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The Saadian Fortifications of Ahmad Al-Mansur in Morocco

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Abstract
When Ahmad al-Mansur became sultan in 1578, he continued the ongoing policy of eliminating Portuguese enclaves along the coasts of Morocco. He also had to ensure the control of the areas which were more hostile to him within his own kingdom. To achieve this, he carried out the construction of a series of fortifications, among which the most important were those with clear European influences, equipped with pentagonal bastions which included casemates and oreillons. Of these forts, those located in Larache and Fes are considered the work of Portuguese and European captives, although it is important to note that al-Mansur must have become well acquainted with Spanish examples throughout the Mediterranean during the time he spent at the service of the Ottoman Empire. However, some of these square or triangular-plan forts present important shortcomings in their design, which made them very vulnerable to assaults with heavy artillery. This leads us to think that either European models were copied without thoroughly understanding their designs, or that they were built merely as intimidating features without taking into account the possibility of an actual assault. These fortresses have been studied with the use of photogrammetric elevations.

Keywords: Saadians, bastion fortresses, triangular plan, rammed earth.

1. Introduction

When Ahmad al-Mansur (1578-1603) was enthroned as the sultan of Morocco after his victory at the battle of Al-Qasr al-Kebir, he resumed his father's policy of eliminating the Portuguese enclaves along the coasts of the kingdom. He also continued ensuring the control over the areas which posed a threat to him due to the hostile attitude their inhabitants had shown with his coming to power. To achieve this, he began a fortress-building program, among which those of clear European influence must be highlighted, constructions with pentagonal bastions at their corners equipped with casemates and oreillons. The fortifications built to defend the Atlantic port of Larache and one of the two built in the city of Fes are among this group. They are unique because they are the only fortresses of the kind built by Moroccan dynasties, in clear contrast with the more common artillery bastions built during the Saadian and Alauite periods, and some scholars consider that they are the work of European or Portuguese captives. However, we must not forget al-Mansur's own experience, and their more than probable participation in the siege and conquest of La Goulette fort in Tunis by the Turks accompanying his brother Abd al-Malik's at the service of the Ottoman Empire (García Arenal 2009: 28-29).

These forts, of which two follow a square-plan layout and one has a triangular plan, show many similarities with contemporary constructions built mainly by engineers at the service of the Spanish Crown. However they present important shortcomings regarding their design, which made them especially vulnerable to heavy artillery assaults. This leads us to think that either European models were copied without an in-depth knowledge regarding the reasons
behind the design, or that the idea was to build merely intimidating features without taking into consideration the possibility of an actual siege. These fortresses have been studied with the use of photogrammetric surveys.

2. The fortresses of Larache

Larache, a town located on the Atlantic coast, 70 km from the Strait of Gibraltar, has a magnificent natural port on the estuary of the Lucus river, an enclave that has been used since antiquity by Phoenicians, Carthaginians and Romans, who founded the city of Lixus on its shores. After the Portuguese attempt of establishing a military settlement there since 1473, the Wattasids fortified the entrance to the port (Duclos y Campos 2001: 28-31). Following Ahmad al-Mansur’s ascent to the throne and due to the pressure of Philip II, who wanted this town ceded to the Spanish Crown, the Moroccan sultan proceeded to reinforce the city’s defenses, all while he delayed and gave excuses to carry out the hand over. In 1582, he built two fortresses which he armed with more than sixty artillery weapons and three hundred arquebusiers (Mouline 2009: 285, 325). The chronicler al-Ifrani confirms this: "At Manāḥil aṣ-ṣaffā, [al-Fištāli] said that al-Manṣūr conceived buildings and bequeathed monuments... And of the two fortifications that he had built in the district of Larache, one is called ḥiṣn al-fath. Both are absolutely beautiful and impregnable" (Al-Ifrani 1888: 160). The state of preservation of these two fortresses differs, but they continue to be part of the city’s monumental features. As we will see when we describe them, both correspond to designs that are in complete accordance with their times, and are clearly motivated by the intention to serve as intimidating elements in the face of the European powers’ desire to control this port.

After al-Mansur’s death and the civil war that ensued due to his sons’ rivalries, the sultan Muhammad II al-Saykh, who was defeated by his brother Zidán al-Nasir, handed the city over to the Spanish monarch Philip III in exchange for his promise to help him regain the throne.

Larache remained under Spanish control between 1610 and 1689, when it was retaken by the Alauite sultan Malay Ismail. During that period, the city and its fortresses were reinforced. With the establishment of the Protectorate, between 1911 and 1956, the town once again came under Spanish control.

2.1. The Hisn al-Fath (Castle of the Conquest)

This fortress is located controlling the entrance of the port, perhaps on the site of a previous Wattasid fortification. The typology of the current construction makes it difficult to attribute it to that period. It is a building with a main, square-plan core, its sides measure 42 m and it has pentagonal bastions attached to its corners. Despite its current, completely disfigured state as the result of subsequent transformations over the years, it is still possible to propose a rather precise hypothesis of its original form (Fig. 1)

The central section has a perimeter wall that is 3.70 m thick, to which a series of vaulted cells are attached, opening towards the interior courtyard. The directrix of these vaults is perpendicular to the outer wall, forcefully
reinforcing it, since their walls serve as buttresses. Within the building, there is a square parade ground the sides of which measure approximately 27.50 m. Of the aforementioned cells, the two central ones on the northern and western sides, facing the sea and the entrance of the port, bore through the outer wall and reduce its thickness to 1.30 m in order to allow opening two embrasures on each of the fronts. It does not seem like there were any embrasures on the southern side, while on the eastern side a gate was placed, the only opening towards the exterior.

The gate of the fortress faces the town. It is composed of a slightly pointed horseshoe arch with a simple rectangular frame surrounding it that is inlaid with respect to the plane of the wall. It is built of sandstone blocks. At present, plaster and decorative tile remains can be seen, which were doubtlessly added during the period of the Protectorate. Beyond the entrance archway, there is a space covered by a growing vault that extends as a barrel vault towards the sides, where the usual recessed spaces to accommodate the open doors are. Beyond this, there is another arch, and behind it, there is a vertical slit to enable the descent of a portcullis. Next, there is a square-shaped space that permits turning to the right and accessing a vaulted portico that reaches the corner of the courtyard. In this way, the eastern side of the courtyard presents two vaulted cells on its southern section, which have since been destroyed, a blank wall behind which the guards' quarters stood, and two vaulted sections of the angled access way as well as three porticoed arches that led onto the courtyard. That archway that, at present, allows passing directly from the gate to the courtyard is clearly from a more recent period, with its timbrel brick arch. At the northern end of the aforementioned portico, a staircase leads to the roof terrace (a structure that originally must have been a ramp), set within the northern bay.

Of the four bastions that stood at the corners of this structure, the northeastern one has completely disappeared and southwestern one has suffered the partial collapse of its salient angle. All of the bastions have casemates formed by corridors laid out around a large central pillar with a diamond shaped section. They are covered by brick barrel vaults with square-shaped openings that served as ventilation shafts for gunpowder fumes. Shooting chambers with openings to accommodate canons open onto these corridors. There are chambers on either side of the bastions to cover the walls of the castle and the sides of the other bastions they face. These embrasures are protected by cylindrical oreillons. There are smaller chambers on each front side of the bastion, a layout that we consider unfortunate, since they are easily vanquishable; if the embrasure were breached.
not only would the artillery piece be disabled, but the entire corridor of the casemate up until the opposite side would be swept. The inner layout of these bastions is the result of an inadequate design, since all of the protection that the cannons provide to the moats and the curtains of the fortress is lost, given their vulnerability to direct shots to the front of the bastion (Sanchez et al. 2000: 183).

Access into the casemates is carried out through vaulted corridors that begin at the corners of the courtyard and cross small, square-shaped rooms that are set at the corners of the central section of the fortress, except in the northeastern bastion, where this corridor begins at the ramp that leads up to the wall-walk. The casemates are accessed laterally through one of the shooting chambers within the flank of the bastion.

The main part of the building is made of rammed earth and lime structures, which allowed its construction to be carried out, by some accounts (Saldhna 1997: 104), in barely six months. The salient angles of the bastions are made of stone, just like the gate into the fortress. Brick was used for all of the arches and vaults as well as the ends of the walls that separate the small chambers which are attached to the inner side of the wall. The jambs and arches of the embrasures are also made of brick, enabling their identification among the multiple openings that exist throughout the walls nowadays, which, for the most part, resulted from later uses. The walls that make up the curtains and bastions are vertical and, judging by how they were represented in historical graphic documents, it seems like they had prominent scarp. Nothing remains of the parapets and embrasures that stood along the terrace, but they must have been similar to those that appear in some of the other castles that we will outline further on.

During the time of Spanish domination in the seventeenth century, this fortress was known as the Castillo de San Antonio. It must have undergone some refurbishments, such as the inclusion of circular bartizans that were placed on the salient angles of the bastions and to finish the oreillons. These bartizans were represented in a drawing that dates back to 1688 (http://catalogue.bnf.fr/ark:/12148/cb41066951p/description). They were later absorbed into the construction of a second floor when the castle was turned first into a military hospital and later into a civil facility, during the Spanish Protectorate. Seventeenth century plans also show a moat along the sides that do not face the sea, however, at present, these areas are completely covered over. The battery built at the foot of the northwestern bastion may also date back to the seventeenth century, as a way of reinforcing the defenses at the entrance of the estuary; it was joined up with ante walls that were located along the northern and western fronts. Nowadays, the castle is in a deplorable state: the hospital that it accommodated was destroyed and the building has been totally plundered. Since its walls lack any sort of finishing, the rammed earth surfaces show numerous repairs carried out with brick and stone masonry work. Some of the reinforced concrete structures that have been incorporated into the building indicate attempts to re-use the building, without much consideration to the original layout (Figures 2 and 3).

2.1. The Hisn al-Nasr (Castle of Victory)

This fortress was built at the opposite end of the town, to protect it against inland attacks. It has a triangular-shaped plan and bastions at its corners. Of these, only two remain standing; the one that pointed northwards was demolished shortly after 1909, a year when it still existed as can be seen in a picture from the time (http://larache-historia.blogspot.com.es/2009_12_01_archive.html). According to historic plans, it seems to have been a demi-bastion, the original gate into the castle must have stood along its side without protection from a bastion. Besides this, all of the seventeenth-century plans of the fortress that have been documented represent the salient angle of this bastion with a rounded shape. The main section of the fortress follows the layout of
a slightly irregular triangle, its southern side measures 52.90 m, its northern side 57.50 m and northeastern side 62.40 m. The walls that make up its curtains are 4.20 m thick to the northeast and northwest, and 4.90 m thick to the south.

On the inner side of the walls and parallel to them there are a series of 2.20 meter-wide passageways covered by barrel vaults. They are separated from the courtyard by 1.45 meter-thick walls that have different-sized openings and follow a seemingly irregular layout. It is possible to consider that the courtyard could have been built up in origin and occupied by different spaces that would be accessed through this corridor by means of the different doors that we can appreciate nowadays. This hypothesis could be backed by the fact that, in the aforementioned 1688 plan, this castle is represented as if it had a large roof terrace occupying its entire surface area. If we compare this castle to the ones we will analyze further on, this hypothesis is reinforced, as well as the fact that there are ventilations shafts at the two corners that have been preserved of these corridors, something that would have been unnecessary if the entire inner part of the castle had been a courtyard. Within what is now this open space, there is cistern with a staircase leading down into it.

The faces of the two bastions that have been preserved are laid out at a sharper angle than those at the Hisn al-Fath castle. There are rhomboid-shaped casemates within them, with just a single shooting chamber on each side, therefore they do not have the design problems we have seen in the previous example. The casemate is formed by a main space with a greater height to which another three, secondary spaces are attached, formed by two shooting chambers and the part that occupies the salient, which has the same shape as the shooting chambers, but without an embrasure. This space also shows openings in the vaults for the ventilation of gunpowder fumes. Access is carried out through a vaulted passageway that begins in the perimeter corridor and crosses the vertex of the triangle of the main section.
stairway leads to the terrace where the angled passageway that we believe led to the gate begins, although it is difficult to tell if it was part of the original design. The current terrace extends over the bastions, the perimeter walls and the corridors parallel to them, generating ample wall-walks. Cannons could be maneuvered with ease, placing them within a series of embrasures along the upper part of the wall that give it its crenellated aspect. The merlons that separate the embrasures have arrow-slits for light weaponry. On the eastern side of this wall-walk there is a rather large bartizan with a similar shape to the ones we have described at the Hisn al-Fath. It is clearly an addition to the original construction and its function was to accommodate the guards, even though it is not placed on the outer wall, but over the inner wall facing the courtyard. Its construction must be attributed to the period of Spanish domination, when the place was known as the Castillo de Santa María or de Nuestra Señora de Africa.

As occurs at Hisn al-Fath, the structure is made of rammed earth with lime walls, except for the salient angles of the bastions which are built of stone and the arches and vaults that are constructed of brick masonry work. However, unlike it, the outer walls are slightly angled, as occurs in this type of fortification, except for the upper parapet, which is vertical. There is a scarp at the base of these walls, at a lesser angle, which must have been level with a moat that can still be seen along the base of the southwestern bastion and in the aforementioned 1909 photograph. The parts of the fortress that have reached us are in a relatively well-preserved condition, and none of its major features are in a ruinous state.

3. The fortresses of Fes and Taza

The city of Fes was never fond of the Saadians, and especially of Ahmad al-Mansur. It had been the capital of his predecessors, the Wattasids, and it was loyal to the sultans of this dynasty until the very end and during the beginning of Mansur's reign there were many attempts to rebel against him. This explains why he built up to nine fortresses and bastions that not only defended the city, but also controlled it. Seven of them were built to reinforce the defenses of Fes al-Jedid, the palatine city where the sultan and government resided during their stays in the city. Another two were finished in 1582 at either side of Fes al-Bali, on elevations above the city, clearly as instruments of control and expressions of power (Laoukili 2008; Kafas 2016). They are known nowadays as Burj North and Burj South. Of the two, doubtlessly the most interesting is the former, which was conceived following the precepts of the European fortifications of the time. The latter seems to be a hybrid, with a pointed bastion and a massive construction that is typical of traditional Moroccan fortresses, just like the rest of the bastions of Fes al-Jedid.

![Figure 6- Plan and elevations of Burj North in Fes](image)

The Burj North fortress is quite similar to the Hisn al-Fath. It has a square plan, the sides of its central section measure 34 m and it has pentagonal bastions at its four corners. Since it is located on a slope, two of the bastions—those situated on the northern side—are 1.80 m higher than the others. Besides this, along that same side and part of their adjacent faces it has a moat that enhances its defensive capacities despite the
topography. Its inner structure is also quite similar to what we have seen at the castle in Larache. The central section has a 4 meter-thick wall. On each of its sides there are three shooting chambers the frontal walls of which are 1.30 m thick. However, the side walls of these chambers and the vaults above them notably reinforce the frontal walls. These shooting chambers open onto a perimeter corridor that is 2.20 m wide which isolates a central core accommodating three storage rooms and ammunition depot, and the staircase or ramp that leads up to the terrace. Underneath the latter there is another staircase that descends into a cistern. At the four corners of the corridor there are small, ventilation shafts similar to those at the Hisn al-Nasr in Larache.

Figure 7- General view of Burj North in Fes

The gate into the castle is set on its southern side, facing the city. It is similar to the gate at the Hisn al-Fath fortress. It is raised above ground level, which means that a drawbridge or a walkway must have existed at some point. It leads into an angled access way with a portcullis behind the gate and small lateral chambers for the guards. There is a mezzanine above this access way that served the embrasures which defended the gate, as well as the murder holes that defend the access passage way. A staircase next to the door leads up to this mezzanine. The four bastions have the exact same shape and are similar to those at the Hisn al-Fath, sharing the same issue: embrasures along the side which, if breached, would render the casemate useless. Above the aforementioned central section there is a courtyard situated at a lower level from that of the terraces and wall walk; it is surrounded by small rooms to accommodate the garrison.

The Burj South is another kind of fortification, one that marks the difference between what can be considered a more advanced kind of fortress that would, nevertheless, barely be used since, and those that would establish the development of the fortresses built during the Alaouite period. It has a pentagonal plan, which, in truth, is formed by a 32.40 x 28.90 rectangle plus a regular, 28.10 m sided triangle that gives shape to spear point as if it were a bastion, but without flanks. Three rectangular towers are attached to this section, one at the center of the base and the other two on the sides, where the faces of the pseudo-bastion begin. These towers cover the walls and faces of the bastion by means of embrasures set in their sides. Internally, the structure is very similar to what we have described in the other fortresses; it has a corridor that follows the pentagonal layout parallel to the outer walls, with shooting chambers on all of its sides opening onto it. This corridor delimits an inner section that occupies the central part of the fortification, with a ramp with steps to one side and three rectangular rooms set parallel to each other plus another triangular room that must have been the ammunition depot. Above this central section there is an upper floor, with
rooms distributed along both sides of a central corridor. The fortress was accessed through an elevated gate located on the left flank of the tower situated along the side that faces the city. The vertex or salient of the pentagon points south, that is, towards the countryside, a fact that led the embrasures placed to cover its sides to be completely exposed to the artillery fire of assaulting parties. The fortress is topped by a parapet with embrasures. In this case, the salient that serves as a kind of bastion is slightly higher than the rest of the construction and the central section also stands above the rest of the terrace.

![Figure 9 - View of the southern side of the Burj South in Fes](image)

From their external apperance, both of these fortresses were built using rammed earth with lime. The salient angles of the bastions were made of stone while their vaults, arches and other corners were made of brick. Both have been recently restored. In both cases, embrasures have been turned into entrance ways and the original gates have been relegated and remain unused.

![Figure 10- View of the bastion of Taza](image)

To reinforce different corners of Fes al-Jedid's medieval enclosure, al-Mansur built, at least three, large, square-planned bastions in the shape of large, solid, parallelepipeds. Given their layout, they are almost like “albarrana” towers that project beyond the medieval wall in order to cover its long stretches with artillery, although, in practice, they create many blind spots along their fronts. Internally, they are very similar to the structure of the Burj South, with embrasures along their perimeter and shooting chambers separated by walls as well as vaults that are perpendicular to the outer wall.

Perhaps, the most interesting case given the innovations it introduces into the design of, what we may call, these traditional models, is the great bastion built at the southern end of the medina of Taza. This city is located on the road that connects Tlemcen with Fes and the heart of Morocco. Therefore, it held a strategic location in the defense of the kingdom against the Ottomans that controlled Algeria. This bastion, which various authors attribute to al-Mansur even though we have not been able to find any explicit mention of this fact in the chronicles of the time, was placed precisely in the most vulnerable part of the city, that is, facing east. It is a massive, practically cubic volume made of rammed earth, lime and gravel, however, since it is set on a slope, it is staggered to maintain all of its various wall walks at the same height above the ground. It was built as an appendix of the medieval enclosure, joining up with it only at one of its corners by means of a series of walls.

![Figure 10- View of the bastion of Sheij Ahmad at Fes al-Jedid](image)
Therefore, it is almost free standing, like an albarrana tower. It is precisely at the aforementioned corner where the gate is located, which is relatively small given the size of the fortress. Its plan is practically a square, the sides of which measure 26.45m and it has a lower, solid section that is 5 m high, with a 2.5 m scarp and a small, 0.25 m step. Above it, the walls are vertical, and they are topped by a stone torus moulding that is set at two levels, following the lay of the land. The embrasures are tiered, following the line of the ramp that communicates them internally.

4. Conclusions

The defensive architecture built by the Saadian sultan Ahmad al-Mansur followed two, very different precepts (Kafas 2009: 314). On the one hand, he constructed a series of bastions with very simple structures, generally to reinforce enclosures that dated back to the medieval period; their plans were either square or rectangular and prismatic-shaped, they were equipped with embrasures with inner shooting chambers, as well as others at terrace level. These different chambers are delimited by walls set perpendicularly to the outer wall covered by barrel vaults, in such a way, that they conform a comb structure that provides rigidity to the ensemble. In order to access these chambers, a series of central, inner, halls are laid out; sometimes these spaces are courtyards, and others, there are perimeter corridors that leave a central space occupied by ammunition depot and storage areas for other equipment. Since these structures project beyond the enclosure, they serve as bastions that flank the long stretches of walls which still preserve their medieval towers. However, given their geometry, they leave many blind spots that are hard to cover. These solutions recall those used at the Alhambra after the Christian conquest. Along with this model, which can be considered a limited evolution of medieval systems and one that will prevail and evolve producing new models during the following centuries, we must highlight the existence of other fortresses, clearly inspired by examples developed in Europe and exported to America during the sixteenth century.

The pentagonal-plan bastions set on the corners of a fortress and equipped with protected embrasures on their flanks resulted from the evolution of the use of fire arms, beginning with their wide-spread use in the fifteenth century until their full implementation during the second decade of the sixteenth century. During the fifteen hundreds, the confrontation between theoretical models and actual war experience led to raging debates regarding fortification design in many places (Castro y Cobos 2000b), especially in the territories controlled by the Spanish Monarchy on four continents. These experiences produced a constant flow of ideas and improvements in the art of fortification. The three fortresses with bastions built by al-Mansur are clearly of European inspiration, and they were probably designed by a renegade at the service of the sultan. From Antonio de Saldanha's (1997: 104) chronicle we know that he commissioned those at Larache in 1582 to a renegade called Mansorico, of whom we do not know his origins or actual skills. Whether he was the actual designer or if it was someone else at his service who carried these works out, is also unknown to us. However, even though the designer of these castles (given their similarity and their uniqueness in these territories, we think they should be attributed to the same author) doubtlessly knew of other similar fortresses built throughout the Mediterranean, a series of details lead us to think that he was not up-to-date regarding the innovations and experience gathered by the engineers at the service of the Spanish empire.

Therefore, even though there are various parallel cases to the Hisn al-Fath and the Burj North, such as the Castillo de la Fuerza in Havana (Cuba) (Castro y Cobos 2000a: 241 ), to mention an example of the same period and of a similar size, it was inconceivable for the engineers of the Spanish empire, whose designs were subjected to many reports and the opinions of different professionals and of the king himself,
to place embrasures along the faces of the bastions or even on the curtains, especially when, given the layout chosen for the casemates, in the event an embrasure was breached, in practice, the entire defensive system of the bastion was rendered useless. It is also surprising to see the design of a triangular-plan fort at such a late date as 1582. Although this layout was typical of theoretical designs, it was soon ruled it out after it was put into practice. Let us recall that the design carried out along these same lines by Ferramolino for La Goulette in Tunisia (Sanchez et al. 2000: 121) was strongly criticized by Escrivá in his 1538 Apology (Sanchez et al. 2000: 119) and that, in the end, during its construction, it was modified to follow a more habitual layout. Escrivá also criticized placing pointed bastions against the battery of the attacker because the embrasures flanking its faces became completely exposed to enemy fire, as occurs at the Burj South in Fes (Sanchez et al. 2000: 62, fig. A).

The impression that these fortifications give is that their designers did not have much experience regarding assaults by armies provided with heavy artillery and that they merely copied models seen elsewhere, without giving much thought to their usefulness or the risk that the design of their defenses entailed. It is probable that the construction of these fortresses had, in some cases, more of an intimidating or propagandistic goal than actual military effectiveness.

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