IMPACT: International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL)
ISSN(E): 2321-8878; ISSN(P): 2347-4564
Vol. 3, Issue 11, Nov 2015, 31-40

ARCHAEOLOGICAL AND ARCHITECTURAL STUDY OF THE VAULTS AT CENTRAL AND EASTERN MAGHREB DURING THE ISLAMIC ERA

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ABSTRACT

Vaults are fundamental architectural systems used to provide to span the space between walls, piers, or other supports and to create a ceiling of a room or other enclosed space. They are characterized by their simplicity in design and in construction materials. Several research studies are interested to the Arab-Islamic cities from their monumentsal, architectural and urban point of view without addressing the topic of the vault. This article deals with the importance of vaults as a part of the urban fabric of Islamic Arab towns and mutual influence between the different Islamic periods. The purpose of the establishment of vaults and their utility in the social connectivity and communication between neighborhoods is also discussed.

KEYWORDS: Vault, Arch, Archaeology, Architectur, Andalusia

INTRODUCTION

Vault is a simple architectural system used to span the space between walls, piers, or other supports and to create a ceiling of a room or other enclosed space. Several researchs are interested to the study of Arab cities and addressed a large number of study to their monuments such as mosques, markets, houses and some treat only the urban fabric. Allmost of these studies deal only with architectural and urban phenomena in the Arab-Islamic city, but overall they are limited to the study of the mentioned monuments and other architectural phenomena without addressing the topic of the vault.

A granted interest to vault construction returns to the early muslims, which have built Saqifah Beni Saada, as was during the Umayyad period in the Levant, and this tradition has been moved to Abbasid state in which they created the arches in their palaces and continued to exist until the Umayyad period in Andalusia [1-5], where the presence of the arches to the palace of Cordoba, and has continued to be used until the Ottoman period, when it was found twenty-one arches in Algeria [2-7]. Almost the same number in Constantine or its use was essential in the Islamic city connecting neighborhoods streets and also play an important social role in the good neighborhood family living side by side in most cases.

The vault is characterized by its simplicity in design and in construction materials used as in homes. Because the vault is built with the same materials that are used to build the home and also it represents a ceiling between two walls and it is simple in its composition because. It contains no decorations except the arches and vaults of the palace houses of the leaders, where we find the walls of symbolic forms. In addition to the presence columns and capitals at the bottom of the vault, with the use of construction materials with a greater diversity compared to vaults that emerged in the early centuries of Islam, such as the use of marble. Then the stage of development of simple style and simple building materials. So he

gave the Ottomans the possibility of creativity by introducing new construction materials. The use of new calligraphic inscriptions on marble plates and installed on walls at the vaultsentrance which characterized the Ottoman era and there has not been in previously. This development does not stop with the design and building materials, but beyond the diversity of jobs, after it was used to connect neighborhoods and streets, and protect the leaders. They held the Diwan or throne room for the parish meeting to decide and consult and discuss various issues. It is also housed prayer rooms for the expansion of the mosque after he became cramped to accommodate a sufficient number of faithful and it also supports a school to teach the Koran and also a prayer room set.

Vault DIWAN, West entry

Figure 1

Vault El-Hout, year 1860

Vault Redjem Bey, West entry

Figure 2

Vault BIALA, West entry

Figure 3

Vault ALAARS, West entry

Figure 4

Vault ERRIH, West entry

Figure 5

Vault EL KOUSAIR, East entry

Figure 6

Vault EL KITAT, West entry

Vault EL KOURA, North

Figure 7

Vault SOUK EL ASR, North entry

Vault EL KALIFA, East entry

Figure 8

Vault Ben El Bouchaibi, East entry

Vault CHEIKH EL ARAB, North entry

Figure 9

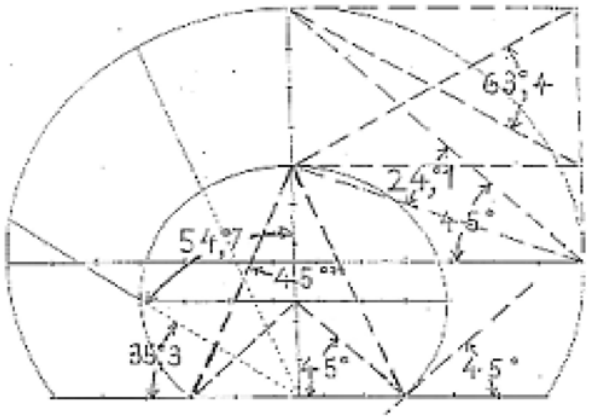

Figure 10a: The Great Mosque of Tlemcen: Construction of the Vault of the Mihrab

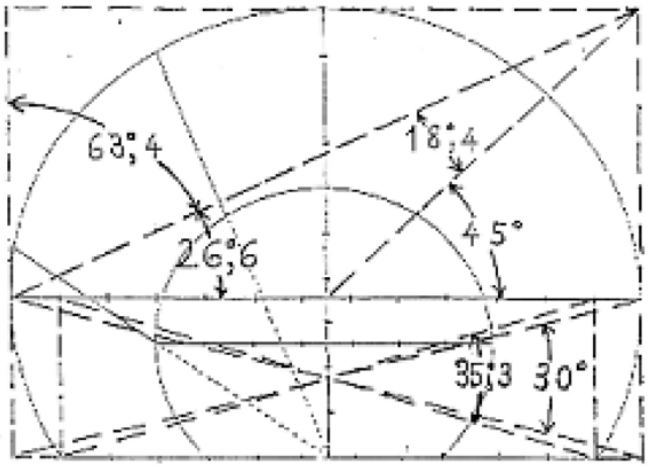

Figure 10b: The Great Mosque of Tlemcen: Construction of the Vault of the Mihrab

Before going further, it seems appropriate to remember that the father of Leonardo Fibonacci of Pisa was consul in Bejaia, and that's at the University of Bejaia, one of the most renowned of the

Mediterranean world, the young Leonardo before becoming at the court of Emperor Frederick, on his return to Pisa, the most brilliant Italian mathematician of his day, discovered some essential properties of number theory [15-17] .

Under the Mihrab of the Great Mosque of Tlemcen, although 5, 8 and 13 are among the first elements of the Fibonacci sequence, we see that the ratio 13/8 = 1.625 and thus is already an excellent approximation of Or number of f = 1.618. It follows that: 8/13 = 1 / f and 5/13 = 1 / f2. Since according to equation (IV): 1 - 1 / f = 1 / f2.

One then notes that the square in question and its decomposition into a Golden f aspect ratio rectangle and a ratio of rectangle sides f2 = f +1, although obviously of the vantage points Q1,1 = 45° and Q4,2 = 63.4° [18,19] (Figure10a). Note also the subtle play between 45° present in the square and QF2 angle is the angle between diagonal and side of the small rectangular lower decomposition, angle defined by tgqf2 = 1 / f2.

It is interesting to calculate the angle subtended by the greatest width of the arc, which is vertical from the one end of the horizontal diameter of the arc which represents the largest dimension of this arc. This angle is obviously equal to a = 45° - QF2, or a = Q1,1 - QF2, and we obtain:

tga = tan (Q1,1 - QF2) = (tgq1,1 - tgqf2) / (1 - tgq1,1.tgqf2) = (1 - 1 / f2) / (1 + 1 / f2)

= (F2 - 1) / (1 + f2)

According to equation (II) and the value of the number of gold, f = (1 + O5) / 2 given by equation (V): tga = f / (f + 2) = ((1 + O5) / 2) / ((O5 + 5) / 2) = 1 / O5 = tgq5,5 therefore q5,5 = = 24.1 °.

On the occasion of the study of the Mihrab of Tlemcen, we have just discovered (or rather rediscovering) a remarkable property with a Golden rectangle, not including a square, or added to a square, as is the If in one of the classical definitions of the golden rectangle, but this time is included in a square of which we have just demonstrated, a small side is seen from the top of the square, opposite him, and n is not top of the Golden rectangle, from the vantage q5,5 = 24.1°(Figure 10b).

Properties similar to it and playing with proportions 1/f, 1/f2 and 1/O5 explain air astonishment and strong character of both the Parthenon, balance, emanate from internal and external proportions of the cathedral Pisa, and other aesthetic elements that we discover some of the most famous monuments.

Historical and Geographical Context

The subject deals with vaults in the North African architecture in the Islamic period. They used in mosques and palaces in and the houses particular. The role in general and by its wide use in mosques, palaces, between houses and walls. We also discuss the study of different models in different times and places.

In time, we study the vaults of models during Almurbati Zayani era and the Ottoman period to a maximum of the seventeenth century, a period in which Islamic architectural movement was booming in the Islamic Maghreb in general and Maghreb central and eastern Maghreb.

This subject has not been studied before, the general way it was addressed in time and place and the problems have not been addressed in the form of academic thesis despite the existence of a study on the vaults Tunis or only one has done a study as a model [10,11,13].

RESEARCH METHODOLOGY

In our examination we have adopted of these vaults, the theoretical side in terms of gathering scientific material jurisprudential provisions and laws organized around the vaults. We also adopted at the study of the ground, where we will be able to develop a statistical form for each model of vault studied at Central Maghreb area and Kenadsa Nedroma Palace and lowest in East Maghreb in Tunis. With this statistical form that will allow us to know the architectural and archaeological features of each arch, in terms of distribution vaults in each city and find the number in neighborhoods which will help to characterize them according to their axes movements [27-29].

The pillars of research for this field study, through which scientific visits applied to the area and Nedroma Kenadsa Palace and the city of Tunis to select models for the study, and their provisions, and importance, from the description up to photography and topographic lifting, In terms of historical methodology that we will use in the historical study we adopted the chronology of texts, ideas and events.

The descriptive approach that describes the diagnosis of the vault in the urban area and Nedroma Kenadsa Palace in central Maghreb and Tunis in East Maghreb [18].

The third approach is the analytical approach that will be used to track various developments structurally and functionally, who entered the item vault and we will interest the analysis of blanks, construction materials, writings and decorations used in the arches .

I'll start with an introduction about the history, which deals with the Islamic conquests, which included the countries of the Maghreb, and I felt that I divide the subject into three sections, each of which includes chapters.

Structure of the Study

Section I: dedicated to the study of the urban fabric of the area and Nedroma and Kenadsa palace and the city of Tunis and the provisions of case law on the vaults can be divided into three parts:

Part 1: in wich we speak about the urban fabric of the region and Nedroma Kenadsa Palace and the urban fabric of the city of Tunis.

Part 2: we will discuss doctrinal studies that gave special concepts vaults,

Part 3: we talk about the vaults in the Islamic Maghreb and provisions and laws relating to the vault. ***Section II:*** This section will address the study of descriptive models of the vault in the area of Nedroma Kenadsa and palace, and the city of Tunis and it is subdivided into two parts:

Part 1: we describe the vault in terms of its location and size and the central Maghreb precisely in the region of Nedroma Palace and the Palace Kenadsa and we will make a descriptive study plans,

Part 2: we reserve the diagnosis of the vault in terms of its location and sizes specifically Maghreb Oriental in

Tunis to make a descriptive study plans.

Section III: It will be addressed to the analytical study where a vaults characterization study is carried out. This section into three parts:

Part 1: a study shoed vaults profile into three groups according to the axes of movement.

Part 2: we address the architectural and technical analysis so that we can understand and learn how the use of decorative elements of writing and floral decoration and symbolic elements on the arches. Part 2: we are interessted to the building materials and construction methods vaults in the palaces, mosques and homes.

CONCLUSIONS

On the occasion of the study of the Mihrab of Tlemcen, we have just discovered (or rather rediscovering) a remarkable property with a Golden rectangle, not including a square, or added to a square, as is the If in one of the classical definitions of the golden rectangle, but this time is included in a square of which we have just demonstrated, a small side is seen from the top of the square, opposite him, and n is not top of the Golden rectangle, from the vantage q5,5 = 24.1°.

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