

Reference List

- Akerraz, A. (1985). Note sur l'enceinte tardive de Volubilis. Bulletin Archéologique du Comité des Travaux Historiques. 429–436.
- Becker, C. (2006). *Amazigh art in morocco*. Texas: Press University.
- Brett, M & Fentress, E. (1997). [ISBN 0-631-16852-4], The Berbers (The Peoples of Africa).
- Hoag, J, D. (2004). *Islamic architecture*. Milan: Electarchitecture.
- Izadi Jobran, A. (2016). *Franz Boas anthropologic Theory*, <http://anthropology.ir/node/2240>.
- Montague, M. (2012). *Marrakesh by design: Decorating with all the colors, patterns, and magic of Morocco*. New York: Artisan.

Table 1. The roots of decorative patterns. Source : Author.

Islamic tradition	Roman tradition	Barbarian tradition	Factors
1- Decorative reactions to the arcs apex in the inscription 2- Development of projections on the arcs	Keystone of arcs	String motif	String motifs at the apex of arcs
1- Muqarnas construction 2- Umayyad arch Iranian Clay Arch 3- Razi style squinches with Sassanid background	Roman circular arc	Shellfish motifs	Shellfish decorations of arches
4- Abstract geometric patterns, Garih tiles	Use of beads and objective sculptures	barbarian colors Plant motifs	Colorful extensions of Geometric motifs

Conclusion

Based on the above comparisons, the origins of each of the following decorative patterns can be categorized as follows:

Thus, it can be concluded that each of the traditions involved in emergence of Moroccan architecture can be identified in the majority of Moroccan architectural patterns. But it must be pointed out that each of these representations may receive more attention in a particular area or subject, depending on their application

background. Moreover, it seems that, apart from the geometry of traditional motifs. Islamic representations usually have a structural role rather than a symbolic one, while the Roman representations have been more effective in forms. On the other hand, barbarian architecture has been more influential in terms of colours and designs. These differences in terms of influence can serve as a basis for further studies.

Endnote

* The article is based on a field trip entitled “The Tourism of Moroccan, native Landscape” which was held in September of 2016 and was funded by “NAZAR research center”.



Fig. 11. Selfish design of Window arch, Ouarzazate.
Photo: Mojgan Mokhtari, 2016.

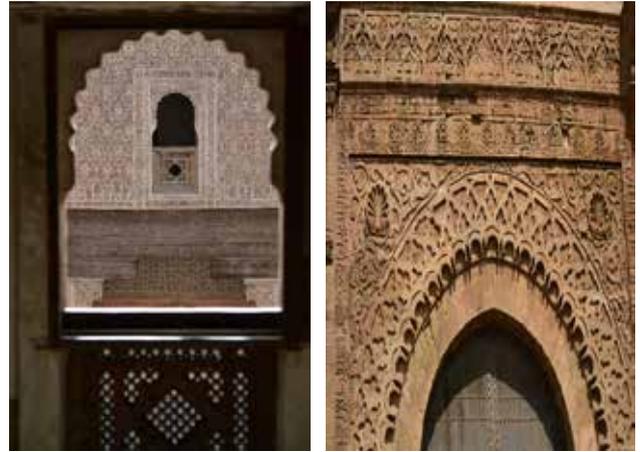


Fig. 12. The entrance of Rabat castle and the window of Bou Inania Madrasa. Meknes.
Photo: Mojgan Mokhtari, 2016.

observe the religious limits. According to this approach, with any shift from foliage arabesque in Islamic art towards merely geometric motifs, colour loses its significance, and the motifs are usually used in monochromatic colours with natural colour of materials (khaki or white). But, given that in Morocco, these motifs are used as a visual representation, rather than a response to a design requirement, they usually adopt some

colours, by covering parts of motifs in the same aesthetic ideas of African and barbaric arts (Izadi Jiran, 1, 1395). The red, blue and green colours used more frequently in the motifs, are known as the colour palette of the Barbarian art (Montague, 2012, 4). Also, in the same de-abstractation approach, the schemas that have adopted these colours are formulated as a projection of flowers that illustrate this eclectic approach (Fig. 13).

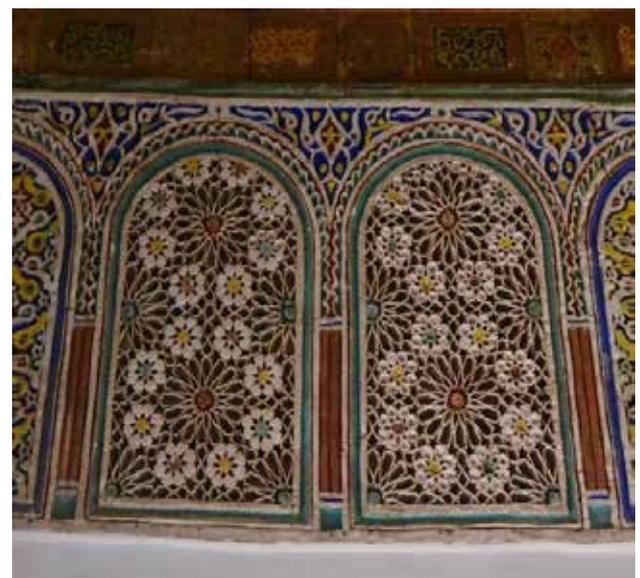
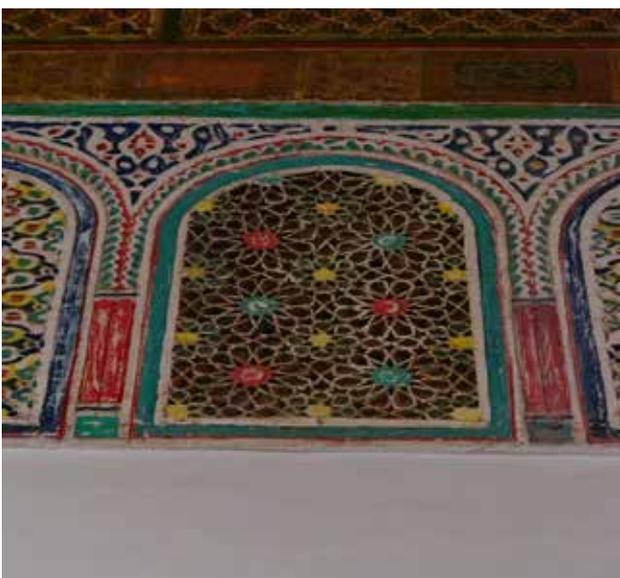


Fig.13. Kasbah Settlements, ourzazate. Photo: Mojgan Mokhtari,2016.

elements, such as the fountain of Bou anania School in Meknes (Fig. 10).

The fact that the usage of shellfish or other organic objects with rich forms can be traced back to the decoration traditions of African tribes, suggests that this form was first used as a design pattern in the southern regions, rather than northern areas, where the culture is more pristine. The arches of the windows of the earthen Amazighian mansions in the Ourzazate approves this theory and field observations show that there are not more prominent examples (Fig. 11).

In this light, a review of the Moroccan decorative icon with shellfish jags, alongside the roman concaved semi-circular and sometimes the Byzantine horseshoe arcs, which are the legacy of the Umayyad architecture and its extension to North Africa, reveals the fact that the famous Moroccan arch is a result of the barbarian, Roman, and Islamic trends, both in terms of structure and texture (Fig. 12).

Islamic geometry motifs with barbarian colours
The stucco motifs used in Islamic decoration are an attempt to develop abstract decorations and



Fig.7. Bou anania School in Meknes.
Photo: Mojgan Mokhtari,2016.



Fig.8. Shellfish Decoration, Fountain next to Tetouan Mosque. Photo: Mojgan Mokhtari,2016.



Fig.9. Shellfish decoration. Source :Becker,2006: 80.



Fig.10. Bou anania School in Meknes.
Photo: Mojgan Mokhtari,2016.

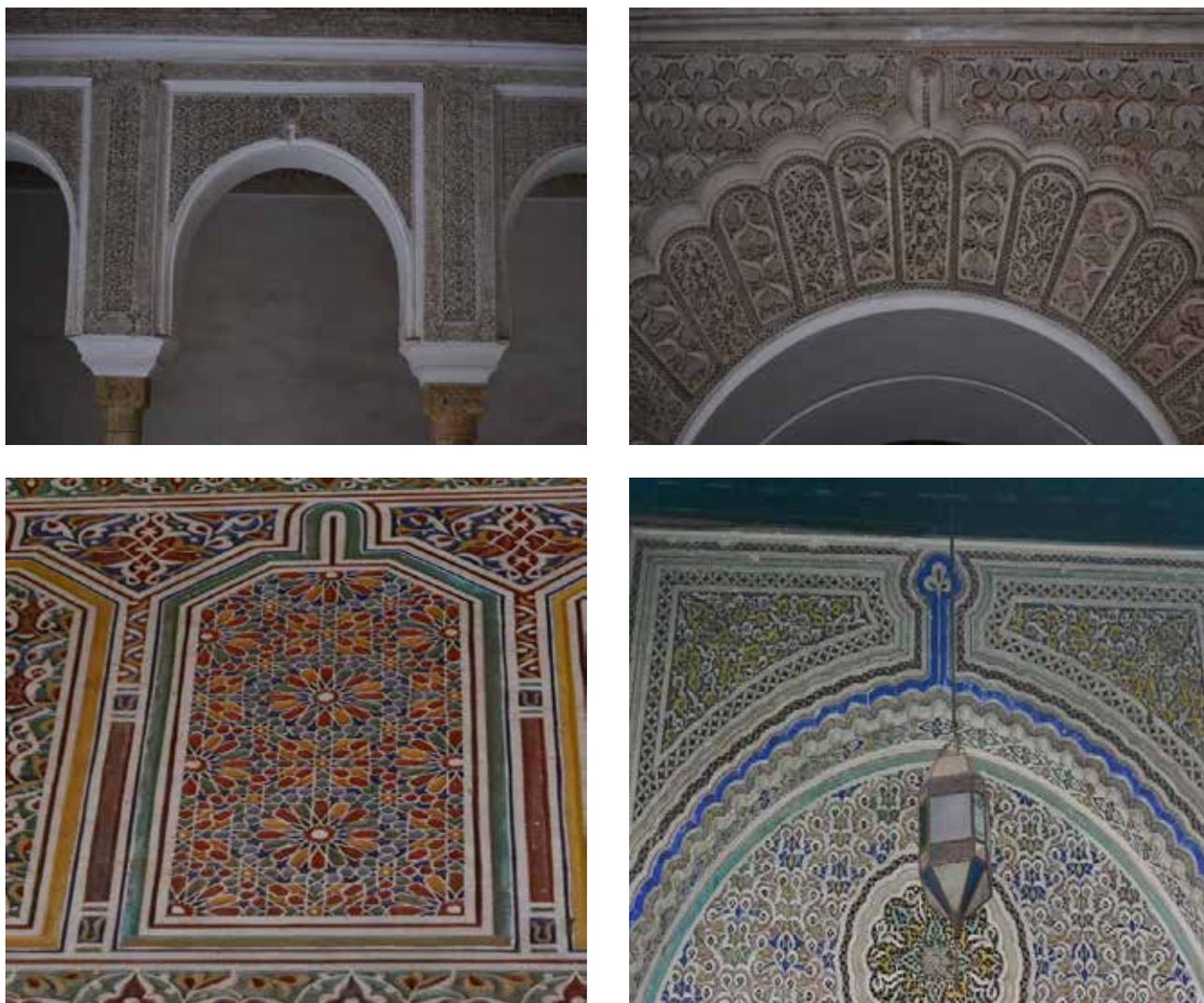


Fig.6. Kasbah Settlements in ourzazate, Bou anania School in Meknes, Zaviyah in Tange Medina, Prayer hall in Mollay Idris Tomb. Photo: Mojgan Mokhtari,2016.

The shellfish motifs: from decoration to structure

Among highly decorated composite and interweaved Moroccan arches, we encountered shellfish-like motifs used in the place of the keystone on the arch. These and other shellfish decorations on the walls and, on the other hand, the manifestation of muqarnas-like shell-motifs on larger arches gives rise to a hypothesis according to which the motif, in its larger and more abstract scale as well as its smaller and more objective scale, can be attributed to specific

Moroccan arches and shellfish icons respectively (Fig.7).

Following this idea in the small scales we found similar decorative traditions including the use of shellfish in jewellery or directly in architectural decoration (Fig. 8 and 9).

On the other hand, the popularity of this notion is worthy of further investigation because it has been used objectively in many gates of different periods so much so that it has been used in more contemporary examples and also used as a desirable visual pattern in other architectural



Fig. 5. Vertical seam on decorative arches of Berber's architecture, Qasba, Ouarzazate. Photo: Mojgan Mokhtari, 2016.



Fig. 4. Structural similarity and display of Roman arches. Volubilis, Meknes. Photo: Mojgan Mokhtari, 2016.

With the evolution of the Moroccan arch, both in two-dimensional or three-dimensional applications, this vertical extension incorporates itself into the arches of the Islamic period in form of keystones. This extension, in many cases, is mostly referential rather than decorative and is an inherited design feature. Because, like in the Maulla-Idris Mausoleum below, removing the aforementioned extension does not cause any change in the composition of the decorations, the arc proportions, the distance between the arc and the horizontal margin above it. Insisting on maintaining this extension in this case or even in other cases is largely unnecessary. However, this motif is used to divide the fine-grained decorative texture over the arc, and whenever the division takes place more decisively, this vertical extension is incorporated into the texture much more effectively.

An review of photos and what can be observed in the decorative arches of Morocco shows that a structural relationship, just like the one between Roman keystone and arches, along with Amazigh formal characteristics, lives on in the pointed arches of the Islamic period, so that Moroccan architecture becomes an amalgam representing traits from all three reigns (Fig. 6).



Fig. 2. Rope's Motif retrieved from the cord-like staging. Saras of Bazar in the city of Morocco. Photo: Mojgan Mokhtari,2016.

The specific layout of this vertical element in the middle of the vault also gives rise to another hypothesis about the effects of the keystone, the most obvious of which can be found in

Vulobilis. The artistic details of the keystone on semi-circular arches, as a design paradigm, or on the flat wooden Moroccan ceilings reflects this proposition; as also the wide usage of semi-circular horseshoe-like archs in Morocco -resulting from concaving semi-circular roman arcs- that, in most cases, doesn't have any structural basis, proves (Fig. 4).

Another evidence of this claim is the use of vertical ducts over the decorative arches, as seen in the earthen architecture of barbar regions in southern Moroccan cities. Just like the wooden constructs in which strings, as a raw decorative material, play the role of keystone, in the earthen architecture, where motifs are created by deepening the lines on the surface of the walls, the sunken vertical lines are used. It seems that the Moroccan designers have accepted to add a vertical motif to the apex of any type of arch (Fig. 5).



Fig. 3. Applications of rope's Motifs in different situations. Residential buildings in Tetouan. Photo: Mojgan Mokhtari,2016.

- Apart from their symbolic functions, the barbarian shellfish decorations seemingly play a major role in shaping the Moroccan arches.
- The barbarian colours and patterns have seemingly created a different decorative pattern by de-abstraction of Islamic geometric patterns.

Research Methodology

This qualitative study draws upon semiotics and analytical comparison of composite samples to separate the Islamic, Roman, and barbarian origins from each other and to describe the formation of these patterns. In this research the main hypothesis -that is based on library studies- is backed with fieldwork on exemplary architectural samples in Morocco. The three sub-hypotheses of the study were set by identifying the three important eclectic patterns in Moroccan decorations; further field and library studies were conducted to explain the distinct origins of these patterns.

String motifs on the arches

Studying the wooden beams used in arches or the wooden covers used in porches and margins of the courtyard and other spaces, show that whenever a wooden cornice is exposed to peoples view, it is usually decorated with motifs and this can be observed, with negligible variations, in all the

cities of Morocco. The motif consists of a strand of string that folds up or down on the cornice. This creates an incomplete cross that looks like a seam, crack, or fold (Fig. 1).

Considering that this motif has not been seen in neither Roman nor Islamic history and is only used in wooden arrays, it can be argued that the string motifs are related to the barbarian and African origins of Moroccan art. Although proving this claim requires research on all visual properties of Islamic, Roman, and barbarian arts, it can be said that the string-like design of this motif, could have been derived from primitive structures, considering the usage of rope on their wooden joints (Fig. 2).

As for the fold created by the string in the middle of the cornice, we should pay attention to some other points. This vertical motif seems like a logical aesthetic reaction across a horizontal and stretched cornice. Generally speaking, with any increase in the length of the cornice, for example in cases where the cornice moves around a courtyard, these vertical components also multiply. Whenever the length-to-width ratio gets very low -as in the cases observed above entries- the number of string folds increase and crowd or the strings become thicker, and in some cases other decorations are added, till the whole plane brims with decorations (Fig. 3).



Fig.1. folding in rope's motifs, Saras of Bazar in the city of Morocco. Photo: Mojgan Mokhtari, 2016.

Introduction

The semiotic examination of an architectural trend can be useful in exploring the origin of its constituent influences. Decorations could be the best field to study that can meet such requirements with high reliability. The semiotic study of Moroccan architecture, which has been repeated in buildings with different uses and scales, allows the identification and determination of different styles and also analysis and comparison of them. It is therefore necessary to research which are assumed as purely-these elements to identify the layers of-Moroccan features influence from other domains. A review of the constituents of Moroccan traditional architecture in various cities, shows that in most cases the structure of ceilings is either entirely wooden, or is composed of wooden structures and other coverings. Hence, the Moroccan ceilings, either in porches and balconies, or in the halls and other spaces, are flat or made of wood. But since the Roman rule in Volubilis, and the Muslims afterwards, Moroccan architects have employed other kinds of forms of construction (Montague, 2012: 1). More than changing the construction systems and underlying foundation horseshoe of Moroccan architecture, the Roman pointed arches alongside the Islamic have changed the Moroccan taste and aesthetics (Hoag, 2004: 7-9). Taking in consideration that both the Romans and the Muslims in Morocco were the ruling class, and both propagated their

architecture as their brand and identity; in an attempt to imitate the powerful class, commoners also welcomed these new visual characteristics. This distinctive indigenous architecture, both in materials and visual aspects, showed an eclectic behaviour in the face of imported items, and the most explicit and clear examples of such behaviours are manifested in decorations. Decorations that are the first layer affected by these different trends, also have the greatest impact on its audience. Studying the origins of Moroccan architectural paradigms would be almost impossible without considering this eclectic context.

Therefore, in studying Moroccan architecture decoration, the search for signs and symbols that reflect all three origins simultaneously, provided the ground for the research, which recognised three important patterns: arch motifs, oyster-shaped ornamentation of Arches, and other compounds of colourful motifs.

It should be noted that these names are originally presented by the author in this research, since neither the written sources nor local queries provided a specific name for the aforementioned elements. Analysing these examples and investigating their historical context can help us understand the origins of the components of these motifs, and to approve the main hypothesis of this research.

Significance of the study

- Identifying the diverse processes of how architectural traditions combine
 - Identifying the degree of traditions differentiation from the early origins
 - Investigating the secondary growth of eclectic patterns and creation of unique components.
 - Analysing Moroccan architectural decoration as one of the richest and most prominent decorative traditions in architecture.
- Understanding the cultural and aesthetic

connections between Muslim nations in terms of artistic and architectural experiences.

The main hypothesis

Moroccan architectural decorations seem to simultaneously reflect Islamic, Roman, and barbarian architecture traditions. Sub-hypotheses

- It seems that the string motifs at the apex of Moroccan arches are formed from a collage of roman arc keystones, the Moroccan string motifs, and the geometry of Islamic pointed arches.

Comparative study on the Origins of some Ornamental Patterns in Traditional Moroccan Architecture

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Abstract

Ornamentation is one of the salient features of traditional Moroccan architecture. Given that studying the semiotics of trends in decoration is more justifiable (is accomplished by more validity), concentrating on the origins of decorative patterns could present a more accurate understanding of traditional Moroccan architecture. Fieldworks have suggested that three trends of Roman, Berber and Muslim architecture have been the most important factors shaping wall decoration patterns in this architecture. Moroccans superposed colourful barbarian patterns on geometrical Islamic designs, used string barbaric embellishments -which later replaced the keystone in arches- and utilized shell-like motifs in many scales, which are a few examples of these influences. This article attempts to explain the evolution of these decorations by investigating the origins of these designs in more intact Moroccan samples and then studying the primitive and advanced amalgams.

Keywords

Architectural Ornament, Rome, Berber, Islamic Art, Morocco, Semiology.