

# HISTORICAL DEVELOPMENT AND CONSTITUENT ELEMENTS OF MUQARNAS IN THE ISLAMIC WORLD

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## ABSTRACT

The main goal of the article is to reveal the etymological meanings of muqarnas, place of origin, original types of stalactites, structural elements and evolutionary development. The article also discusses the first types of stalactites.

**Keywords:** Muqarnas, Karbandi, Rasmi bandi, Yazdi bandi, Kaseh sazi, stalactite, shamseh, toranj, taseh, parak, shaparak, tee, espar, takhts, scroll.

## INTRODUCTION

Among the various types of architectural decoration, muqarnas play an important role because of their strong aesthetic appeal in both arts and crafts and the architectural design of Islamic monuments. Initially, muqarnas used as a functional element in architecture until the Islamic period and were not formed as muqarnas (the first types of muqarnas are similar to squinch). Over time, because of the evolutionary development of architecture, muqarnas began were used not as an architectural and constructive element, but as a decorative and applied element of the architectural monument.

The muqarnas is a three-dimensional composition created by assembling, in a variety of combinations, simple prismatic elements, comparable to portions of vaults and composed according to precise rules, in overlapping corbelled levels. The disposition of such elements, as well as their size and form, can vary according to geographical location, the historical period to which they belong, the part of the building to which they are applied, and the materials used to build them. The dimensions of the elements can range from just a few centimeters, as in the case of the Moroccan muqarnas, to meters, as in the Iranian Friday Mosque of Isfahan. The size depends not only on the building materials — much larger muqarnases can be created from a stone than from wood, the latter ones measuring as little as five to ten centimeters — but also on the period of construction.[1] Sometimes an element is present at different scales in the same composition.[2] The materials employed for the construction of the muqarnas vary according to the region of the Islamic world under consideration. [3] In Syria, Egypt, and Turkey, muqarnases are made of stone, the predominant local building material, which requires great precision of execution. In North Africa, the muqarnas is made of plaster and wood. In Iran and Iraq, they are made of bricks, sometimes covered with plaster or ceramic.

## BODY

However, to embark upon a historical study on the use of muqarnas in architectural decoration is a complex task, since it is not easy to pinpoint the place and time at which muqarnas were first used.[4]

In order to understand the word “Muqarnas”, it is better to take a glance over its etymology in different languages, but we should remark that the etymology of the Arabic term muqarnas has not established. In medieval Arabic dictionaries, the word has no architectural meaning. According to Yasser Tabbaa, it appeared for the first time in the twelfth century.[5] Necipoglu and Al-asad [6] state that the word “Muqarnas” is an Arabic word for stalactite vault, derived from “Qurnas” (or Qirnas), meaning decorated ceiling with three-

dimensional elements. Several scholars agree that it comes from the Greek word *korōnís*, meaning “cornice”, [7] although, as Tabbaa says, this origin “is not confirmed in any Arabic or Persian source.” [8] According to Garofalo [9], Chronology and geographical origins of Muqarnas are still unknown. Some scholars date the muqarnas to the end of the eighth century in Syria, and others to the ninth century in Iran, still others to the eleventh century in North Africa or Baghdad [10]. What is certain, however, is that by the twelfth century the muqarnas had become a common characteristic in the decorative arts of all territories of the Islamic world, and that different local decorative traditions favored the development of regional variations. [11] Among the oldest examples of muqarnas in the Western world, Fernández-Puertas includes those present in Palermo — on the ceiling of the Cappella Palatina, commissioned by Roger II (d. 1154), and in the Zisa and the Cuba, a palace built in 1180 by Guglielmo II d’Altavilla. [14] (Table 1).

(Table 1.)

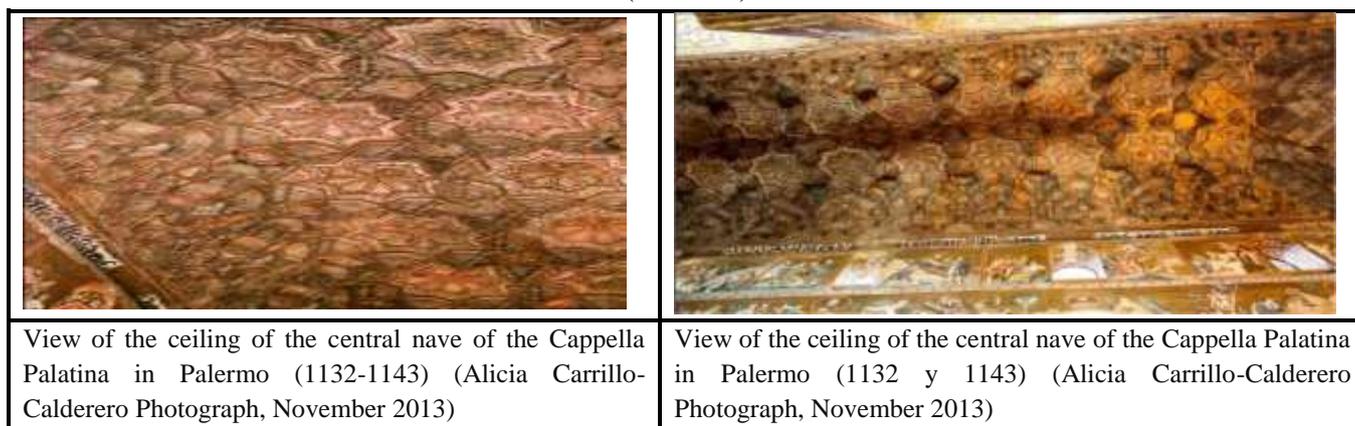
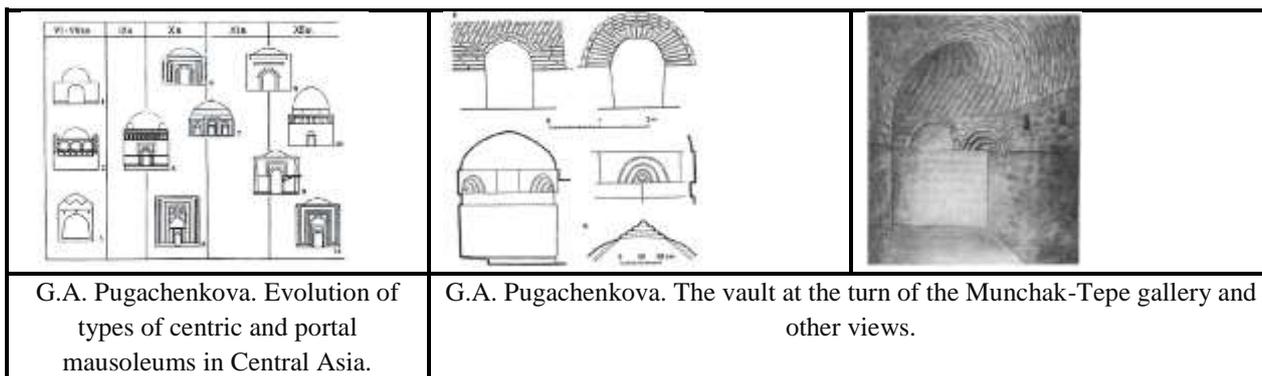


Fig. 1.

There are many theories, and one of the most reliable theories according Garofalo [15] and G.A. Pugachenkova [16] the functional origin of the muqarnas goes back to the corner tripartite squinch [17], which used for the first time in domes in Iran in the tenth century to enable the smooth transition from the square base of the walls to the circular dome. (Table 2.).

Écochard argued that the structure of these early corner squinches anticipated what would later become the muqarnas [18]. The matter of the link between two different forms had already been resolved in Roman architecture through the use of the pendentive [19]. According to Hautecoeur, it was in the Maghreb that the cells that constitute the muqarnas were first detached from the wall, thus abandoning the shape of bas-reliefs, to hang in isolation similar to stalactites [20]. Necipoglu and Al-asad [21] persuades that, the oldest example of Muqarnas has emerged around the middle of the 10th century, simultaneously and independently in northeast of Iran and Africa, then it was developed from the 11th century throughout the entire Islamic countries from India to Spain, according to each country different materials and culture.

Table 2.



However, a number of authors, including de Beylié, Bloom, Creswell, Ettinghausen, Grabar and Tabbaa, pointed to four possible origins: namely, Bukhara in present-day Uzbekistan, Samarra in today's Iraq, Egypt and today's Algeria ( see **Table 3. and Table 4.**)[22], like the Ismail Samani Mausoleum at Bukhara, the southeast and northeast domes of the Great Mosque of Isfahan, the Shrine of Imam al-Dawar at Samarra and the muqarnas fragments found in the Hammam of Abu'l-Su'ud in Fustat in Cairo[25].

1. Uzbekistan, Bukhara and Samarkand.
2. Iraq, Samara.
3. Egypt.
4. Algeria.

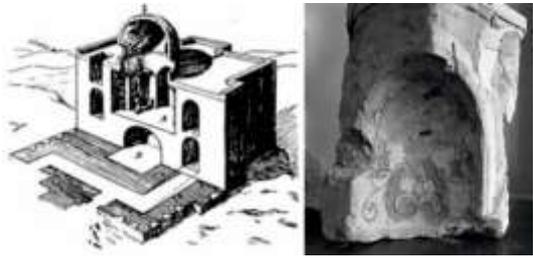
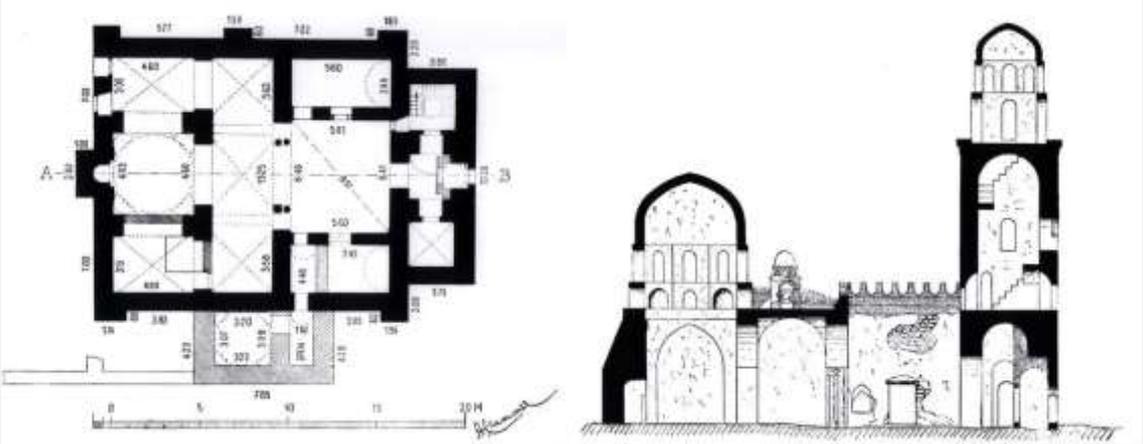
While some suggest that this ornamental device may have arisen independently and virtually simultaneously in North Africa (Qal'at Bani Hammad built between 1015 and 1152 in Algeria) and the Near East[26]. This diversity of views testifies to the complex nature of the question.

Table 3.

Table constructed by autor based on Alicia Carrillo.(2016). The Sasanian Tradition in Abbasid Art. squinch fragmentation as The structural origin of the muqarnas.

BUILDINGS with MUQARNAS	PERIOD/DINASTY
<b>Ismail Samani Mausoleum at Bukhara, Uzbekistan (914-943.).</b>	Samanids (819-1005)
<b>Arab-Ata Mausoleum in the village of Tim, Samarqand Region, Uzbekistan. (977-978.)</b>	Samanids (819-1005)
<b>Jameh Mosque of Isfahan (Great Mosque's dome), Iran (1072-1088).</b>	Saljuqids (1040-1194)
<b>Shrine of Imam al-Dawar at Samarra, Iraq. (1085).</b>	Abu'l-Makārim Sharaf al-Dawla Muslin ibn Quraysh (1061-1085), governor of the 'Uqayli (990-1169).
<b>Minaret's Mosque Badr al-Jamali, Cairo (1085). + window northern section, Cairo wall commissioned by Badr al-Jamali in (1087).</b>	Faṭimids (909-1171)
<b>Hammam of Abu'l-Su'ud, Fustat, Cairo (about 9-10 c.).</b>	Abbasid (750-1258)
<b>Qal'at Bani Hammad, Algeria (1015 - 1152).</b>	Ḥammadids (1015-1152) Al-Naṣīrb. 'Al - Annas (1062-1088)

**Table 4.**

 <p><b>1</b></p>	 <p><b>4</b></p>
 <p><b>2</b></p>	 <p><b>5</b></p>
 <p><b>3</b></p>	 <p><b>6</b></p>
 <p><b>7</b></p>	

1 - Ismail Samani Mausoleum at Bukhara, Uzbekistan. 2 - Arab-Ata Mausoleum in the village of Tim, Samarqand, Uzbekistan. 3 - Jameh Mosque of Isfahan (Great Mosque's dome), Iran. 4 - Shrine of Imam al-Dawar at Samarra, Iraq. 5 - Hammam of Abu'l-Su'ud, Fustat, Cairo. 6 - Qal'at Bani Hammad, Algeria.

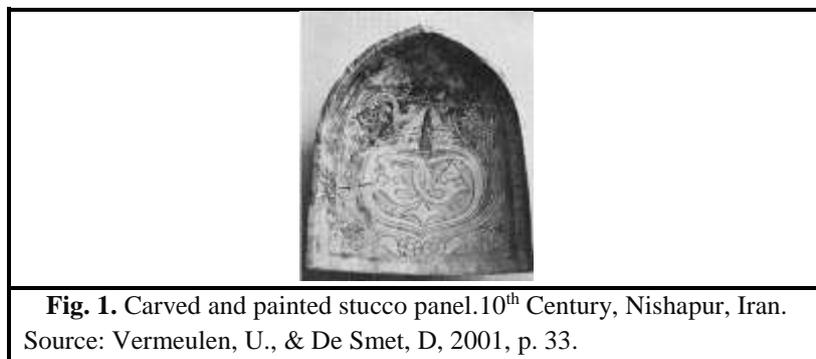
## CONCLUSION

Based on the above data, it can be concluded that the etymological origin of the word muqarnas and its homeland are unknown. Research shows that the terms and techniques associated with the word muqarnas can be found not only in Muslim countries but also in European regions.

In addition, studies have shown that initially, muqarnases were in the form of squinch and pendentive. Examples of this are the ceramic muqarnas found in Nishapur (10th century Iran) (**Fig 1.**) and the squinches of the Samanid mausoleum in Bukhara (Uzbekistan). In addition to our opinion, it is possible to carry out pre-Islamic architectural devices between the walls and the ceiling in the form of a trumpet, which contributed to the formation of muqarnas in the history of architecture.

In conclusion, we can say that pseudo-forms of stalactites began to appear even before the 9th century. Incomparable and unrepeatable specimens of stalactites can be found in the buildings of the 14-17 centuries. By this time, it can be observed that not only the type of muqarnases but also their structural elements change and lose their functional characteristics at the regional level. The evidence for our opinion can be found in the study of Hamidrez Kazempur[27].( **See Table 4 and 5.**)

Table 4.



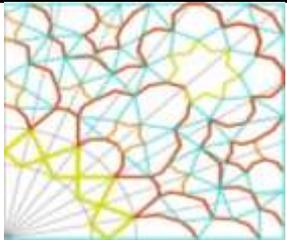
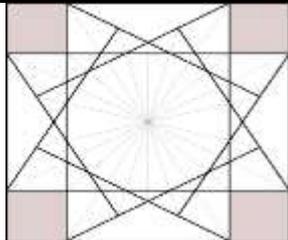
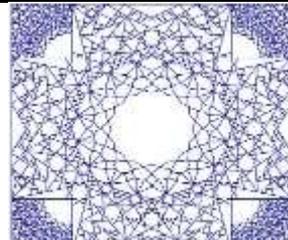
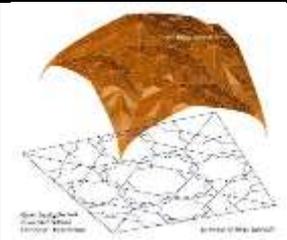
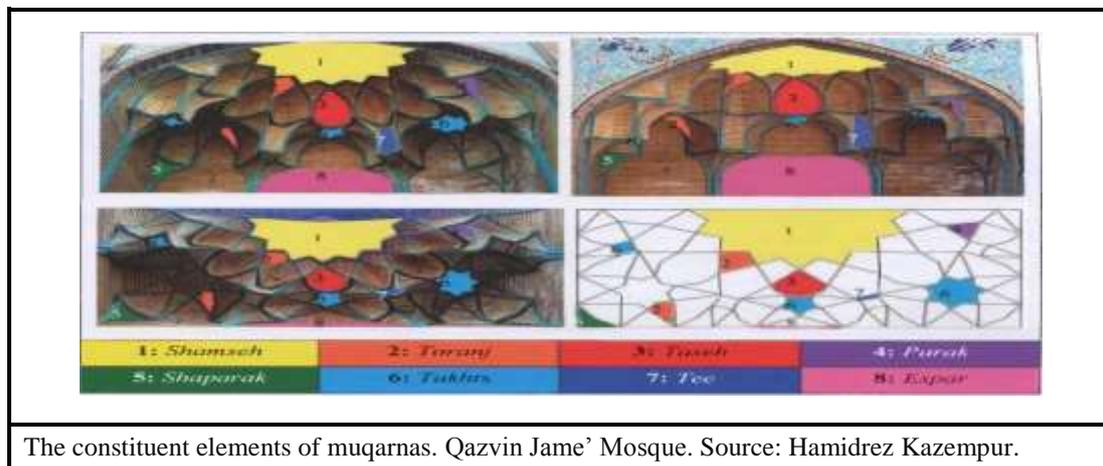
			
Muqarnas.	Karbandi. (Rasmi bandi)	Yazdi Bandi.	Kaseh Sazi.

Table 5.



In the 19th and 20th centuries, the construction of stalactites can be considered not only as architectural decoration but also as a unique form of decorative art. As a result of the formation and evolutionary development of new forms, in general, there is a growth in the work of architects. An example of our opinion is the manuscripts of Ust Shirin Murodov[28] and Mirza Akbar scrolls[29].

It should also be noted that the knowledge and skills of the muqarnas have passed from hand to hand in the history of humankind, and over time, this knowledge and experience have developed and introduced innovations. The most historical manuscript of Muqarnas, in a plaster plate, was discovered by archaeologists in Takhti Sulayman[30] and is the oldest artifact among stalactites.

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2. Vincenza Garofalo (2010). A methodology for studying muqarnas: the extant examples in Palermo. *Muqarnas*, 27(27). p.357.
3. Innovative materials such as fiberglass and associated advanced technologies are also employed today.
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  19. Ulrich Harb. (1978). *Ilkhanidische Stalaktitengewölbe: Beiträge zu Entwurf und Bautechnik*. Archäologische Mitteilungen aus Iran: Ergänzungsband, vol. 4. Berlin: D. Reimer. See also for a study of the different types of oriental squinches and Islamic pendentives; Louis Hautecoeur. (1931). *De la trompe aux Mukarnas*. *Gazette des Beaux-Arts* 6.p. 26–51. for the Persian and the Syrian squinch look; M. Edmond Pauty. (1929). “Contributions à l’étude des stalactites,” *Bulletin de l’Institut français d’archeologie orientale* 29. p. 129–53, for the Islamic squinch and pendentive look; J. Rosintal. (1912). *Pendentifs, Trompen und Stalaktiten: Beiträge zur Kenntnis der islamischen Architektur*. Leipzig. for the Byzantine and the Persian squinch, the Byzantine pendentive, and the Turkish triangle look; Auguste Choisy. (1883). *L’art de bâtir chez les Byzantins*. Paris. for the Byzantine squinch and pendentive and technical terminology used in relation to transitional elements in Islamic dome structures; Daria Jones and George Michell. (1972). *Squinches and Pendentives: Problems and Definitions*. *Art and Archaeology Research Papers* 1.p. 9–25. for transitional elements that demonstrate the influences of Islamic architecture in medieval dome structures in Sicily: Vincenza Garofalo. *Islamic Influences in the Architectural Elements of the Twelfth Century in Sicily*. In *Islamic Civilization in Sicily, East–West Nexus/PROTA Institute, Amman*, ed. Attilio Petruccioli.
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