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CHARACTERISTICS OF MILITARY ARCHITECTURE IN THE TOUAT REGION – THE CASBAH OF OULED IHAMMED AS A MODEL –

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ABSTRACT:
A study of Saharan ksour reveals the greatness of their builders, while also allowing insights into the economic, social, and political life of their inhabitants, thereby portraying a society that demonstrated creativity and resilience in challenging nature, leaving behind landmarks worthy of study and preservation. The Touat region is among the most important areas in Algeria that contain numerous ksour.
Observation of the Saharan ksour in the Touat region shows that they were constructed in a manner suggesting that the area experienced continuous warfare, as evidenced by the defensive system they possess. Moreover, these ksour incorporate the most important defensive elements of Islamic architecture, inspired by the defensive systems of Islamic cities and Saharan ksour spread across the desert. In this paper, we attempt to shed light on the ksour of the Touat region, with a particular focus on one of their architectural aspects, namely defensive architecture.

Keywords: Architecture, Touat, Casbah, Defensive

Introduction:

The Algerian Sahara may be considered an open-air museum due to its wealth of archaeological sites and manuscript repositories that are rare worldwide, particularly from the Islamic period, which witnessed the emergence of thousands of small towns or ksour in the desert. These were cities in the full sense of the word, as they contained all the essentials of life, including dwellings, markets, mosques, and even a seat of governance, as well as commercial agencies, in addition to military fortifications that protected them from external raids.

Among the most important regions forming the Algerian Sahara is the Touat region, which is distinguished by its rich and diverse architectural and artistic heritage, represented by the ksour, whose number exceeds 300. These ksour emerged along the commercial route extending from the urban centers of the Far Maghreb and from Tlemcen toward Western Sudan. Since most of this route passed through the desert, it was necessary for these ksour to develop as stations for rest and for the exchange of goods. Others were built to protect caravans, while some were established by migrating tribes as a result of the political conditions prevailing in northern Morocco. As for the history of their foundation, most of them date back to the 15th and 16th centuries. With the settlement of various tribes in the region and their construction of ksour, efforts were made to protect them from those coveting their wealth by fortifying them with walls, towers, and dug moats.

1. Definition of the Touat Region:

Touat is a region of the Algerian Sahara located in the southwest of Algeria. It is an ancient region bordered to the north by the Great Western Erg and Wadi Mguiden, to the south by the Tanezrouft Desert, Wadi Garit, and the Mouydira Mountains, and to the east by the Tadmait Plateau. It is divided into three vast geographical sections: Gourara in the north, Touat in the center, and Tidikelt in the south. Geographers have collectively referred to these three regions as Touat.

This region begins from the upper ksour of Bouda at the point where Wadi Massoud bends westward, taking a north–south direction. It consists of an archipelago of ksour and oases extending as far as Reggane, and is known as Original Touat [i]. Among its most important ksour are Bouda, Timmi, Tamentit, and Zawiyat Kenta. Central Touat also includes the ksour of Tsabit, south of Dghamsha, approximately 30 km from Wadi Saoura; this is a group of ksour beginning with Ksar Ariyan al-Ras. The ksour of the Touat region are distributed along the banks of well-known wadis such as Wadi Mguiden and Wadi Massoud, as well as around existing sabkhas, including the Timimoun Sabkha and the Tamentit Sabkha. Their total number is approximately 300 ksour[ii]. These three geographical sections, together with the Tanezrouft Desert, form the Wilaya of Adrar. Astronomically, the region lies between longitudes 1° east and 3° west, and between latitudes 26° and 30° north [iii].

2. Definition of the Ksar:

According to the Encyclopaedia of Islam, the word ksar is of Turkish origin (kushk). The term qasr appears several times in the Holy Qur'an, sometimes in the singular and sometimes in the plural (qusur), and in some instances refers to the palaces promised in Paradise [iv], as mentioned in the verse: **((واذكروا إذ جعلكم خلفاء من بعد عاد وبوأكم في الأرض تتخذون من سهولها قصوراوتنحتون الجبال بيوتا ....)**[v]
and also in the verse:
((تبارك الذي إن شاء جعل لك خيرا من ذلك جنات تجري من تحتها الأنهار ويجعل لك فصورا))[vi]
Saharan ksour are also characterized by their strategic locations, as they are often found on mountain tops, mountain slopes, or solid rocky plateaus. They are usually situated near arable land and watercourses.
A ksar is surrounded by a wall that generally contains only one entrance, known in most ksour—particularly those of the Touat region—as Fam al-Qsar ("the mouth of the ksar"). It is reinforced by one or more watchtowers. As for naming conventions, ksour are often named after a righteous saint, such as Ksar Sidi سليمان, or after the tribe or lineage that settled there, such as Ksar Ouled El-Hadj or Ouled Ya'qoub. They may also be named according to cardinal directions, such as al-Qsar al-Qibli or al-Dhahrani, or descriptive names like al-Qsar al-Jadid (the New Ksar) or al-Qsar al-Kabir (the Great Ksar) [vii].
The primary reason for building ksour was the storage of food products for nomadic tribes or neighboring tribes, since most Saharan ksour originally emerged along the routes of commercial caravans, travelers, and pilgrims crossing the desert. Some ksour were established as commercial stations providing rest, shelter, and food. The urban fabric of ksour is based on civilizational traditions resulting from the interaction of several factors and inspired by the principles of Islam, which seek to preserve life, honor, and property. Consequently, Saharan ksour were built in a manner that fulfills these objectives [viii].
In addition to these religious objectives, Saharan ksour were constructed to protect their inhabitants from climatic fluctuations, especially given that the environment in which they were built is known for extreme heat and sandstorms. This compelled their designers to adapt to such conditions. As a result, ksour represent an engineering achievement that has endured the vicissitudes of time and ensured security for their inhabitants against diverse natural and human threats [ix].

3. Location and History of the Casbah of Ouled Ihammed:

a/ Location:

The Casbah of Ouled Ihammed is considered one of the most important casbahs forming the ancient Ksar of Tamentit*, in terms of its location. It is almost the only surviving model that has remained standing in the face of various factors of deterioration, whether natural or human. Through its form, it is possible to identify the prevailing urban pattern of the casbahs of Tamentit, and indeed of the ksour and casbahs of the Touat region as a whole (see Figure 01).
The Casbah of Ouled Ihammed is situated among three other casbahs, and together they constitute a single defensive unit in the event of external threats. This arrangement is observed in many Saharan ksour, particularly in the Touat and Gourara regions, as well as in the ksour of the Mzab Valley. Each of these casbahs possessed its own independent defensive system.

b/ History of the Casbah:

There is no precise date for the establishment of the Casbah of Ouled Ihammed, as is the case with the other casbahs of Tamentit and the ksour of the region in general. This is due to the absence of historical sources that address its history, including manuscripts, which focused mainly on religious, linguistic, medical, and judicial aspects, while neglecting the historical dimension of the ksour of the region. Only a single reference was found in the work of the French writer Echallier, who suggests that the casbah was founded around the 10th century AH / 16th century AD.

4. Selection of the Site of the Casbah of Ouled Ihammed:

The founders of the Casbah of Ouled Ihammed paid great attention to choosing a site that met the well-known conditions for the establishment of the early Islamic cities such as Kufa, Basra, and Kairouan, as well as later cities like Fez, Tahert, and Marrakesh. These conditions revolve around a naturally fortified location, the availability of water, a suitable climate, the presence of fertile land and grazing areas, forests, and proximity to commercial routes.

Ibn Khaldun summarized these conditions by stating that consideration must be given to repelling harm through protection from sudden attacks and to securing benefits and facilitating amenities. Protection from harm requires that all dwellings be surrounded by defensive walls and that the site be located in a naturally impregnable position, either on a rugged mountain plateau or encircled by a sea or a river, so that access is possible only after crossing a bridge, thereby increasing its strength and defensibility. Among the considerations related to protection from natural afflictions is the quality of the air, as a safeguard against diseases; stagnant or polluted air, or air adjacent to corrupt waters, decaying substances, or unhealthy marshes, leads to rapid putrefaction and consequently to disease among living beings without doubt.[x]

He also states that among the amenities to be considered in cities is the quality of pastures for livestock, since the inhabitants of any settled area inevitably rely on domesticated animals for reproduction, milk, and transport. These animals require grazing land, and if such pasture is nearby and fertile, it greatly facilitates their way of life [xi].

Among the conditions for choosing urban sites according to Ibn Khaldun is the availability of farmland. He notes that crops constitute staple foods; therefore, if agricultural lands are close to the city, their cultivation becomes easier and their produce more readily obtainable. This also includes trees for firewood and construction, since firewood is indispensable for fuel used in heating and cooking, and timber is essential for roofing and is frequently used among basic necessities [xii].

These conditions cited by Ibn Khaldun were fulfilled in the Casbah of Ouled Ihammed. From a defensive perspective, it derived its strength from its proximity to neighboring casbahs, which facilitated collective defense in the event of danger—a tradition found in many Saharan ksour of the Touat region as well as in other areas such as Gourara and the Mzab Valley.

In addition to its natural defensibility, the casbah contained the essential elements for life, foremost among them agricultural land. The Casbah of Ouled Ihammed, like all the casbahs of Tamentit, was surrounded by extensive gardens where palm trees were primarily cultivated, alongside cereals, vegetables, and fruits. Grazing lands were also available along the banks of wadis, such as Wadi Massoud adjacent to the casbahs of Tamentit.

Groundwater was likewise available and was distributed to the gardens through the foggara system[*].

5. The Defensive System of the Casbah of Ouled Ihammed

The builders of the Casbah of Ouled Ihammed took great care to fortify the casbah in order to protect it from external dangers. Its defensive system consists of the following elements:

a. The Wall:

The city wall is the structure that surrounds it; its plural is walls, and it encircles a house or a town [xiii]. In archaeological terminology, the wall is a massive, high structure that surrounds a building for protection [xiv]. It is also a type of defensive fortification that may take the form of an earthen, wooden, or stone barrier [xv].

In Saharan ksour, walls are of two types: some are formed by the outer walls of houses, while others are independent structures. The use of the rear façades of houses supported by visible buttresses is an architectural phenomenon known in many Saharan ksour. This can be observed in the regions of Fezzan and Jabal Nafusa in southern Libya, the ksour of southern Tunisia, the forts of the Aurès in Algeria, the ksour of Tajmout and El-Houita in Laghouat, as well as the old and new ksour of Touggourt and Temacine in the Oued Righ region [xvi].

The Casbah of Ouled Ihammed is surrounded by a continuous, uninterrupted wall on its northern and southern sides. On the western side, the wall is formed by the walls of houses, in which windows were opened at a later period (see Figure 02). This wall functions as a protective barrier against external attacks to which the casbah might be exposed (see Figures 03 and 04).

The wall has an almost square ground plan, made possible by the flat terrain of the site. Its length measures 64 m on the southern side and 67 m on the northern side, while it measures 51 m on the western side and 55 m on the eastern side, giving a total perimeter of 237 m.

The height of the wall is approximately 6 m. Its thickness is uniform at the base, measuring 1.65 m, then gradually decreases as the wall rises, reaching 0.60 m at the top. This gradual reduction contributes to the stability of the wall and helps prevent its collapse.

b. The Towers:

Towers (sing. tower) are parts of the walls of a city or fortress. They are structures built on the wall, usually at the corners of a fortress or city. A fortress tower served as a dwelling, and its plural forms are buruj and abraj[xvii].

Towers were used for observing the enemy due to their height; for this reason, they have been employed throughout different historical periods. Their shapes varied between cylindrical, square, and semi-circular, and the materials used in their construction ranged from stone to earth.

The architects of the Casbah of Ouled Ihammed ensured that the wall was reinforced with four towers located at the corners. These towers are double in form and are distinguished by façades that gently incline inward as they rise, giving them a pyramidal shape. This architectural feature is found in all the towers of the ksour of Touat and has been known since ancient times. It has generated debate among researchers regarding its origin: some consider it to be influenced by ancient Egyptian architecture, likening it to the towers of temple entrances, while others attribute it to local origins rooted in Maghrebi culture [xviii]. Accordingly, this form is found in many Moroccan regions as well as in several ksour of the Algerian Sahara, such as those of Béni Abbès, Djanet, and Laghouat. It is also known in the western Sudan, Mali, and Niger [xix].

Other scholars argue that this form is primarily functional and results from the materials used in construction: as walls incline inward and approach the point of support, their resistance and stability increase [xx]. This interpretation appears to be the most convincing, as building materials often impose their own constraints on architectural design.

Regarding the dimensions of the towers of the Casbah of Ouled Ihammed, the base measures 3.90 m in length and 5.40 m in width, then tapers to 3.20 m in length and 3 m in width, with a height of approximately 6 m. These towers remain in a good state of preservation (see Figures 05 and 06). The towers also contain entrance doors measuring 1.80 m by 0.78 m. Both the wall and the towers were constructed using the same building materials, namely limestone and tabshmint[*].

c. The Entrance:

The entrance is the gate of the city, or the façade of a mosque, palace, or house, and it may consist of a single or double-leaf door [xxi].

Entrances have been of great importance since ancient times because they connect the inhabitants of a city or palace with the outside world and also represent potential points of intrusion. For this reason, humans have long sought to fortify them to ensure protection against attack [xxii].

Entrances varied according to successive civilizations. Among the most important types is the entrance opened at the base of a tower. In Pharaonic times, the bent entrance appeared; in the Mashriq it is known as the bashura and was used by the Byzantines in the 9th century AD. It became

widespread among Muslims from the 5th century AH / 11th century AD [xxiii]. This type of entrance underwent significant development under the Almohads in the Maghreb, where it came to consist of three bends and was sometimes reinforced by one or two towers flanking the entrance [xxiv].

In Saharan ksour, entrances varied in form and location. Several types exist, the most important being entrances located at the base of towers in order to enhance protection. This is particularly evident in the ksour of the Mzab Valley and Oued Righ, as well as the ksour of Kenadsa in Béchar, and those of Gourara and Touat.

Ksour of the Touat region generally contain a single entrance due to their small size, which does not require multiple gates. This is the case with the Casbah of Ouled Ihammed, which has only one entrance opened in the eastern wall of the casbah. It consists of a rectangular opening 2.50 m high and 1.50 m wide, flanked by two pyramidal buttresses, each with a thickness of 1.27 m (see Figure 07).

d. Loopholes:

Linguistically, loopholes derive from the verb meaning "to pour" or "to discharge at once" [xxv]. They were named as such in reference to their function, since arrows were discharged through them in volleys at attackers, resembling the pouring of water all at once, thereby preventing enemies from advancing and allowing for their neutralization without direct confrontation [xxvi].

In technical terms, loopholes are small, narrow openings on the exterior found in city walls, towers, and fortresses, used by warriors to shoot arrows at attackers. In addition to their defensive role, loopholes also served to provide light and air to the alleys inside the ksar.

The towers and the wall along its entire length were equipped with firing openings, spaced at varying intervals depending on the strategic importance of the section of wall or tower. Their number increases near the entrance of the casbah. On average, their external width measures about 0.70 m, while the internal width is approximately 0.35 m (see Figure 08).

e. The Ditch:

The ditch—also referred to as a trench or moat—is a deep, [xxvii]elongated excavation dug on the battlefield to protect soldiers from attack. It is also dug around the walls of cities, fortresses, and military camps to protect them and hinder attackers. A ditch may be dry or filled with water [xxviii]. It is excavated to varying depths to ensure protection from the enemy's view and fire.

Saharan ksour made use of ditches, such as those of Laghouat, Taouiala, Ain Madhi, and Tajmout[xxix].

The ditch is considered a distinctive feature of ksar architecture in the Touat region. Most, if not all, of its ksour contained a ditch, locally known as ahfir. Many of these ditches have disappeared due to deliberate filling or natural infilling by sand. This was observed in the Casbah of Ouled Ihammed, which, according to local accounts, was equipped with a ditch on its eastern side, where the entrance is located.

Conclusion:

The region served as a destination for displaced populations fleeing their homelands due to the political conditions prevailing in northern Morocco, which made it a refuge for dissidents. It was therefore natural that fear accompanied them, prompting the fortification of ksour in anticipation of any potential danger. Through our observation of the ksour in the region, we found that they meet the essential conditions for the establishment of cities, in terms of proximity to grazing lands, the availability of arable land, and the level of fortification that made them difficult to access.

To fortify the ksour of the region, reliance was placed on walls reinforced with towers, in addition to loopholes and the digging of moats.

The wall in the region is continuous and surrounds the entire ksar. The walls are also characterized by their height, indicating the prevalence of wars and conflicts in the area. They are equipped with closely spaced loopholes and reinforced with corner towers of a pyramidal profile, most of which consist of two stories and are also provided with loopholes for shooting.

In the construction of the ksour of the region, locally available natural materials were used, such as limestone and clay mixed with other substances like salt and organic materials, in addition to wood sourced from palm trees.
The architect employed different construction techniques depending on the available building materials.

Figure 01: Aerial view of the Casbah of Ouled Ihammed.

Figure 02: The casbah wall, which includes openings for the windows of the houses.

Figure 03: The southern side of the wall of the Casbah of Ouled Ihammed.

Figure 04: The eastern side of the wall of the Casbah of Ouled Ihammed, where the entrance is located.

Figure 05: The southeastern tower.**Figure 06:** The southwestern tower.

Figure 08: Loopholes in one of the towers. flanked by

Figure 07: The entrance of the casbah, two buttresses.

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Footnotes:

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[i]Muhammad al-Salih Houtiya, *Touat and Azawad during the Twelfth and Thirteenth Centuries*, Doctoral dissertation in Modern History, University of Algiers, Institute of History, academic year 2004, p. 06.

[ii]Muhammad Ben Souissi, *Islamic Religious Architecture in Touat: Tamentit as a Model*, Master's thesis, Institute of Archaeology, University of Algiers, 2008, p. 06.

[iii]Association of Historical Studies and Research, *Guide to the Wilaya of Adrar*, on the occasion of the Zawaya Symposium, 2000, p. 2.

[iv]Muhammad Ibn Manzur, *Lisan al-Arab*, Vol. 11, Ali Muniri edition, 1st ed., Dar Ihya' al-Turath al-Arabi, 1408 AH / 1989, p. 55.

[v]*Al-A'raf*, verse 74.

[vi]*Al-Furqan*, verse 10.

[vii]Ali Hamlaoui, *Ksour of the Amour Mountains Region (Southern Slope)*, State Doctorate dissertation, Algeria, 2001, pp. 59–60.

[viii]Faraj Mahmud Faraj, *The Touat Region during the Eighteenth and Nineteenth Centuries*, National Office of University Publications, Algeria, 1984, p. 19.

[ix]Ali Hamlaoui, *The Ksar in Southern Algeria: Its Concept and Components*, Issue 10, Soumar Press, Bir Khadem, Algeria, 1422 AH / 2001, pp. 32–33.

[*]*The Ksar of Tamentit (or Taman□īt as mentioned in some sources) is one of the ancient and important ksour of the Touat region. It functioned as a political, cultural, and economic center for the area and was considered a major station for commercial caravans carrying goods from the urban centers of the Islamic Maghreb in the north, such as Tlemcen, Fez, and Marrakesh, to the cities of the Western Sudan, such as Gao and Timbuktu. With its various casbahs, this ksar served as a resting station for these caravans, which led to the flourishing of economic activity in Tamentit. The scholar Abd al-Rahman Ibn Khaldun referred to this in his book Al-'Ibar, stating: "The last of them on the eastern side is called Tamentit; it is a town abundant in civilization and a stopping place for merchants traveling back and forth from the West to the land of Mali in the Sudan up to this time, and from the land of Mali to it." Today, the Ksar of Tamentit is a modern city and the seat of a municipality located 12 km from the provincial capital Adrar and 1,592 km southwest of Algiers.*

[x]Abd al-Rahman Ibn Khaldun, *Diwan al-Mubtada' wa al-Khabar fi Tarikh al-Arab wa al-Barbar wa Man 'Asarahum min Dhawi al-Sha'n al-Akbar*, Dar al-Kitab al-Lubnani, Vol. 7, Beirut, 1981, p. 224.

[xi]Ibid., p. 224

[xii]Abd al-Rahman Ibn Khaldun, *op. cit.*, p. 225.

[*]*Foggara: a series of wells connected to one another, through which water flows from a higher ground level to a lower one. The distance between each well ranges from five to twenty meters. These wells are interconnected by an underground channel through which the water flows until it reaches the "qasri," from which it emerges through openings of varying sizes.*

[xiii]Ahmad ibn Muhammad ibn Ali al-Muqri al-Bayumi, *Al-Misbah al-Munir*, revised according to the edition printed at the Amiriya Press by Mustafa al-Saqqa, printed at Mustafa al-Babi al-Halabi and Sons Press, Egypt, 1950, p. 315.

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[xv]*Military Encyclopedia*, Vol. 4, 2nd ed., Arab Institution for Studies and Publishing, Beirut, 1990, p. 458.

[xvi]Yahia Bouras, *Defensive Architecture in the Mzab Valley: The Ksar of Beni Isguen as a Model*, Master's thesis, University of Algiers, Algeria, 2002, p. 11.

[xvii]Ibid., p. 44.

[xviii]Mercier, M., "Notes sur une architecture berbère saharienne," *Hespéris*, 3rd and 4th quarters, 1928, p. 429.

[xix]Yahia Bouras, *op. cit.*, p. 45.

[xx]Emilio Templo, *Le Mzab: A Model of Spontaneous Architecture*, Edjezair, No. 14, Algiers, p. 26.

[*]*Tibshmint (Tabashment): a building material used in Saharan ksour, especially those of the Touat region. It consists of a mixture of clay and gypsum, producing a solid material. Builders used it to bind stones and adobe blocks in wall construction and also as a wall coating.*

[xxi]Yahya Waziri, *Encyclopedia of Elements of Islamic Architecture*, Book Two, Cairo, 1993, p. 11.

[xxii]Lewis Mumford, *The City in History: Its Origins, Its Transformations, and Its Prospects*, translated by Ibrahim Nus'hi, Vol. 1, Anglo-Egyptian Bookshop, Cairo, 1964, pp. 118–119.

[xxiii]Farid al-Shafi'i, *Arab Architecture in Islamic Egypt during the Period of the Governors*, General Egyptian Book Authority, Vol. 1, Cairo, 1970, p. 191.

[xxiv]Ismail Othman, "Architecture and Characteristics of Almohad Monumental Gates in Ribat al-Fath," *Arab Museum Journal*, Year 2, Issue 3, January–February–March 1987, p. 123.

[xxv]Muhammad Ibn Manzur, *op. cit.*, p. 400.

[xxvi]Nour al-Din Ben Abdallah, *Ksour of the Central Touat and Gourara Regions: An Archaeological, Urban, and Architectural (Typological) Study*, Master's thesis, Institute of Archaeology, University of Algiers, 2008, p. 146.

[xxvii]Muhammad Ibn Manzur, *op. cit.*, p. 197.

[xxviii]Asim Muhammad Rizq, *op. cit.*, p. 173.

[xxix]Ali Hamlaoui, *op. cit.*, p. 174.