

A Comparative Structural Analysis of the Muqarnas of the Iwan-i-Maqsura of Goharshad Mosque in Mashhad with the Linear Model from the Topkapi Scroll

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Introduction

The muqarnas of the porch of the Goharshad Mosque in Mashhad is among the most distinguished Timurid muqarnas, which was made in layers with a precise and elegant geometric design. This design is not merely decorative; it depicts the beauty and spiritual grandeur of the sacred space as well. The Topkapi Scroll, as one of the most important documents obtained from the ninth and tenth centuries AH, displays a variety of geometric designs applied to the body of walls and arches. This scroll was prepared by the Timurid and the early Safavid designers and contains a valuable collection of geometric patterns. A leaf from this scroll is closely related to the structure of the mogharnas of the porch of the Goharshad Mosque in Mashhad, suggesting the possibility of a connection between the linear pattern of the Topkapi Scroll and the porch of Goharshad Mosque.

Research Method

This research is comparative in terms of its fundamental objective and descriptive-analytical method. It employs the methods of library study, documentary and field observation data (visiting Goharshad Mosque and taking pictures of the moqrans of the porch of the courtyard). This research uses the general image in two samples of moqrans of the objective model and the linear model and detailed images of the tools to show the structural differences and similarities of the two moqrans. In the first sections, the research introduces the muqarnas. Then, it collects information about this element in the porch of the courtyard of Goharshad Mosque and evaluates the understanding of the structure of this decorative element.

Research Findings

The evidence and analyses available on both the objective and linear muqarnas, summarizing and comparing in three different parts of the center, body, and margin, show that the differences in the number and size of the muqarnas are related to their placement. In this design, many forms are drawn similar to the objective muqarnas, but with lines that have changed their shape. According to the images of the linear design of the Topkapi Scroll, it can be seen that in some of the six-band forms of the first row, a line is drawn in the lower part of it, which has transformed the form six-band into a Five-Kond form. It can be concluded that there were errors in the linear design that were not eliminated and the correct lines were also drawn. The presence of the star form, as a part of the flat form in the muqarnas of Goharshad Mosque, includes five-pointed, four-pointed, six-pointed, seven-pointed, and eight-pointed stars. However, in the linear scroll pattern it includes

five-pointed, four-pointed, six-pointed, and nine-pointed stars. More complexity is seen in the muqarnas of Goharshad Mosque because the ends of the flat forms create a form Tanure and the number of forms Tanure in this muqarnas is more in comparison to other cases. In other words, except for the form Taas, all the star forms in two-dimensional and three-dimensional forms in the muqarnas of Goharshad Mosque can be considered a kind of complete Shamsa. The findings show that the Shamsa form in both muqarnas is drawn in the same way in the two parts of the central core and the body. The structure used in both muqarnas is a cluster-type geometry and shows its tendency towards infinity, which is derived from fractal geometry. At the same time, there are differences between the linear design and the objective model pattern, which are probably due to the artist's taste during execution or because of various restorations of the muqarnas of the porch of the courtyard of Goharshad Mosque or the linear pattern. The beginning and end of each row in the linear design, which is two-dimensional, cannot be compared to the objective muqarnas. On the edge of the Goharshad muqarnas, there is a partial civil form that cannot be seen in the linear design pattern of the Topkapi Scroll.

Conclusion

The results show that the central part of the muqarnas is in the form of a large semicircle or half circle with an emphasis on the Shamsa, which has a significant effect on the circular or rotational movement in the trains below them. In the middle part of both muqarnas, repeating units are seen; the star form is one of the most important. It is also the factor that creates Shirazi muqarnas and the complexity of the muqarnas. Regular polygons are another recurring form and a reason for creating movement in the entire muqarnas. They indicate that a transformation of forms has been created in both muqarnas. The similarity between the central parts of both samples, in the type of structure as well as in the type of forms, is great. At the same time, with an increase in the different forms that make up the muqarnas, another factor creating the Shirazi muqarnas, the multiplicity of forms that are used in the linear design of the Topkapi scroll is less evident than in the objective muqarnas. The Shamsa form is drawn in the same way in both muqarnas. Another difference between the objective and linear muqarnas is the lack of a border in the linear design, which may have been due to the two-dimensional nature of its drawing in the linear design. In both muqarnas, waves and distortions are seen in the rows that are directed towards the center or the Shamsa. This is a unique feature of the art of Muqarnas from the Timurid era, which can be seen and proven in both physical and written examples of Muqarnas left from that era, and is a source of pride for the industrial arts of Iran.

Keywords: Timurid architecture, Goharshad Mosque, Iwan-i-Maqsura, Muqarnas, Topkapi Scroll, Comparative Structural.