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ANALYTICAL STUDY OF THE EGYPTIAN MILITARY FORTIFICATIONS UNTIL THE END OF THE MIDDLE KINGDOM

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Abstract

The study of Egyptian castles and fortresses is one of the important topics in the field of Egyptian antiquities in general and Egyptian architecture in particular. It is also unique in studying military architecture because Egypt witnessed many conflicts and wars, of which these castles and forts were the most important results. Castles and forts refer to the interest of the kings of this era in building castles and fortresses, to repel foreign invasions.

This research deals with an analytical study of the Egyptian military fortifications until the end of the middle kingdom, through several axes, including:

The analytical study of the forts of the pre-dynastic era, the era of the Old Kingdom and the era of the Middle Kingdom, and through each of these axes, models of the forts were dealt with in each of the historical periods covered by the research, which extends from the pre-dynastic era until the end of the Middle Kingdom. The study also dealt with the advantages of the architectural planning of the forts in these ages.

It also dealt with the architectural elements that include: fences, entrances, ratchets, the inner tower and the watchtower, toilets and bathrooms, and building materials.

Keywords: Pre-dynastic era, Old Kingdom era, Middle Kingdom era, military fortifications, Egyptian fortresses.

Introduction

Castles were often surrounded by trenches intended to impede attacks, and had openings at the top of high walls and doors; With the aim of shooting arrows through it, the castles served as a center of protection, a military and administrative center[1], and a symbol of wealth and power [2].

Because the main objective of building castles is defense and protection, a high site was chosen overlooking large areas of land and roads to monitor them. The castle contains many rooms to accommodate the soldiers, clerics, and administrators who will live in them.

Castles within ancient Egypt held multiple functions, during the Middle Kingdom period, in the Twelfth Dynasty of Egypt means to control the Nubian Nile were established through the establishment of fortified stations. The site of the Egyptian forts was not limited to the river bank only. Sites within Egypt and Nubia are placed on rocky or sandy uplands.

The aim behind this method was to spread their influence throughout the region, as well as discourage rival groups from invading positions. Inspections of these castles in Nubia led to the discovery of copper smelting materials, which indicate the existence of a relationship between the miners in the region, and the occupation of these Nubian castles indicates the existence of a commercial relationship between the two parties. Miners were collecting materials and transporting them to these forts in exchange for food and water, until the era of the Thirteenth Dynasty, Egypt was controlling Nubia through the use of these forts [3].

The castle contains a spacious hall where its residents eat, kitchens, toilets, warehouses to store the largest amount of supplies, wells to collect drinking water from rain or water that can be obtained from sources outside the castle, and it also contains stoves distributed between the rooms to provide lighting, and because The windows are small, attached to the castle are watchtowers, and warehouses for military equipment. Surrounding the castle is a deep trench that sometimes fills with water to make it difficult to pass. As for the outer doors of the castle, they are equipped with mobile bridges to facilitate lifting when the castle is under attack. These entrances were narrow so that it was easy to defend, and they were These castles mostly consist of two floors or more. The second floor is for senior officials and the bottom floor is for soldiers and the rest of the service staff [4].

The fortifications within ancient Egypt were built during times of conflict between the

rival principalities. Of all the forts analyzed during this time frame, most if not all were built from the same materials. The only exception to the rule was some of the forts from the Old Kingdom as forts such as Fort Bohn used stone with the construction of its walls. The main walls were built mainly with mud bricks but were reinforced with other materials such as wood. The rocks were also used not only to preserve them from erosion as well as paving. Secondary walls will be built outside the walls of the main castles and are relatively close to each other. As a result, this will prove to be a challenge to the invaders as they will have to destroy this fortress before they can reach the main walls of the fort.

Another strategy was used if the enemy managed to break through the first barrier. Upon reaching the main wall, a trench will be built between the secondary and first walls. The purpose of this was to put the enemy in a position that would make him vulnerable to arrow fire. The position of this trench the walls within the interior will become demilitarized in times of unity; leading to their destruction. The parts that were used to build said walls can be reused, making the overall design very useful.

First: Analytical study of pre-dynastic forts

Strong forts with walls built of mud bricks with towers or balconies spread before the dynasties [5]. Since we did not find visible archaeological evidence, it is possible to rely on the representation of castles on two halls from the early dynastic period. They show a wall on a square plan with rounded corners and towers on the outer surface and the outer edge of which is provided with a frieze that can be interpreted as representing a wall extending along the top of the wall.

It seems that the cities were surrounded by a wall on a square plan with rounded corners and were found like a wall in the first places of settlement in the Cape region, and the planning became polygonal or rectangular [6]. As it appeared from the pre-dynastic era, on the ramparts of forts and spoils, seven forts were walled with walls of brick, and the top of each fortress was a sacred symbol [7-8].

It was the beginning of the appearance of drawings of fortified cities on the slate of King Narmer or Narmer, which was found in Hierakonpolis, near Edfu. Written and drawn during the reign of Pharaoh Narmer, where we find below the second face the king

depicted in the form of a strong bull, evidence of his strength, destroying one of the enemy's fortresses and setting foot on an enemy,It is noted that the fortress, which adopts the circular layout, is surrounded by a wall with defensive towers (fig. 1).

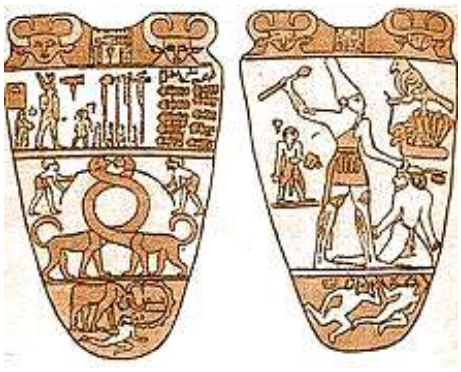

fig. (1) Drawing a circular city fortified with towers destroyed by oxen on the Narmer Pile [20]

This drawing was spread in every circular or square, as in the painting of the bull. In the first, a bull appears full of its likeness on the Narmer painting, where one of the soldiers is struck by its horns, and under it a city with a layout closer to the square appears, and the wall is equipped with square towers, as in the Narmer painting (fig. 2). As for the second panel, it shows six cities with a layout closer to the square, as in the previous figure, and they also have walls with square towers [9] (fig. 3).

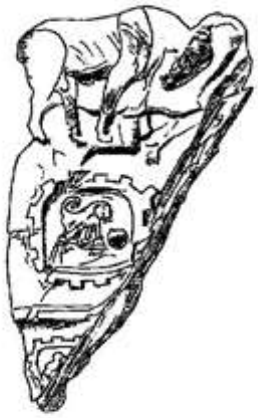

fig. (2) Draw a fortified city with towers [9]

fig. (3) Drawing fortified cities with towers [9]

Among the inscriptions of the late pre-dynastic and early dynasties, there is evidence that some of the cities were surrounded by a thick, rounded or rectangular wall, and had prominent pillars or towers that allowed the defenders a wider area under it from which they could monitor everyone who approached it and aimed their arrows at those who tried to pry it from the enemies [10].

The ivory piece in the Berlin Museum is (fig. 4) Which was found in Al-Araba Al-Madfunah, and its era dates back to the first families of Egyptian history, and some think that it is from the era of the First Dynasty itself. It has balconies in the form of a semicircle [10]. The tower did not have an entrance at ground level, but was taken up by a ladder from a rope to a window at the top [10].

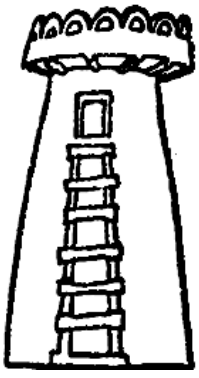

fig. (4) Model of the tower [10]

We note in this tower that it takes a circular shape, with less drop at the top, with the aim of strengthening and strengthening the tower and making its architectural axis in the center of the circle. Spaces that allow the soldiers to stand to defend the tower.

This tower is one of the buildings of the utmost importance in the architecture of Egyptian castles, as it includes architectural elements that were the basis on which the architecture of Egyptian castles was based later, represented in the circular tower and the high entrance, which ascends to it by a escalator, and one of the most important defensive architectural elements in this tower is the half balconies Circular above the pedestal that is based on a prominent balcony on cables, extending in the diameter of the tower, to represent the floor of the exposed floor, and it is certain that he was keen to implement ratchets in the floor of the prominent section of the balcony to throw boiling oil and burning liquids at the enemy soldiers if they approached the tower trying to storm it .

As for the gates of the places that were called the gates of the kingdom [11], all these forts had gates built on the same style, and they differed from each other only in the extent of the area of each fortress and the density of its outer walls. The layout of the fort resembled a parallelogram surface. Its outer wall was often divided into vertical blocks of buildings with rectangular inserts reminiscent of the outer wall of King Djoser's group at Saqqara.

In other places, he saw an orderly succession of decades along the wall, and he did not know the secret of erecting these walls in this way. Some have thought that building in this way is more resistant, and this is true, as these spaced blocks, between which the inputs are supported, the external walls, and they represent solid supports for the walls, to strengthen them. This new building is one of the best military fortresses we have preserved now, and its construction dates back to between the Sixth and Tenth Dynasties.

The walkway that stared at the wall was crowned by a small, low parapet, with round balconies, which one could access by porches carefully fixed to the walls [11].

Examples of the fortresses of the early dynastic era

The fortress of Tell al-Sakan is distinguished by the presence of large remains of mud bricks [15-16], and two mud-brick walls, the first wall being rectangular in shape, and in the northwest, part of one of the towers was revealed [16].

As for the fortress of Tal RasBadran, it is built of semi-circular limestone, and the entrance was protected by the construction of a watchtower. This fortress adopts a circular layout, ascending to it by a six-step staircase that leads to the top of the fortress walls [17] (fig. 5).

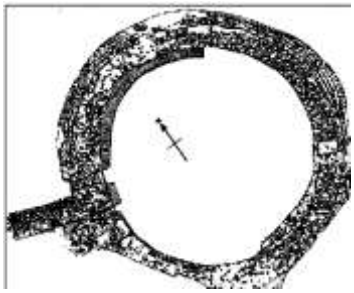

fig. (5) RasBadran hill fortress[17]

The fortress of Wadi al-Maghara is a semi-circle built of stone and protected by stone walls [17]. It is accessed by a stone staircase.

As for the fortress of Nekhen (Hirakonpolis - the red mound) [18-19], it consists of the remains of a double rectangular wall of bricks, and the entrance gate in the western corner protrudes from the northern façade, and was probably protected by two towers on either side of a narrow vestibule, and with the inner wall there are vertical entrances. The two towers represent the facade of the palace [6].

The construction system refers to a fortress building consisting of an area surrounded by a mud-brick wall dating back to the reign of King Kha-Sekhemwi. The area is surrounded by a mud-brick wall.

As for the fortress of Hierakonpolis (the red mound) [20], it consists of two walls, one from the inside of the other, and the outer wall is lower than the inner wall and less than half its thickness. Northeast has a height of 5 meters. The entrance is surrounded by two closely spaced towers that can be well defended.

This model is one of the entrances surrounded by two rectangular towers, each with a guard room, and between the two towers the entrance opening leading into the fortress, one of the unique models of the entrances to the Egyptian forts in this period. It is a characteristic that continued later, especially in the gates of the forts [21] (fig. 6).

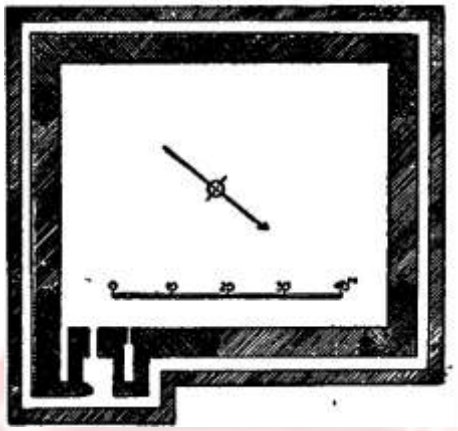

fig. (6) Hierakonpolis fortress [10]

As for the fortress of Shouneh al-Zebib [22] whose outer walls appear as a palace facade, it is the first huge building built with mud bricks [23]. The external facades resembled the facades of royal palaces. It has two entrances, one in the eastern corner and the other in the northern corner. These entrances were surrounded by huge stone counters [24].

The fort has doors similar to rooms, and near this fort there are two castles of its type [24]. The first is about the same size and associated with it, and is believed to be older than the aforementioned. There is a third castle in a more square shape, which is occupied today by a Coptic monastery [26-27].

Because of the striking architectural similarity between Shunet el-Zebiband the pyramid complex of King Djoser of the Third Dynasty, archaeologists and Egyptians often describe the middle fortress as an advanced example of a step-pyramid complex. King Djoser [24], the founder of the Third Dynasty, was inspired by the design of the pyramidal group that he built in the Saqqara region, and where the stepped interior of Shunet el-Zebibis considered a primary pyramid [28] (pls. 1-2-3).

pl. (1) Shunet el-Zebib

pl. (2(Shunet el-Zebib

pl. (3) Shunet el-Zebib

As for the middle fortress, it includes a building built on a square plan, with its outer surface interspersed with vertical entries, one entrance, and three rooms [6].

3. Features of the architectural planning of the pre-dynastic forts:

- Strong forts with adobe walls with towers or balconies. The outer walls are on a square plan with rounded corners and towers on the outer surface, in the area of the Cape.
- Its layout has become a polygonal or rectangular dimension. As it appeared from the pre-dynastic era, on the ramparts of forts and spoils, seven forts were walled with walls of brick, and the top of each fortress was a sacred symbol.
- It was the beginning of the appearance of the drawings of fortified cities on King Narmer's hall, where we find that the fortress, which adopts the circular layout, is surrounded by a wall equipped with defensive towers (fig. 1). In the painting of the bull, a bull appears similar to its counterpart on the Narmer painting, and a city with a layout closer to the square appears, and the wall is equipped with square towers, as in the Narmer painting (fig. 2). Six cities with a more square layout are also shown, also with walls with square towers (fig. 3).

- The walls had pillars or prominent towers to strengthen the walls and allow the defenders a wider area from which they could watch all who approached them and aim their arrows at those who tried to penetrate the enemies.
- The towers were erected with walls inclined to the inside, topped by a roundabout with balconies in the form of a semi-circle. The tower had no entrance at ground level, but was taken up by a ladder from a rope to a window at the top of the fig. (4). And this tower is that it takes a round shape that is looted, with a drop at the top, and the tower has a high entrance to which it can be climbed by a ladder.
- It is certain that the architect was keen to implement ratchets in the floor of the prominent section of the balcony to throw boiling oil and incendiary liquids at the enemy soldiers if they approached the tower trying to storm it.
- The outer wall of the Kingdom's gates was divided into vertical blocks of buildings with rectangular entries between architectural blocks. These spaced blocks, between which the entries are supported, the outer walls and they represent supporting pillars for the walls, to strengthen them. It is reminiscent of the outer wall of the King Zoser group in Saqqara.
- The walkway that stared at the wall at the gates of the kingdom was crowned with a small, low parapet, with rounded balconies, accessed by manholes carefully fixed to the walls as in the tower (fig. 4).
- The fortress of Tal al-Sakan, to the north of Wadi Gaza, south of Gaza City, was distinguished by its mud-brick construction, and the two walls made of mud-brick in a rectangular shape.

The fortress of Tal RasBadran was distinguished as being semi-circular and built of limestone. A watchtower was also built.This fortress adopts a circular plan, ascending to it by a six-step staircase that leads to the top of the fortress walls (fig. 5).

Wadi al-Maghara fortress was distinguished as a semi-circular fortress built of stone and protected by stone walls. It is accessed by a stone staircase.

As for the fortress of Nekhen (Hirakonpolis - the red kom), it is made up of the remains of a double rectangular wall of mud bricks, and it has an entrance gate in the western corner that protrudes from the northern facade, and it was probably protected by two towers on either side of a narrow vestibule, and in the inner wall there are vertical entrances, and the

two towers represent the palace facade. The fortress consists of two walls, one from the inside of the other, and the outer wall is lower than the inner wall and less than half its thickness. The inner wall is characterized by the fact that its outer surface has pillars, and there was a huge gate at the southern end of the northeastern wall with a height of 5 meters. The entrance is surrounded by two closely spaced towers that can be well defended.

This model is one of the entrances surrounded by two rectangular towers, each with a guard room, and between the two towers the entrance opening leading into the fortress. It is one of the unique models of the entrances to the Egyptian forts in this period, a characteristic that continued later, especially in the fortress gates (fig. 6).

As for Shunet el-Zebib, its outer walls are in the form of a palace facade, and it is the first huge building built with mud bricks, and King Djoser, founder of the Third Dynasty, inspired the design of the pyramid group that he built in Saqqara. The external facades resembled the facades of royal palaces. It has two entrances, one in the eastern corner and the other in the northern corner. These entrances were surrounded by huge counters of stone. In the fortress doors like rooms.

Because of the striking architectural similarity between Shunet el-Zebib and the pyramid complex of King Djoser of the Third Dynasty, archaeologists and Egyptians often describe the middle fortress as an advanced example of a step-pyramid complex. where the stepped inner plane of Shunet el-Zebib is an initial pyramid (pl. 1-2-3).

The middle fort includes a building built on a square plan, with its outer surface punctuated by vertical entries, one entrance, and three rooms.

Second: Analytical study of the old state fortresses

Nothing remains of the forts of the old state, except for very few examples, including the fortress of Sneferu [11-29], but the features of this fortress do not appear, which causes the inability to determine the architectural features of the forts in this period, nor the architectural elements in them.

Third: Analytical study of the fortresses of the Middle Kingdom

The tomb of Governor Amenemhat (No. 2) in Beni Hassan from the era of the Middle Kingdom is of paramount importance in defining the architectural characteristics of castles in the era of the Middle Kingdom, where we find a scene showing a castle that is closer to the tower in form, its height is about four meters, and it has one entrance.

The pictures show what represent Egyptian castles with thick walls sloping in the lower part, straight in the upper part, and ending with small balconies, interspersed with narrow partitions (figs. 7-8).

The forts were also characterized by inclined walls in the lower part of them to prevent the attacking enemy forces from climbing the fence. The castles had prominent lanes at the top surrounded by a row of merlons, and they were also prominent, allowing the implementation of flaps to pour oils and incendiary materials on the enemy soldiers if they approached the walls.

fig. (7) Castle with small circular merlons [9]

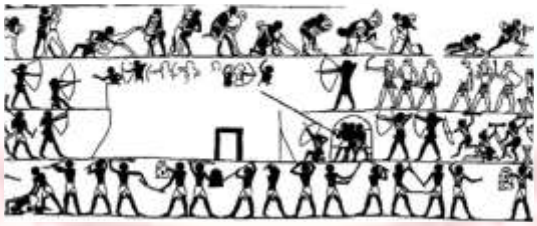

fig. (8) Castle with leaning walls [9]

The forts were built in a circular, square or rectangular shape, and the buildings built on the river bank were surrounded by a dry moat covered with mud bricks, or by a double wall of mud bricks, and there were towers on all sides for use in defense and observation, and there were two walls on both sides of a narrow corridor that leads To the main gate, other buildings were erected inside the fort, such as military barracks and stores that were used

to store weapons and foods. Some forts were double with each other on the two opposite shores of the Nile, such as Semna Fort east of Qima and Fort Semna West. Each fortress represented a small city, and each fortress had a temple and a granary [22-30-31].

Castles in the Middle Kingdom varied into two types, the first being castles that were built in valleys, and the second type being built on mountains, and the castles that were built in valleys were distinguished by the fact that some of them were double walls, while we find that most of the waterfall forts that were built on sloping rocks do not always have a system Double wall erection.

Examples of forts in the Middle Kingdom

The fortress of Tel Judea was a huge mud-brick fortification of (4) meters [32], and it was square and had round corner towers, and in the middle of the eastern side, a long (58.68 meters) slope covered with sloping mud-brick courses ascending Between two mud-brick walls to the top of the building and behind the layer of plaster there is a supporting wall of mud-brick built with terraced courses, perhaps its purpose was mainly to form the outer surface of the fortress, but it was covered with sand when it turned out to be very weak, and after the construction was completed a wall of mud was built on both sides of the course Ascendant.

It was surrounded by a great limestone wall, and the fortification system suitable for archers and arrows consisted of a large quay, covered with a layer of white plaster and inside with mud bricks (fig. 9) [6].

fig. (9) The fortress of Tel Judea [6]

As for Ascot Fort [3], it has an area of (87 x 77 m), the thickness of the outer wall is (3.50 m), and it was equipped with buttresses. The entrance includes the entrance gate, which is in the form of two huge towers, projecting at a right angle from the surrounding wall. To the north of the entrance, there is a temple built of mud bricks (8.0 x 25.0 m), at a right angle to the fortified wall.It is distinguished in its last axial layout by two narrow transverse chambers, in front of which is a square chamber.

As for the eastern fortress in Heliopolis, it is square in shape with rounded corners without any gate [6] (fig. 10).

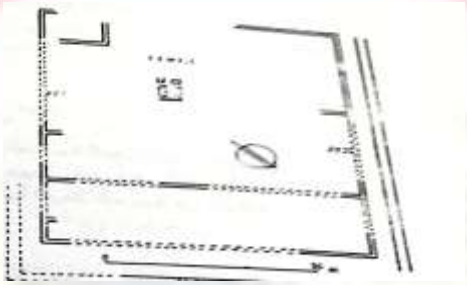

fig. (10) The Eastern Fort in Heliopolis[6]

The fortress built in Wadi al-Natrun consists of a rectangular wall built of mud bricks, surrounded by a trench (3 m) to the east and west [6] (fig. 11).

Also among the forts was the Bohen fortress, which was built of mud bricks and wooden beams. It was fortified with a thick wall of stones, and its buildings were rectangular in bricks [33]. The fortifications included a rectangular stone wall (4.80 m) thick of bricks, nine meters high, pierced by spaced square openings, and topped with barricades made of scorched and rounded mud.

As well as the fortress of Ambos, with its western façade, a huge gate [34] (Fig. 8), and its fortifications included a trench three meters deep [35]. There are towers in the northern and southern corners, each fifteen meters apart.

The castle of Semna [36-37] was a great fortress built with mud in a fortified site, west of the Nile, and on the eastern side of the river opposite Semna, another small castle was erected known as Qima [38]. They were built in the narrowest part of the river, and thus

are considered the most controlled areas in the river [39-40].

The fortress of Samna is surrounded by a deep moat that protects the northeastern corner of the fort. The fort consists of two main buildings, both square in shape, and characterized by the fortifications that consist of two walls ranging in height between fifteen and twenty-five meters, while the thickness at the base ranges between eight and nine meters and reaches at the top four meters These walls were built of mud [22], and in their architectural characteristics they are a continuation of what we found in the drawings of castles in the tombs of Bani Hassan, which are characterized by inclined walls whose thickness expands at the bottom and decreases at the top due to constructional considerations on the one hand due to its high height and to increase its durability and prevent the enemy from climbing it on the other hand.

Several pillars were erected at the summit fortress to strengthen the external parts of the higher fortress [41], and this fort is unique to the square towers without all the forts [42].

The walls were reinforced with pillars of wood placed vertically and at close distances, and it consists of the meeting of the outer surface of the walls with the ground at an angle of approximately (160 degrees), and this is a phenomenon that we notice in all the buildings of the ancient Egyptians, and several pillars were erected at the top of the fort, each two meters thick. To strengthen the external parts in building the higher fortress [22], this fort is unique, without all the Pharaonic fortresses, with the square towers, which are the first Egyptian examples.

The western fortress is surrounded by a trench with an average width of 26 meters. This fort is doubled with the fortress located at the top and its layout is in the form of a letter L. The outer wall is about 10 m high. It had two gates in the north and south, and there was a third gate that reached the river to the east. This feature is double between this fortress and the fortress of Mirgisa as well as the moat. Two temples were built inside the fortress (fig. 12).

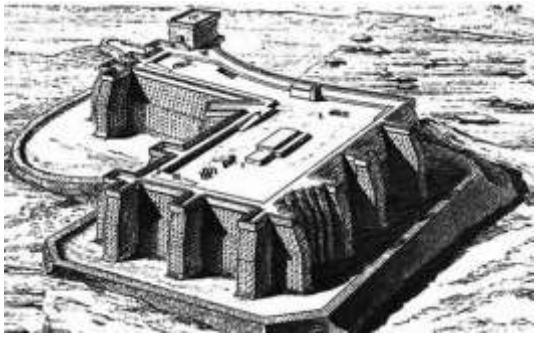

fig. (12) The site of the fortress of Semna

As for the fortress of Qimmah (Simna al-Sharq), it is planned in the form of a trapezoid, with two long protruding walls, and a prominent entrance gate in the southeast, and in the northern corner there is a temple made of mud bricks from the outside and stone from the inside [43].

Fourth: Architectural elements

1. Fences

The most important thing on which the fortifications depended was the fences, which represent an integrated defensive line, and in order for this line to achieve its mission efficiently, it must be easy to provide it with what it needs, and to strengthen some of its points at different distances with towers, and it was necessary to facilitate communication between the soldiers defending it, and to organize the work Between them in the required way, which necessitated that the fence be planned with accurate specifications and measurements that meet these requirements, and these matters were reflected in the architecture and method of constructing the fences, including the various architectural elements it included [45].

Therefore, the military architects meant walls as the first defensive steps that protect the fortifications, and we found patterns of fortified walls that surrounded the trenches and attached them to the corridors and the polygonal, square, circular and rectangular towers. to the interior and digging trenches around it so that the enemy could not mine or excavate it, and the architects meant to reinforce the walls with granite and marble columns to strengthen the foundations [45].

The idea of obstructing the attacking enemy becomes clear through two main barriers represented in the earthen wall and in the trench, which costs the enemy the hardship of landing and ascent and makes it easier for defenders behind the stone drapes, which represent multiple and close basic defensive elements. To the cities as a result of the possibility of climbing the forts represented by the earthen walls, the idea was to establish high forts that are difficult to climb by making them completely vertical at the bottom, and this was achieved by building the wall, which was first built with milk, as evidenced by the effects of the Hyksosian, Hithi and Pharaonic eras, and then a desire to increase its durability to resist the attacks of the attackers He built the wall with stone, and this development achieved greater capabilities in defense and increased the possibility of defense. Choosing a high site for the city originally to achieve a better view, and to enable the attacking enemy to ride, then it was also seen that this fence has an important position in the attack on the enemy and is not limited to the position of passive defense And in order for the fence to achieve this purpose, it was designed to be above it in the form of a corridor or a walkway that enables the defending soldiers to perform their work at a high level and achieves the foot soldiers. Or the stirrups have a better view and a farther and wider goal [45].

The double walls appeared in the fortress of Hierakonpolis (the red kom) from the era of the Pharaonic Second Dynasty and consisted of two walls, one inside the other, and the outer wall was less high than the inner wall and less than half its thickness. It also appeared in Shunet el-Zebib [22] and in the fortress of El Kab of the family (6-10) and the two walls were separated by a courtyard. On the mountains on the double fence system.

Thick walls appeared, the thickness of the outer wall of the fortress of Kab (11.5 m) [23], and the thickness of the fortress of Samna from the bottom (8-9 m) and from the top (4 m) [22], and the thickness of the walls of the fortress of Buhen (4.80 m) [22], and the thickness of the walls of the fortress of Buhen (4.80 m) [22], Sissibi fortress walls (4-5 m) [22].

The building of the walls took into account the inclination of the walls inward, which is a phenomenon that we find in all the buildings of the ancient Egyptians. This appeared from the beginning of the dynasties [10], and the pictures of the tombs of Bani Hassan are castles with thick walls, sloping in the lower part and straight in the upper part [10]. The

walls of the forts were surrounded by trenches, and the northeastern corner of the Sumna fortress surrounded a deep ditch [22], and this is what we find in many examples of ancient forts and through the ages.

The walls were fortified with towers and pillars. Prominent pillars or towers were implemented in the Pharaonic walls to allow the defenders under the walls a wider area that they could monitor everyone who approached him and aim their arrows at those who tried to pry him from the enemies [10]. However, it is very primitive in its architectural style. The two towers built in the northern and southern corner do not control the sides connected to it except from one side.], and found the clear-cut and square-planned towers in the Smna Fort, which is the first clear example of Pharaonic architecture [22].

2. Entrances

The high entrances to which are climbed by stairs appeared in a tower from the era of King Zoser from the beginning of the dynasties and he was ascended to his entrance with a ladder from a rope to a high window at the top [10]. From him, the enemy attacking the fort incurred the heaviest losses in the attempt to set out from the gate of the fortress, especially during darkness, or when he withdrew when his attack failed [45].

3. Machicolations

They are made of stone or wood with holes that protrude from the wall by means of cables and are erected over the walls of forts or at the top of their entrances. Through the holes, soldiers can throw projectiles or pour incendiary materials over the heads of enemies who storm the fortress [45].

4. Inner tower and watchtower

We found in the Cape fortress that it consisted of two square buildings surrounded by walls, one inside the other, and the inner tower is a huge edifice in the middle of the fortress, which is the last refuge of the defenders called (donjion).

The defects of the square tower became clear in the successive siege wars, as its building only allowed a limited number of garrisons, unless the door of the tower allowed the garrison to withdraw when conditions were necessary. Also, one of the technical

disadvantages that accompany both the square tower and the square tower of the fence is that they are exposed from their angles to destruction as well. About that their shape does not allow them to be completely protected by fire [45].

5. Toilets and showers

Toilets and bathrooms were built with military fortifications throughout the ages and were located in walls or towers in separate rooms. As for the delivery of water to the forts, the soldiers could not leave the castle to fetch water. The castle was supplied with water through underground pipes extending from the water source to the tanks inside the fortress. And cisterns were used to conserve water inside the castles [45].

6. Building materials

The building materials used in fortifications varied from mud to stones to bricks. Mud was used in Pharaonic fortresses and supported by columns of wood placed vertically at close distances, as in the fortress of Samna, and bricks were used in the Bohen fortress [45], and since the family (19) the pharaohs used new methods of building materials. They did not confine their castles to bricks, but rather covered them with stones, as they did in the ancient walls of Heliopolis and Memphis [45]. A castle was found with walls made of bricks, mud, limestone and granite.

The pillars were used to strengthen the walls, as in the wall of the fortress of Hierakonpolis (the red mound), and they used the old columns and then planted them in the width of the construction of the walls and incorporated them between the rows of construction so that only their tops appear from the outside in order to take supports to support these walls [46].

Conclusion

- The letter confirmed the spread of strong forts with walls built of mud bricks and with towers or balconies in the pre-dynastic period.
- The letter confirmed that the depiction of castles and fortified cities on the chapels was a reflection of the architectural development of these castles and fortresses, which were surrounded by a thick, rounded or rectangular wall, and had prominent pillars or towers

that allowed defenders under it a wider area from which they could monitor everyone who approached him and aimed their arrows at those who tried to pry it from enemies.

- The towers with inclined walls appeared, topped by arcades with balconies in the form of a semi-circle, and they had high entrances. There were also semi-circular balconies above a pedestal crowning the facade and based on a prominent balcony on columns.
- The architectural study of the Egyptian forts contributed to identifying all the architectural and defensive elements.
- The letter confirmed that the inclination of the walls inward was taken into account in the construction of the walls, which is a phenomenon that we find in all the buildings of the ancient Egyptians. This has appeared since the beginning of the dynasties.

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