

An essay on Byzantine architectural influence on the spatial organization of the Architect Sinan's square baldachin single-domed mosques

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The works of the Ottoman Empire's Master Architect Sinan that he attached great importance to and produced the greatest in number were mosques. Mimar Sinan made use of multiple-support systems such as 4, 6 and 8-baldachins in his domed structures, planning the layouts of his domed buildings around the framework of these systems.

In this article, five of Mimar Sinan's square baldachin, single-domed mosques (Edirnekapı Mihrimah Sultan, Zal Mahmut Pasha, Lüleburgaz Sokullu Mehmet Pasha, Fatih Bali Pasha and Manisa Muradiye) are selected, aiming to present an essay on the observed influence of Byzantine architecture in the domed square-baldachin and adjacent spaces that form the main area of these buildings.

Key words: Ottoman architecture, Byzantine architecture, Architect Sinan, square baldachin, single-domed mosque.

The Ottoman Empire's master Architect (Mimar) Sinan produced close to 400 works in a wide range of types that included mosques, hammams or bath-houses, madrasahs, masjids (prayer rooms), khans (inns), caravanserais, hospitals (darüşşifa), imarets, guest houses (tabhane), Koranic schools (darülkurra), primary schools (sıbyan mektebi), waterways, dervish lodges (tekke), fountains and palaces. The works of Mimar Sinan that he attached great importance to and produced the greatest in number were mosques. Sinan built mosques at different locations throughout the Empire, particularly in the capital city of Istanbul but never used the same layout plan in any of these, never repeated himself, choosing instead to experiment continuously with different schemes.

The principal structural component that Sinan employed in his mosques was the dome. The dome is the principal element used in determining the plans of his mosques and this structure is an architectural component that dominates the entirety of the space and also the outer plastic of the building. The dome at the same time is a determining factor in a city's silhouette and in its central position in the structure; it also stands as a symbolic representation in Sinan's mosques. Sinan's mosques are important parts of the architectural landscape and it can be seen that Sinan as-

signed a new identity to the tradition of domed structures, in fact creating a new architectural style. It can therefore be said that domed structures matured in Sinan's hands and gained new meaning and identification.

Domes, which form a structural and a symbolic covering over their structures, are the principal architectural components of Sinan's works. Sinan experimented in numerous ways in creating the dome compositions in his mosques and he used this element at the same time as a mold of space and mass.¹ Domineering over the interior space, the dome also shapes the exterior of buildings in Sinan's works. The articulation of a domed covering is actually an architectural style for Sinan. This style is characterized by a dominating dome that constitutes a fundamental principle of design in the structure. Beyond providing a structural formation, the dome in its architectural composition has turned into an independent structure in and of itself in Sinan's hands. The homogeneity and stylistic simplicity of the dome contributes to the basic volumetrics of the spatial effect.² The visual and physical relationship between the dome and the interior space completes the impact generated by the space.

For the Master Architect Sinan, the dome is an architectural element that has the multipurpose of creating both a central and plenary spatial presence as well as a symbolic effect. Sinan tried a rich array of different variations in the basic concept of the domed covering and for him, the dome was never simply a structural component of a whole. The dome was an important plan archetype and characteristic of Ottoman architectural style but also a stylistic form that crowned an architectural composition.

Mimar Sinan made use of many different variations of dome in his Agha mosques. The structure and functionality was different in each of his mosques and therefore he treated the dome and consequently the spaces differently. It was these elements that determined the plan in this system and the dome was treated with a formal-

¹ G. Necipoğlu, *The age of Sinan. Architectural culture in the Ottoman empire*, Princeton-Oxford 2005, 69.

² D. Kuban, *Sinan'ın dünya mimarisindeki yeri*, in: *Mimarbaşı Koca Sinan: yaşadığı çağ ve eserleri I*, ed. S. Bayram, Istanbul 1988, 585.

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Fig. 1. Edirnekapı Mihrimah Sultan Mosque (photo: author)

istic approach. Structural principles predominate in this design. Basically the product of a tectonic approach, the dome is the main element of the spatial arrangement in this construct. The nucleus of space in Sinan's mosques is the domed baldachin. The structural system of the baldachin is a construct that consists of a space, different numbers and variations of load-bearing elements (columns, piers, wall piers, corner wall) that carry the dome, which acts as a covering over the space. The plan and the space is formed around the baldachin. The system allows for a rich spatial construct and a variety of spatial variations are thus made possible.

The renowned architect of the Ottoman Empire, Mimar Sinan, experimented with many different dome structures in his mosques. It was the construct of Sinan's mosque plans that determined the structural characteristics that would form his domes. Mimar Sinan made use of multiple-support systems of sometimes four, six or eight elements in his dome structures, planning the layouts of his domed buildings around the framework of these systems.

In this study of five of Mimar Sinan's mosques in which he uses the square baldachin as a structural system in his approach to domed buildings (Edirnekapı Mihrimah Sultan, Eyüp Zal Mahmut Pasha, Lüleburgaz Sokullu Mehmet Pasha, Fatih Bali Pasha and Manisa Muradiye), where we examine the domed main area and the

adjacent spaces (side *mahfils*) that the architect employed around the construct of the main space, we have considered the square baldachin construction and the spatial arrangement of the adjacent spaces one by one and made a comparative analysis of the Byzantine architectural influence observed in the domed square-baldachin and its adjacent parts.

Sinan's square baldachin single-domed mosques

Mimar Sinan employed multiple-support systems of four, six or eight elements in his structural arrangement and one of the basic typologies he chose in his mosques was the square baldachin established on a square base. In the square baldachin system that signifies a differentiating typology of Sinan's mosques and is actually an experiment with central spatial organization, geometrical arrangements are different. Sinan has treated each square baldachin differently, both in terms of its installation and also in reference to its adjacent spaces, thus virtually creating a new typology in this group of structures. It can be said that a style that is uniquely Sinan's has been created in this group.

The first square-based baldachin system (the square baldachin) that we will consider in this study is the one found in Edirnekapı Mihrimah Sultan Mosque. Built in 1562–1565 by Mimar Sinan for the daughter of Süley-



Fig. 2. Edirnekapı Mihrimah Sultan Mosque (photo: M. Cambaz)

man the Magnificent, Mihrimah Sultan, this building was erected in Edirnekapı and stands as a statement of stylistic creativity in architecture. The architectural composition of the building, with its wide courtyard in front, its 6-cells congregational space, points to a broad layout that spreads out to the sides. Sinan used the widening breadth of this scheme to plant at the center a square baldachin formed on the south with pier walls adjoining the mihrab wall on two sides and on the north, on each side of the entrance, with four massive pillars connected to wall arches (Fig. 1). The four load carriers that make up the square baldachin are connected to each other with four main suspended arches. The square baldachin has been placed in the center of the building and is covered by a pendentive dome measures 20 m in diameter and 25 m in height. This domed central section is framed by a 2-floor, domed inner section of two low-lying galleries (adjacent gathering places), the upper floor reserved as a congregational space for women, set in the back inside the depth of the suspended arches in the space situated to the east-west between the outer walls of the building and the suspended arches carrying the dome and shaping the square baldachin. These galleries expand out toward the sides. Here, Sinan has heightened the central, domed baldachin system, together with its main piers and its suspended arches, thus creating a domed central space, raised with load-bearing piers and arches with two galleries on either side, lower in height (adjacent gathering places) (Fig. 2, 3). These side galleries (*mahfil*) open out into the domed

central space, carried by three symmetrical arches on each side which have been placed inside the suspended arches of the square baldachin in an east-west direction and which are said to have once been the granite columns of the Ionnese Prodromos Monastery that was once situated in this district.³ The area above the 4 large suspended arches carrying the pendentive dome (the tympanon) was filled with 3 windows in a row, looking out in all directions in order to attract the maximum flow of light into the building. Thus, the four facades of the structure are also composed of large suspended arches filled in with windows that tie the four piers of the dome together. This adds an unusual appearance to the structure, since it is made of masonry and has a system of piers on four sides, the walls formed by the suspended arches no longer function as load-bearing walls. The bright central space that Sinan has created with a system of arches, the center of which features the baldachin and contains windows, is repeated in the walls of the lower side galleries, thus saturating the interior of the building with light. Besides the spatial construct and the novelty in the structural arrangement, the plastic design of the building is also quite impressive.

Another structure that Mimar Koca Sinan has formulated with a square baldachin on a broad layout expanding along its breadth is in Eyüp, a building that is

³ *Mihrimah sultan külliyesi*, in: *Dünden bugüne İstanbul ansiklopedisi* V, ed. İ. Tekeli, S. Eyice et al., İstanbul 1994, 455 (D. Kuban).



Fig. 3. Edirnekapı Mihrimah Sultan Mosque. The side gallery (mahfil) behind the main structural arch (photo: author)

estimated to have been built in 1577 by one of the viziers of Selim II, Zal Mahmut Pasha and his wife. This is the Zal Mahmut Pasha Mosque. Here, as in the Edirnekapı Mihrimah Sultan Mosque, Sinan has created the baldachin with four load-bearing elements, two pier walls on either side of the mihrab and the other two close to the north wall of the building, standing as two columns tied to the walls with arches (Fig. 4). The four main load bearers have been tied together again with four large suspended arches. The top of the square baldachin created in this way is covered with a pendentive dome with a diameter of 12.40 m.⁴ The domed center formed with large suspended arches sitting on four main load bearers on a widthwise rectangular plan is framed by two-story adjacent galleries (mahfil or gathering places), the upper stories of which are reserved for the ladies, on three sides this time—east, west and north—that surround the square baldachin. The main space covered by the central dome thus expands out toward three directions. The two-story adjacent galleries with suspended arches that Sinan has placed at each of these directions stand behind the large suspended arches to the east, west and north that make up the square baldachin and are situated between the arches and the outer walls of the building. The side galleries framing the cen-

tral domed baldachin on three sides are supported by four columns each on the lower floor. The tops of these side galleries are covered on the lower floor with a plain and on the upper floor with a cavetto vault, independent of the dome. This time Sinan uses a three-story windowed plain wall instead of suspended arches for the main walls or facades of the buildings outside of the mihrab wall. The dome of the building is on the outside and is barely visible and almost lost in the midst of the side walls.⁵

The Ottoman master builder Sinan experimented with a different style when he erected, in 1569, his complex külliye in the form of the Lüleburgaz Sokullu Mehmet Pasha külliye Mosque, where he used the square baldachin construct and an adjacent spatial organization. The building has an almost square rectangular plan with a wide courtyard in front and in this, Sinan did something different by installing massive pillars of a diameter of 4.25 m in the four corners of the structure.⁶ The four massive pillars at these four corners project out from the building in all directions (Fig. 5). There are weight towers rising from each pier. The piers are connected to each other again with suspended arches and the square baldachin created in this manner is covered by a dome of 12.35 m in diameter. The domed central square baldachin here is again situated on an east-west axis and has been expanded on two sides by galleries. However, this time the adjacent spaces differ from how they were used at Edirnekapı Mihrimah Sultan and Zal Mahmut Pasha Mosques. The suspended arches were fitted into the thickness of the arches on the east-west axis. The two-story adjacent galleries are supported by three pillars on the lower floor. On the north side of the suspended arches, nestled in the depth provided by the minaret base, is the stairwell leading up to the women's gallery.⁷ The walls of the building comprise suspended arches with steps and windows on the curtain walls between the piers on four sides.

Another of Mimar Sinan's square baldachin single-domed structures is Fatih Bali Pasha Mosque, built during the era of Suleyman I. This building has a 5-compartment congregational hall in the shape of an exact square. Sinan here created a square baldachin, supporting it on the outside of the south wall with wall buttresses on four sides (Fig. 6). The central dome, of a diameter of 11.80 m, covering the entire space, sits on large suspended arches that connect the four corner walls.⁸ In this building with a square plan, Sinan has placed the side galleries, as in the Lüleburgaz Sokullu Mosque, in the depth of the suspended arches situated to the east, west and north. This time however, the galleries are quite narrow due to the shallowness of the arches. The side galleries, which were designed in two-story style, differ from the previous ones because this time they are supported by two piers connected to the

⁵ *Zal Mahmud paşa külliyesi*, in: *Dünden bugüne İstanbul ansiklopedisi* VII, ed. İ. Tekeli, N. Akbayar, İstanbul 1994², 542 (D. Kuban).

⁶ Ş. Sönmezer, S. Ögel, *Lüleburgaz Sokullu Mehmed paşa camii'nde oran – strüktür ilişkisi*, İtüdergisi/a mimarlık, planlama, tasarım 3/1 (2004) 77.

⁷ *Ibid.*

⁸ *Bali Paşa camii*, in: *Türkiye Diyanet Vakfı İslâm ansiklopedisi* V, İstanbul 1992, 21 (S. Eyice). A. Kuran, *Mimar Sinan*, İstanbul 1986, 56.



Fig. 4. Zal Mahmut Pasha Mosque (photo: S. Doğan)



Fig. 5. Lüleburgaz Sokullu külliye Mosque (photo: M. Cambaz)

wall and open out into the main space on the lower floor with three arches on each side. The side galleries reserved for the women on the upper floors have high balustrades,

giving the appearance of a balcony, while on the lower floor, the piers connected to the walls provide only a very narrow space between the pointed arches where only a



Fig. 6. Fatih Bali Pasha Mosque (photo: S. Doğan)

single person can sit for prayer. The spaces allocated for prayer here between the arches are far from providing the appearance of an integrated gallery because of the interruptions produced by the piers.

A different type of baldachin construct that master architect Sinan designed is found at Manisa Muradiye Mosque. Built in 1583 by Mimar Sinan for Sultan Murad III, the 5-compartment *riwak* for the congregation has a mihrab that is raised, as in mosques built on a tabhane plan, and projects outside in the form of an *iwan* (Fig. 7). In this structure, Sinan has shaped the baldachin using four wall piers, two of which are at the corner wall of the mihrab iwan on the south, while the other two are embedded into each side of the north entrance. The piers are connected to each other again with wide suspended arches and a pendentive dome constitutes the covering for this central area. The square-shaped domed unit in the center has been expanded toward the west with side spaces. This time Sinan has left the side galleries as one-story structures, and they are covered by a semi-groin vault (Fig. 8). These spaces, which are independent of the dome, are different in terms of their system of covering and provide the building with an atmosphere of mobility.⁹ Thus the spatial construct of the building derives from the expansion of the adjacent spaces covered with a semi-groin vault on a single-story toward the sides. There is a two-story gallery, the upper floor reserved for the ladies, towards the entrance of the building. All of the facades of the structure were designed with windows.



Fig. 7. Manisa Muradiye Mosque (photo: M. Cambaz)

⁹ E. Yücel, *Manisa Muradiye camii ve külliyesi*, Vakıflar Dergisi 7 (1968) 210.



Fig. 8. Manisa Muradiye Mosque (photo: M. Cambaz)

Organization of the main space and the side space

The archetypes of the main spatial plan Mimar Sinan uses in his square baldachin, single-domed mosques consists of four main load-bearing elements (columns, piers, wall piers, corner walls) and four large arches (suspended arches) that connect the load carriers to one another, and the adjacent spaces (*mahfil*/galleries) that have been placed toward the back of these arches in an east-west direction.

The grand master architect of the Ottomans, Koca Sinan, constructed his square baldachins, which constituted the main space of his single-dome baldachin mosques, in two ways. In the first type of main space organization, used in Edirnekapı Mihrimah Sultan, Zal Mahmut Pasha and Manisa Muradiye Mosques, the square baldachin is situated on a broadening scheme that features wall piers, two of which support the mihrab adjoined to the adjacent walls on the south and two on the north side; to the north, sometimes the baldachin appears adjoined to the walls on two sides of the entrance, and sometimes stands on piers independently inside the space. The wall piers and piers are adjoined by four main structural arches. The main feet and the central square baldachin composed of a suspended arch system that connects them are generally covered with a pendentive dome. This domed central square baldachin is surrounded on two or three sides with side galleries that broaden the spatial scheme.

A second main space organization, Mimar Sinan used in these types of buildings is a common feature of the Lüleburgaz Sokullu and Fatih Bali Pasha mosques. In this plan, Sinan has designed the buildings as perfect or

almost-perfect squares and the square baldachin is supported with wall piers on the four corners of the structure or with corner walls. The central dome covering the entire space sits on large suspended arches that join these piers or corner walls together.

Sinan often expanded the square baldachin of his mosques of these types toward the east, west and sometimes to the north with side galleries (*mahfil*). These side spaces that Sinan used to expand the spatial construct were organically integrated into the central space. In Sinan's design, the integrated side galleries or mahfil adds a composition that blends a cubic form into the square form. The side spaces are also used to soften the effect of the overpowering structural composition of the dome.¹⁰ Sinan uses three basic constructs in these side galleries, which surround the central space covered by the dome and soften the relationship between the supporting wall and the covering in the tradition of domed structures. This concept was first seen at Edirnekapı Mihrimah Sultan and Zal Mahmut Pasha mosques. Here, the side galleries have been nestled into the depth of the area between the suspended arches carrying the dome and the outer walls as two-story structures that stand to the east, west and sometimes to the north, making up the square baldachin. While these side spaces are covered with small domes that are independent of the main dome in Mihrimah Sultan Mosque, at Zal Mehmet Pasha Mosque, the lower story is flat and the upper floor is covered with a cavetto vault. The different covering systems used in the main and side spaces do not provide an integrated appearance in the main space. The side spaces on the lower

¹⁰ D. Kuban, *Osmanlı mimarisi*, Istanbul 2007, 455.



Fig. 9. Hagia Sophia (after: Pentcheva, Hagia Sophia, fig.1)

floor are adjoined to the main space on the east-west axis with arches in-between the load-bearing main arches.¹¹ At Edirne Mihrimah Sultan Mosque, where a different arrangement has been implemented compared to other mosques in the same group, the central domed square baldachin carried by suspended arches has been raised while the two-story, domed side galleries on the east-west have been designed at a lower level. The central baldachin opens out into the side galleries by means of arches that are carried by columns that have been placed inside the suspended arches forming the square baldachin on the east-west.¹²

The second spatial organization Sinan uses for the side galleries can be seen at Lüleburgaz Sokullu and Fatih Bali Pasha Mosques. In these two mosques, Sinan has placed wall footings at the four corners of the structure and the corner walls are connected with suspended arches, forming an exact or almost-exact square plan. The side galleries on the east, west and north have been planted into the depth of the thickness of the arches in the form of two-story galleries. These galleries are carried by pairs of piers adjoined to the wall and on the lower floor, they open out into the main space with an arch that connects the piers.¹³ The narrow spaces between the arches are used as prayer areas. Here, however, because there is an interruption in the space occupied by the prayer areas between the arches connecting the piers adjoined to the

wall, the space does not appear to be integrated with the adjacent galleries.

The mosques in this category of Sinan Agha use a third concept for the adjacent (side) spaces; this time, the galleries on the east-west of the baldachin are designed as single-floor spaces. This arrangement, used solely in the Manisa Muradiye Mosque, this time features single-floor galleries in the space left deep by the arches behind the suspended arches to the east-west of the domed square baldachin in the center.¹⁴ Here, Sinan has created a different covering system for these spaces, which are independent of the dome and covered with semi-groin vaulting, providing the structure with mobility.

Byzantine architectural influence in spatial arrangements

The Ottoman master architect Koca Sinan's concept of a main space with extending adjacent galleries that he designed as an extension of the domed square baldachin in his single-domed mosques is reminiscent of Byzantine architecture.

In one of Mimar Sinan's major mosques in this group, Edirnekapı Mihrimah Sultan Mosque, the square baldachin stands on the south with wall piers on both sides of the *mihrab*, and on the north, with four massive pillars connected to the wall arches on either side of the entrance. These four load-bearers comprising the square baldachin are linked to each other with four large structural main arches or suspended arches. These structural

¹¹ Idem, *The style of Sinan's domed structures*, Muqarnas 4 (1987) 89.

¹² J. Erzen, *Sinan as anti-classicist*, Muqarnas 5 (1988) 76.

¹³ B. Özer, *The architect of domed mosques as a master of pluralism*, Environmental Design: Mimar Sinan, the urban vision 1–2/5–6 (Rome 1987) 148.

¹⁴ A. İnan, *Mimar koca Sinan*, Ankara 1968, 122.



Fig. 10. Constantinos Lips Monastery South Church (Fenari İsa Mosque) (photo: M. Cambaz)

main arches making up the domed square baldachin have, nestled inside toward the east-west, granite columns that allow integration with the low, two-storied side galleries and these are covered with a pendentive dome or tympanon with windows.

This arrangement that has influenced the architectural design of Sinan's Edirnekapı Mihrimah Sultan Mosque first appears in the Hagia Sophia. Here, the square baldachin, standing on four supporting piers, each 5 m. wide, are joined to main structural arches of a diameter of 31 m. and the arches extending into the east-west direction have nestled in them columns opening out into the side naves of the basilica, which are covered by a windowed tympanon (Fig. 9).¹⁵

Also, Sinan implemented another type of plan in the Edirnekapı Mihrimah Sultan Mosque by raising the domed square baldachin upwards. Thus, the central space of the square baldachin with its raised dome hovers over a spatial arrangement of lower side galleries. Sinan made use of different covering structures in the side areas, independent of the main dome, building smaller domes over these.

This scheme reminds us of "the Ambulatory type" of plan unique to Istanbul that emerged in Late Byzantine architecture. This type of plan was appeared in Istanbul at the end of the thirteenth century in the Constantinos Lips Monastery South Church (Fenari İsa Mosque), the Hagios Andreas Church (Koca Mustafa Pasha Mosque) and the north building of the Pammakaristos Monastery Church (Fethiye Mosque) (Figs. 9, 10). The plan is characterized by a raised central space covered with a dome that is sur-

rounded by vaulted ambulatories placed at a lower height extending out in three directions.¹⁶ The columns that separated the central dome from the ambulatories in the Constantinos Lips Monastery's South Church (Fenari İsa Mosque) and the north building of the Pammakaristos Monastery Church were removed in the era of the Turks.¹⁷

Another element that Mimar Sinan designed for his square baldachin, single-domed mosque was the organization of the side galleries (*mahfil*) that he constructed around the domed square baldachin. This design was intended to expand the main space out onto the sides and for this purpose, Sinan widened the square baldachin towards the side spaces or galleries toward the east and west, and sometimes toward the north. One of the spatial arrangements that Sinan was seen to have used for the side galleries with the intention of expanding the main space is that observed in the Lüleburgaz Sokullu and Fatih Bali Pasha Mosques. The wall piers Sinan has placed at the four corners of these three mosques are again connected to the corner walls with suspended arches, forming an exact or almost-exact square plan. The side galleries on the east, west and north have been planted behind the arches, into the depth of their thickness in the form of two-story galleries. While the arch thicknesses that house the side galleries are wide in the Lüleburgaz Sokullu Mosque, these have been kept rather shallow in the Fatih

¹⁶ Idem., *Approaches to Byzantine architecture*, Muqarnas 8 (1991) 42; R. G. Ousterhout, *Contextualizing the later churches of Constantinople. Suggested methodologies and a few examples*, DOP 54 (2000) 246.

¹⁷ S. Eyice, *Son devir Bizans mimarisi. İstanbul'da Palaiologoslar devri anıtları*, Istanbul 1980, 67.

¹⁵ C. Mango, *Byzantine architecture*, New York 1986, 50.



Fig. 11. *Constantinos Lips Monastery South Church (Fenari İsa Mosque)* (photo: M. Cambaz)



Fig. 12. *Hagia Irene* (photo: M. Cambaz)

Bali Pasha Mosques. The side galleries open out on the lower floor by arches that tie the piers to the main space.

This spatial composition of the side galleries (*mahfil*) resembles to the “cross-in square”, which appeared in the Middle Byzantine period of Byzantine architecture. In this type of plan, the high, hooped dome in the center of the building sits on the columns, piers and sometimes on the cor-

ner walls that connect the arches.¹⁸ The side galleries to the east-west in this plan, which was also used in the Late Byzantine period, are built in the form of two stories and placed in the same way in the depth behind the arches. These spaces

¹⁸ K. P. Matschke, *Builders and building in Late Byzantine Constantinople*, in: *Byzantine Constantinople: monuments, topography and everyday life*, ed. N. Necipoğlu, Leiden 2001, 320.



Fig. 13. The Church of Hagia Sophia in Bizye (Vize) (after: Bauer, Klein, *Hagia Sophia in Bizye*, fig. 5)

are connected to the domed main space (naos) with two or three columns that are nestled inside the suspended arches on this side. The earliest example of this in Byzantine architecture can be emerged at Hagia Eirene, rebuilt in 532 by Emperor Justinian I after the structure was burned down in the Nika riots. The main space, or naos, of the structure, which symbolizes the transition into the domed basilica and cross-in-square, crossed dome type of plan, is shaped by a main dome that sits on a diameter of 4 feet of 15 m., rising up to a height of 35 m.¹⁹ The two-storied side galleries are set into the rear depth of the suspended arches to the east-west that tie the feet together (Fig. 12). Another example of this in Istanbul is the Hagia Theodosia Church (Gül Mosque), in which the two-storied galleries have been placed behind the arches on this side between their west-north branches of a cross, which is covered again by a barrel vault. These side galleries open out into the central space with arches sitting on two piers each. The same spatial arrangement is seen in another structure of the Byzantine era—the Church of Hagia Sophia in Bizye (Vize). Known today as Gazi Süleyman Pasha Mosque, this structure with the “cross-in square or crossed dome” was built in the time of Justinian I in the sixth century.²⁰ Here too, the two-story side galleries have been placed in the rear depth of the suspended arches to the east-west and they open out into the central space on piers that support a column in one direction and arches on the other (Fig. 13).

Another spatial concept that Koca Sinan Agha uses in the mosques in this group is arranging the side galleries

on the east-west of the baldachin as single-floor spaces. He used this arrangement in only one mosque, Manisa Muradiye Mosque, and in this structure, the side spaces have been designed in a single-floor plan and have been placed again in the area created by the depth of the arches behind the suspended arches to the east-west direction of the central square baldachin dome. Here too, Sinan has covered the side spaces with an independent semi-groin vault, setting these galleries apart from the dome, and this differentiation in the covering system gives the structure a more distinct appearance.

This spatial organization that Mimar Sinan adopted in his domed square baldachin with a single-story side gallery carries inspirations that bring to mind the spatial organization in “the cross-in square” plan type that was built with corner walls. The Virgin Mary Kyriotissa Monastery Church, an important Byzantine structure in Istanbul, known as Kalenderhane Mosque or Eski Imaret Mosque, was built according to a cross-in square, crossed dome plan that featured corner walls. Its pendentive dome rises on top of four arches that connect the corner walls.²¹ The arches have been given depth to produce the cruciform and their interiors have been left as single-story structures (Fig. 14). Sinan’s Manisa Muradiye Mosque has a semi-groin vault over the single-story side galleries that also have the same similarity (Fig. 8).

A common spatial characteristic that Mimar Sinan embraces in his single-domed square baldachin structures can be observed in the way he approaches the facades of the buildings. Sinan paid particular attention to the facades of his buildings, especially to the frontality of his design. The

¹⁹ Mango, *Byzantine architecture*, 78.

²⁰ Eyice, *Son devir Bizans*, 123; F. A. Bauer, H. A. Klein, *The church of Hagia Sophia in Bizye (Vize). Results of the fieldwork seasons 2003 and 2004*, DOP 60 (2006) 265.

²¹ C. Mango, *Byzantium. The empire of the New Rome*, London 1980, 67.



Fig. 14. The Virgin Mary Kyriotissa Monastery Church
(Kalenderhane Mosque or Eski İmaret Mosque)
(photo: S. Doğan)

facade was an essential element of his design of architectural masses. When the facade organization Sinan employed in this group of mosques is examined, it can be seen that the facades are generally brought to life with the suspended arches that form the square baldachin. This style can especially be seen at Edirnekapı Mihrimah Sultan Mosque, where the domed central space is raised and the facades on all four directions are formed by the suspended arches tying together the piers that shape the square baldachin. Another example of the facade construct formed by windowed suspended arches can be beheld in the Lüleburgaz Sokullu Külliye Mosque. Here, the body walls of the building are curtain walls on all four sides in-between the piers; the interior is formed by windowed suspended arches.

The design of the outer mass of the structure is also produced by the facade system with its curtain walls formed by suspended arches, its light and windows, again taking us back to Byzantine architecture. First developed by Byzantine masons, the main facades of the building consist of arches that form a manifestation of the structural system. The wall inside the arches is simply a curtain wall that principally features non-structural windows and closure slabs.²² The facade stands out as an echo of the structural systems of the building.

²² R. G. Ousterhout, *Master builders of Byzantium*, Princeton 2008, 204.

Conclusion

Our observations on the influence of Byzantine architecture on the spatial organization of Mimar Sinan's single-domed square baldachin structures have not in any way been intended to initiate a critical discussion of the architecture of Sinan. Sinan experimented in different ways in each of his structures and never repeated himself. This characteristic of Sinan can be seen as well in the buildings that are the subject of this study, namely the single-space, square baldachin group of structures. In each structure of this group, Sinan has organized the baldachin and the side galleries differently.

The atmosphere in which Mimar Sinan developed his skills elevated the value of learning from tradition. Sinan himself never denied the worth of "learning from the past". Sai Mustafa Efendi, the author of the book "Tezküret-ül Bünyan" said this about the master architect;

"I worked in determined fashion at the service of my Master, just like the fixed spike of a drawing compass, and I observed both the center and the surroundings. Then I took care to explore different spaces, this time like the rotating spike of the compass. For a time, at the service of the Sultan, I wandered through the Arab and Persian lands and memorized every fragment of every corner and every ruin from an elevated iwan and then returned to Istanbul. I served my elders some more and it was only then that I emerged from the gate".²³

Sinan's architecture is not a creation originating from nothingness but on the contrary, it awes the spectator with the competence and creativity with which he has revitalized and put together what had already existed. Sinan was born into a spectacular accumulation of architectural form and he used this advantage well. Each of his structures carries a different organization, born out of his observations and experience. In his buildings, Sinan works not with new architectural elements but, just the opposite, with familiar forms and traditional elements.²⁴ The styles and designs inherited from different cultures are immediately apparent in his structures. He has masterfully brought together the rich culture of architectural elements of the environment into which he was born. On the other hand, Sinan never directly uses the elements and the accumulations of the past that have inspired him but instead adds his own flavor and interpretation. He continued to explore new forms that used the architectural elements of his own creation. Every detail is a testimony to his experimental power and genius. Sinan bestowed upon the cities of Turkey new visual dimensions with his interpretation of architectural mass.

Mimar Sinan stands out with an original "Sinan synthesis" that is reflected in his domed spatial structures, so much a national symbol for Turks, and for the spaces in which he brought together Islamic and Byzantine architectural characteristics to create a unique Turkish Mosque physiognomy.

²³ A. U. Peker, *Mimar Sinan'dan öğrenmek. Cami tasarımında özgünlük arayışına yanıtlar*, in: *Gelenekten geleceğe cami mimarisinde çağdaş tasarım ve teknolojileri*, ed. H. Tokay et al., Ankara 2013, 256.

²⁴ Kuban, *Osmanlı mimarisi*, 604.

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Есеј о утицају византијске архитектуре на просторну организацију једнокуполних џамија архитекте Синана

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Главни архитекта Османског царства, (Мимар) Синан, саградио је близу 400 грађевина различитог типа, међу којима су: џамије, хамами или купатила, медресе (религијске школе), месциди (мањи објекти за молитву), одморишта (ханови), караван-сараји, болнице, имарети (јавне кухиње за сиромаше), гостинице, школе Курана, основне школе, аквадукти, текије, фонтане и палате. Дела којима је мајстор Синан придавао највећи значај и која је градио у највећем броју биле су џамије. Подизао их је широм царства, нарочито у главном граду Истанбулу, али приликом њихове изградње никада није користио исто просторно решење, нити се понављао, већ се уместо тога одлучивао за непрестано експериментисање са различитим просторним шемама.

Као просторни и симболични покривач грађевине, купола чини главни архитектонски елемент на Синановим џамијама. Она је битно утицала на план његових здања и доминира како читавим унутрашњим простором тако и масама екстеријера. Употпуњујући силуету урбаног окружења у којем се налази, будући постављена у средиште грађевине, купола представља битан део визуелног идентитета Синанових џамија. Која Мимар Синан користио је куполу као елемент грађевинске структуре вишенаменски – за стварање централног простора и истовремено за симболичко назначење архитектонског остварења. У рукама тог градитеља, који је експериментисао са различитим варијантама куполног покривача, кубе, које обликује архитектонску композицију, претворено је, уједно, у

самосталну структуру. Развијајући свој архитектонски стил, Синан је дао нов идентитет традицији куполних грађевина као битним чиниоцима урбаног окружења. Могло би се рећи да је куполна грађевина достигла зрели, нови значај и идентитет захваљујући Синану.

Поставка плана његових џамија одређивала је структуралне црте које је Синан користио за своје куполе. Користећи вишеструке потпорне системе за куполну структуру, са четири, шест и осам подупирача, Мимар Синан је изводио планове својих здања из тих потпорних система.

Пет џамија – Султаније Михримах у Едирнекапи (Истанбул), Зал Махмуд-паше у Ејупу (Истанбул), Мехмед-паше Соколовића у Лулебургазу, Бали-паше у Фатиху (Истанбул) и Султана Мурата III у Маниси – грађевинских остварења Мимара Синана, која припадају типу једнокуполне грађевине, предмет су овог рада чији је циљ да истражи утицај византијске архитектуре на обликовање поткуполног дела и поставку бочних простора, као главних елемента разматране структуре.

Основни тип вишеструког потпорног система – са четири, шест и осам подупирача – који је при уобличавању куполне структуре користио архитекта Синан, представљао је „балдахин“ квадратне основе надвишен кубетом. Унутар те структуре богате варијантама Синан је, експериментишући, долазио до различитих решења и практично створио нову типологију поменуте врсте грађевина. Могло би се рећи да је јединственост Синановог стила остварена управо у тој групи здања.

Главни плански архетипи, које је Мимар Синан користио у својим једнокуполним џамијама чине четири главна подупирача (стуб, стубац, пиластар, угаони пиластар), четири велика лука, који повезују главне подупираче, као и бочни волумени (галерије), издвојени луковима и постављани у смеру исток–запад (*mahfil*).

Дворски архитекта Османског царства, Синан, давао је поткуполном простору џамија вид „балдахина“ квадратне основе у облику слова „х“. У првој варијанти такве поставке коју је користио при изградњи џамија Султаније Михримах у Едирнекапи, Зал Махмуд-паше у Ејупу и Султана Мурата III у Маниси, „балдахин“ квадратне основе је био у решен у шкољколикој форми, попречно развијеној унутар грађевине. Два пиластра који се налазе лево и десно од нише окренуте према Меки на југу и друга два пиластра на северној страни унутрашњег простора уздижу се упоредо са слободно стојећим стубовима. Те пиластре и стубове повезују четири главна лука веома великих димензија (главни лукови грађевине). Централни „балдахин“ квадратне основе – саздан од стубова и система лукова који их повезују – прекриван је главном куполом на пандантифима. Бочне галерије, које проширују простор, биле су постављене у два или три правца око овог средишњег, поткуполног дела.

Друга просторна организација, коју је користио Синан у овој групи остварења, представља уобичајени просторни распоред, који се може видети у ње-

говим џамијама Мехмед-паше Соколовића у Лулебургазу и Бали-паше у Фатиху. Синан је, када је реч о поменутим примерима, пројектовао грађевину на потпуно или готово квадратној основи, постављајући „балдахин“ квадратне основе на пиластре или на угаоне пиластре у четири угла грађевине. Централна купола, која прекрива читав унутрашњи простор лежи на огромним лучним подупирачима, који су повезани са стубовима или угаоним пиластрима.

Синан је проширивао квадратни „балдахин“ куполе у џамијама овог типа, додајући им бочне просторе (галерије, *mahfil*) на истоку, западу, а каткад и на северу. Ови бочни волумени, које је Синан користио да прошири простор, органски су припојени централном поткуполном делу грађевине. Овако интегрисане бочне галерије допуњују склад композиције здања, које се пружа од кубета до основе у Синановом пројекту. Ти бочни простори (галерија, *mahfil*) ублажавају, такође, доминантну црту композиције у куполној структури. У традицији куполне грађевине, Синан је користио три основне поставке за бочне просторе (галерије), које су окруживале централни део покривен куполом, да би учинио финијим однос између потпорног зида и покривача.

У првобитној замисли, у џамијама Султаније Михримах у Едирнекапи и Зал Махмуд-паше у Ејупу, уочљиво је да су бочни простори (галерије, *mahfil*) постављени изнад два спрата на источној, западној и понекад северној страни, у дубини потпорних лукова, односно у простору између спољних зидова грађевине и лукова који носе куполу и омеђују средишњи део здања. Док мале куполе, независне од оне главне, покривају ове бочне просторе у џамији Султаније Михримах, доњи и горњи спратови Зал Махмуд-пашине џамије су наткривени равним и полуобличастим сводовима. Различити системи покривања простора, који су коришћени у главном и бочним деловима грађевине, не стварају утисак целовитости унутрашњег простора. Главни део и бочни простори повезани су у приземљу помоћу лукова, који се нижу између главних лукова-подупирача, постављених у правцу исток–запад. Овој групи споменика придодата је џамија Султаније Михримах у Едирнекапи за коју је Синан направио нешто другачије решење. Учинио је то тако што је уздигао средишњи простор под главном куполом, док су двоспратни бочни простори (галерије, *mahfil*), такође са куполама, који се простиру у правцу исток–запад, постављени ниже у односу на њега. Поткуполни део је отворен према бочним просторима захваљујући луковима на стубовима, који су постављени у правцу исток–запад, исто као и велики лукови који носе куполу.

Други начин на који је Синан организовао простор може се уочити на џамијама Мехмед-паше Соколовића у Лулебургазу и Бали-паше у Фатиху. Синан је конструисао ове џамије на квадратној или готово квадратној основи, повезујући међусобно пиластре у четири угла грађевине, или саме зидове углова здања, помоћу лукова и бочних простора у виду двоспратних галерија на истоку, западу и северу. Ове галерије подупрте су паром стубова повезаних са зидном ма-

сом и отворене у приземљу према главном простору у ширини лукова између поменутих пиластара. Узани простори испод ових лукова служе за обављање молитви. Пошто су овог пута ти простори за молитву испод лукова раздвојени пиластрима и постављени непосредно уз зидове, они не одају утисак просторно јединствених бочних галерија.

Трећи начин обликовања Синанових џамија ове групе огледа се у постављању бочних простора у правцу исток–запад у виду јединственог спрата. У џамији Султана Мурата III у Маниси, јединој у којој је користио овакву поставку, Синан је организовао галерије као јединствене спратове, смештајући их у простор који се налази иза лукова централног, поткуполног дела. Овде је Синан бочне просторе, одвојене од дела под главном куполом, покрио преломљеним крстастим сводовима, па читав систем због те разлике у горњим деловима даје конструкцији диманичан изглед.

Концепт куполне џамије главног Османског архитекте Коце Синана – са средишњим делом у виду „балдахина“ квадратне основе под куполом и с бочним просторима (галерије, *mahfil*), који га окружују – подсећа, у неким аспектима, на архитектуру Византије.

Четири главна лука грађевине, који повезују четири потпорника, а које је Мимар Синан уткао у своју

џамију Султаније Михримах у Едирнекапи, први пут су примењена у цркви Свете Софије у Цариграду. Синан је прибегао нешто другачијем приступу у својој џамији Султаније Михримах, на тај начин што је знатније уздигао средишњи део у виду „балдахина“ са куполом. То је омогућило примену решења с нижим бочним просторима, постављеним око узвишеног средишњег дела са куполом. Главни простор проширен је тако према истоку, западу и понекад северу својеврсним галеријама. Распоред карактеристичан за овај тип грађевине реминисценција је на план здања с деамбулаторијумом, који се појавио у позновизантијској архитектури и био особен за Цариград.

Утицај византијске архитектуре осећа се и у начину на који је Мимар Синан решавао фасаде својих једнокуполних грађевина. Фасадни систем сачињен од прозора, слепих лукова и лукова на спољној зидној маси подсећа такође на византијску архитектуру. Главне фасаде грађевине, састављене од лукова одражавају архитектонски систем који су развили византијски градитељи. Унутар распона лукова, зид је тек параван који је углавном сачињен од нефункционалних прозора и парапета. Фасада представља тако непосредан одјек структуралног система грађевине.