the size and value of the superpower multi-ethnic world Ottoman Empire in the sixteenth century. In Sinan's day, the Ottoman state was no longer that emerging state in Anatolia in the fourteenth century; instead, it was a big kingdom affecting larger areas that stretch through three continents, Africa, Asia, and Europe. But the capital, the seat of the work of architect Sinan, remained in Europe. Indeed, the only option left in the hands of architect Sinan was to aim at providing a sophisticated and new style in Islamic architecture over the European territories: a style that carried Islamic tradition and was capable of living in harmony with the local environment, able to compete with the architectural styles in Europe, especially the architecture and architects of Rome.

4. Creativity and Maturity: the formation of the Ottoman Mosque

Reading the history of architecture through the eyes of the architect Sinan is important for understanding the historical factors that influencing his decisions of making the Ottoman mosque, and the questions that arises here is: How did architect Sinan benefit from the architecture of the past and its historical complexities, and how he was able to achieve his objectives to develop the Ottoman mosque architecture from historical perspective? In fact, engineer Sinan must have obtained the skill and sufficient experience that qualifies him to start his big project in creating a new style in Islamic architecture.

4.1 Avoiding the Architectural Mistakes of the Past

Almost there is no profession in human history devoid of mistakes, and the architecture is not an exception. But people sometimes differ in how to define what is wrong or what is not. For example, is it a mistake that the design be not well proportioned? Or is it not a mistake when the architecture of the mosque does not meet the ambitions of the Sultan, or does not possess the expressive ability and symbolic value of the status of the state and the power of the Sultan? This is what happened when the Al-Fatih Mosque (Figure 9) was built within modest proportions and a ceremonial design that could not match the form of the great buildings in Europe, 1470, although it was one of the largest examples of Ottoman-Islamic architecture in Istanbul in the fifteenth century. (Aga-Oglu, 1930: p. 179-195). One can also ask are mistakes considered mistakes in case of the fall of any part of the building or the collapse of the main dome by an earthquake, which happened in the Hagia Sophia when the first dome collapsed in 558. (Taylor, 1996: p. 66–78).

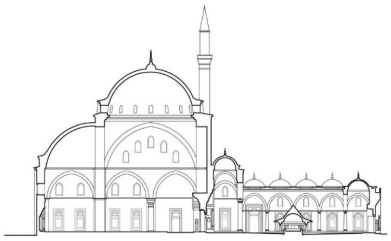

Figure 9: Fatih Mosque, Section (From Archnet)

The architectural products of architect Sinan are well thought out, rational and structurally not exaggerated. This can be seen when comparing the measurements of the Hagia Sophia and Suleymaniye mosque, despite the similarity of the two buildings (Figure 10). The diameter of the dome of Hagia Sophia is 31.5 m. while the diameter of the dome of Suleymaniye mosque is 26.5 m. The height of the top of the dome of Hagia Sophia was 56 m. while the height of the top of the dome of Suleymaniye is 53 m. The history of Hagia Sophia reveals that the building suffered many structural problems that affected the central dome and the main semidomes several times and necessitated external reinforcement that destroyed the external shape of the elevations. (Taylor, 1996: p. 66–78). On the contrary, Suleymaniye building is characterized by stability and permanence in spite of the seismic activity of the city of Istanbul; during the more than four hundred and fifty years of the age of Suleymaniye mosque, the building still holds and has kept its solidity and coherence.

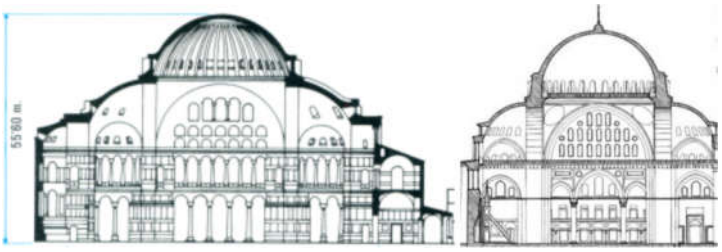

Figure 10: Hagia Sophia and Suleymaniye Mosque, Sections (www.ottomanarchitecture.com)

Faults that accompany large projects and buildings were not lost on architect Sinan; he must have read the lesson well and knew what to avoid, so as not to fall in the mistakes of the past.

4.2 Creating New Style in Islamic Architecture

It can be noticed through seeing the plan of Shehzade mosque, as one of the earliest Sultanic projects of architect Sinan, that the first important decision he took and implemented on the style of Ottoman mosque architecture was adopting the idea of the central baldachin dome that rises above the intersection of the longitudinal and transverses the central axes in the plan of the mosqueThis dome was an essential and dominant element internally and externally in the architecture of Ottoman mosque. (Kuban, 1987: p. 72-97)

The decision of adopting the central dominant dome was transformative in the history of Islamic architecture and had no historical depth, especially with big scale mosques. Old Islamic schools of architecture used different designs and styles to create domes at the crowns of the mosques, such as the great mosque of Qairawan 670 (Figure 11), the great Umayyad Mosque of Damascus 705 (Figure 7), the great mosque of Cordoba 785 (Figure 5). But none of these domes were used in a dominant manner on the interior spatial planning and the design of the exterior form of the mosque; all domes were built for aesthetic, expressive or symbolic objectives without affecting the manner of spatial planning or distribution of the interior space on the floor level. (Petersen, 1996: p. 235, 55, 61)

Figure 11: The Qairawan Mosque, Courtyard (www.kairouanmosque.com)

The only central dome that might look similar in the idea with the design style of architect Sinan's mosque is the Dome of the Rock, 705 (Figure 12). It is located in the Old City of Jerusalem in Palestine, which was built in the Umayyad period, but that this building was not originally intended to be exploited as a mosque, but closer to be an architectural edifice glorifying the rock that lies below the dome from which Prophet Muhammad made his night journey to heaven. The Dome of the Rock is generally regarded as an attempt to provide a Muslim alternative to the Church of the Holy Sepulchre which had previously dominated the city of Jerusalem. The plan and design of the Dome of the Rock reflect this rivalry (Petersen, 1996: p. 69).

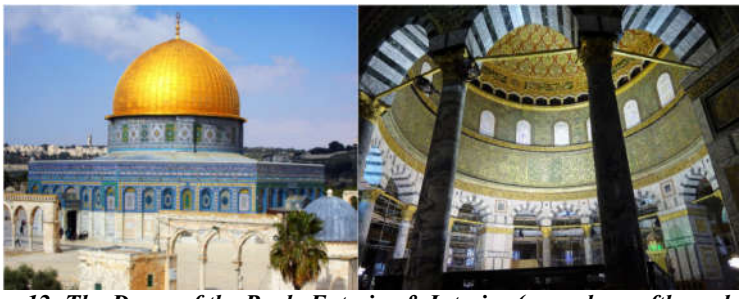

Figure 12: The Dome of the Rock, Exterior & Interior (www.domeoftherock.com)

The structure of the dome of the rock is basically octagonal, it is capped at its center by an astonishing dome, approximately 20 m in diameter, mounted on an elevated circular drum standing on 16 supports (4 tiers and 12 columns). Surrounding this circle is an octagonal arcade of 24 piers and columns. The octagonal arcade and the inner circular drum create an interior roofed space that encircles the holy rock. (Britannica, 2020)

It is clear that the central baldachin dome as a conceptual space design had previously been employed in some of the earlier Ottoman mosques like Al-Fatih Mosque 1470 (Figure 9) and Bayezid II mosque 1505 in Istanbul (Figure 13), it was considered as an attempt to simulate the central dome of Hagia Sophia which dominates the monumental interior space largely. Architect Sinan took advantage of this gradual evolution towards giving the dome more importance and dominance in the interior space of the mosque, and he worked hard on the development of all supporting structural integrated systems in order to raise the dome perfectly and peacefully to the top of the upper part of the mosque while maintaining the centrality and openness of the interior space with a minimal number of construction elements on the ground level.

4.3 Architect Sinan, adding his touch to Ottoman architecture

Two hundred years of work and construction experience enabled the Ottoman architects to build one of the most important models in the history of Ottoman architecture at the beginning of the sixteenth century. It is Bayezid II Mosque (Figure 13), which represents the gate through which the Ottoman architects entered the golden age in mosque architecture. Beyazidiye mosque built between 1501 and 1506 for sultan Beyazid II, an architectural work of the very first importance that combined many arts and fine decorations. The mosque is oriented along the northwest-southeast axis and is preceded by an open courtyard to the northwest. The prayer hall is square in shape and entered through a muqarnas portal from a portico, and the same size as the open courtyard (Goodwin, 2003: p. 168-174). The upper part of the mosque consists of a domed central space extended with two semi-domes along the qibla axis and patterned after the Hagia Sophia on a smaller scale, The dome measures, 17 m. in diameter and 44 m. in height. (Freely, 2000: p. 152)

Understanding the importance of the role played by the exterior and interior design of Bayezid II mosque enabled architect Sinan to add his touch on all architectural Ottoman products of the golden age, and in the direction which is not in contradiction with what went pn in the former Ottoman architecture. In fact, the Bayezid II mosque can be considered as an inspiring historical Ottoman model for

architect Sinan. He has adopted most of the spatial and structural elements in this mosque, then he worked on reformulating these elements. He discarded unneeded elements like the exterior appendixes and added the elements that were missing in Bayezid II mosque, such as the corner half domes and the exterior laterally aisles, to his first monument, Shehzade mosque (Figure 14).

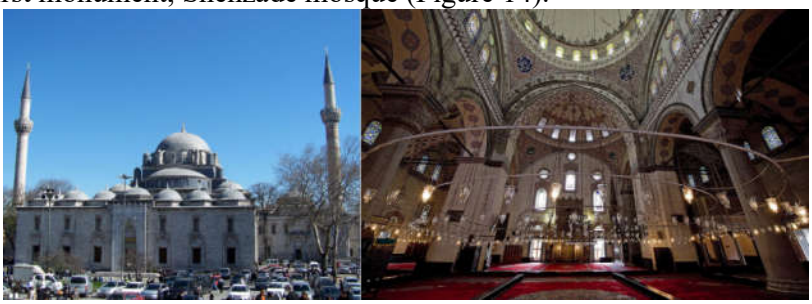

Figure 13: Bayezid II Mosque, Exterior & Interior (www.bayezidiimosque.com)

Architect Sinan's first truly important architectural commission was the Sehzade Mosque, which was completed in 1548. The mosque plan consisted of two squares similar to the plan of Bayezid II mosque. The prayer hall has a square base upon which rests a large central dome flanked by four half-domes and numerous smaller, subsidiary domes. The dome is supported by four piers, and has a diameter of 19 m. and a height of 37 m. It was in this building that Sinan first adopted the technique of placing colonnaded galleries along the entire length of the north and south facades in order to conceal the buttresses. (Necipoğlu, 2005: p. 196.) Also he adopted the corner half dome as a spatial and structural element to extend the upper space and support the central dome.

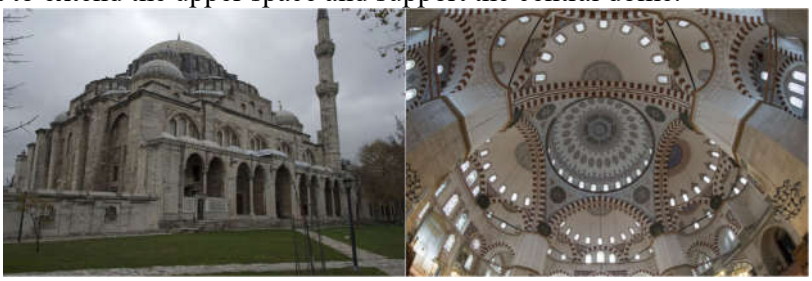

Figure 14: Shehzade Mosque, Exterior & Interior (www.shehzademosque.com)

With the mid-sixteenth century the Ottoman Empire reached the height of its glory and global presence, and architect Sinan reached an advanced stage of intellectual and architectural maturity. Sultan Suleiman the Magnificent wanted to build a great mosque that bears his name and commemorates his memory, so he commissioned the architect Sinan to design his monument. This was the appropriate time for architect Sinan to show his architectural creativity and all the knowledge and structural experience he had by designing a majestic mosque that matches the splendor of the Ottoman Empire and proves to be a competitor to the great mosques and historical religious buildings that he witnessed during his commuting with the army or heard about around the world.

Actually,this was the perfect time for architect Sinan to write his personal narration and professional history through the stones and domes of the Suleymaniye Mosque between the years 1550–57 (Figure 15). The mosque has

four elegant minarets at the corners of the rectangular courtyard, and the transverse rectangular prayer hall is covered with an enormous unprecedented domed structure at the front of the mosque to brilliantly emerge over one of the hills of Istanbul. It is considered by many scholars to be the finest work by architect Sinan. The central upper structure of the mosque resembles that of the Hagia Sophia and Bayezid II mosque in Istanbul, with the main central dome supported by two big semi-domes. The Suleymaniye Mosque has a massive drum under the dome that is pierced by 32 openings, thus giving the dome the effect of lightness while also copiously illuminating the mosque's interior space. The interior space of the mosque is one of the largest spaces ever erected in the Ottoman architecture. (Goodwin, 2003: p. 168-174)

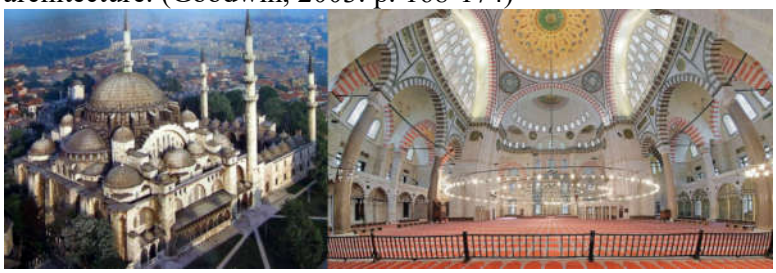

Figure 15: Suleymaniye Mosque, Exterior & Interior (www.suleymaniyemosque.com)

In addition, he worked hard and diligently to ensure the quality, modernity and superiority of his architecture and compete with all what was considered contemporary architecture in the sixteenth century in renaissance Europe, such as St. Peter Church in Rome (1506 -1626), which was the most important building erected in the period (Figure 16).

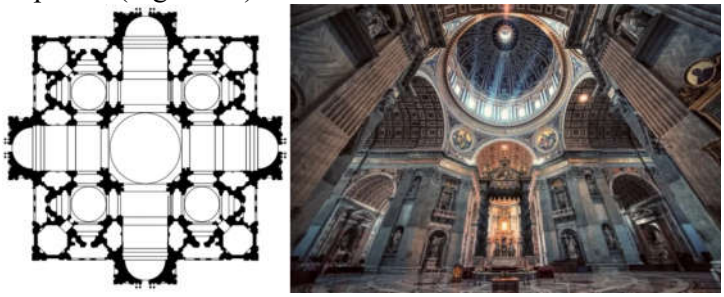

Figure 16: St. Peter Church, Plan & Interior (www.stpeterchurch.com)

St. Peter's is a church built in the Renaissance style located in the Vatican City. The central space is dominated both externally and internally by one of the largest domes in the world. It was the design of Donato Bramante that was selected, and for which the foundation stone was laid in 1506. This plan was in the form of an enormous Greek cross with a dome inspired by that of the huge circular Roman temple, the Pantheon. The main difference between Bramante's design and that of the Pantheon is that the dome of the Pantheon is supported by a continuous wall, while the new basilica is supported only on four large piers. The later extension of the nave and aisles toward the east practically brought the whole scheme to a Latin cross. (Fletcher, 1975 p. 456-473).

5. Evaluating Achievements and Shaping the Future of Ottoman Architecture

The time has come to answer the questions that were raised in the first part of this research and to identify the way in which architect Sinan benefited from the contradictory historical factors to build and develop the architecture and the interior space design of the Ottoman Mosque.

Architectural history includes the ideas, philosophies, and discourses that have shaped architectural application during the historical stages of successive human civilizations, and architects need to analyze, interpret and evaluate ancient and modern architectural elements, concepts, and forms in order to develop critical thinking skills. It is quite clear that architect Sinan understood this concept well, he worked hard to bring his architecture to the summit of glory in the sixteenth century. He also endeavored to make his buildings flawless and timeless. In fact, the main factor that helped him to achieve his objectives is his interest in the history of architecture and the diverse architectural schools that preceded the Ottoman architecture. Also, he had a great sense of responsibility towards the present and future of Ottoman architecture and arts to be on top of the global art and architecture peaks.

The concept of modernity in architecture and design is accompanied historically by what is available from technological innovations and inventions that contribute to making the architectural production advanced in time. Selimiye mosque, which is located in the city of Edirne in western Turkey (Figure 17), is the third monumental mosque built by architect Sinan between 1568 and 1575. Its massive central dome that dominates the entire building with extension of 32 m is considered to be the largest dome in the history of Ottoman architecture and in architect Sinan's mosques. The mosque's four very tall and slender minarets, placed in an unprecedented manner at the corners of the domed cube of the prayer hall, are the highest and shapeliest minarets in the Ottoman architecture on the date of erection (Kuban, 1987: p. 295-297).

This most magnificent dome and these four loftiest and thinnest minarets show the best use by architect Sinan per ounce of very modern building techniques and design, which enabled him to access these great architectural and structural innovations in the Selimiye Mosque (Britannica, 2019).

Indeed, Selimiye Mosque is one of the late mosques of architect Sinan, which represents post-classical phase in his career. It also showed a lot of improvements in the form of the Ottoman mosque structures, especially externally where all the bold structural elements like turrets and buttresses have merged completely with the formation of the integrated exterior design. The exterior body of the mosque abandoned the semi-domes and pyramidal shape in favor of a body characterized by straight lines and vertical elevations. Interiorly, architect Sinan re-emphasized the plan of the unified interior space in the Ottoman mosque, which was based on the consistency and integrity of the relationship between the cubic prayer hall on the ground level and the semi-spherical dome at the top of the mosque.

Architect Sinan himself considered the Mosque of Selim at Edirne to be his masterwork. This mosque is the culmination of his centralized-domed plans, the great central dome rising on eight massive piers in between which are impressive

recessed arcades (Britannica, 2020).

Figure 17: Selimiye Mosque, Exterior & Interior (www.selimiyemosque.com)

Selimiye mosque has characteristics and features that shaped the future of Ottoman mosque architecture up to the very advanced stages of the age of the Ottoman Empire in the eighteenth and nineteenth centuries. Among these characteristics is the abandonment of the traditional hierarchical appearance in classical Ottoman mosque building with a vertical cubic form, the integration of the structural elements with the exterior shape of the mosque, the unity of the interior space covered by one enormous dominant dome, and the complete abandonment of the large semi-domes.

A good example from the eighteenth century is Nuruosmaniye mosque 1755 (Figure 18), located in the center of the historic city of Istanbul to the east of the covered bazaar. The mosque is preceded by a courtyard of comparable size to the northwest and it consists essentially of a single cubic interior space covered by a large dome that measures 25 meters in diameter and is raised to a height of 43.50 meters, resting on four monumental arches in the walls, whose form is strongly emphasized, especially on the exterior. (Goodwin, 2003: p. 382-387)

The mosque's plan was designed in the Ottoman traditional style, while the decorative mode was different. In fact, the decorative arrangement of Nuruosmaniye mosque constitutes an important turning point in the history of Ottoman art and architecture. It achieves one of the finest instances of Ottoman baroque, a unique synthesis between classical Ottoman and contemporary Western styles, epitomized in the scallop muqarnas domes crowning its portals. (Saliba, N. 2019: p. 167-186).

Figure 18: Nuruosmaniye Mosque, Exterior and Interior (www.nuruosmaniyemosque.com)

A follower of the achievements of Architect Sinan notes that his great mosques, even if they differ in shape, are meaningful and no less important than the monumental mosques that were built in previous Islamic civilizations and countries. For example, just as the Umayyad Mosque documents the Umayyad civilization and the greatness of their state, the Suleymaniye Mosque documents the most important stage in the history of the Ottoman Empire during the reign of

the Sultan Suleiman the Magnificent. The architectural features and spaces included in the design of the Umayyad Mosque mentioned above are available in the Suleymaniye Mosque, such as the symbolic strength of the singular royal dome at the top of the construction in the two mosques, the extensive rectangular prayer hall, the central axis that confirms the direction of the qiblah, the multiple lofted and glorious minarets, the open courtyard and the corridors surrounding it from all sides, in addition to the richness of the design and the quality of the materials used internally and externally in both mosques (Figure 19).

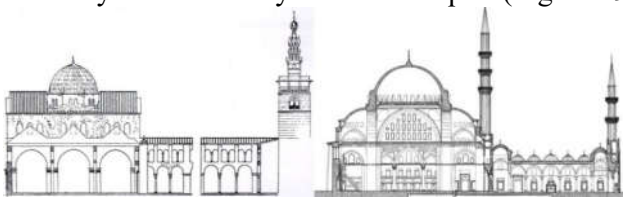

Figure 19: The Umayyad Mosque & Suleymaniye Mosque, Sections (www.islamicarchitecture.com)

As for the old Ottoman style of the architecture of the Sultanic mosques, Ottoman architecture has known a group of styles in the design of mosques in the fourteenth and fifteenth centuries. The author Abdullah Kuran classified these styles in his book "The Mosque in Early Ottoman Architecture" and stated that they include a single-unit mosque such as the Orhan Gazi Mosque in Gebze 1340, a multi-unit mosque such as the Great Mosque of Bursa 1399, and a multi-unit dissimilar mosque which is also called the Iwan Mosque or the Bursa style mosque Like the Green Mosque in Bursa 1421 (Figure 20) (Kuran, 1968).

A deep look at the plans of the mosques of architect Sinan shows that he has combined the styles of early Ottoman architecture in his architecture. He took from the old styles some selected elements and constructive shapes in order to create a unified Ottoman mosque style with a homogeneous visual body linked to the past intellectually and architecturally. He was inspired mostly by the style of the single-unit mosque because of its unity of design, centrality, the majestic shape of the dome and its aesthetics, and the distinctive spatial relationship between the cube on the ground level and the hemispherical dome at the top of the building. He also benefited from the multi-unit style by enlarging the interior spaces of the mosque via adding some other boundary spaces, various in shape and size, around the imaginary central cube under the central dome. But in particular, architect Sinan's superlative addition to the Ottoman style is the harmonious pyramid structure below and around the central dome: he saved the cube under the dome in the center of the mosque and built other interior and exterior spaces and structures around them to enlarge the centralized space.

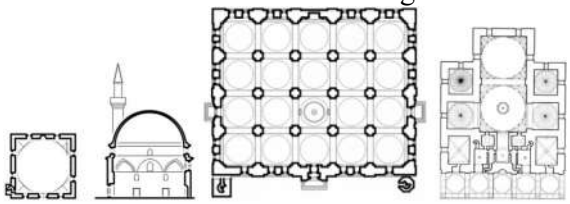

Figure 20: Orhan Gazi Mosque (Single-Unit Mosque: Plan & Section), the Great Mosque of Bursa (Multi-Unit Mosque: Plan), the Green Mosque (Multi- Dissimilar Unit Mosque: Plan), (www.ottomanarchitecture.com)

With regard to the construction sites and the influence of Byzantine monuments on Sinan architecture in the city of Istanbul, in fact, there is a great similarity between the mosques of architect Sinan and the Hagia Sophia building, especially with regard to the structural system represented by the central dome, semi-domes and a series of arches, pillars and buttresses that give the hierarchical appearance of the building. Therefore, some authors may see the mosques of architect Sinan as an architectural reproduction of Hagia Sophia, but when looking deeply it appears that each mosque designed by architect Sinan is considered a special and individual creation and new design. So that, the Shahzade mosque is distinguished by the presence of four semi-domes around the central dome, and the Suleymaniye mosque had two semi-domes around the central dome aligned along the qibla axis, but in Selimiye mosque he has abandoned the pyramid shape and large semi-domes and leaned more towards constructing a vertical building dominated by the majestic dome that simulates the dome of Hagia Sophia in shape and measurement. The architecture of Mimar Sinan expresses a great stage in the history of Islamic architecture, just as Hagia Sophia expresses the value of Byzantine architecture. In summary, the architecture of architect Sinan represents a great stage in the history of Islamic architecture just as Hagia Sophia expresses the value of Byzantine architecture (Figures 14, 15, 17).

6. Innovative Features of the Ottoman Mosque Architecture

Architect Sinan added obvious innovations that cannot be hidden on the domes, minarets, facades, courtyards, decorations and interior space of the Ottoman Mosque. In the following paragraphs some characteristics related to the architecture of architect Sinan mosques will be clarified through a comparison between the architectural products of architect Sinan with preceding mosques in Ottoman history of architecture, or with the structure of the Hagia Sophia.

Adopting the central baldachin dome as an individual dominant element on the interior space and exterior form of the mosque confirms the Ottoman style of mosque architecture with a different layout from previous Islamic architecture. In Shahzade Mosque, despite the presence of four semi-domes in the upper prominent part of the building, the central dome had a very strong planning and formative effect, internally and externally.

Architect Sinan made great efforts towards centrality and openness of the interior spaces of the mosque by controlling the size, shape and location of the pillars and columns interiorly. The best example here is the central and open design of the interior space of the Suleymaniye mosque, which, thanks to the accuracy and agility of the structural system, is in clear difference with the colossal structural system in Hagia Sophia, which isolates the central space from the spaces surrounding it to a large extent.

Proportionality is evident in the architectural and spatial elements of architect Sinan's mosques; all of the design elements of the mosques are subject to the principles of ideal geometric design. An important example is the great dome of Selimiye mosque that did not force architect Sinan to build massive pillars or buttresses like the case in Hagia Sophia's structural system. Delicate harmony between the interior design and the exterior shape has always been present in the

mosques of architect Sinan.

Architect Sinan was giving sufficient attention to the design of the exterior facades of his mosque to show the importance of the independent and united form of the mosque. The buttresses of Hagia Sophia and the architectural extensions of the Bayezid II Mosque greatly damaged the shape of the exterior façades of both buildings.

Knowledge and wisdom appeared evident in the mosques of architect Sinan, both in measurements of domes and minarets and through the solidity of the structural and support systems of the mosque. A good example here is the most spacious dome in the Selimiye mosque which appears weightless as it floats above the prayer hall. It rests on eight muqarnas-corbelled squinches supported by eight large piers, in an unconventional style that differs from the square system that relies on inverted triangles in the Suleymaniye mosque and Hagia Sophia. The placement of the pencil minarets at the four corners of the prayer hall focuses the attention on the volume of the Dome. He also maintained the traditions of the Ottoman mosque architecture by emphasizing the social role of the mosque through the surrounding multifunctional social complex.

The interior decoration in the mosques of architect Sinan was another innovation that many researchers overlook. He benefited greatly from the flexibility of Arabic calligraphy in making calligraphic panels and sentences that are completely consistent with the central shape of the main dome and the semi-domes. He also exploited the muqarnas, an ancient decorative element in Islamic architecture, to facilitate the rotation of the main dome of the Selimiye mosque and small domes in Suleymaniye and Shehzade mosques. Architect Sinan excelled in the design of the illuminated interior space of his mosques; the windows were distributed through multi horizontal layers on the facades and drums. (Figures 14, 15, 17, 20).

Figure 21: Selimiye Mosque, Interior (From Basak Buyukcelen)

7. Conclusion

The architectural vocabularies of the past play an important role in the present day architectural design, especially in mosque design. So, different styles of mosque architecture mark different periods of Islamic history. The Ottoman architectural history possesses information about the construction methods that were employed and developed through different periods of the Ottoman state history, whether before or after the sixteenth century, through which the star of the architect Sinan emerged and his architectural products appeared in the open. In addition, the Ottoman Empire was multi-religious, multilingual, and multicultural, made up of various races inhabiting the land around Istanbul, which added a global dimension to architect Sinan's products.

In light of the above, a set of conclusions can be drawn from this study:

1. Studying the history of architecture is part of the interest in the present and its challenges to make the world of architecture and design better. It can be considered also as a serious attempt to look to the future of architecture and interior design to identify the features and improvement potentials.
2. The complex and interwoven historical factor had a positive effect on architect Sinan's elaborate mosques, which were built more than 450 years ago and are still delightful and have a distinctive architectural presence.
3. It is possible to take lessons from the architecture of architect Sinan to apply to the modern and contemporary trends, especially in the Islamic world, where there is always an urgent need to build more mosques in Muslim communities.
4. Architect Sinan outrivaled in shaping his mosques. He made good use of his knowledge of his time in planning for the future of mosque architecture by designing buildings more proportionate and with more compatibility.
5. During fifty years of work, architect Sinan was able to write his personal historical narrative on the stones, walls, minarets and domes of mosques, and he was able to develop the architecture of Ottoman mosques. This narrative can be evaluated by present-day architects to make their personal mark on modern architecture.

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