Egyptian Journal of Archaeological and Restoration Studies "EJARS"
An International peer-reviewed journal published bi-annually

Volume 3, Issue 2, December - 2013: pp: 139 – 168 www. ejars.sohag-univ.edu.eg

Original article

DEFENSIVE FORTIFICATIONS IN BARIS OASIS, EL-KHARGA AT THE END OF THE 13th CENTURY H. (19th CENTURY A.D.): AN ARCHAEOLOGICAL AND ARCHITECTURAL STUDY

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Received 14/8/2013 Accepted 30/11/2013

Abstract

Numerous archaeological studies have investigated military buildings in different Egyptian cities throughout the Islamic Era as an important type of Islamic buildings. However, these studies have not taken into consideration the military buildings built in the Oasis of Egypt's West Desert, whose architectural history does not receive as much attention by ancient historians and modern researchers as other Egyptian cities such as Cairo and Alexandria or any other Egyptian city. Had it not been for the incidental dispersed references made by some geographers and historians to oases in the Islamic Era such as Al-Masoudi, Ibn Hawqal, Ibn Daqmaq and others, there would have been almost no news about these oases. All these references indicate the isolation of these oases from consecutive ruling authorities in Cairo and their weak position at that time. As a result of this isolation and neglect, the oases were exposed throughout the Islamic Era to a lot of attacks and raids by those who coveted their wealth. They were ruled by Al Abdoun of the barbaric Lowata tribe. They were invaded by the Nubians in the mid (4th century H. /10th century A.D.). They were attacked by Banu Sulaym at the end of the 11th century H. /17th century A.D. After that the Nubians came back and raided them in the early (13th century H. /19th century A.D.) Then, the oases, especially Paris, were attacked by Al-Darawish coming from the Sudan through Darb Al-Arba'in in (1311 H. /1893 A.D.). Therefore, during that period, a lot of defensive fortifications were constructed in this oasis, only five tawabi (plural of tabia meaning "fortresses") survived as they were the southern border of El-Kharga Oases and their first defense line against these attacks preventing them from penetrating into the north. This paper provides an accurate architectural documentation of the architecture of these tawabi which have not been investigated by any previous studies and of what remained of their architectural units and elements, especially that there are many factors which led to the deterioration of their architecture. The paper then makes a comparison between their planning and the planning of their contemporary counterparts which were constructed in other Egyptian cities, to highlight the similarities and differences between them on the one hand, and to have thorough knowledge of the design patterns of this kind of military buildings in Egypt at this time of its history on the other hand.

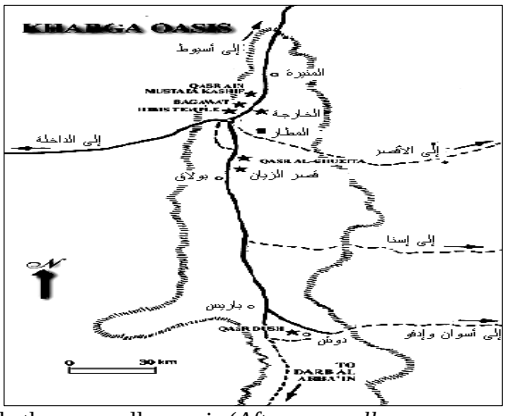
Keywords: *Defensive fortifications, Western Desert Oases, El-Kharga Oases, Baris Oasis, Fortresses, Tawabi.*

1. Introduction

Although the conquest of Egypt was mostly through Al-Arish in Sinai Desert, which represents the eastern borders, the western borders of Egypt

and its oases are not less crucial than its eastern borders, as Egypt has been targeted by the danger coming from the west in ancient and modern times [1]. Since the dawn of history Libyan Tahnud (Tamhu) tribes took hold of Siwa Oasis and from there they started to proceed into Egypt and attack Lower Egypt [2]. In (347 H./958 A.D.) the Fatimid armies stormed into the western borders of Egypt and took hold of them [3]. Finally, the Axis armies conquered the West Desert and occupied Siwa Oasis in July 1942 [1]. What made the western oases more important is their geographical location which is bordered by Libya to the west and the Sudan to the south, which made the Egyptians, the Ptolemies and later on the Romans interested in building castles and fortresses along these borders to prevent enemies from infiltrating into Egypt, safeguard the trade roads to the Sudan, protect their natural wealth which made them liable to continuous raids by those coveting them, and prevent prisoners from running away, as the oases, particularly the southern ones (El-Kharga), were used as an exile for political opponents and criminals as early as the time of the 21st dynasty [1][4][5]. Some remains of these fortifications still exist in dispersed areas in the oases [5]. After the Islamic conquest of Egypt the oases were not as stable as the Arab tribes which preferred to settle in the Nile Valley where the land was fertile and water was abundant [6]. This gave the barbaric tribes coming from North Africa the chance to immigrate to the Egyptian oases, settle there and even take control over their affairs. Ibn Hawqal (367 H./977 A.D.) states that Al-Abdoun of Lowata tribe inherited the reign of the oases since the Islamic conquest till the time in which he wrote his book [7]. The oases were conquered by the Nubians in (339 H./950 A.D.), and there were a lot of wars and disputes between them and Al-Abdoun [8]. Since the Islamic conquest of Egypt till the end of the Ayoubi Era the oases remained an independent territory not subject to the central authority in Cairo [9]. However, historical and geographical sources report that the oases had been fortified since news about them emerged in the Islamic Era in the (3rd century H./9th century A.D.). Al-Yacoubi referred to the fortresses of Al-Kharga [10], and Ibn Zulaq talked about the fortresses of the oases on the borders with Al-Magherb countries and the Sudan [11]. The writer of "Al-Istibsar" (the 6th century H./12th century A.D.) states that there are a lot of rampartd towns in the oases [12], and this explains why historians and geographers frequently use the term "fortress" when they talk about the towns of the oases such as Al-Qasr Fortress and Al-Qalamon Fortress [13]. In the absence of the central authority, it can be said that these ramparts were built by the inhabitants of these towns to protect them and force out the attacks of enemies and neighboring tribes, especially after the deterioration of the architecture of the oases and the decrease in population after the Islamic conquest. In the Age of the Mamluks the oases were under the control of the central government in Cairo. Ibn Daqmaq (809 H./1406 A.D.) says that they were under the authority of two Tabalkhana emirs (princes): Al-Janab Al-Ala'i Bin Al-Tablawi and Prince Farag, the representative of Lower Egypt [9]. Military campaigns were sent when necessary to protect villages, fortresses and caravans and collect taxes [5]. In the Ottoman period the oases was under the authority of Girga which includes, besides the oases, most of the lands of Upper Egypt [14]. Security in the oases during that period was so stable that it allowed foreign travelers to travel to them, as testified by the French traveler, Poncet, who visited El-Kharga Oasis in (1110 H./1698 A.D.), and there he found a garrison consisting of 800 soldiers, 500 of whom were Janissaries and 300 were Spahis. The oases remained under the control of the Ottomans for two

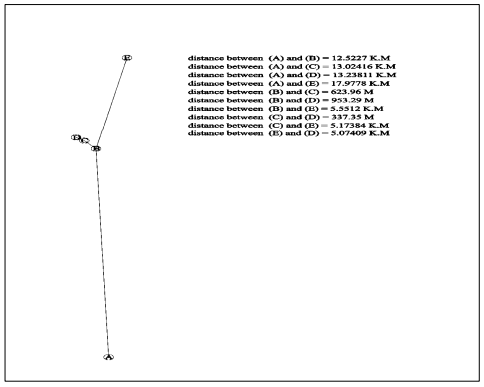
centuries till the end of the (12th century H./18th century A.D.), as the oases were under the authority of the Ottoman employee Ibrahim Bey [5]. After Mohamed Ali came to power in Egypt, he sent a campaign to the oases in (1235 H./1820 A.D.) which managed to subjugate them to his authority [8]. After that his army left them on condition that they would pay taxes, leaving no garrison behind so that this garrison might not gobble up the biggest share of the wealth of these oases, as mentioned by Hoskins who visited the oases in (1248 H./1832 A.D.) [5]. In (1240 H./1824 A.D.) the oases were annexed to Assiute Governorate under the authority of the French Emy Bey who was allowed to exploit the economy of the oases for 100 pounds in return which he would pay to the treasury every year [1][8]. Emy Bey continued to enjoy this privilege for ten years, after which the Egyptian government laid its hands on the oases and appointed an Egyptian official called the "assistant" in his place. However, Said Pasha's government that appointed this man did not support him with a military or police force that would guard the area [1][15]. This neglect led to the disappearance of many military fortifications and buildings, which had been built in previous periods and whose news had been circulated by historical and geographical sources, as mentioned earlier in this paper. After using them for several centuries, it was necessary to repair and renovate them when necessary. Since interest in the oases for the ruling authorities at that time was no more than collecting taxes, this led to the disappearance of military buildings in Al-Kharga Oasis, except for Baris[(a)] tawabi, the subject matter of this paper, and the presence of a few of these buildings in some towns of Al-Dhakhla and Siwa, such as Al-Qusair, Al-Qalamon, Mout and others [16]. Also as a result of this isolation and neglect, the oases were exposed to many attacks and raids by those coveting their wealth. An example was the attack by the bedwin Al-Gawaber Tribe which lived in the area lying between Assiute and the oases, and which sent a campaign having 1000 knights headed by Omar Al-Masri, the leader of the tribe, and that campaign reached Al-Kharga City whose people resisted the attack until a garrison from Assiute arrived to help them upon the request of the assistant. Omar Al-Masri was defeated and ran away with his men. Following this campaign the garrison returned to Assiute again, leaving no soldier behind in the oases [1][15]. This led to the invasion of the oases by Al-Darawish, the army of Al-Mahdi after his revolution in the Sudan in (1311 H./1893 A.D.), coming from the south via Darb Al-Arba'in, in a direction opposite to that followed by the aforementioned Omar Al-Masri. The army had 500 soldiers headed by Emir Othman Azraq Al-Ga'ili. They reached Baris Oasis, the southern border of Al-Kharga Oases, map (1).



Map (1) Kharga oasis, guide the new valley oasis (*After new valley governorate, 2009*)

It happened that the employees of the Egyptian government were in Baris, and Al-Go'ali arrested them, sent them to the Sudan and collected arms and horses from the inhabitants [1][15][17]. On August 18 (1893 A.D.), the Egyptian government sent a campaign headed by Hegel to fight Al-Darawish. When the campaign reached Baris, the invaders had already withdrawn, so the campaign got down to setting up fortresses. They stayed there for about a year and a half waiting for the coming back of Al-Darawish, but this did not happen, so Hegel returned back leaving behind a small garrison, which is considered the first regular garrison that the Egyptian government ever left in the oases [1] [5] [15] [17]. Anyway, the Egyptian southern borders up to the year (1235 H./1820 A.D.) extended to the south of Wadi Halfa. After that Mohamed Ali started to conquer the Sudan and add large parts of it to Egypt. The Turkish authority recognized the addition of these parts to Egypt in (1256 H./1840 A.D.), and thus the fate of the Sudan was connected with Egypt, and the Egyptian southern borders between Egypt and the Sudan no longer had any effect [18]. However, after the outbreak of the Mahdist Revolt in the Sudan in (1299 H./1881 A.D.) and the waning of the Egyptian control over this country, the situation of the Egyptian southern borders changed, as they were repeatedly attacked by the Darawish, especially that both Al-Mahdi and his successor Abdallah Al-Ta'ishi insisted on conquering Egypt [19]. Therefore, Al-Ta'ishi sent an army commanded by Al-Nigoumi in (1307 H./1889 A.D.) This army moved towards the Egyptian borders, but it was defeated. Then it received reinforcements, so it moved to meet with the Egyptian army at Toshki. The Darawish were defeated again [19], and Al-Nigoumi was killed along with a large number of his soldiers. Thus, Al-Ta'ishi's dreams of invading Egypt again ended up in vain, except for some skirmishes like the aforementioned campaign he sent to Baris. Therefore, in (1311 H./1893 A.D.) the garrison sent by the Egyptian government to drive away this campaign built a set of defensive fortifications in Baris as the southern border of Al-Kharga Oases. Five tawabi survived up to this present time. In fact, we cannot say for sure that these five tawabi were all the tawabi that were built at that time, especially that the writer of "Egypt's Well-Known Oases", written in 1920 A.D., says, "Beside (and along) the wells in Baris there are square-shaped building that were constructed by the Egyptian government to confront the attacks of Al-Darawish and to be dwellings for the guards whose job was to protect the oasis and the wells." [17]. This text explicitly refers to the establishment of these tawabi at the hands of the Egyptian government, and not at the hands of the British as some modernist researchers have claimed without giving and documentation [5]. This text also reveals that the function of these tawabi was not limited to protecting Baris Oasis from Al-Darawish and preventing them from penetrating into the Egyptian territory in the north, but they were also intended to protect the wells and water springs in this oasis so that they might not be filled up with earth by these invaders as they used to do in their attacks, especially that these wells and springs were the only source of drinking and irrigation in these oases. In addition, the presence of a large number of wells and springs in Baris, besides its distinguished geographical location, made it an important station for commercial caravans where they were provided with food and drink and where customs were paid. This accounts for naming the two towns in

the south of Baris at Darb Al-Arba'in leading to the Sudan "South Max" and "North Max". Among the well-known water springs of Baris are "Ain Bargis", "Ain Al-Gohar" "Ain Fouk Al-Doum" "Ain Bella" [17], "Ain Khoushishi" [1], "Ain Agil", "Ain Al-Hamra", "Ain Gaffy", "Ain Dab", and "Ain Lebakh" [5]. If we connect these springs with the aforementioned text of the author of "Egypt's Oases" which refers to the presence of tawabi beside and along the wells, we can say that a large number of tawabi were built in Baris, and this number was proportionate to the number of these wells, but they might have been wrecked due to neglect and the passage of time. Therefore, we have only the five tawabi which survived till our present day.



Map (2) Baris tabias

Plate (1) Ain Al-Doum, Abu Sulaiman & Baris tabias

Anyway, these tawabi were built in two chains. One of them penetrates Baris Oasis from the south to the north and extends 17,977.80 km. It starts in the south with Al-Darawish tabia in the South Max (A) and ends in the north with Ain Tafnis tabia (E) near Ain Bargis Farm, and between them lies Ain Al-Doum tabia which serves as a link between them. The second chain extends from the east to the west and is perpendicular to the first chain and intersects with it at Ain Al-Doum tabia, map (2). Abu Sulaiman tabia (D) lies to west followed by Baris tabia (C), pl. (1), in the west, too, and between them lies Ain Al-Doum tabia (953.29 m).

It is noticed that the distribution of these tawabi does not take into account the presence of regular distances between them or the firing range of missiles or bullets. Perhaps the distribution of these tawabi was connected with the wells and the reinforcement of the weak points of the oasis with fortifications equipped with firearms; therefore, the distances between these tawabi were not even, as listed in tab. (1). These are only some of the tawabi. They are Al-Darawish tabia, Ain Tafnis tabia, and Ain Al-Doum tabia. They were built on high hills overlooking the surrounding areas tab. (2). This height makes the tabia look like a defensive point and a lookout as the height of the location is one of the conditions that achieve these goals and makes it easy to defend the surrounding area. This table shows that the highest level between the place in which the tabia was built and the ground under this place exists in Ain Tafnis Tabia and Ain Al-Doum Tabia, since the difference between the two levels is 21 m. in the first and 13 m. in the second. This may be due to the fact that both of them were built beside an old well in Baris Oasis. The first was built next to Ain Tafnis), pl. (2), and the second was built next to Ain Al-Doum or Ain Fawk Al-Doum, as it is called by the author of "Egypt's Well-Known Oases", especially if we know

that the people of the oases, since the Roman Age and perhaps before it, used to dig their wells in high places where the soil was fertile while the soil in low places had less or no fertility due to the salts that leaked or penetrated into it with the drainage water in the underground [1][15]. However, this does not mean that these tawabi which were not built in high places did not lie beside wells. Since the French Emy Bey was given the right to exploit the economy of the oases in (1240 H./1824 A.D.), he dug wells in low areas, and the people of the oases imitated him thinking that this way would produce a large number of wells, in addition to the low costs and the quick access to water sources [15].

Table (1) the distances between tawabi

From Tabia	To Tabia	m.
A	B	12522.70
A	C	13024.16
A	D	13238.11
A	E	17977.80
B	C	00623.96
B	D	00953.29
B	E	05551.20
C	D	00337.35
C	E	05173.84
D	E	05074.09

Table (2) the height of tawabi related to sea level

Sea Level	Tabia				
	Al-Darawish	***Ain Al-Doum***	***Abu-Sulaiman***	***Baris***	***Ain Tafnis***
At the Surface	70.50	60.00	56.00	55.00	69.00
Under the Surface	69.50	47.00	--	--	48.00

Plate (2) Ain Tafnis

2. Building Materials

Numerous building materials were used in building Baris tawabi, including bricks and doum and palm woods, and these are materials were available and abundant in the area. This variety of building materials led to the strength of the construction and resistance to erosion.

2.1. *Bricks*

Bricks were used as an essential material in building the foundations and walls of these tawabi, and also in building the base on which these tawabi were built. It is noticed that these tawabi were not built right on the ground, but

rather on a brick base separated from the ground by a distance of 0.50 m, except for Al-Darawish tabia whose base is 1 m. The bricks used in building these tawabi were made of a mixture of mud, sand, hay, and loam. All these were blunged until the mixture got coherent and solid. Then the mixture was pressed into a wooden mould before it dried. It is noticed that the sizes of these bricks were constant, as every brick was 0.22 m long, 0.11 m wide and 0.06 m high, and the ratio between the width and the height was (1:2), Perhaps this indicates that Baris tawabi were built at the same time, and that the moulds used to make bricks at that time were of fixed sizes and their makers were known. Slime or lime mortar was used to paint the walls of these tawabi from the inside and the outside, and the remains of this paint still exist on some walls.

2.2. *Wood*

The use of wood, particularly doum and plam wood was common in the architecture of Baris tawabi, and even in the architecture of all the oases, because these oases used to, and still, live on doum and palm trees. Doum trees are characterized by its solidity and insensitivity to climate and water changes. However, it is noticed that most of the wood used in the architecture of these tawabi has eroded, and most of the original ceilings of these tawabi have fallen down due to the wide spread of termites (white ants) in all parts of Baris Oasis, pl. (3). Doum wood and palm trunks and leaves were used to make the ceilings of these tawabi, pl. (4). Doum wood was used to make the shutters and lintel of the doors of these tawabi. It was also used in the form of beams that were aligned horizontally, sometimes with bricks, to help keep the building strong and prevent the falling or cracking of walls. Pieces of doum wood and palm tree trunks were also used to line the sides of the discharge slots in the walls to protect them and prevent cracking around these slots as shown in pl. 3.

Plate (3) slot in the wall of Al-Darawish tabia

Plate (4) ceiling of Al-Darawish tabia

3. Descriptive Study

The tawabi surviving in Baris Oasis will be studied according to their geographical distribution from the south to the north. Although these tawabi were built after the arrival of the military garrison to Baris in August, 1893, we can say that the tawabi lying in the south of Baris near Darb Al-Arba'in are older than their counterparts which were built in the north of this oasis because they were intended to fend off the attack of Al-Darawish and prevent them from reaching the north if they decided to invade Baris again.

3.1. *Al-Darawish tabia*

This tabia was named so because it was built to fend off the attack of the Sudanese Darawish who attacked Baris Oasis in (1311 H./1893 A.D.), as we have previously mention-ned.

3.1.1. Location

It is located in the north-western sector or the South Al-Max Village, as shown in map 2 and pl. (5) which, in turn, is about 20 km south of Baris Oasis. It was built on a hill that was formed due to sediments 7.50 m above the sea level, pl. (6). This tabia was not built right on the ground, but rather it was constructed on two brick terraces, the lower one was 0.50 m high, 33.80 m long, and 22.60 m wide, and the upper one was of the same height as the former, but it was smaller in area. This tabia can be reached through two stairways in the north-western section of the lower terrace, each having two steps, fig (1) and pl. (7).

3.1.2. Architectural design of the tabia

This tabia occupies a square lot of land whose area is about 47.60 m^2. It has two levels: the ground floor and the first floor. Some other architectural units were attached to it outside its borders. These include two rectangular rooms. One of these rooms, which is greater in size, is adjacent to the north-western section of the northern façade of the tabia, while the second room is adjacent to the north-western section of the western façade of the tabia, as shown in pl. 6 & 7, and there is a stairway next to the eastern wall of the first room leading to the first floor of this tabia pl. (8). Beneath the southern end of this stairway there is a square area whose eastern and southern walls have a door opening that forms an entrance whose southern hole leads to the inside of the ground floor of the tabia, as shown in fig_s.1& 2 and pl_s. 7.

3.1.3. External description of the tabia

It is noticed that the four facades of this tabia are completely similar, and the only difference is that the northern façade has two door openings; one of them is in the first level and leads to the ground floor of the tabia. This opening is hidden behind the square area which lies below the aforementioned stairway, fig. (2) and pl. 6. The second door opening is in the second level of the northern façade and it can be reached through the aforementioned stairway. It leads, in turn, to the first floor of the tabia, as shown in fig. 2 and pl_s. 7 & 8. The north-eastern section of the northern façade of the tabia also has a small rectangular door opening which is now closed by building inside, and which was perhaps a secondary entrance of this tabia fig. (3) and pl. (9). The height of each of these facades up to the ceiling of the first floor is 5.55 m. above this there is a 1-meter-high wall above which there is a row of seven rectangular parapets (darawi), and each of these parapets is 0.40 m high and 0.48 m wide. These are used interchangeably with six slots which are 0.35 m wide each, as shown in fig_s. (4 & 5) and pls. (10 & 11), in addition to pl_s. 7, 8 & 9 The thickness of the walls of this tabia at the base is 1.50 m, and this thickness decreases as the walls get higher until it becomes 0.800 m at the highest point, as the walls of the tabia bend to the inside as the building gets higher, as shown in fig_s 2, 3, 4 & 5, in addition to pl. 7. The first level of each of the four facades of the tabia includes three slots which start at a height of 1.65 m above the ground of the terrace on which the tabia was built. It is noticed that they are quite similar, as each of them is 0.15 m high and 0.25 m wide as shown previously in fig_s. 2, 3, 4 & 5 and pl_s. 7, 9, 10 & 11. It is also noticed that only one of the slots of the northern façade of this tabia is visible while the others are hidden behind the aforementioned stairway, as mentioned in fig 2 and pl_s. 7 & 8. As for the second level, which is the first floor of this tabia, it is noticed that each of its eastern, western and southern façades has four slots which start at a height of 1.45 m above the ground of the first floor, as noticed in fig_s. 3, 4 & 5 and 9, 10 & 11, while the northern façade has only two slots. These slots look like their

counterparts in the first level. The remaining part of the northern façade has a door opening which leads to the first floor. It has been mentioned before and it is rectangular in shape. It is 1.05 m wide and 2 m high, as shown in fig 2 and pl. 7

3.1.3.1. *The main entrance*

It is in the middle of this tabia, fig. 1. As aforementioned, it lies behind the area which is under the stairway leading to the first floor. This area is 1.25 m wide and 2.25 m long. It is covered with a ceiling made of doum wood and palm leaves. It has a door opening in its eastern wall which is 0.65 m wide and 1.15 m high. This door opening, along with the main entrance of the tabia, forms a bent entrance. The opening of the main entrance is 1.05 m wide and 1.60 m high, and above it there is a segmental arch. It leads to the inside of the tabia, fig. (6) and pl. (12).

3.1.3.2. *External description of the annexes of the tabia*

As mentioned earlier in this paper, two rectangular rooms were annexed to this tabia. One of them, which is the larger one, is perpendicular to the north-western section of the western façade of the tabia. This room has two facades: the western façade and the northern façade. The aforementioned stairway is adjacent to its eastern façade. The walls of this room are 0.50 m thick and 3.10 m high. Its western façade is 7.10 m long, and it has two triangular slots that start at a height of 1.30 m above the ground level. Each of these slots is 0.30 m high with a maximum width of 0.15 m, as sown previously in fig. (7) and pl. 11. As for the northern façade of this room, it is 3.60 m long and its north-western section has a rectangular door opening which is 1 m wide and 1.80 m high. It has a wooden door with one shutter. It leads to the inside of this room. To the right of this door there is a rectangular window which is 0.70 m wide and 1 m high, as mentioned in fig. (8) and pl. 7. The stairway that lies to the east of this room consists of six steps; some of them are ruined now. It leads to the first floor of the tabia, figs. 1, 2 & 6 and pl. 7 & 8. As for the second room, it is smaller than the previous one. Only two of its façades, the southern and western ones, are visible. The southern façade is 0.40 m thick, 1.70 m long and 2.95 m high. Its south-eastern section has a small opening which is 0.40 m high and 0.30 m wide, and it has a segmental arch above it. The western façade is 0.20 m thick, 1.50 m long and 2.95 m high, as previously noticed in figs. 1 & 4 and pl. 3 & 11.

3.1.4. Internal description of the tabia

From the aforementioned main entrance we reach a rectangular space of the same area as the door opening. Its length is 1.50 m, which equals the thickness of the walls of the tabia. It ends with a hole which looks exactly like the door opening and leads to the inside of the tabia, pl. 12, which occupies a square area whose sides are 3.90 m long each. Thus, the total area is 15.21 m^2. Each of its four walls has three slots which start at a height of 1.65 m above the ground level. These were described when we described the external appearance of the tabia, figs. (9, 10 &11). Next to the southern wall of this tabia there is a stairway having five steps and leading to the first floor of the tabia, as mentioned in figs. 2 & 9, in addition to pl. (13). The first floor of the tabia is covered with a ceiling made of doum and palm tree wood logs which are covered from above with a thick layer of mud, pl. 4. As for the first floor, it has the same area as the ground floor, fig. (12). The thickness of the walls of this floor is 1.15 m at the bottom, which is 0.35 m

less than the thickness of the walls of the ground floor. This thickness decreases as we go higher until it reaches 0.80 m at the top, as shown in figs. 9, 10 & 11and pl. 7. Each of its eastern, western and southern walls has four slots at a height of 1.45 m above the ground floor. These slots resemble their counterparts in the walls of the ground floor, as shown in figs. 9, 10 & 11and pls. 9, 10, 11 & pl. (14). As regards the northern wall, it has only two slots due to the presence of the door opening which leads to the inside of the first floor through the stairway lying outside the tabia, figs 5, 6 & 11 and pls. 7, 8 & (15). This floor is covered with a ceiling which resembles its counterpart covering the ground floor. It is noticed that there is no stairway in this floor that leads to the roof of the tabia. Perhaps a mobile wooden ladder was used to reach this roof. The roof of the tabia is exposed and bare, fig. (13). The thickness of the walls of the tabia at the roof is about 0.80 m. It is surrounded by a wall which is 0.50 m thick and 1 m high, above which there is a row of rectangular parapets which are 0.48 m wide and 0.40 m high. These are used interchangeably with slots which are 0.30 m wide each. The height of this wall along with the row of parapets above it is 1.40 m., behind it there is a passageway for the patrol which is 0.30 m wide as previously noticed in figs. 2, 3, 4, 5, & 6, and pls.9, 10 &11).

3.1.4.1. *Internal description of the annexes of the tabia*

As aforementioned, two rectangular rooms were annexed to this tabia. The larger one is 6.10 m long and 3.60 m wide, as shown in fig. 1. It is covered with a ceiling made of doum wood and palm wood and leaves, pl. 8. As for the smaller room, it is 1.50 m long and 1.30 m wide. It is covered with a ceiling resembling that of the previous one. These annexes were used as an armory and loddgings for the garrison soldiers.

Plate (5) Al-Darawish tabia (*After google earth*)

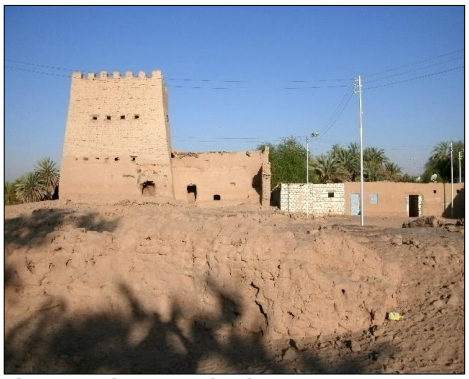


Plate (6) Al-Darawish tabia overview

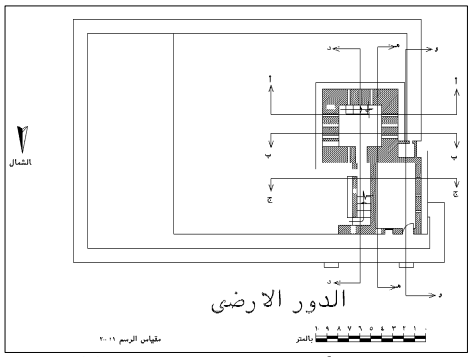


Figure (1) plan of ground floor of the tabia

Plate (7) tabia W. façade

Plate (8) tabia stairway facing E. wall

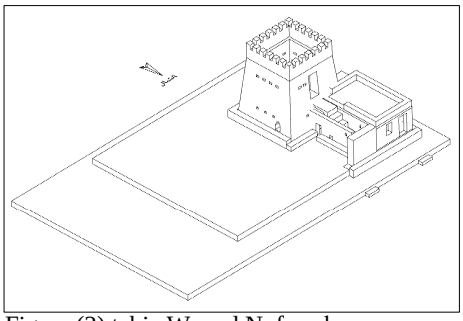


Figure (2) tabia W. and N. façades

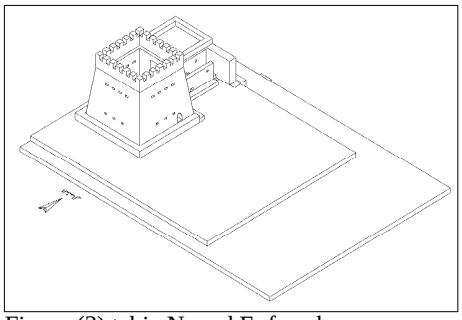


Figure (3) tabia N. and E. façades

Plate (9) tabia N. façade

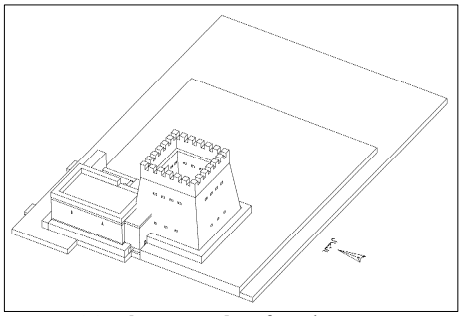


Figure (4) tabia E. and S. façades

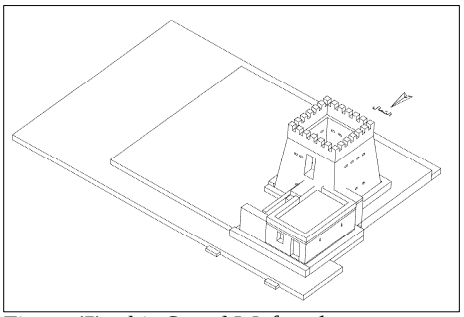


Figure (5) tabia S. and W. façades

Plate (10) tabia E. façade

Plate (11) tabia S. façade

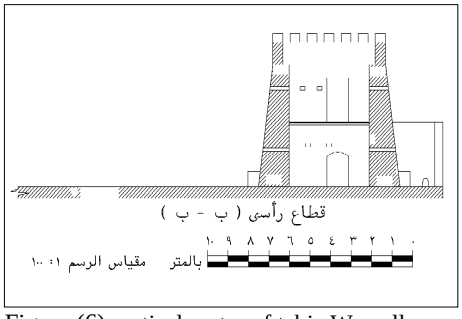


Figure (6) vertical sector of tabia W. wall

Plate (12) tabia S. wall of ground floor

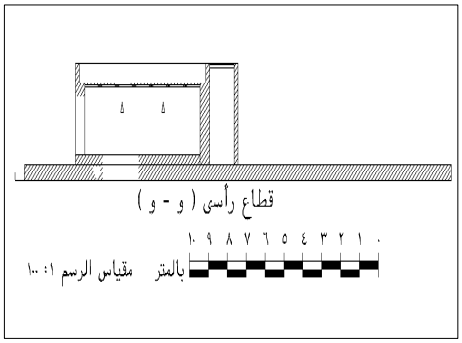


Figure (7) southern façade of tabia annexes

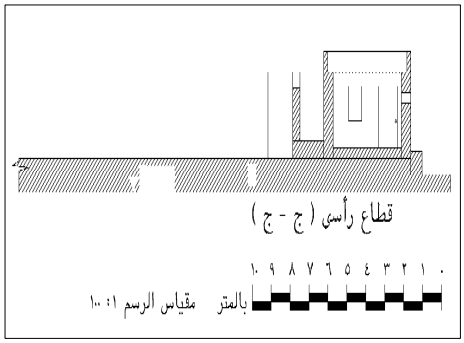


Figure (8) vertical sector of annexes W. wall

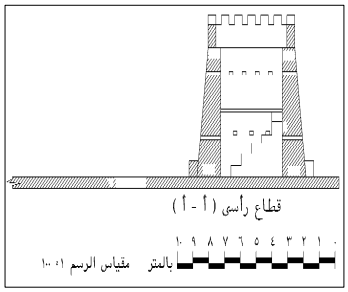


Figure (9) vertical sector of E. wall

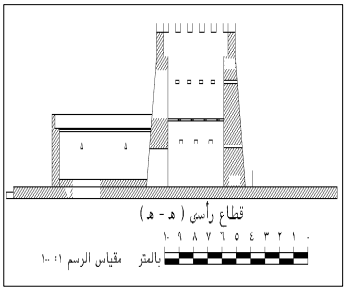


Figure (10) vertical sector of S. wall

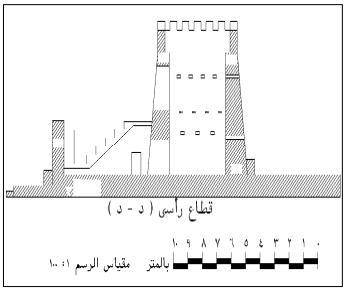


Figure (11) vertical sector of N. wall

Plate (13) tabia eastern wall of ground floor

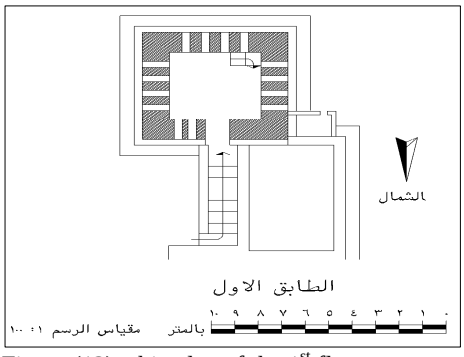


Figure (12) tabia plan of the 1st floor

Plate (14) Eastern wall of 1st floor

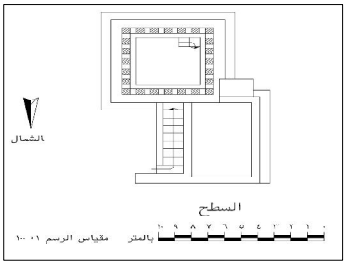


Figure (13) plan of the tabia roof

Plate (15) Western wall of 1st floor

3.2. *Ain Al-Doum tabia*

Ain Al-Doum tabia was given that name because it lies near the well-known water spring called Ain Fouk Al-Doum as mentioned earlier in this paper.

3.2.1. Location

This tabia is located to the north of Al-Darawish tabia as previously described in map 2. It was built on a hill composed of sedimentary formations at a height of 60 m. above the sea level, as shown, pl. (16), in addition to pl. 1 which had been previous seen.

3.2.2. Architectural design of the tabia

This tabia occupies a rectangular lot of land whose length from the east to the west is 7.38 m and whose width from the north to the south is 6.15 m. This means that its total area is 45.39 m^2, fig. (14). Like Al-Darawish tabia, it had two levels: the ground floor and the first floor, but it is now wrecked due to environmental factors like winds, and the transgressions of people who deeply occasionally dug the floor of this tabia in search for treasures, pl_s. (17 & 18).Only the eastern and southern façades of the tabia survived, and it is noticed that some of their upper parts are wrecked, fig_s. (15 & 16) and pl_s. (19 & 20), and only the foundations of the western and northern façades still survive, fig_s. (17 & 18) and pl_s. (21). Some other architectural units were attached to this tabia outside its borders. These include a rectangular room that is adjacent to the southern façade of the tabia. However, this room is wrecked now, and only a few parts of its eastern and western walls whose height is about 0.70 m still survive, as mentioned previously in figs. 14, 15 & 16 and pl_s. 19 & 20. The western and northern façades of this tabia are wrecked, and so are the ceilings of the ground and first floors, and only some parts of the southern and eastern façades still exist, pl_s. 19 & 20. The length of the southern façade is 7.38 m and the height of its remaining part is 7.20 m. It has two levels; the height of each of them is 3.60 m. The lower level represents the wall of the ground floor and it has no openings, while the upper level represents the wall of the first floor, and its three completely similar slots, as each of them is 0.15 m high and 0.25 m wide, and starts at a height of 1.45 m above the first floor ground level, fig_s. 15 & 16 and pl_s. 20 & 21. The eastern façade is 6.15 m long, and the height of the surviving part of it is 8.45 m, and this part has three levels: the ground floor which has no slots; the wall of the first floor which has two slots; and a wall above the first floor, which is 1.25 m high. Above that wall there was a row of rectangular parapets whose remains still exist in the south-eastern section of this façade, fig_s. 17 & 18 and pl. 19. It is noticed that the thickness of each of these façades up to the level of the first floor ceiling is 1 m, but it is 0.80 at the first floor wall, while the thickness of the wall above the roof of the tabia is 0.50 m. This means that the thickness of the wall decreases as we go up. However, the walls of the tabia do not bent towards the inside, fig_s. (19 & 20), in addition to pl. 21 as is the case with the walls of the Al-Darawish tabia.

3.2.3. Original the architectural form of Ain Al-Doum tabia

Despite the destruction that befell Ain Al-Doum tabia, we can, through its archaeological remains, say that each of the four façades resembles the one opposite it. The southern and northern façades are similar, fig_s. (21, 22 & 23). We notice that the façade of the ground floor has no slots, while the façade of the first floor has four slots. Above the roof of the tabia there is a wall, above which there are parapets which are used interchangeably with the slots. The two façades differ in that the north-eastern part of the northern façade has a door opening which leads to the tabia, as shown in fig. 22. The eastern and western façades are similar too. The façade of the ground floor has no slots, while the façade of the first floor has three slots. Above the roof there is a wall crowned with a row of parapets which are used interchangeably with the slots, fig_s. (24 & 25). It can be estimated that the height of each façade is about 8.85 m. The height of each of them up to the level of the ceiling of the first floor is 7.20 m. The height of the wall above the roof is 1.25 m, and the height of the row of parapets above it is 0.40 m, compared with the parapets of Al-Darawish tabia, fig_s. (26, 27, 28 & 29).

Plate (16) Ain Al-Doum tabia (*After google earth*).

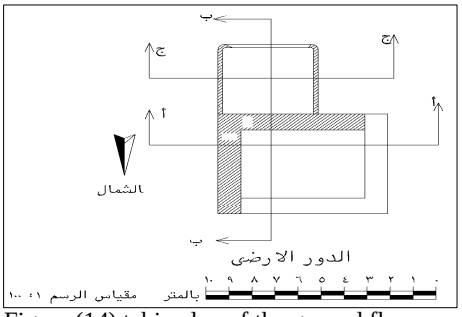


Figure (14) tabia plan of the ground floor

Plate (17) tabia S. and E. façades

Plate (18) tabia "drilled in the floor"

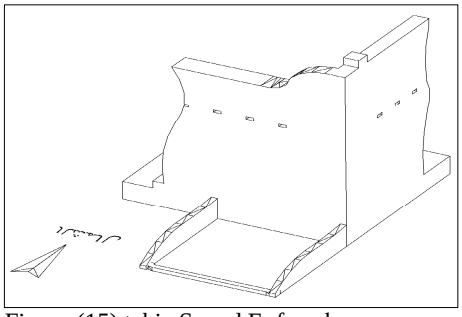


Figure (15) tabia S. and E. façades

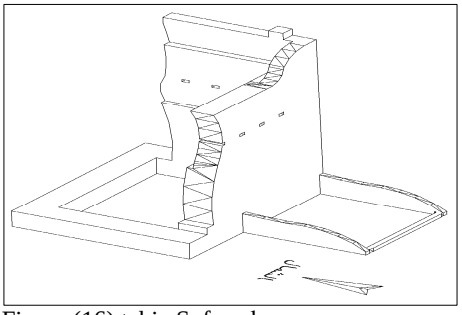


Figure (16) tabia S. façade

Plate (19) tabia E. façade

Plate (20) tabia S. façade

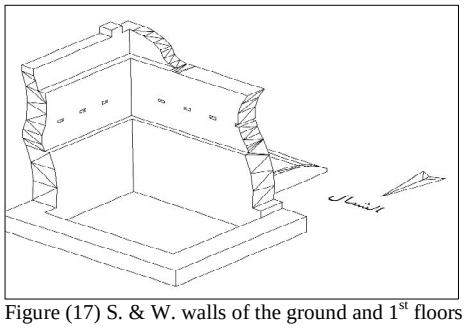


Figure (17) S. & W. walls of the ground and 1st floors

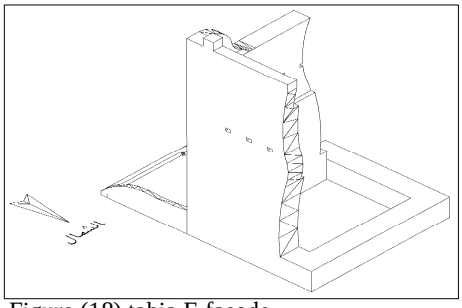


Figure (18) tabia E façade

Plate (21) tabia southern and eastern walls

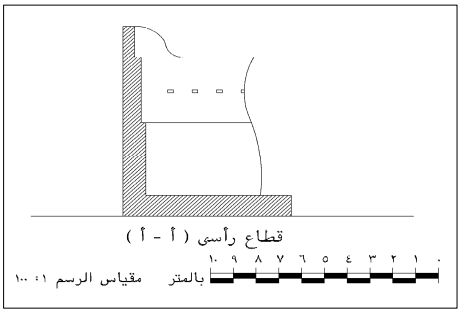


Figure (19) vertical sector of the S. wall

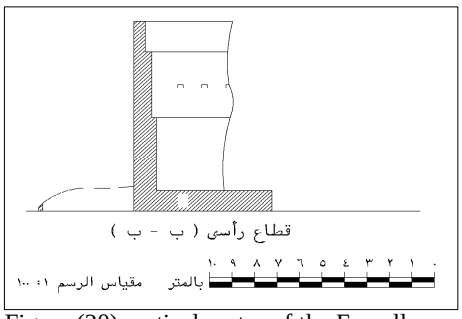


Figure (20) vertical sector of the E. wall

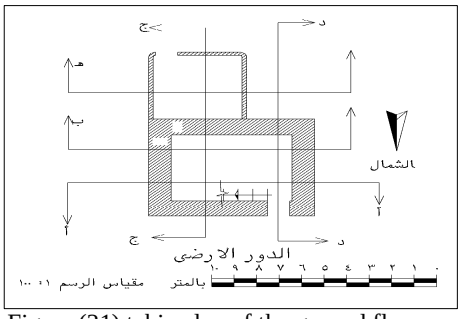


Figure (21) tabia plan of the ground floor

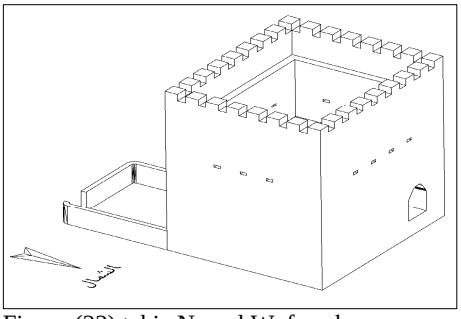


Figure (22) tabia N. and W. façades

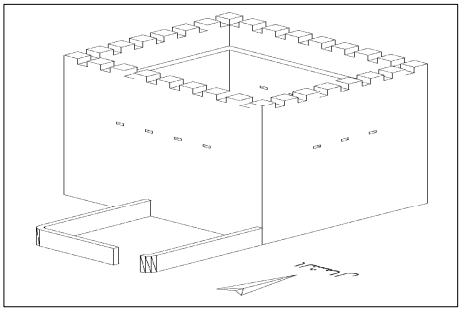


Figure (23) tabia E. and S. façades

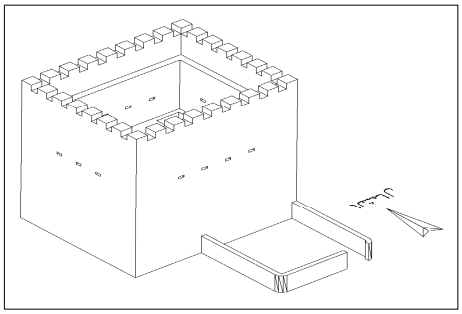


Figure (24) tabia S. and E. façades

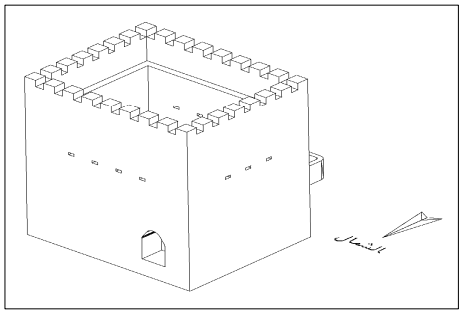


Figure (25) tabia W. and N. façades

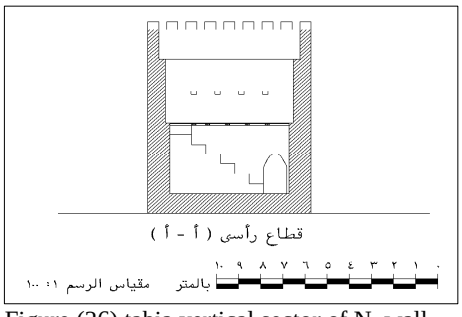


Figure (26) tabia vertical sector of N. wall

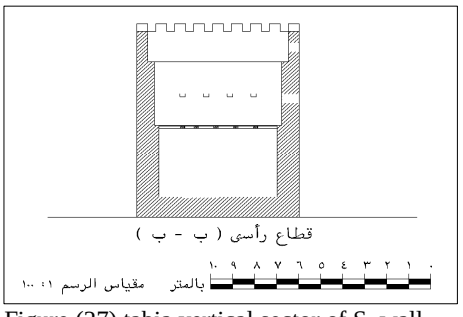


Figure (27) tabia vertical sector of S. wall

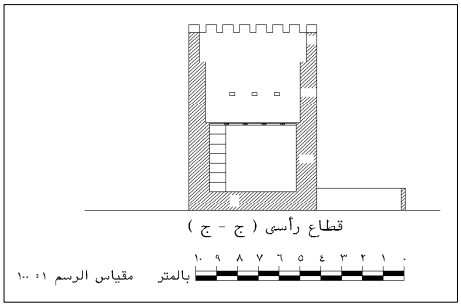


Figure (28) tabia vertical sector of E. wall

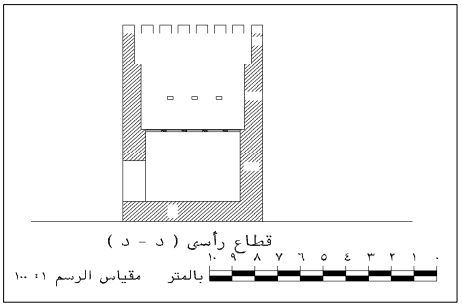


Figure (29) tabia vertical sector of W. wall

3.3. *Abu Sulaiman tabia*

This tabia lies to the north-east of Ain Al-Doum Tabia that we have previously described, as shown in map 2 and pl. (22). It is located in an area that is 56 m above the sea level. It is surrounded by a wide range of palm trees in the north, south and west. In the east there is the pathway leading to the tabia, pl. (23). We do not know yet why this tabia is called "Abu Sulaiman Tabia".

3.3.1. Architectural design of the tabia

It is difficult to determine the architectural form of this tabia at the time of construction, as it was buried in sands, and only the upper parts of its walls can be seen. Some other walls were wrecked and new units were constructed in modern buildings constructed beside it, pl. (24). However, through the uncovered parts of this tabia it appears that it occupied a rectangular open space. Some other architectural units were added to it, and these include a group of about thirteen rooms of varying areas fig. (30). The multitude of these annexes and architectural design of this tabia which is somewhat different from the architecture of its counterparts indicate that it used to be a dwelling for the commander and soldiers of the garrison who came from Assiute and settled in Baris Oasis for one and a half years, as mentioned earlier in this study, to fend off the attacks of the Darawish against this oasis. It was also the dwelling of the soldiers left behind by this garrison after going back to Assiute to defend the oasis, especially that this tabia lies in a place midway among the other remaining tawabi in Baris Oasis, as shone previously in map 2.

3.3.2. Architectural description of the tabia

At a 4-meter distance from the eastern façade of this tabia there is a brick rampart that is 1.30 m thick. The length of what remained of it is 21.80 m. Its lower section was buried in sands, and the uncovered part is 0.30 m high, pl. (25) and fig. (31).There are no other remains of this rampart that indicate that it was enclosed by this rampart from the four directions, or from a particular direction, although it can be probably said that it was confined to the east where there is the pathway leading to the tabia, while it is surrounded by heavy palm trees from the other three directions as noticed previously in pl. 22. Anyway, this tabia has one roofless floor, and it occupies a rectangular space whose length is difficult to determine due to the entire collapse of its northern façade, while its width, from the east to the west, is about 18.50 m, fig. 30. Its walls up to the pathway are 2 m thick, and this pathway lies at a height of 3.80 m above the ground level. This pathway or passageway is 1.50 m wide, and above it there is a wall that is 0.50 m thick and 1.20 m high. It is washed from the outside for a distance of 0.50 m. Thus, the total length of the walls of the tabia is 5 m, fig. (32), in addition to

pl$_s$. 26 & 27. It is noticed that the eastern façade of this tabia was buried in sands, except for its lower section on which a recent rampart that is less thick was built, pl. 24. As for the southern façade, it is 18.50 m long, while what remained of the western façade is only a section that is 16.45 m long. After that there are the remains of the entrance of this tabia, but the rest of this façade to the right of this entrance was wrecked, pl. (26) and fig. (33)

3.3.3.1. *Annexes of the tabia*

The annexes of this tabia are adjacent to the north-western section of the western façade of the tabia. There are covered with sand, and only some upper wrecked parts can be seen, as noticed in pl. 24. These annexes include a group of thirteen rooms in one floor. These rooms are of varying areas, and their walls are 0.50 m thick. These rooms are of two groups, as shown previously in fig$_s$. 30 & 31. The first group is adjacent to the eastern façade of the tabia, and it consists of an open yard with three rooms to its south and one room to its east. The second group lies to the east of the first group. It has an open yard in the middle with room rooms to its north and six rooms aligned in two parallel rows to its south. It is noticed that these rooms are smallest rooms in the two groups, as mentioned in fig. 30, and their upper sections are wrecked. They were probably used as a dwelling for the soldiers of the garrison and as an armory.

3.3.3. Original the architectural form of Abu Sulaiman tabia

Through the archaeological remains and uncovered parts of Abu Sulaiman tabia, we can say that this tabia occupied a rectangular area of land whose length from the north to the south is 45.63 m and whose width from the east to the west is 18.50 m. This means that its total area is about 844 m^2, fig. (34). This area was left open, as there is nothing that indicates that it has a roof, although large parts of its walls maintain their full height, pl. (27) and fig (35). This tabia has one entrance in its western façade. It is noticed that this entrance is not in the middle of this façade, but it is in its south-western section, fig$_s$ (36 & 37). The façade of this entrance is about 0.50 above the level of the western façade of the tabia, pl. 27. It leads to the inside of the tabia which, as aforementioned, occupies a rectangular open space. Its eastern wall probably had an opening that led to the annexes of the tabia behind this wall. It is probable that there was a stairway to the right of the entrance adjacent to the north-eastern section of the eastern wall of the tabia and leading to the passageway above the walls of the tabia, because of the proximity of this point to the annexes of the tabia which were used a dwelling for the soldiers of the garrison and as an armory, fig. 37.

Plate (22) Abu Sulaiman tabia (*After google earth*)

Plate (23) tabia location

Plate (24) tabia the E. section

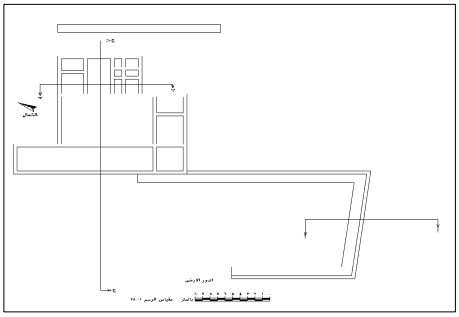


Figure (30) tabia plan of the ground floor

Plate (25) tabia remaining of the E. rampart

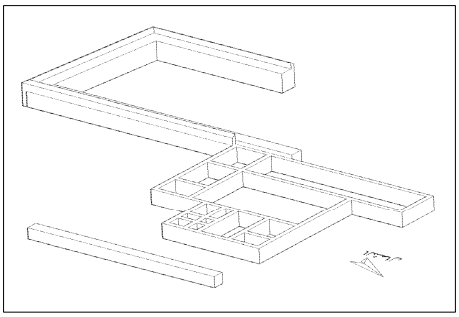


Figure (31) tabia isometric

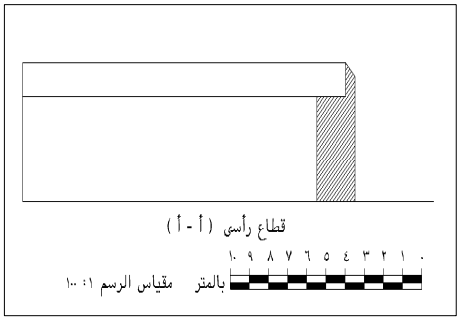


Figure (32) tabia vertical sector of S. façade

Plate (26) tabia W. façade

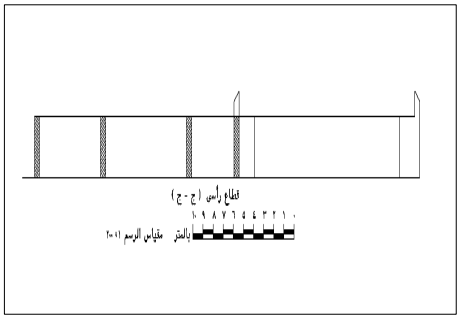


Figure (33) tabia vertical sector of the S. wall

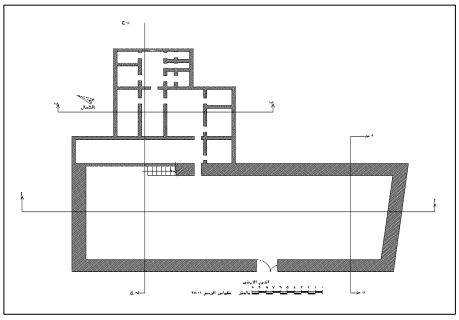


Figure (34) plan of the tabia ground floor

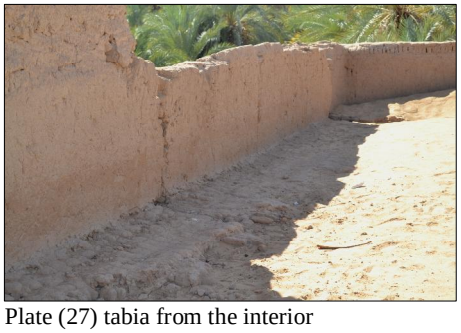


Plate (27) tabia from the interior

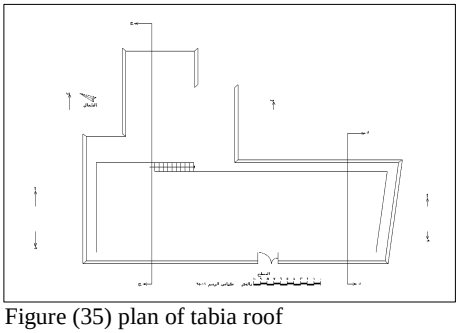


Figure (35) plan of tabia roof

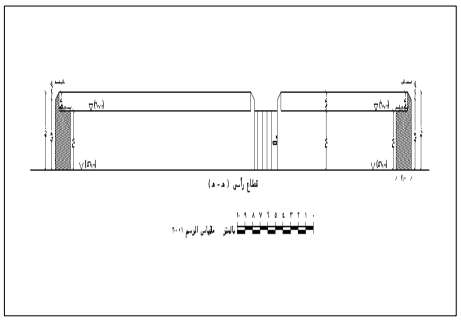


Figure (36) tabia W. façade

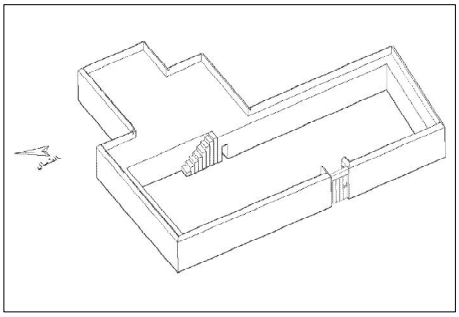


Figure (37) tabia roof

3.4. *Baris tabia*

This tabia lies to the north-west of Abu Sulaiman Tabia that we have previously described as shown in map 2 and pl. (28). It is located amid a residential area near one of the old mosques of Baris, pl. (29). This indicates that this residential area surrounding the tabia was established before the tabia. It overlooks a main street to the south, and its eastern and western façades are adjacent to a recently built house, but its northern façade constitutes one of the walls of the house adjacent to the tabia to the east, pl. (30), as this tabia was added to this house and is now used as a pen. Inside it a recent wall has been built extending from the north to the south and dividing the tabia into two sections, pl_s. (31 & 32).

3.4.1. Architectural design of the tabia

This tabia occupies a rectangular space with irregular sides, as the southern side is 9.70 m long, and the western side is 9.75 m long, while the northern side is about 9.42 m long and the eastern side is 9.52 m long. The total area of the tabia is about 94 m^2, fig. (38), and it has one level, which is the ground floor. It should be noted that the floor of this tabia is about 1 m higher than the current street ground level, pl. (33). This tabia was constructed on a brick terrace. The height of the uncovered part of this terrace is 0.20 m, fig. (39).

3.4.2. External description of the tabia

Each of the four façades of this tabia is 1.90 m thick, and height of each up to the ceiling level is 4.05 m., above this there is the passageway which is 1.40 m wide, and above it there is a wall that is 0.50 m thick and 1.60 m high. This wall was washed from the outside for a distance of 0.40 m, as presented above in pl_s. 29, 30 & 31). Thus, the total height of the façades of the tabia is 5.65 m., fig. (40). With the exception of the southern façade of the tabia which includes its main entrance, pl. (34), in addition to fig_s. 38 & 39, it is noticed that the other three façades are quite similar, as each façade has four slots at a height of 1.80 m above the ground level, fig_s. (41, 42 & 43) and pl. (35). The ceiling of the slots is padded with doum wood and palm tree trunks .These slots are quite similar. The height of each of them inside the tabia is 1 m, and the height of its opening is 0.60 m. These measurements decrease along the slot towards the outside until it is .20 m wide and 0.12 m high from the outside. It takes the form of a triangle, one of whose sides being oblique while the other straight, as mentioned previously in fig. 38 and pl. 35. Many of these slots are now filled and closed from the outside to be used as nests for birds, as mentioned in pl. 30. The southern façade is the main façade of this tabia. Its southern section has the only entrance of the tabia, which is a rectangular opening that is 1.60 m wide. Above it there are straight steps made of doum wood logs, and it has

one shutter made of doum wood, too, pl. (36), in addition to fig. 40 and pl. 34. In the southern section of the wall above this façade there is a 1.20 m. wide opening as high as the wall, fig. 40 and pl. 36. Perhaps it was used as a slot for one of the canons installed in the passageway, or perhaps it was used by soldiers, according to the oral accounts of the people of Baris, to go up to the roof of the tabia through the mountains whose remains still exist in this façade, as noticed before in pl. 36, when they wanted to lock the tabia to safeguard it. As for the upper part of the south-western section of this façade, it collapsed, and perhaps it had an opening similar to the previously mentioned one, pl. 34.

3.4.3. Internal description of the tabia

The previously described door opening leads to a rectangular space as wide as the door opening (i.e., 1.60 m). It is 1.90 m long, which is the same as the thickness of the walls of the tabia. It is covered with a semi-cylindrical cellar and ends with a rectangular opening with a horse shoe arch above it that leads to the inside of the tabia, fig. (44), in addition to pl. 33. The inside of the tabia occupies a rectangular space with irregular and asymmetrical sides, as its southern side is 5.80 m long, and its western side is 5.90 m long whereas its northern side is 5.52 m long and its eastern side is 5.76 m long. Thus, its total area is about 34 m^2, as previously seen in fig. 38. Each of the walls of this tabia, except for the southern wall, has four slots that start at a height of 1.60 m above the ground level. They were described in the section on the external description of the tabia, fig_s. (45, 46 & 47) and pl. 35. This tabia was covered with a ceiling made of doum and palm tree trunks with a layer of palm leaves above it, and above this layer of palm leaves there was a layer of mortar whose remains still exists although it declined and deteriorated, as seen before in pl_s. 31, 32 & 33. It is supposed that there was a stairway inside the tabia that leads to the passageway which was above the roof, fig. (48), but these stairways no longer exist, perhaps due to the transgressions to which the tabia was exposed.

Plate (28) Baris tabia (*After google earth*)


Plate (29) tabia roof


Plate (30) tabia N. façade


Plate (31) tabia roof

Plate (32) tabia from the interior

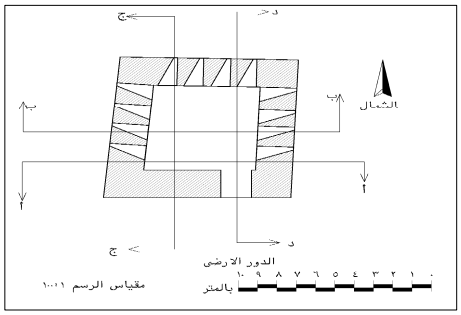


Figure (38) tabia plan of the ground floor

Plate (33) tabia main entrance from the inside

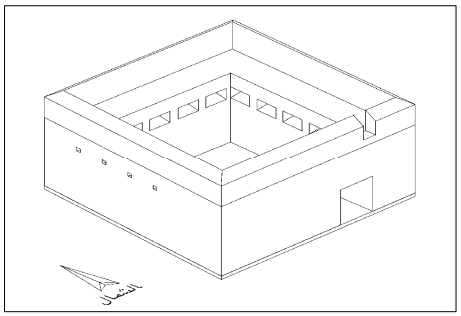


Figure (39) tabia S. and W. façades

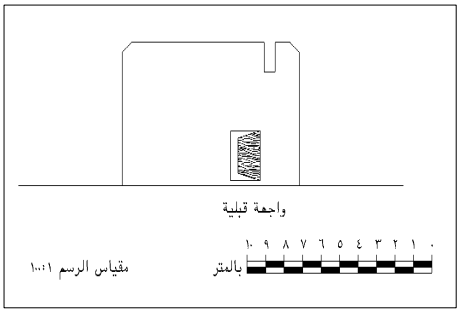


Figure (40) tabia S. façade

Plate (34) tabia S. façade

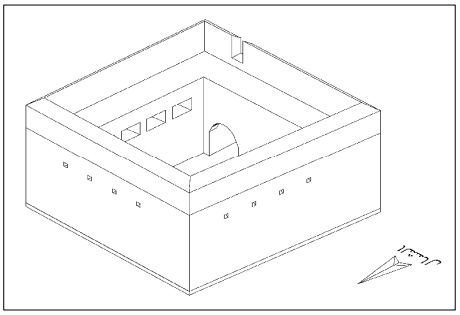


Figure (41) tabia S. and e. façades

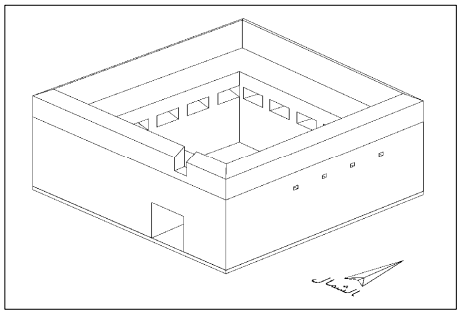


Figure (42) tabia E. and S. façades

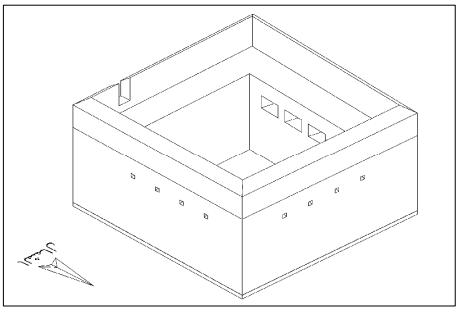


Figure (43) tabia N. and W. façades

Plate (35) tabia W. wall of the ground floor

Plate (36) tabia main entrance

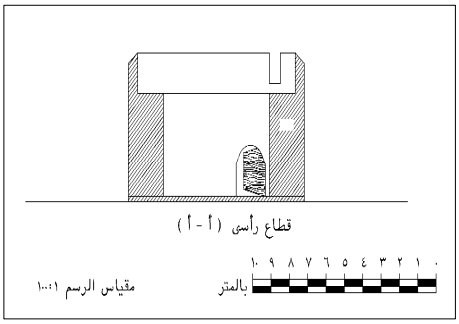


Figure (44) tabia vertical sector of S. façade

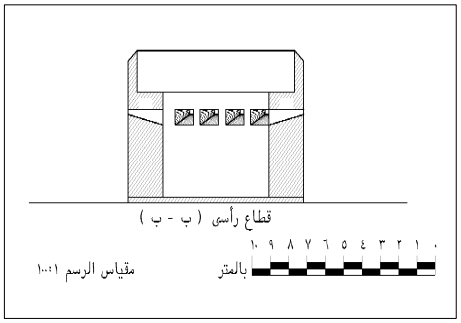


Figure (45) tabia vertical sector of N. façade

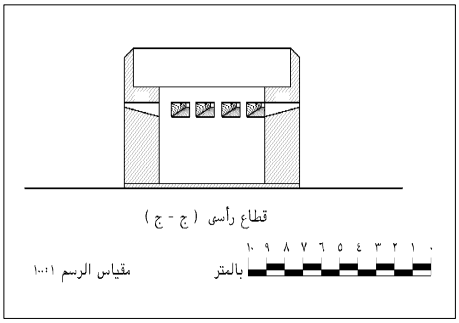


Figure (46) tabia vertical sector of W. façade

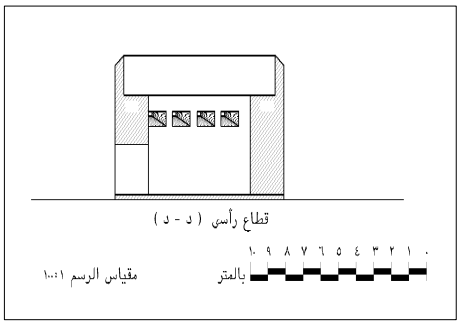


Figure (47) tabia vertical sector of E. façade

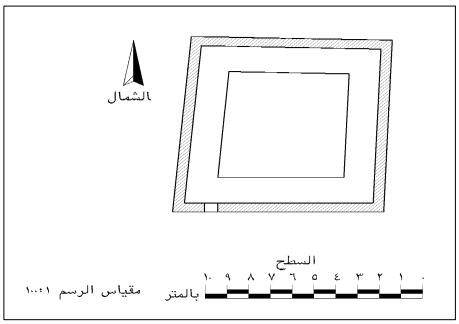


Figure (48) tabia roof

3.5. *Ain Tafnis tabia*

This tabia lies in the north-east of Baris Oasis. It is bordered by Ain Bargis Farm in the west, and Tafnis Mountain, after which this tabia and the water spring that borders it in the north were named, in the east, pl. (37). It is considered the last remaining tabia in north Baris. This tabia was built on a hill composed of sedimentary formations of sand mixed with mud crests at a height of 69 m above the sea level, pl. (38), in addition to pl. 2 seen previously. This tabia was built on a square brick terrace whose side is 9.10 m long, and it is 0.50 m high, pl. (39).

3.6.1. Architectural design of the tabia

This tabia occupies a square space whose sides are 9.70 m long each. Thus, the total area of this tabia is about 32.50 m^2. It has one level, which is the ground floor, fig. (49). To the south of this tabia, right down the hill on which it was built, there are remains of architectural units, which were perhaps annexes to the tabia, used as a dwelling for the soldiers of the garrison and as an armory, pl. (40).

3.6.2. External description of the tabia

It is noticed that the four façades of this tabia are exactly similar, and the only difference among them is that the north-western end of

the northern façade includes the main entrance of the tabia, fig. (50) and pl$_s$. 2 & 40, and that the south-western section of the southern façade has a slot which is 0.60 m wide and 1.30 m high. Above this slot there is a Horse-shoe arch. This slot starts at a height of 0.50 above the ground level, fig. (51) and pl. (41). Each of these facades is 0.80 m thick and 2.60 m high.

3.6.2.1. The main entrance

It lies in the northern façade of the tabia, as aforementioned. Its opening is 1.10 m wide and 1.90 m high. The right-hand part of the opening of this entrance was wrecked, and so were the steps above this opening, fig$_s$. (52 & 53), in addition to pl$_s$. 2 & 40 that had been previously seen.

3.6.3. Internal description of the tabia

The previously described entrance leads to the inside of the tabia. This tabia occupies a square space whose sides are 4.90 m long each. Thus, the total area of this tabia is about 24.10 m^2. The ceiling of this tabia has fallen down, fig$_s$. (54, 55 & 56), but some cylindrical gaps which still exist in the upper section of the walls of this tabia reveal that it was covered with a ceiling made of doum and palm tree trunks and palm leaves, as is the case with the other aforementioned tawabi of Baris Oasis, pl$_s$. (42 & 43).

Plate (37) Ain Tafnis tabia (*After Google earth*)


Plate (38) Ain Tafnis tabia overview


Plate (39) tabia S. and E. walls

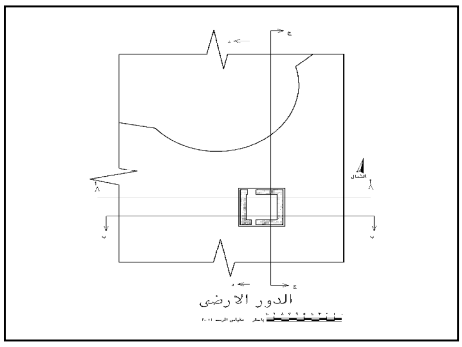


Figure (49) tabia plan of the ground floor


Plate (40) tabia N. and W. walls

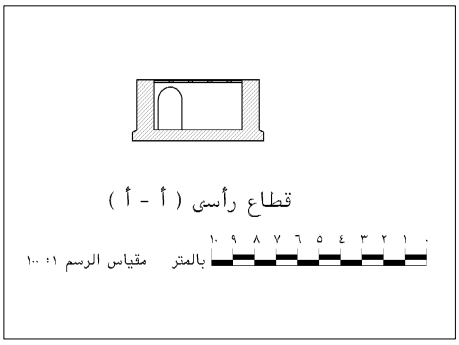


Figure (50) tabia vertical sector of the N. wall

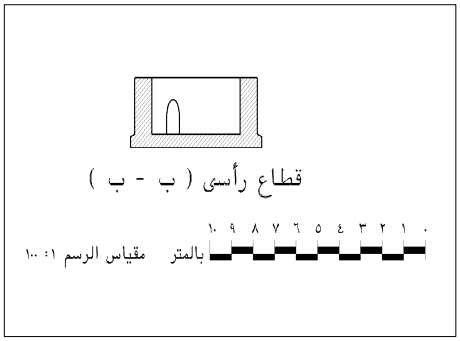


Figure (51) tabia vertical sector of the S. wall


Plate (41) S. and W. façades

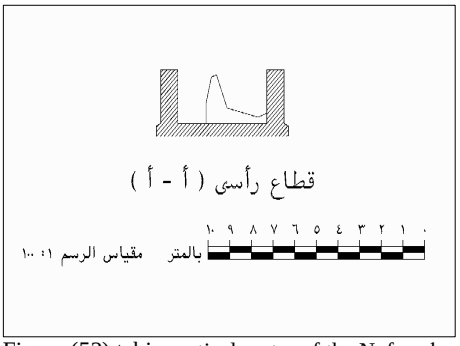


Figure (52) tabia vertical sector of the N. façade

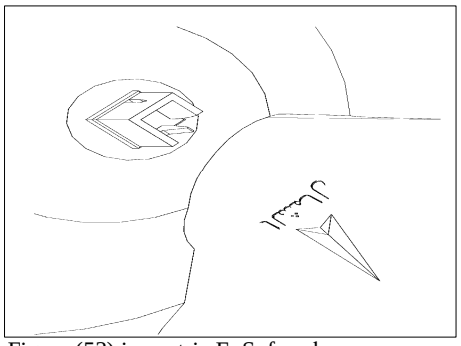


Figure (53) isometric E. S. façades

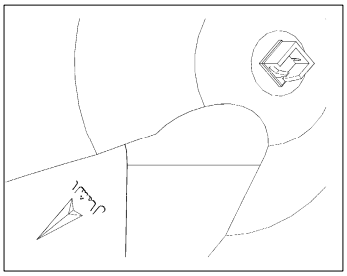


Figure (54) isometric N. E. façades

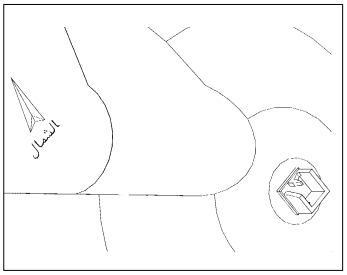


Figure (55) isometric W. N. façades

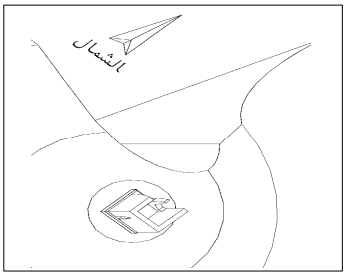


Figure (56) isometric S. W. façades


Plate (43) tabia S. wall from the interior


Plate (43) tabia E. wall from the interior

4. Analytical Study

The descriptive study of Baris Oasis tawabi has shown the utility of topography and geographical location in the construction of these tawabi. Some of them were built on top of a hill which has natural immunity and overlooks the surrounding area, which it makes it easy to defend the oasis and watch the movements of any attack against it, pl_s. 6 & 39. As regards the location, the study has revealed that these tawabi were built in two chains, fig. 2. On of these chains extends for a distance of 20 km and penetrates Baris Oasis from the south to

the north. It starts with Al-Darawish Tabia in the South Max which lies at the entrance of Darb Al-Arba'in, which is considered the connecting link between the oases and the Sudan. It is followed in the north by Ain Al-Doum Tabia, and finally Ain Tafnis Tabia. Through these fortifications that are equipped with firearms the roads connecting South and North Baris can be controlled, and thus the movements of whoever tries to invade the oasis can be watched. The second chain of tawabi is about 12.50 km north of Al-Darawish Tabia, and it extends from the west to the east. It includes only two tawabi, i.e., Baris Tabia and then Abu Sulaiman Tabia to its east which is perpendicular to Ain Al-Doum Tabia, fig. 2, which constitutes the connecting link between these two chains. This second chain is a strong defense and support point that prevents attackers from penetrating to the north of Baris Oasis if they manage to surpass the tawabi in the southern section of this oasis. The descriptive study shows the clear concentration on the defensive procedures to fend off any attempt by the invaders to fill up the wells with earth through building the tawabi next to these wells and springs. That is why the tawabi are named after some adjacent wells, such as Ain Al-Doum Tabia and Tanfis Tabia, pl. 2. The provision of water in the oases is a matter of life or death, and these wells are the only source of water necessary for drinking and agriculture in these oases. The descriptive study has shown that bricks were used as a primary building material in the construction of Baris tawabi. Although this material is less durable than other building materials such as rock and tiles or baked bricks, the scarcity of rain in this country fits with the nature of this material. Also the increased thickness of the walls of these tabia, which sometimes amounts to 2 m, as shown in the table below, enables the walls endure the blows of firearms on the one hand and atmospheric factors, particularly winds, which are the first enemy of urbanization in this country, on the other hand. The scarcity of rain in the oases in general suits the nature of this material which is known for its ability to absorb water and to get swollen and contracted and its sensitivity to moisture and drought. For the same purpose, these tawabi were built on terraces which are between 0.50 and 1 m high to insulate the bricks with which their walls were built from moisture and ground water, tab. (3).

Table (3)

Tabia Name's	*Abu Sulaiman*	*Baris*	*Al-Darawish*	*Ain Al-Doum*	*Ain Tafnis*
Walls Thickness (m.)	2	1.90	1.50	1	0.80

Also for the same purpose, i.e. the durability of walls, the number of openings in these walls was small, as each of these tawabi has one main entrance and a few slots that may be reduced to one slot, as is the case with Ain Tafnis Tabia, fig. (56). The walls of Abu Sulaiman are even devoid of any slots. It is noticed that these slots are wide in the inside and narrow in the outside, and start at a height that is proportional to man's stature, and this indicates that they were used for slots barrels and not for canons, except for the slot in the southern wall of Ain Tafnis Tabia whose big measurements and extension to a level close to the ground level indicate that it was used for the slot, as shown previously seen in figs. 49 & 51 and pl. 42. It is noteworthy here that the slots in Baris Oasis witnessed a significant development in form and function. In terms of form, it is noticed that these slots have the form of a triangle, one of whose sides being straight while the other oblique. The slot extends 1.90 m, which is the same as the thickness of the walls of the tabia. This slot is 0.60 m high and 1 m wide in the inside, fig. 38 and pl. 35. Then its height and width decreases as we go outside until it is 0.12 m high and 0.20 m wide,

fig. 39 and pl. 30. Such a design allows the soldier lie on his face during firing bullets from his canon. Thus, we can explain why one of the sides of the slot is straight. It is so to be a dead zone to protect the defending soldier from the strikes of the attacking enemy. The descriptive study of Baris tawabi shows that they are similar in terms of their general architectural design, as they occupy a square or rectangular space, and their walls often have slots. Above their roofs there is a passageway called "banquette". However, the design of these tawabi is of four patterns as follows: * 1st pattern, the design of the first pattern is square or rectangular, and it has two levels, the ground and first floors, in addition to the roof above which there is the banquette or passageway. The walls of the tabia has slots, and above the banquette there is a wall, above which there is a row of rectangular parapets which are used interchangeably with slots for letting out the slots of firearms or canons. This pattern is represented by Al-Darawish Tabia and Ain Al-Doum Tabia. Some architectural units were annexed to them as a dwelling for the garrison and as armories, figs. 1-14. * 2nd pattern is a rectangular open space whose walls are 2 m thick and have no slots. The walls end with a banquette, above which there is a wall that is washed from outside. This pattern is represented by Abu Sulaiman Tabia, to which a large number of architectural units that were used as a dwelling for the garrison and as armories, fig. 30. * 3rd pattern is a rectangular space consisting of only one level, which is the ground floor besides the roof. The walls have slots, except the main façade which has the entrance of the tabia. Above the roof there is the banquette, above which there is a wall that is washed from outside and resembles its counterparts in Abu Sulaiman Tabia. This pattern is represented by Abu Baris Tabia, fig. 38. * 4th pattern is a square space consisting of only one level, which is the ground floor besides the roof, but without a banquette above it. It is noticed that the walls of the tabia do not have slots, except the southern façade which has only one slot. It is also noticed that their shape differs from that of their counterparts in the other tawabi, as mentioned earlier in this study. This pattern is represented by Tafnis Tabia, fig. 49. Although there are four patterns of the architectural design of Baris tawabi, as aforementioned, this does not mean that the difference among them is a fundamental one. They are similar in the general architectural design, and if there is a difference among them, it is a result of their function and the conditions of the geographical location. Al-Darawish Tabia and Ain Al-Doum Tabia, representing the first pattern, each has two floors besides the roof, above which there is a banquette to be more fortified and equipped with firearms due to their presence in the southern section of Baris Oasis. Therefore, they represent the first defense line of the oasis against any attack coming from the Sudan through Darb Al-Arba'in, map 2.Abu Sulaiman, representing the second pattern, is located amidst the five tawabi. Thus, it is considered a connecting link between the chain of tawabi penetrating Baris from the south to the north and that extending from the west to the east. The thickness of its walls (i.e., 2 m), their lack of slots, and the width of the banquette (i.e., 1.50 m) indicate that they were intended for carrying heavy canons. That is why they were left uncovered and roofless so that the suffocating smoke and gases emitted by the shooting of canons might not affect the soldiers using them, especially that the building materials used to roof the other tawabi (i.e., doum and palm tree wood) cannot carry heavy canons. The multiplicity of the architectural units annexed to this tabia can be accounted for by the fact that it was the headquarters of the commander and soldiers of the campaign that came from Assiute to fend off the attack by Al-Darawish. After that it became a dwelling for the

garrison left behind by this commander after he went back to Assiute. In addition, it was used as the main armory for other tawabi, especially that it is located amidst all of them. It is noticed that Baris Tabia, representing the third pattern, was built beside a residential zone. Therefore, each of its northern, eastern and western facades overlooking the residential zone is equipped with four slots for the slots, fig 38 As for the southern façade overlooking the road leading to this tabia, it has no slots, while the south-eastern part of the wall above the banquette has a slot that seemed to be used for a slot, fig 39, especially that the walls of the tabia are 1.90 m thick, and the banquette above the roof is 1.40 m high, fig 48.Ain Tanfis Tabia, representing the fourth and final pattern, has one level which is the ground floor whose walls are 0.80 m thick, which is less thick than the walls of Baris Tabia. As a result, there is no banquette and no wall above the roof of the tabia, fig 49 and pl. 40. This tabia was built on a hill that is 69 m above the sea level, with a difference of 21 m between this height and the ground level at the bottom of this hill. Also its southern façade has a slot for the slot of the canon pointed to the south, which was the source of danger, as mentioned before, to fend off any attack that might come from this direction and surpass the fortifications in the south of this tabia, map 2. Thus, it is clear that the difference in the architectural design of these tawabi came as a response to the needs of their function on the one hand and the conditions of their location on the other, as it was necessary that the tawabi of the southern section of the Baris Oasis, directly facing the attack by the Darawish, be a control point as well as a front of line defense whose function was to consolidate and strengthen weak points exposed to the danger of attack and protect and safeguard the tawabi lying behind it. Therefore, it was more fortified and was equipped with more firearms than its counterparts in the north of the oasis, map 2. Anyway, despite the simplicity of the design and architecture of Baris Oasis, in comparison with their contemporary fortifications, what remains of these tawabi is considered a good example of the fortifications of the West Desert oases in the (13th century H./19th century A.D.), within the limits of available economic resources and building materials, and the environmental and atmospheric conditions in these oases, especially that the military buildings in Egypt did not keep up with the development in military techniques due to the emergence of heavy firearms and canons and using them in wars and the repercussion of this on military fortifications in Europe since the (10th century H./16th century A.D). as a result of the weakness and break-up of the ruling authorities in Egypt at that time until the military buildings in Egypt began to witness remarkable development with the arrival of the French Campaign (1213 H./1798 A.D.). Thus, Egypt is considered one of the last Arab countries to apply this development, compared with other countries such as Morocco, East African countries, and Oman which have known military architectural systems since the second half of the (10th century H./16th century A.D.) due to the military contact of European countries, particularly Spain and Portugal with these countries [20]. Mohamed Ali came to power in Egypt (1220-1265 H./1805-1848 A.D.), numerous military fortifications and control points were constructed in Egypt, particularly in Cairo, according to the latest architectural military systems and techniques consistent with the development of firearms, especially canons [21] [22], at that time. These fortifications, which were established during the reign of Mohamed Ali's dynasty, were characterized by the diversity of their architectural designs. Among the most important of these architectural designs are: * **The redan design:** It is considered the most important and commonest design, especially on the northern coasts of Egypt. It takes the shape of a triangle with a missing side, and looks somewhat like a crescent [20] [21] [22]. * **The lunette**

design: It is a developed shape of a redan design. It takes the shape of a pentagon. It was used to increase the number of the sides of the aforementioned redan design [20] [21] [22]. *** The redoubts fortress:** It is square, circular or polygonal in shape, but the most commonly used design was the square one. It is one of the simplest and most commonly used front fortresses, as it was used as watch point that were constructed at a long distance from the primary fortifications. It also served to consolidate weak points exposed to attacks [20] [21] [22]. * **The polygonal or serrate design:** This design was not common. There is only one example of this design that dates back to Mohamed Ali's dynasty in the fortifications of Al-Koum Al-Ahmar Citadel at the end of Abu Qir Dam. It has a shape made up of straight and intersecting lines producing internal and external angles [20] [21] [22]. * **The bastion design:** It is a square or rectangular fortress from whose four corners triangular shapes come out. The word "bastion" comes from the Latin "bastion". This design is evident in Mohamed Ali's tabia at Al-Mokattam, Cairo, and in many of the fortifications of Alexandria such as Koum Al-Nadoura and Koum Al-Deka fortresses [20] [21] [22]. In the light of the above outline of the most important military fortifications in Egypt during the reign of Mohamed Ali's dynasty, we can say that Baris tawabi, which were built in the late (13th century H./19th century A.D.) during the reign of this dynasty, follow the design known as "Balinqa", which has a square or quasi-square design. It is noticed that it they have a simple architectural character that was governed by available economic resources and building materials as well as by the environmental and atmospheric conditions in these oases, as we have previously mentioned.

5. Conclusion

The study of the tawabi of Baris Oasis has produced a lot of results that have to do with its history and architectural design and elements. Among the most important of these results are the following:

** Despite the isolation of the Oases from the successive ruling authorities in Cairo, most of their cities and villages were fortified and enclosed by ramparts built by the inhabitants of these oases to safeguard them and fend off enemies' and invaders' attacks.*

** The study has confirmed the disappearance of the military buildings constructed in Al-Dakhla Oases in the Islamic Period, as indicated by historical and geographical sources, and only the tawabi of Baris Oasis, the subject matter of the present research, are what survived of these military buildings and fortifications.*

** The study has indicated that the southern borders of Egypt were not a source of danger throughout the reign of Mohamed Ali's dynasty, after Mohamed Ali added large parts of the Sudan to Egypt. However, after the outbreak of the Mahdist Revolt in the Sudan, these borders were repeatedly attacked by the Darawish. Among these attacks was the attack on Baris Oasis, which led to the establishment of a number of tawabi in this oasis.*

** The study has revealed that only five tawabi survived in Baris. They were built in two chains. The first chain extends from the south to the north, and includes Al-Darawish Tabia, Ain Al-Doum Tabia and Ain Tanfis Tabia. The second chain has two tawabi, i.e., Baris Tabia and Abu Sulaiman Tabia, and extends from the west to the east. The tawabi of this chain are perpendicular to those of the first chain, as they meet at Ain Al-Doum Tabia which constitutes a connecting link between the two chains (Map 2).*

** The distribution of the tawabi shows that they were built on high hills so that they might be defense and control points that would control the road penetrating Baris from the south to the north, and thus fend off invaders' attacks and prevent them from penetrating into the north.*

** The study has shown the dependence on bricks as the primary building material in the construction of Baris tawabi, and that doum and palm tree wood and palm leaves were used for roofing them, as these were the environmental resources available in the area. Although these materials are less durable than other materials such as rock and tilt, they suit the arid weather of the Oases. Also they relied on the thickness of the walls of these tawabi to make up for the weakness of the building materials.*

* *The study has shown that Baris tawabi are similar in terms of their general architectural design, as they occupy a square or rectangular space, and consist of one or two floors, in addition to the roof, above which there is the passageway or banquette. Only Abu Sulaiman Tabia was left roofless, and Ain Tanfis Tabia had no banquette above its roof.*
* *The study has also shown that despite the similarity of Baris tawabi in terms of their design, they can be classified into pattern. The difference in their architectural design came in response to the needs of their function and the conditions of their location.*
* *Through outlining the most important designs of the military buildings and fortifications during the reign of Mohamed Ali's dynasty, the study has shown that Baris tawabi follow the design known as "Balinqa", which has a square design that is considered one of the simplest and most commonly used types of frontline fortresses at that time.*

RECOMMENDATIONS

1. The Islamic and Coptic Antiquities Sector, Ministry of Antiquities, should include and record the unrecorded tawabi of Baris (i.e., Ain Al-Doum Tabia, Abu Sulaiman Tabia, Baris Tabia, and Ain Tanfis Tabia) soon, as these tawabi have an architectural and cultural value that tells that history of an important period in the history of the development of military architecture in the Oases in particular, and in Egypt in general.
2. The inhabitants' transgressions on these tawabi should be eliminated, and some inhabitants should be dispossessed of some of the lands of these tawabi, as is the case with Baris Tabia and Abu Sulaiman Tabia. Also the random digging inside Ain Al-Doum Tabia in search for treasures must be stopped immediately.
3. These tawabi should be repaired and renovated in sound scientific ways as soon as possible.

Endnotes

(a) Views varied concerning the name of Baris. Some think that it is from the Hieroglyphic word "Barso" meaning "the southern land". Some others think that it came from the Hieroglyphic word "Bireast" meaning "Isis's house", i.e. Dosh Temple that is located near the area. Still others believe that it was founded by the Persian knight Bires, one of the leaders during King Cambyses's reign, and that it was named after him. Some inhabitants pronounce it "Bires" by they change the "s" into "z" so that it becomes "Birez". Thus, it was founded in the year 525 B.C. All the attached maps and figures except map No.1 are developed by the author. Also all the plates have been photographed by the researcher.

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