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Structural and Spatial Evolution of Mosque Architecture in Ottoman Turkey: The Classical Age

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Abstract: This paper aims to show that mosque architecture in Turkey from its stylistic roots in the Seljukid *medreses* and grand mosques in Anatolia, to the most sophisticated stage of development in the Selimiye Mosque of Sinan in the late sixteenth century, has evidenced certain clear and specific intentions which have given it its basic aesthetic character. These are centrality, dominance of the dome, homogeneity of space. Ottoman Architecture, from its early conception to the realization of the Selimiye Mosque has produced an articulation where space and structure were totally interdependent. The first Ottoman mosque was a simple single unit space; on the other hand, the most developed Ottoman mosque, the Selimiye, after many experiments of form and structure also arrives at a configuration which has the basic look and offers the experience of a single unit mosque. In between, the various experiments to arrive at a homogenized centralized space create aesthetic and formal qualities without necessarily perfectly resolving the structure. The organic character of the Ottoman mosque, which made the variations of space and structure possible, was basically the system of arched buttressing with a core baldachin. This process shows that the single unit space was expanded and enlarged by encircling it with perfectly integrated secondary spaces, which also functioned as structural support.

Introduction

This paper will try to analyze the evolution of the Ottoman mosque from the 14th to the 18th centuries from the aspect of form and structural and experiential quality of its interior space. The relation of spatial form and structure, which will be made explicit, will show the individuality of the Ottoman mosque's interior space. With the assumption that spatial characteristics, articulating and symbolizing a culture's choice of self-orientation, imply certain aesthetic preferences, the paper will offer a guide to the paradigms and values of Ottoman society at a certain period of history.

The physical articulation and aesthetic qualities of architectural spaces, especially when they happen to be covered spaces, depend greatly on the way their boundaries are made to resist gravitational forces, in short, on their structure. This is true of all forms of architecture regardless of the technology used. In other words, a very evolved technology, reducing the problem of static to a minimum will not be able to create spaces that have qualities independent of the formal conditioning of their structure.

From this point of view Ottoman architecture's history, as the gradually sophisticated solution to the structural problem of covering a closed space with as few vertical hindrances as possible evidences an increasing maturity in the attainment of a homogeneous space.

The process of experimentation with different structural solutions is realized as distinct phases of spatial form, all with their particular aesthetic qualities. Even when structural solutions have not reached a mature and economical state, the resulting spatial configuration has a unique quality. The reason for this may be that at least when we today analyze this process in retrospect, we find the evidence of a very strong and clear intention about the functionality and quality of space that gears the

structural development and problem solving in a certain direction. This may mean that when a form of art has strong intentions towards which it is striving, its technical and aesthetic search, as a creative force, will inevitably end in quality.

This paper analyzes this structural development of the Ottoman mosque from the late 14th to the 18th centuries, through its various changes, and elaborates upon the aesthetic qualities of space for each different phase of development.

The fact that the mosque is a building type with specifically defined function and extremely significant symbolism and spiritual value, made the search for a proper form and for the appropriate structure to enable that form an extremely ambitious one. In a medieval Islamic society where the state's power was also invested in the religion, the mosque's structural solidity often put to the test by its large size, and its durability was of primary importance. These facts often contributed to the mosque's grandeur.

The Ottoman architect Sinan who designed well over a hundred mosques during his half-century career, was the sole architect in the Moslem world to write about his own work. He often wrote about the fact that he made his buildings to last till doomsday and that he surpassed the great dome of Hagia Sophia of the Christian world. These are evidences of how primary of a concern the structure was. Turkey being in an earthquake zone made the problem of structures a greater issue.

The formal intentions that became immediately apparent in mosque architecture as soon as some Turkish principalities began to assert their power as independent states towards the end of the 14th century, were clearly to achieve the least uninterrupted interior, collected under a central dome. Even during the Seljuk State in Anatolia, in the 13th to early 14th centuries, the most important religious buildings, the *medrese* (religious college) showed this concern, as clearly evident in the Karatay and

dome and flanked by an eiwan on each side. This central hall, which was rather in the form of a court, is visibly similar to the central Harem of a later classical mosque, in terms of its spatial atmosphere.

Furthermore, especially from the interior, the dominance of the dome, and its relation to the central hall's cubic structure is important both as a structural and formal motif and as a symbol. In the later development of Ottoman architecture, this generic form will be of significance in giving birth to new forms. In the Seljuk medrese, the Karatay in Konya, the great effort to smoothly integrate the sphere with the cube, and the very unique and idiosyncratic solution testifies to the fact that the relation of the cube and the sphere was of a very special importance. It will be shown later that this relationship of form and its various structural solutions will make the marked character of Ottoman architecture (Fig.1).

Symbolically, this relationship reflects a basic understanding of the human's place on earth and its relation to heaven, and thus to the infinity. Although the relationship of the square to the circle and of the cube to the sphere is often used as one of the most basic geometrical relationships to create decorative patterns in many Islamic contexts, the roots of such a relationship being explained in Chinese cosmography may indicate a special interest in such geometry for the Turkish culture which originally had close relations with the Chinese during its early settlement in Central Asia and Mongolia. It has been stated that the sky of Chinese cosmography is circular, the earth square. The cosmos is also described as a covered wagon: the square body covered by a round umbrella on four posts.[1]

The basic unit of Ottoman architecture has always been the cubic body covered by a semi sphere. All structural forms and abstract decorative compositions in Ottoman architecture are variations of the revolution of the square within the circle. With the mosque having been the most significant building, which assumed large dimensions in its most important examples, the adaptation of these two forms to each other created a special articulation in the exterior form. However from the beginnings, the development of space and structural form can be investigated from this point.

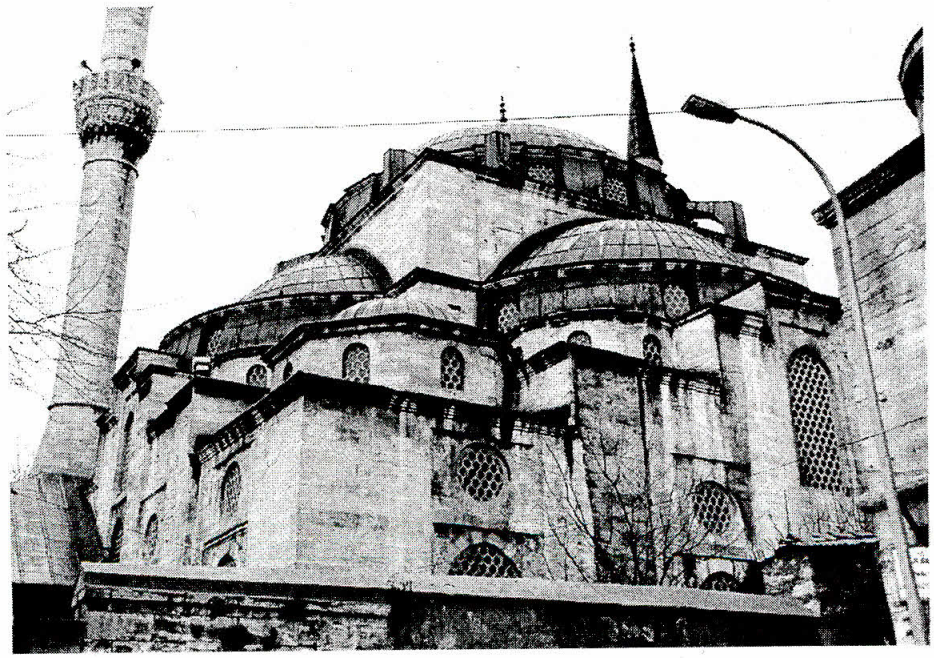


Fig. 1: The Mihrimah Sultan mosque (1548) by Sinan showing the relationship of dome to the lower part.

Evolution of a Style

As previously mentioned, before the Ottomans grew as a state from their settlements near the city of Bursa, the direction Ottoman architecture would take was well established in the Seljuk examples of medreses built in central Anatolia. Therefore, the character of any Turkish architecture after the twelfth century, be it Seljuk or Ottoman derives basically from its relations and background in Anatolia with a basic form of simple geometry, which probably originated in Asia. Thus it is possible to trace a singular line of development from 13th to 19th centuries. In mosque architecture, it is important to see how from several typologies such as the single unit, the multi-unit, and the grand mosque, the evolution is a syncretic one.[1]

In most Islamic lands, the great mosque, such as *Kairawan* in Tunis, or *Al Azhar* in Cairo, well fulfilled the purposes of bringing together a whole community in a space that was quite homogeneous with the exception of the *maqsura* which indicated the direction of mihrab and which served the community's dignitary who acted both as judge and high priest.

In Anatolia, in the 13th and 14th centuries, with the sophistication of religious, theoretical education, the medrese buildings took on a special form, related to the varied articulation of functions, such as the main gathering hall and semi separate lecture halls where different studies were pursued. As previously explained in relation to the Seljuk *Karatay* and *İnce Minareli Medrese*, the emphasis given to the central hall under the great dome, with the flanking eiwans as secondary spaces, becomes the main theme of development (Fig.2). Although the grand mosque type continued to be built in Anatolia, it differentiates itself with the emphasis given to the central unit, generally accentuated with a special dome over it.

1 Aptullah Kuran classified and discussed the early Anatolian examples under three typologies, as the "single unit", "*eyvan*", and the "multi-unit" mosques [2]. However, further investigations show that any rigid classification has to end up in appropriations that do not necessarily reflect the specificity of the situation. Many *eiwan* and multi unit mosques can be classified under both typologies. Therefore, the author has chosen to make the classification as "Grand Mosque" type, which is definitely an obvious case with similar units, and a "Multi Unit" mosque, which often has dissimilar units.

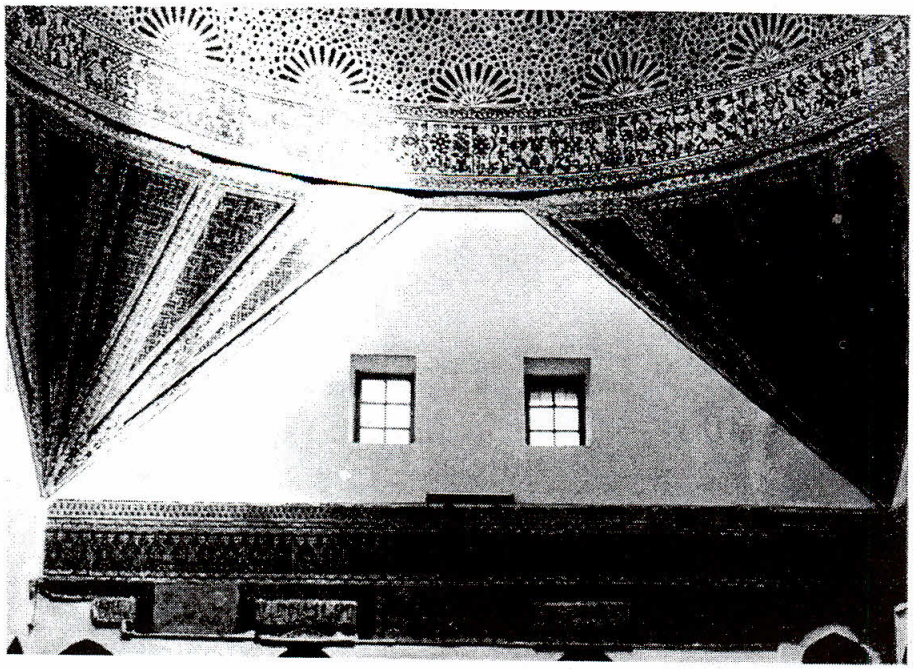


Fig. 2: The interior of Karatay medrese in Konya, with the Turkish pendentives.

The multi-unit mosque, almost a development over the Seljuk medrese type, with the central hall well emphasized with its monumental dome and eiwans adjacent to it on three sides, is seen with many of its variations in the first Ottoman capital Bursa. If we can make a generalization of basic elements, we see that there is a central space collected under an emphasized dome, that is surrounded by secondary spaces, which are also covered by domes. The entrance on the north is through a late-comer's portico, which is also covered with domes above each unit of *rewaq*, the central one in front of the portal being generally higher.

These general description points will be the basic common denominator of the mosque developed to its greatest formal potential in Ottoman architecture, and which in its most mature and articulate form will act as:

i. A single unit mosque, because of the great emphasis given to the central hall which dominates and conditions the interior with its monumental dome (Figs. 3 and 4).

ii. A multi-unit mosque because the way the developed Ottoman mosque functions in its spatial character, both structurally and in the way it is experienced (as in the cases of *Süleymaniye,* or any other mosque such as *Sokollu Mehmet Paşa*).

The fact that the central space of the mosque is always encircled by secondary spaces creates in fact, a multi unit space. This hierarchy and encircling of central space also acts as a structural guarantee, in what is called an arched buttressing system.[2] The developed Ottoman mosque also contains within its configuration what might be called a latent grand mosque potential, in that all its spaces function in a homogeneous manner where an individual feels a specifically favored point. Although the experience may differ when being situated under a gallery or when being right under the main dome, the domination and conditioning of the main dome, and the diffused light is such that wherever one is placed, he relates to the center.

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[2] The terms Baroque, early Baroque or Mannerist are generally used for Ottoman architecture in terms of its similarities with these European styles. Yet, since several decades, a phase of Ottoman architecture as been clearly termed as Baroque. The term early Baroque applies to the early examples.



Fig. 3: A late single unit mosque by Sinan, Semsi Pasa at Uskudar, Istanbul, 1585.

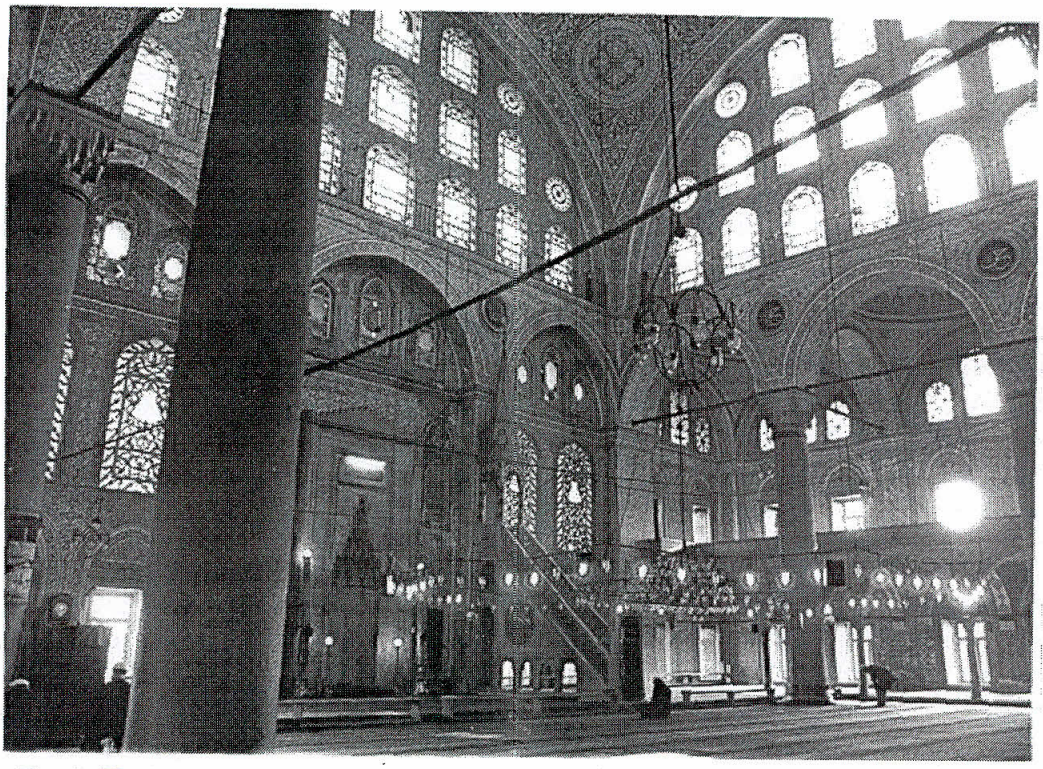


Fig. 4: The interior of Mihrimah Sultan mosque, at Edirnekapi. A perfect example of the single unit space of a large mosque by Sinan, 1565.

Stages of Development

The First Stage: The first grand manner in Ottoman architecture emerges in the first capital city of Bursa where the *Yıldırım Complex* (1390) and the *Green Mosque* (1419) can be studied, both of similar plans with two large domes in the middle, the central one sometimes being higher, and the east and west sides flanked by adjacent rooms and *eiwans* (Fig.5).

The plans' similarity with the Seljuk medrese is obvious; the mosques still serve as *zawiya* mosques, meaning that religious education is not limited to *Sunni* teachings and the separate halls may be used for different teachings. In terms of the spatial experience, however, a mosque is very different, once inside, from what is seen on a two dimensional plan. The flow and integration of spaces, which open into each other through huge arches, the spaciousness, and simplicity of the interior, and the light effects all are impressive.

In the second capital city Edirne, the striking edifice from 1437-1447, the *Three Şerefeli Mosque* (Fig.6) has evolved visibly important qualities in space and structure: the integration of the whole interior upon a unified rectangular floor with only two vertical interruptions: the two piers upholding the great central dome. When people are within the mosque our gaze can span uninterruptedly from wall to wall, although as the plan makes evident, the cover's divisions into one dome in the center and two on each side express the level of integration effort. One other quality, which is very important, especially for the Saladin mosques of the grand classical style of the 15th century, is the geometrical, spatial and formal integration of the semi open galleries court and the mosque proper.

The Second Stage: The second period of development belongs to the time of *Beyazıt* II who succeeds Mehmet the Conqueror. The close contact with Byzantine architecture and especially with Hagia Sophia contributes in two important ways to Ottoman architecture: Haghia Sophia became not only a model to follow but also a goal to be surpassed. It was used as a mosque by Fatih (Mehmet II) and was seen as a monument that was built by Christians, but in truth intended for Moslems. The conquest of the ancient city of Constantinople (Istanbul) had also been prophesized in the Hadith.

The second contribution, the familiarity with Byzantine architecture made, was the adoption of the half dome, which made the long intended integration of different units of space possible. Since the half dome had the same diameter as the dome, the large arch, which connected them, made a continuous space possible.

The two important edifices built during the time of Beyazıt II, were the Beyazıt Mosque in İstanbul and the great Beyazıt complex in Edirne. The Edirne *Beyazıt Mosque* is of a strikingly pure form, with a cubic body covered by a dome; it is entered from the great court, which is surrounded by *rewaks* (Fig.7).

The simplicity and purity attained in its interior, with the visible contrast of cube and sphere is also due to the practical fact that the adjoining cells have been kept separate as units attached to the exterior of the building. On the other hand, the Beyazıt Mosque in İstanbul introducing the classical manner of Sinan lacks a few minor steps to reach maturity. Here, the use of the half domes, adopted to the use of the mosque from Byzantine architecture, are used only on the south north axis, in the way they are used in Hagia Sophia. The spaces encircling the central praying area of the mosque, which complete the plan to a square are covered by half domes on south and north, and by small domes on east and west. The width of the main dome's arch being twice as wide as the small domes, it has been necessary to add columns to support these, besides the four piers carrying the dome. Another minor problem is the extensions on east and west, containing zawiya cells, which make the otherwise pure geometry somewhat, crowded (Fig.8).

The perfectly square court surrounded by *rewak* and with an ablution fountain in the center marks the final development of this important element of the Saladin mosques. Of course, in the later examples such as the Süleymaniye, the basic difference is the fluidity of proportions creating a luxurious spaciousness.

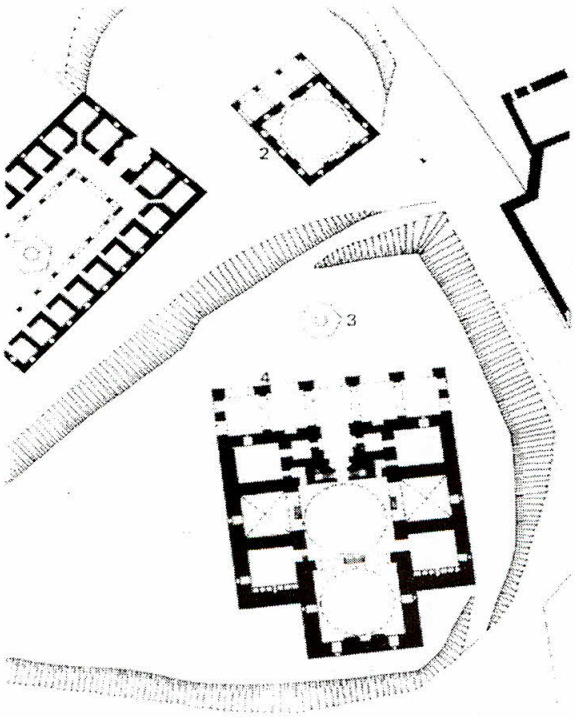


Fig. 5: Plan of the Green mosque, Bursa. [3, p. 69]

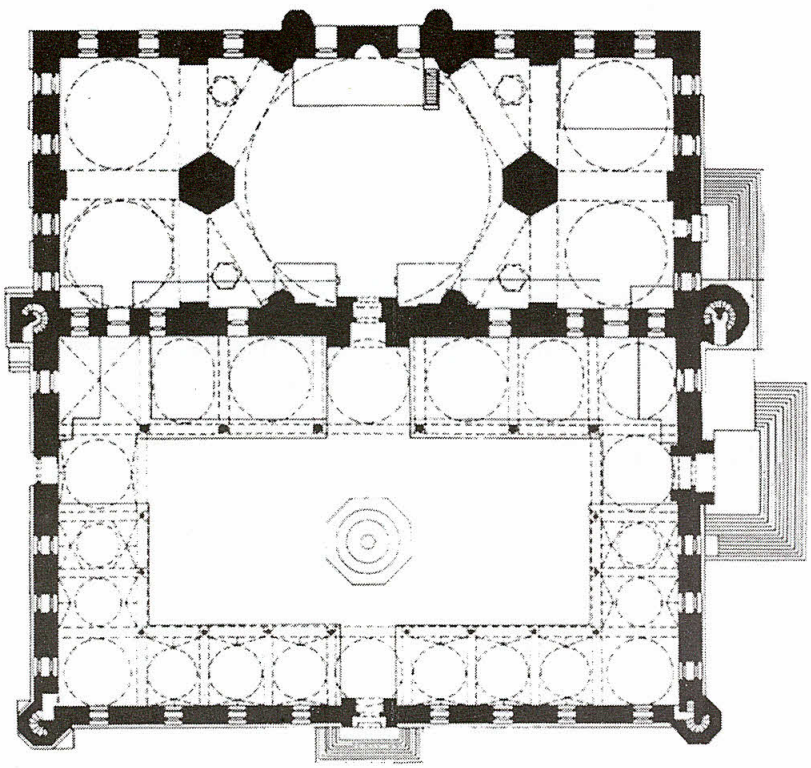


Fig. 6: The plan of Ucserefeli mosque at Edirne. [3, p.99]

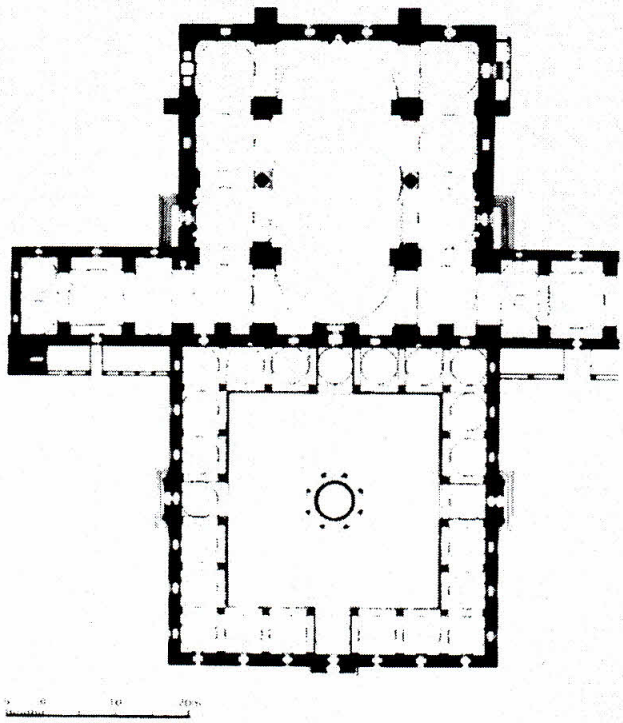


Fig. 7: The plan of Beyazit mosque, Istanbul. [3, p. 169]

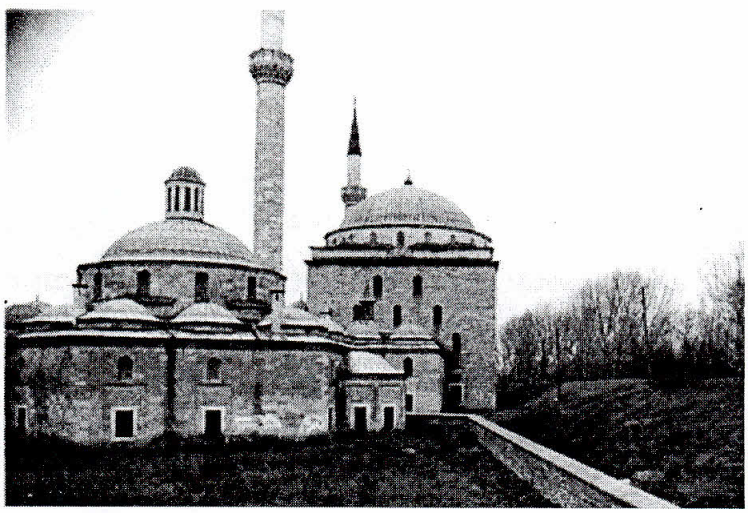


Fig. 8: Edirne Beyazit mosque lateral extensions.

The Third Stage: The climax of structural and spatial developments happens with the genius of Sinan. In his three Sultans mosques, the attainment of a final structural solution can be witnessed, the perfection and refinement and the last stage of development where absolute integration of form and structure is reached. The first attempt at a Saladin mosque by Sinan, which was originally a mosque for Süleyman but which upon the death of his son Mehmet was dedicated to his name, is the *Şehzade Mosque* of 1543-1547. The rather clumsy structural solution of Istanbul Beyazıt Mosque is here in the Şehzade solved by using four half domes, so that the central space is expanded in all four directions without any interruptions; the rather heavy look of Beyazıt reminding one of Hagia Sophia is surpassed for a light, high, and spacious interior in the Şehzade (Figs.9 and 10).

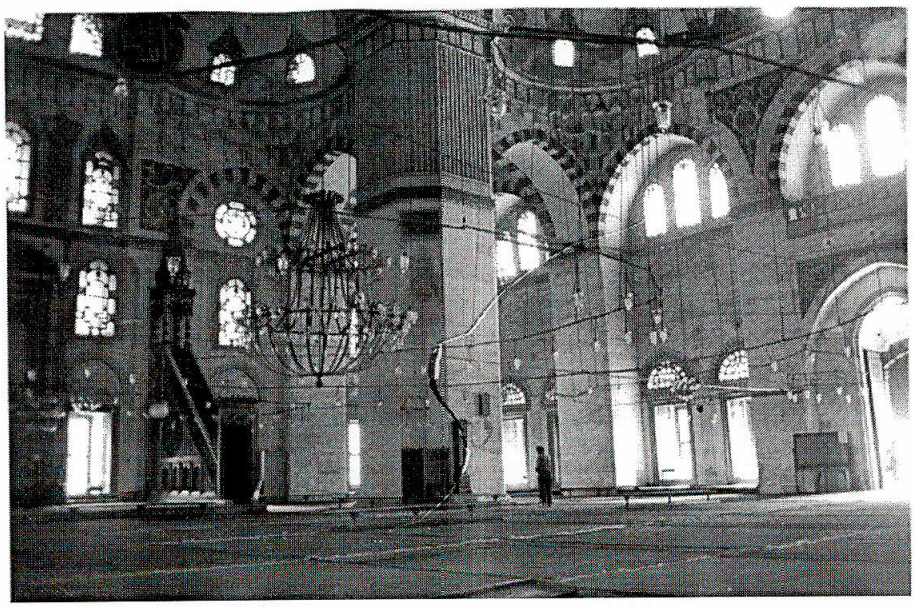


Fig. 9: The interior of Sehzade mosque.

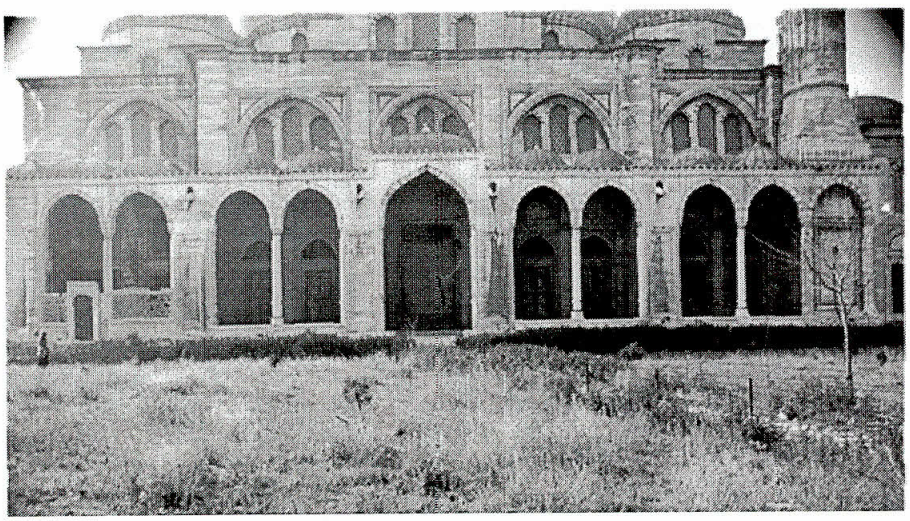


Fig. 10: Sehzade mosque with its side galleries.

The four piers are visible but not hindrances. The obvious step further concerns the finally acquired homogeneity of space. The next and most refined solution to creating an uninterrupted homogeneous space with the so far largest Ottoman dome is the mosque in the name of its patron Sultan Süleyman. Here although half domes are used only on the south and north extensions, the east west extensions are covered by groups of three small domes with the central one being larger, thus creating almost the same effect of a half dome. The schematic plan is similar to that of Hagia Sophia, with the emphasized axis on the north south direction, but the spatial quality is altogether different and intended clearly for the functions of a mosque (Fig.11). The plan without considering the projection of the cover with its many domes shows a quasi-square space with four huge piers articulated to receive space and movement, almost in a sculptural way. These can be compared to the piers in the drawings of Michelangelo for St. Peters in Rome, where the piers have been articulated in their contours so that they do not feel like obstacles.

The two columns on each side upholding the small lateral domes create a transparency rather than a boundary. One looks beyond them to the almost transparent walls of the edifice, filled with fenestration for light. What is significantly different than all the other buildings of Ottoman architecture is the play of forms, the flow of surfaces, the undulation of contours into each other at the ceiling level (Fig.12). With the springing of the arches, especially with the polychrome voussoirs, begin a play of almost musical movement, which is continuous. On the ground level, it is the freedom of movement on the horizontal plane that moves uninterruptedly towards the light and joins the interior with the exterior. The dome, which measures 26 meters, may not be a huge one, yet the effect of its continuous curvature onto the other arches and domes and the stalactite articulations surrounding it give an impressive monumental effect.



Fig. 11: Elevation of Suleymaniye mosque.

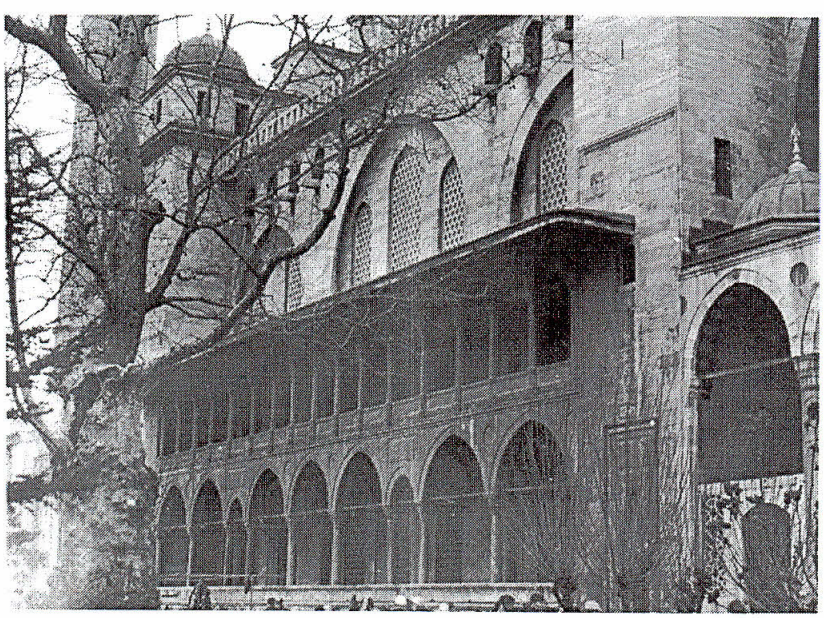


Fig. 12: Elevation of Suleymaniye mosque.

In contrast to the Süleymaniye, the *Selimiye* Mosque, built in Edirne for Sultan Selim II, in 1574, expresses the absolute resolution of tension, and thus the removal of any structural problem and of the duality between cover and body of the building, and between the sphere and the cube (Fig.13)

The interior looks as though it has been carved from a huge single block of stone. The *Selimiye's* interior no longer provides any clues to its basic geometry except for the overall dominance of the dome which seems to almost come down to the earth as a protection from heaven (Fig.14). The walls and the piers have been completely integrated to each other, the outer boundary is articulated as a contour, which breathes, with a rhythm of receding and protruding forms (Fig.15). Not only does this give extra stability to the structure, but also it creates the effect of a constantly revolving form which has no end or beginning. The dome and the lower section of the mosque are now one single continuous surface which is abundantly fenestrated. The fact that light penetrates the interior from all sides and all angles creates the atmosphere of a space without direction, perfect and in harmony. The pure geometry, the sculptured stone become almost metaphysical (Fig.16).

With the Selimiye Mosque, which brings the development of structural and spatial solutions to a climax, it becomes obvious that from the very beginning in the 14th century, the aim of Ottoman architecture was to create one pure uninterrupted space, covered by one single dome. [4-8] This is also almost a return to the simple and pure origin of the single unit mosque of which there still exist many modest examples dating from the 14th century and from the first settlements of the Ottomans.

From the modest, yet in its simplicity monumental, single unit mosque to the Selimiye's grand style, which also gives us a single unit, the stages in between are all efforts with similar intentions but varying historic, economic, political conditionings. The process gives us many interesting solutions. A summary up to this climactic point would show that besides the already mentioned general qualities concerning structure and space, the structure's becoming increasingly lighter, its gradually having increasing vertical thrust, and the walls becoming more transparent and filled with more fenestration with time, are also important issues to be noticed. A comparison between a building from Bursa, from the late 14th century and the Süleymaniye, or between any other mosque of Sinan would also make clear that there was also an evolution from static forms to an articulation where each form, each element began to flow into each other. Thus, the *Selimiye* with its constant circular movement, its being infused with light and its design that was conceived in the round, can almost be called the first instance of Baroque in Turkish architecture. From this point onwards, almost till the 18th century when westernization influenced architectural forms in distinctive ways, Ottoman architecture moved in three directions: a popular style developed from the classicism of Sinan, what could be called a manneristic style, and early Baroque.

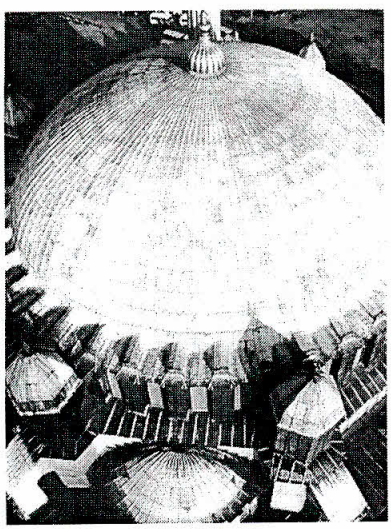


Fig. 13: The dome of Selimiye mosque.

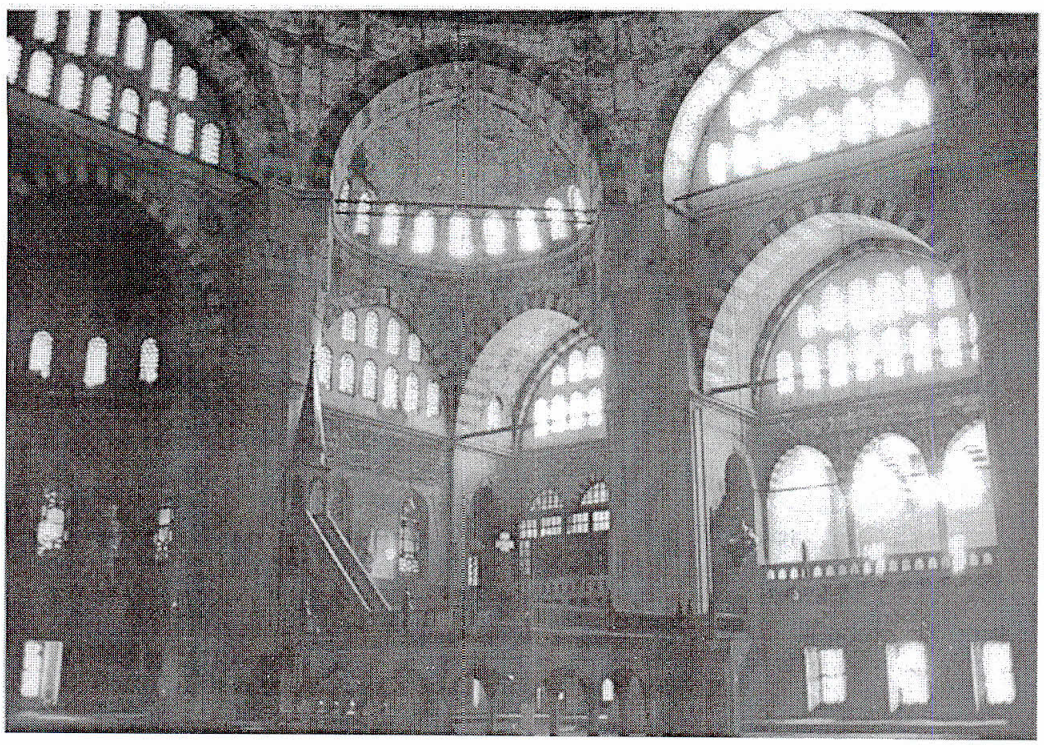


Fig. 14: Selimiye mosque interior.

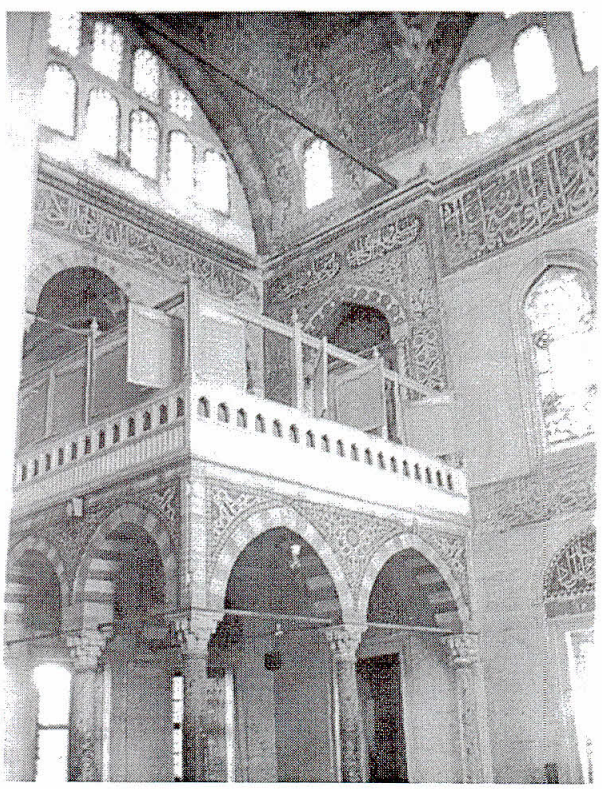


Fig. 15: Selimiye mosque interior.



Fig. 16: Selimiye passage from the dome.

Popular Style: This type of mosque, which became common already during Sinan's lifetime, is the established schematized version of his Saladin mosques. They begin to emerge in the provinces as copies of the architectural style of the capital In contrast to Sinan's specificity of design for each mosque that he planned, in relation to the patron, to the functional priorities of the complex and to the site, these mosques have been developed as a type, with a dome, half domes in the case of four carrying piers, excedras in the case of six or eight carrying piers. In terms of structure and spatial quality, they have not contributed anything new to what was developed by Sinan; on the contrary they neutralize the striking qualities of Sinan's classical designs which were the outcome of new solutions each time. These type of mosques still continue to be built; they are today constructed in cement, which makes their form, which was due to structure, obsolete.

Mannerist Experiments: Sinan's continuous experiments with structure, from his first works on, bring him to the rational solution of having a single dome, for the best integration of cover and the lower part of the building. However, the transformation of the once exclusively domed cover to one that has only one dome with flat lateral covers or vaults surrounding the dome, also create the need to construct higher walls that rise up to the cover to uphold the flat roof. This creates a whole new effect of having tall, planar walls in the place of a system of arches and domes. In the arched system the number and arrangement of fenestration depended on the arch and usually reflected the shape of the arch, in the new system the wall seems independent and the opening on it are conditioned by the need of light in the interior. Not only this necessity is increased because of the fact that having a double system (an arch and dome one in the middle, requiring its own vertical supports- piers or columns, and a flat roof or vaulted system surrounding the middle with its own structure) created a crowded and rather dark interior as compared to the earlier architecture. Thus one can see that larger, more vertical openings are used for fenestration, with the added fact that many varying sizes and types of windows are used side by side. This creates a disturbed, non-classical appearance, but also a tense, crowded and dark interior.

An example from 1585 is the *Kılıç Ali Paşa* Mosque in İstanbul. It follows the plan type of Hagia Sophia, but all the side extensions of space, encircling the central dome are covered by vaults (Figs.17 and 18).

This creates a space that is divided once again and thus becomes darker and filled with carrying elements. From the outside, the separation between the roof and the lower parts of the building is also emphasized by the lead covering of the whole roof. Although these last experiments are extremely interesting and original and may have developed into an architecture that was quite unique, they were not continued after Sinan. On the other hand, as such as they are interesting to study as variations of form, they do now show the grandeur of the classical buildings such as the *Süleymaniye* or the *Mihrimah Sultan* Mosque at Edirnekapı (Fig.19). But, if arts and architecture are the true expressions of a culture, than it is natural that these edifices built at a time when the Ottoman Empire was beginning to have political and economic difficulties would have these qualities and moods of tenseness and contradiction.

Early Baroque: The *Selimiye* Mosque built in 1574 was both the climactic finale of the development of Ottoman architecture's search for the complete integration of forms, and for the homogeneity of space and the beginning of a new direction.[3] Already with its mixture of colored tonalities on its surface forms, the lightness and fluidity of its structure was a forecast of the Baroque. But the first mosque to be built in the 17th century, *Sultan Ahmet*, by keeping Sinan's structural principle of arch buttressing yet increasing size, number of elements and spatial expansion creates exactly the same effect as the painting of Tintoretto in the Renaissance, by exaggerating and opening up spatial movement (Fig.20). The spatial feeling inside the *Sultan Ahmet* does not give us a new experience, it only overwhelms us by its hugeness. Instead of two rows of windows there are three, instead of one layer of half domes, there are two, etc. Effect is created by quantity rather than through originality or quality.



Fig. 17: Kilic Ali Pasa mosque by Sinan.

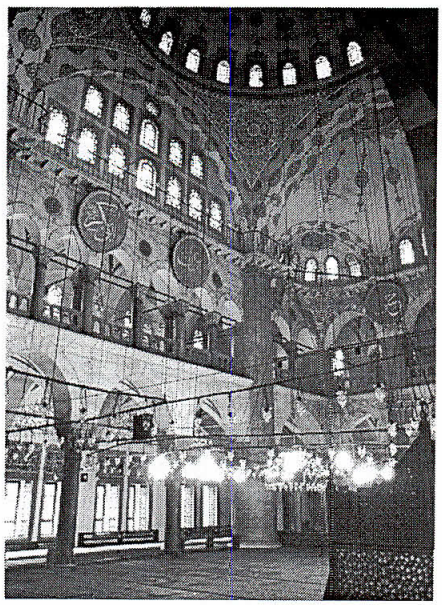


Fig. 18: Interior of Kilic Ali Pasa mosque.

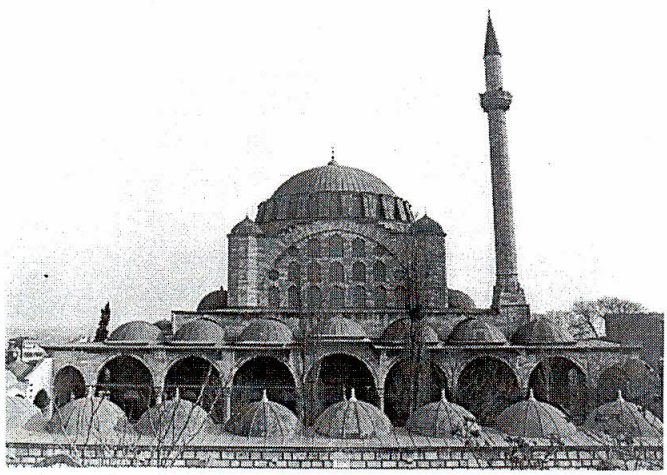


Fig. 19: Mihrimah Sultan mosque at Edirnekapi.



Fig 20: The court of Sultan Ahmet mosque.

Conclusions

As has been pointed out, the development of Ottoman architecture, which used the single cubic unit covered by a sphere, as its common denominator, manifested a constant effort to acquire the homogenized central space covered with a central dome. To enable this the domed central space was encircled with secondary spaces, which were also a structural necessity to support the outward thrust of the central structure, which is a baldachin with four vertical supports upholding a dome. Thus, this system of arched buttressing constructed upon the principle of repeating and mutually supporting baldachins evolves into a single baldachin, which has a complex undulating boundary and a single dome in the Selimiye example. From this time on the perfect solution having been attained, both Sinan and later architects experiment with alternative solutions.

Since this text so far concentrated on the structural transformations, the author would like to conclude by summarizing the aesthetic qualities of interior spaces.

The structure was dependent on a hierarchical system of supports, that started with the main dome and its piers and incorporated the supports of the encircling spaces and units, which also became supports for each other; in turn this structure was correlated by a spatial articulation that was also dependent on a hierarchical ordering. Since the priority in the spatial experience was the dome with its symbolic significance as the heavens or the sultan's representation, everything in the interior helped move the eye upwards and revolve with the rhythmic flow of the domes and semi domes, and excedras. The other important features which capture the eye are the arches with polychrome voussoirs, adding to the flowing movement of forms. The eye moves slowly downward following vertical forms which are simple columns or piers which have been articulated in their contours. Following vertical elements our gaze moves to the horizontal floor, and the large windows attract us towards the light.

Another important quality was the use of contrasting shapes and forms. Foremost are the play of two-dimensional and three dimensional, curved and planar surfaces. The use of stalactites or *muqarni*, help not only by solving certain structural points like the pendentives, but also act as transition between the three dimensional and the two dimensional elements.

The experience of space on the horizontal floor plane of mosques has a quality of freedom due to the unobstructed movement towards the boundaries and beyond. This is not only due to the fact that there is no furniture except some few functional elements like *minbar* and book support, but also due to the fact that space is homogeneous and uninterrupted. As can be seen later in the last mosques built by Sinan, this quality will be lost due to spatial divisions caused by the abundance of vertical elements needed for the new vault covers on the lateral expansions and due to the diminishment of light.

As our gaze moves on the horizontal plane we are also made aware of how interior and exterior is integrated and how we are freely in contact with the exterior through the large windows that come all the way down to the floor.

One important fact in the overall ambience of space is the homogeneous light. Light is admitted into the interior from all levels and from all sides, in an evenness that is achieved in almost all mosques of the classical period, that is to say till 1574. The way light enters and plays on the surfaces often creates reflections and vibrations, and brilliant color effects on the glazed surfaces, or on white surfaces of marble. This is an ephemeral quality, but one that is common and very much valued in all of Islamic architecture.

To finalize the spatial qualities of Ottoman architecture, the author concludes with the aesthetic, sensory qualities and experiences such as the tactile, kinetic. The physical relationship with the building during the prayer, such as touching the head on the ground in prostration, or sitting on the floor on the carpets is extremely important in the relation of the individual to the building and emphasized the aesthetic, lived qualities of architecture. The softness of the floor, the hardness of walls, the transparencies through columns or through windows, the flow and movement of the

congregation within the space are extremely important issues without the consideration of which interior spaces cannot correctly be evaluated. These aesthetically qualities which make the experience of being in the mosque special, pleasant and congenial are often related basically to the structural solutions that give form to space. Yet, by pointing them out, it is hoped that the humane aspects and human scale of this monumental and highly formal architecture will serve as an example to present day architects.

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تطور الفراغ والنظام الإنشائي لعمارة المساجد في تركيا العثمانية خلال العهد الكلاسيكي

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ملخص البحث: يهدف البحث إلى التدليل بأن عمارة المساجد التركية، منـــذ جذورهـــا النمطيـــة في المـــدارس الســـلجوقية ومســـاجدها العظيمة في الأناضول وحتى أكثر مراحلها تطورا في نموذج المسجد السليماني للمعمـــاري ســـنان في آخـــر القـــرن الســـادس عشـــر، تســـتند إلى مقاصد واضحة ومحددة أضفت عليها طابعا جماليا أساســيا. وتشـــتمل تلـــك المقـــاصد علـــى توســـط القبـــة وســـيطرتها وانســـجامية الفراغ. وتميزت العمارة العثمانية منذ بداية تكونها وحتى اكتمالها في مسجد السلطان ســـليمان بوضـــوح التعبـــير الـــذي تمثـــل في الاعتمـــاد الكلي بين الفراغ والهيكل الإنشائي. بينما تكون المسجد العثماني المبكـــر مـــن فـــراغ بســـيط مفـــرد؛ إلا أن مســـجد الســـلطان ســـليمان والذي يعتبر الأكثر تطورا للعمارة العثمانية وبعد العديد من التجارب في التوفيق بـــين الفـــراغ والهيكـــل الإنشـــائي، إلا أن المصمـــم وصـــل إلى نفس النتيجة وبنفس الشكل الأساسي حيث تم فيه تحقيق الشعور بالوحدة الفراغية في تصميـــم المســـجد. خـــلال تلـــك الفـــترة، نتـــج عن محاولات الوصول إلى فراغ مركزي متجانس نماذج تتمتع بخصائص جمالية ولكن علـــى حســـاب الهيكـــل الإنشـــائي. ويعتمـــد النمـــط العضوي للمسجد العثماني، والذي تميز بالتوفيق الفني الرائع بين الفراغ والهيكل الإنشائي، على نظام مـــن العقـــود الداعمـــة/الحاملـــة حـــول قلب مظلة حجرية فوق المسجد، ويوضح ذلك المسار بأن الفراغ المركزي الرئيســـي المفـــرد تم توســـعته وتضخيمـــه عـــن طريـــق إحاطتـــه بعدد من الفراغات الثانوية والمحيطة به تم دمجها بعناية فائقة والتي بدورهـــا تخـــدم كدعامـــات إنشـــائية.