

THE IMPACT OF THE DEVELOPMENT OF WEAPONS ON DEFENSIVE BUILDINGS IN THE SULTANATE OF OMAN IN LIGHT OF SELECTED MODELS

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Abstract

This research deals with the impact of the development of the military armament system on the castles and forts of the Sultanate of Oman. With the use of cannons and rifles instead of the throwing weapons that were commonly used in previous eras, the firing holes in the walls and towers took forms commensurate with these weapons, as the openings of the guns became narrow from the inside and widened from the outside, in contrast to the plan of the slots for the arrows, in order to give enough movement to the barrel of the cannon, and the upper openings in the towers that were prepared for the guns have become a small circular shape that allows only movement for the barrel of the gun, and this is what we see evident in many architectural models in the Sultanate of Oman in general for the buildings that accompanied the emergence of these weapons.

As for the reality of the development of the military armament system on the defensive buildings in Oman, it was applied to the selected models, which include: Al-Jalali Castle, Al-Mirani Castle, Jibreen Fort, and Al-Hazm Fort. Making many architectural modifications to the buildings to suit the nature of the conditions and circumstances of the new weapons (such as cannons, rifles, etc.), which requires making some changes in the design and architectural elements to comply with the nature of these weapons.

Keywords: armament system, defensive buildings, Sultanate of Oman, Al-Jalali Castle, Al-Mirani Castle, Jibreen Fort, Al-Hazm Fort.

Introduction

Islam has always urged arming himself with all the life requirements of the Muslim man to make him always at the forefront of peoples, so he urged Islam to seek knowledge and

acquire it to be the first pillar for him through which he can get acquainted with the knowledge of his Creator and all his different creatures around him, as the honorable Sunnah called in many places for the necessity Learning, so I urged the pursuit of knowledge and considered it an obligation for every Muslim, and therefore it can be said that Islam has always urged learning and knowledge. Whoever wants peace, let him prepare for war.”

And if Islam calls us to arm ourselves and take precautions, then this does not mean that Muslims carry arms in order to transgress, but rather it is a protection from the enemy. It is a sound Islamic rule that is suitable for every time and place, and Islam encourages man to work, think and be creative in everything, with the aim of making analogues of the tools used by the enemy and how to confront them, based on the principle of thought that can only be confronted with thought.

Since the establishment of Islam, the Arab weapon of all kinds was considered a symbol of strength and justice, so it was a symbol of the challenge and the will that raised the structure of the Islamic state, and ended long eras known to the world of injustice and oppression, and this weapon was not a means of boasting, arrogance and oppression, but rather a symbol of honor and truth. Islam is for humanity, so the armies of darkness and tyranny were destroyed by it, and the sun of truth and truth shone¹.

Before Islam, the Arabs knew many types of metal weapons, and in the Islamic era, political and military conditions imposed the development and multiplication of weapons and the search for new means, they also used what is called "the litoute", and they also used the drum, which is the axe, shield to prevent the blows and arrows of the enemy. They also used helmets² or iron eggs to protect their heads, and they wore "Al-Jawashin"³ to protect their chests.

The Muslim Arabs also used heavy siege weapons, such as catapults that destroy

¹Khadrawi, Mahmoud Ramadan Abdel Aziz (2010). *Islamic Weapons in Qatar*, Doha: Resnod Modern Press, 2010, p. 7.

²It is a Persian word, and the khawz is used to protect the head. It is attached to the back of the wearer and his ears to protect the neck. Sometimes it is called al-mughfir. For more see: Al-Qatari, Sahar Muhammad. *Military fortifications in Alexandria during the Mamluk era*, master's thesis, Faculty of Arts, Tanta University, 1992, p. 215.

³Guashin: These are machines that are placed on the chest to protect it, and they act as protective masks.

fortresses¹, and the Muslims knew advanced weapons long before the European countries. Throwing at the enemy by hand, "as bombs are thrown at the present time." When they collide with any solid object, they break and foul odors come out of them, entering their nostrils, causing suffocation for the attackers.

The Muslim Arabs in the Maghreb and Andalusia, since the seventh century AH, also discovered and used firearms by mixing oil with gunpowder salt. Ibn Khaldun mentions that the Sultan of Morocco, Jacob al-Marini, when he attacked the city of Saljamas (672 AH / 1272 AD), and set up siege machines on it from catapults and catapults. Where the oil machine² was dressed, and this weapon was used in the Maghreb countries in several battles and many places, and from here it is clear that the Muslim Arabs in the East and the Maghreb reached the use of firearms many times before their appearance in Europe³.

As for some materials related to the use of these weapons and the diversity of their use, this is due first to the availability of raw materials within the borders of the Islamic state, where sometimes some materials were imported from other countries, and we mention that the Ayyubid state was characterized by a warlike character that dominated most aspects of its civilization as it surrounded it. There are many circumstances and factors. The continuation of the Crusades, especially in the Levant, led to the establishment of continuous industries, especially since the Levant enjoys an abundance of raw materials.

This is in addition to the presence of skilled industrialists, as it contains many forests and many mountains that make wood material abundant and abundant, including pine trees, oaks, oaks, beech and many others. It is likely that heavy fighting tools such as tanks, catapults, towers and others were manufactured in the country Levant, because the basis for making these tools was the wood that is abundant in this region, in addition to that, it was not possible to import these tools in their form made from outside the borders of the Ayyubid state, due to their weight, the difficulty of transporting them, and the high price, as for iron, it was severely deficient in the region, and from here, Saladin deliberately

¹Abdel Latif, Mohamed Ahmed (2013). The Egyptian army and fleet in the Islamic era, first edition, Alexandria: Dar Al-Wafaa, p. 30.

²Ibn Khaldun (1886). The Book of Lessons and the Diwan of the Beginner and the News, seven parts, 7, Beirut, p. 188.

³Sweed, Nafez (1999). The manufacture of weapons in the Islamic era and the manufacture and history of Arab swords, Arab Heritage, Syria, pp. 95-96.

imported it from outside the borders of the Ayyubid state¹.

First: The development of the military armament system in the Sultanate of Oman

Since pre-Islamic times and the early Islamic era, the nature of war in Oman was decided in the light of the tribal character of its social organization, as it is similar to other parts of the Arabian Peninsula in which tribesmen used to respond to the call of their elders to bear arms and gather in numbers consistent with the seriousness of the situation and according to their obligations towards their clans and allies. And it was necessary for all able-bodied males to rise to bear arms when necessary, and they had to arrange their own weapons, horses, or camels, and the organization of these military groups clearly reflected the organization of these tribes or clans in alertness and readiness.

The usual weapons at that time were spears, daggers, and shields. As for swords, they were limited to the nobles of the common people, while the crossbow was known, but it was not commonly used, and horses were commonly used while they wore helmets. The twelfth AH (18 AD), along with wick guns, and it is possible that there was an industry of bronze shields in southern Arabia and Oman prior to this period².

If we touched on the reality of the buildings that were built in the pre-Islamic and early Islamic eras, we would find that the defensive buildings took in the essence of their planning a variety of patterns, and used defensive walls, towers, merlons, and manholes to fortify them, and with reference to the city of Khor Ro'er (Sumharam) that was built in the pre-Islamic period. Islam, where the city enjoyed a military fortification consisting of a defensive wall of stone built in a tight manner in addition to two towers; The first is on the southeastern side and the second is on the northern side of the city, in addition to a military fortification that looks like a castle. It was eight feet wide and about 20 feet high³.

¹Ali, Mervat Othman Hassan. Military fortifications and combat tools in the Ayyubid era in Egypt and the Levant, an unpublished master's thesis, Faculty of Archeology, Cairo University, 2002, p. 195.

²Office of the Deputy Prime Minister for Cabinet Affairs (1994). Castles and Forts in Oman, Department of Studies, Sultanate of Oman, pp. 37-38. Nicol, D (1980). Arms industry and trade in the southeast of the Arabian Peninsula in the first Islamic era, a research participant in the harvest of the Omani Studies Symposium, Volume VII, Second Edition, Ministry of National Heritage and Culture, Sultanate of Oman, pp. 231-247.

³Ministry of Information (1995). Oman in History, pp. 97-98. Al-Watan Omani Newspaper, an article under the title Samhuram City was published in the newspaper on March 8, 2015. Nizwa Journal (2000) Dhofar in

The ancient city of Al-Baleed, which dates back to the early Islamic period¹, was also fortified with a defensive fortification located on the western side of the city. This fortification contained, through the images received, semi-circular towers that were erected at equal distances in the walls of the building, of which only its bases remained. The remains of the ruins of this building illustrate It was fortified in accordance with the requirements and circumstances of the city.

The historical Bahla Fort was also surrounded by a defensive wall built with foundations of stones, while its construction was completed with adobe. Its length reached seven miles. It contained war balconies, arrow-shooting arrows, and a number of defensive towers, some square in shape and others semi-circular². The old Rustaq Fort was also established, and it was an oval triangle tower. The shape of its walls is about 13 meters high, then additions continued to it in successive eras until it reached the current shape of the castle³.

During the era of the Nabahana kings and as a result of political stability and economic prosperity, some palaces, mosques and fortresses were built, including the "Black Fort", which is believed to have been built during the reign of "Falah bin Mohsen" who died (1003 AH / 1595 AD). It contains three defensive towers in its corners, while its walls were built of stones and bricks⁴.

Through the previous architectural models that date back to the pre-Islamic era and the early Islamic eras and through to the sixteenth century, we note that some of these buildings relied in their architectural planning on the residential assembly system as large settlement units that include among their contents all the facilities that are suitable for establishing an integrated city system.

This required a defensive fortification that works to protect and defend these facilities, which was found in the city of "Samhuram" as it contained a wall of stones and defensive

Historical Writings and Researchers' Journeys, research published in Nizwa Journal, on October 1, 2000, p. 2.

¹Ministry of Information (1995). Oman in History, p. 98.

²Office of the Deputy Prime Minister (1994). Castles and fortresses, p. 58.

³Badr, Hamza Abdul Aziz (2001) Rustaq and its archaeological monuments in the Islamic era, a research participant in the symposium held by the Literary Forum (Rustaq through History) in the period 23-24 October 2001, third edition, 2013, p.115.

⁴Al-Hajri, Muhammad (2003). Shura in political history, p. 156. Office of the Deputy Prime Minister (1994). Castles and fortresses, p. 63.

towers in the corners, as is the case with Al-Baleed Fort, whose remains show that it contains a number of defensive towers at great distances. equal walls, in addition to the remains of the building indicating that it was of several floors,

In the walls of the city of Bahla, lattice and war balconies were used in the wall at equal distances. Towers were also used and archways were opened for shooting arrows, especially in the old part of it known as the Kasbah. In Rustaq Castle and the Black Fort, archaeological evidence indicates that lattice, walls and towers were used in them to defend them in cases of aggression.

This is in addition to the materials used in the construction of previous buildings, some of which were built with stone blocks placed in a precise manner in the construction of walls and towers, and in others mud bricks were used alone or even side by side with stones. With the type of weapon used at the time, whether it was arrows, spears, or others, this matter changed after the introduction of new types of weapons in Oman when the armament system developed in the late fifteenth century early sixteenth century, which had an impact on building materials, which became entirely all of stone, in addition to changing the plan for building towers, fences, arrow holes, and others.

As a result of the use of gunpowder and the progress made in the field of effective artillery equipment by the ninth and tenth centuries AH (15-16 AD)¹, it became necessary to use new methods of defense, unlike what was the case in previous eras when the heights of walls and towers became less, after it became Modern war machines are capable of demolishing forts and high walls, no matter how high and huge they are, and with the spread of artillery and the mastery of its art in France and Turkey, and the spread of explosive materials in Italy during the Italian Renaissance, where artillery became one of the main weapons that were removed from medieval weapons such as catapults, swords, etc., and became Artillery is a strong foundation in warfare and the main criterion in achieving victory, and this had an impact on the fortifications that were usually established to protect cities².

Where the walls of forts and defensive towers built of mud became unable to bear the artillery shells that were easy for them to penetrate, and it also required the construction of

¹Office of the Deputy Prime Minister (1994). Castles and fortresses, p. 38.

²Othman, Mohamed Abdel Sattar (1988). The Islamic City, National Council for Culture, Arts and Literature, Kuwait: Knowledge World, p. 130.

high walls to control the flat lands¹, but they were no longer able to withstand artillery strikes due to their height and it was necessary to strengthen these walls. With a thick slope of sand, or what is called "the hills", and a keen effort to protect them, their heights were reduced to obscure them as much as possible from the enemy's reach. Planning also tended to deepen the trench in front of them. Thus, the importance of the high forts began to disappear, to become later earth forts hidden as much as possible.

With the use of cannons and rifles instead of the throwing weapons that were commonly used in previous eras, the throwing holes in the walls and towers took forms commensurate with these weapons, as the openings for the guns became narrow from the inside and wide from the outside, in contrast to the plan of the slots for the bolts intended for throwing arrows, with the aim of giving sufficient movement of the barrel of the cannon, and the upper openings in the towers that were prepared for the guns have become a small circular shape that allows movement only for the barrel of the gun², and this is what we see evident in many architectural models in the Sultanate of Oman in general for the buildings that accompanied the appearance of these weapons.

Second: The development of the military armament system on defensive buildings

1. Al-Jalali Castle (Fig. 1, Pl. 1-2)

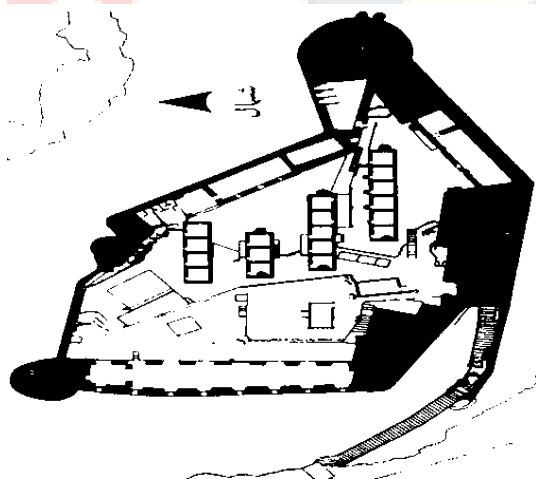


Fig. 1. The architectural plan of Al-Jalali Fort 995 AH / 1587 AD
from: castles and fortresses

The first shape of the castle, which was at the arrival of the Portuguese, which was an

¹Office of the Deputy Prime Minister (1994). Castles and fortresses, p. 38.

²Othman, Muhammad (1988). The Islamic City, p. 131.



observatories or defensive towers on top of the rocky cliff surrounding the old city of Muscat¹, was changed into square-shaped bastions surrounded by a defensive wall defining its architectural structure on top of the rocky mass, sophisticated form of the initial observatories that are believed, that they were defensive towers and artillery was placed as the main weapon on top of the square defensive bastions for protection and defense².

Therefore, these bastions were built and strengthened in a way that allowed pieces of cannon to be placed on top of them, without causing cracks or vibration in their walls, and when the Portuguese were expelled from Muscat around the year (1057 AH / 1650 AD)³, the planning pattern was modified in a manner consistent with the policy of the new state (the Ya'rubi state) aimed at increasing the number of defenders with defensive fortifications to carry out raids outside the borders of these castles⁴.

Paying attention to the quality of construction in a relatively good manner, no matter how great the cost, as a natural result of the state of political stability that this state has been blessed with.

Al-Ya'ariba introduced a set of architectural reforms in the Muscat region, which first included; Building the old walls of Muscat, which were demolished after the expulsion of the Portuguese, in a new way by increasing the thickness and height of the walls and erecting defensive towers with a new architecture that is compatible with the requirements and requirements of new and advanced weapons.

In a way that allows it to use artillery and even to counter its projectiles in cases of attack on it, while the (cannon platform) was added to it, which contained eight openings for cannon muzzles inside it standing on a floor furnished with thick wooden lining, and openings were allocated for the cannons in a way that allows the cannon muzzle to move completely freely without restriction.

¹Omani Ministry of Information (1995). Oman in History, p. 267.

²Badr, Hamza Abdel Aziz (2000). Omani castles and forts and their relationship to the Portuguese styles, research published in the scientific journal of the Arab Archeologists Association, first issue, Cairo, p. 65.

³Al-Khaws, Badr Al-Din Abbas (1984). Studies in the modern and contemporary history of the Arab Gulf, Kuwait: That Al Salasil Publications, p. 65.

⁴Al-Sharouni, Youssef (1990). Omani features, first edition, Riyadh Al Rayes Books and Publishing, p. 189.



Pl. 1. Al-Jalali Castle from the outside



Pl. 2. Al-Jalali Castle from the inside

2. Mirani Castle (Fig. 2, pl. 3)

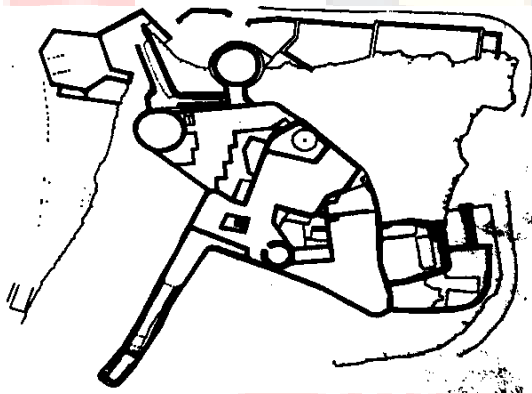


Fig. 2. The architectural plan of Al-Mirani Castle 996 AH 1588 AD
(From: castles and fortresses)

The architectural style of the castle was changed during the time of the Portuguese in a manner consistent with the new modern state, based on the paintings drawn by "De

Resende" in the year (1042 AH / 1635 AD)¹, where the castle consisted of four bastions, two of which were large, the first on the eastern side, on which pieces of cannons were erected and a bell on it. A warning, while a second stronghold is located in the southwestern part, in addition to two other strongholds, one of them in the middle of the previous two and the other in the northwestern side².

These four strongholds were built in Al-Mirani Castle in a way that allows pieces of cannons to be placed on top of them to protect the area surrounding the castle, so that they form a barrier that can be used to reduce Hostile naval attacks by the Ottoman Empire.

After the demise of the Portuguese from Muscat, the Ya'rubi brought about an architectural change in the plan of building the castle, like the case of Al-Jalali Castle, by increasing the area and thickness of the walls of the castle and converting the four bastions on the sides into circular-shaped towers compatible with their techniques in the use of artillery, and in a way that allows this country to launch intensive attacks and raids. tripping through these castles.

Thus, the architecture of these two castles changed from their first character as defensive points only to centers from which the soldiers departed, and they became the main base from which the forces departed and returned to them³.



Pl. 3. Mirani Castle

3. Jibrin Fortress (Fig. 3, Pl. 4-5)

¹Al Qasimi, Sultan bin Mohammed (2009). Description of Muscat Castle and other castles on the coast of the Gulf of Oman, United Arab Emirates, Al-Qasimi Publications: Sharjah Library., p.11.

²Bader, Hamza (2000). Omani castles and fortresses, pg. 66.

³Al-Sharouni, Youssef (1990). Omani features, p. 189.

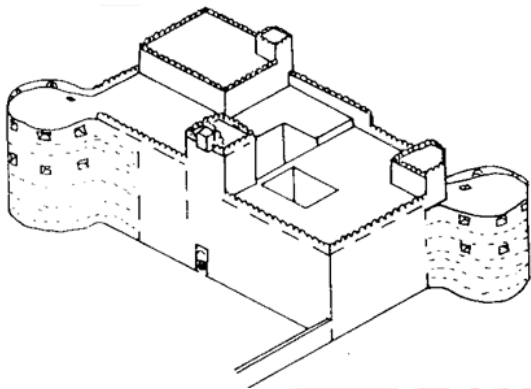


Fig. 3. Jibreen Fort according to the theory of succession of construction stages by Eugenio Calderi

The Ya'ariba¹ made a difference in the plan of their military buildings by introducing artillery as a major part of the plan for building their defensive forts, as a result of the state of economic prosperity and political stability enjoyed by the Ya'ariba state. The beginning of the eighteenth century, with a regular architectural structure known as the style of defensive forts or fortified palaces, as a result of the nature of the state of political stability that Oman enjoyed during the period of the rule of the Ya'arubis, which is known as the era of the independent states², where the need to establish strong defensive fortifications befitting the entity of the new state seeking to establish themselves on the stage of political life, so they built many defensive buildings that provided, in their urban planning, the maximum means of subsistence by providing all the necessary internal facilities for them.

In terms of defense, it was mainly relied on the artillery within the military fortifications, by inserting a number of war cannons inside the towers, to be in the range of confrontation with the enemy in cases of assault on the fort, where it was relied on to have a number of cannons (from four to five Cannons) within the scope of each defensive tower so that one tower works to cover the largest amount of fire within its range of fire, so that one tower with four cannons inside it can cover two facades of the building if the building is square in shape or rectangular in shape, so that two corner towers are stationed at its corners, diagonally opposed (they are on opposite corners and not together on one line of the

¹Al-Afwi, Allama Abu Suleiman Muhammad bin Amer bin Rashid Al-Ma'awali, d. 1190 AH / 1776 AD (2014). Stories and news that took place in Oman, investigation, Saeed bin Muhammad bin Saeed Al Hashemi, second edition, Ministry of National Heritage and Culture, Sultanate of Oman, Muscat., p. 238 .

²Drico, A (1980). Military Historic Buildings in Oman, p. 230.

building walls), so that each defensive tower works to protect two walls of the fort.

Hence, the old ideas were abandoned through the presence of a large number of towers distributed on all the walls and walls of the building at equal distances, and they were replaced with only two towers. Each defensive tower works to protect two of the facades of the building, and we can say that this change came as a result of the use of artillery as a main part Within the scheme of building these fortifications.

This innovation of Omani origin, in turn, began in Jabreen Fort, when two separate architectural blocks were combined with each other, and provided with two pivotal towers in two opposite angles diagonally opposite each other¹, so that each defensive tower works, as we indicated, to protect two walls of the building, which appeared after that in many One of the defensive buildings in the Sultanate.



Pl. 4. Jibreen Fortress



Pl. 5. Jibreen Fortress

4. Al-Hazm Fortress (Fig. 4, Pl. 6)

¹Badr, Hamza Abdel Aziz (1998). Jibrin Fortress, a new style in defensive architecture, research published in the Journal of the Faculty of Archeology, Cairo University, Issue 9: Cairo University Press, pg. 329.

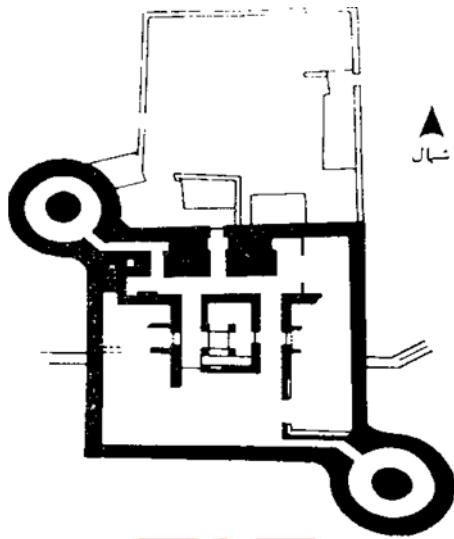


Fig. 4. Architectural plan of Al Hazm Fort
From castles and fortresses

In the forts that used artillery in their towers, it required increasing the thickness of the walls of the towers and strengthening them in a way that allows the tower to resist the recoil of the cannon during the bombing process, as this results in severe recoil immediately after the hit, which causes the demolition and cracking of the walls of the tower if it is not strong enough. And the durability that qualifies it to resist this recoil, in addition to that, the diameter of the towers was increased to accommodate four or five cannons in one tower.

This allows a distance between each cannon and the other to be independent of the one next to it, in addition to providing sufficient distance for each cannon in the way individuals work in terms of unloading and filling ammunition and then firing it.

This was done by increasing the diameters of the axial towers in these buildings until we see that the diameter of the two towers of Jabreen Fort was about 21 meters¹, while the diameters of the two towers of Al-Hazm Fort exceeded 16 meters, so that each tower contained five cannons².

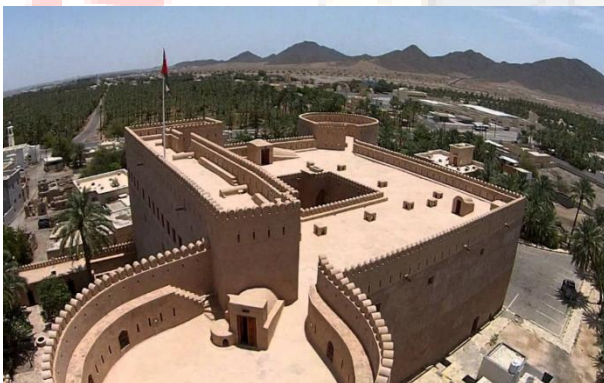
In Al-Falaj Fort, the diameter of the northwest tower was about 8, 64 meters, while the diameter of the southeastern tower was about 8.60 meters, so that each tower contained four cannons to protect two facades in the building sector.

¹Bader, Hamza (1998). Jibrin Fortress, p. 322.

² Office of the Deputy Prime Minister (1994). Castles and fortresses, p. 138.

We notice through the study that most of the buildings that relied on the defensive towers in the building to be used to place a number of cannons in them on the first floor or even for rifle slots in the upper part or even both, have relied to a great extent on the circular shape in the towers and the square shapes were abandoned as much as possible Or even rectangular in construction.

Because it is very simple, the circular shape is the most appropriate shape in the process of distributing fire in a circular manner that is balanced in an amount that allows an equal distance between each cannon and the one that follows it without hindrance, while the square or rectangular shapes in the towers impede this thanks to their bends at right angles, which causes an obstacle In the process of distributing the cannon fire in a way that covers all the facades assigned to protect it, and we see in this that the best circular shape has begun in the historic Nizwa Fort, which was built during the Ya'rubī era and the circular tower was relied upon to a great extent in protection.



Pl. 6. The Fortress of Packages

Conclusions

- The development of the use of weapons caused a major change in the architectural design of all the aforementioned castles and forts under study, as it required making many architectural modifications to the buildings to suit the nature of the circumstances and circumstances of the new weapons (such as cannons, rifles, etc.), which required making some changes in the design and elements Parameters of compatibility with the nature of these weapons.
- Based on the foregoing, when the Omanis used artillery in their buildings and wanted to use them as basic units within the plan of the architecture of defensive buildings, but rather to include them within the plan of the towers themselves internally, unlike the

Portuguese who placed them on top of the roofs of the bastions, this resulted in accurate calculations in the art of building defensive towers from In terms of the thickness of the tower, its diameter and its building material, so that the tower can resist the recoil of the cannon immediately after the bombing, as well as tying the cannon with some ropes so that it does not rush out of the tower after firing and the technique of leaking the gases resulting from it, and therefore resulted in the use of artillery art in defensive buildings in Oman represented in Forts and castles Some changes in the architectural planning and defensive elements of these buildings.

- The introduction of the art of artillery and its use inside the military fortifications resulted in a change in some of the walls of the towers and the walls behind which the cannon stands, as openings were made in the walls of the towers specifically to accommodate the nozzles for firing missiles from the cannons, in addition to providing the necessary freedom as much as possible that gives complete freedom to the soldier controlling the cannon in Identify and hit the target.
- The use of guns in the defense process also led to the creation of small circular openings in the walls of the towers and fences, as the upper openings in the towers that were prepared for the guns took a small circular shape that allowed only the movement of the barrel of the gun, to move easily in order to hit the target.

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