

Azemmour, Morocco: Early Sixteenth-century Portuguese Defences

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The Portuguese in the Maghreb

Azemmour is a Moroccan town located on the left bank of the Oum er-Rbia, one of the major rivers of the country, about 3km inland from its mouth. For a short period of its urban history, Azemmour was in Portuguese hands. The Portuguese presence here, which lasted from 1513 to 1541, would irreversibly mark the town's image, dimension and limits. It would also witness one of the most important phases of military architecture experimentation as its defences would play a key role in the early sixteenth-century renovation that all the Portuguese Northern Africa possessions were to undergo. In fact, Azemmour was the last big Portuguese conquest in the Maghreb. (Figure 1)

From Ceuta to Azemmour

Political and religious motivations were among the most important incentives for the Portuguese to venture beyond the Mediterranean. By conquering Morocco, the Portuguese Crown aimed to reaffirm a new dynasty in power (the House of Aviz, 1385-1580), to provide a service to Christianity in a wartime scenario and to control the Portuguese nobles, inciting them to a royal, warring mission while discouraging individual acts. Ultimately, this action would take hold of maritime spaces that were vital for a strategic affirmation over the oceans. Therefore, North Africa represented a privileged location for the Portuguese Crown and its overseas expansion from the beginning of the fifteenth century, enlivened by the crusading ideal and the search for a solution to internal social, political and geo-strategic blockades.

Portuguese intervention in North Africa profoundly marked the first phase of the European presence in this region during the Late Medieval and Early Modern Age. (Figure 2) Notable for the conquest of various coastal positions and the interference in Moroccan political issues, the Portuguese benefitted from a time locally, under the Wattasid Dynasty (1472-1549), when power was extremely fragmented and the political centre located in Fes was weak. In fact, the decisive arrival of this dynasty to power coincided with the collapse of the Merinid Dynasty (1269-1472), not only shaken by Portugal's taking over of Asilah and Tangier in 1471 by king Dom Afonso V, but also the complete domination of the southern shore of the Straits of Gibraltar that the conquests of Ceuta in 1415 and Ksar Seghir in 1458 offered to Lisbon's crown.¹

In the beginning of the sixteenth century, these military actions in Morocco were also part of king Dom Manuel I's imperial project. He was a strong supporter of the ideals of the Crusades and aimed to dethrone Muslim power, fighting it in the western borders (Northern Africa) and the eastern ones (the Red Sea), thus sponsoring huge North African missions. This happened at a time when surviving medieval ideas were being enriched by the influx of new ideas, brought by the widening of geographical and mental horizons in an age of discovery.

Therefore, the first two decades of the sixteenth century were the periods in which the conquest of Morocco was most seriously considered and where it reached its peak. Besides the ownership of several coastal cities in southern Morocco, the Portuguese also converted a considerable number of rural tribes in the regions of Doukkala and Abda. It was clear that only military domain over local populations would allow them to dream of conquering more territory, since Christian groups were always on a smaller scale. Through continuous military actions, the main challenge was to persuade the locals that they would be safer under Portuguese control than under the Wattasid Sultan of Fes, Marrakech's Hintata Emir, or the Saadian Sherif of Suz, yet again showing how the political map of the region was fragmented. This allowed the Portuguese expansion to move inland, making military actions possible across the territory and even in Marrakech. One of the main goals was to prevent this city from accessing its harbours. So, Dom Manuel I's action took place in a more southerly geographical arc than the location of previous conquests shows.

In the late-fifteenth century, Morocco faced an unprecedented situation. The recently emerged Wattasid dynasty already existed at a particularly unstable political moment which led to internal divisions. Plus, Morocco faced a direct threat not only from Portugal, but also from neighbouring Christian kingdoms such as Castile and Aragon.² In the absence of a strong central power and an efficient administrative apparatus, local and regional structures emerged, such as tribes, confederations and cities, especially along the seashore, the favourite setting for Portuguese accomplishments. Among the coastal cities, Safi and Azemmour became commercial warehouses for the Europeans. Goods such as textiles, wheat and horses were particularly sought as they were essential for the trading of gold and slaves in the region between Arguin (nowadays in northern Mauritania) and Guinea, which the Portuguese had been exploring since the second half of the 1400s.³ These conditions enabled Safi and Azemmour to become definitely autonomous from Fes, freely organizing themselves according to their municipal interests.⁴

Political and military instability in the region and the need for protection from external plundering (mostly by Europeans, including the Portuguese) led the Azemmouri authorities to request Portuguese suzerainty. In 1486, the city and the Portuguese signed a suzerainty treaty stating that local inhabitants would have to pay an annual tribute which included an enormous stash of fish (10.000 shad). Furthermore, the Portuguese were exempted from ship taxes, they were authorised to buy horses and were granted a house in the city to be used for a commercial factory. In exchange, the Portuguese crown would provide military protection to the city and allow Azemmouri merchants to

conduct their trade. The Portuguese crown made other similar treaty agreements in the region, such as the one concluded with the city of Safi around 1480, followed by one signed with the city of Massa in 1497. This policy stands in contrast to that of warfare which the Portuguese had been following in the north of the country since the conquest of Ceuta in the beginning of the fifteenth century.

Maghrebian conquests established the core of Portuguese expansion in Morocco, which was understood as an extension of the Christian Reconquest of the Iberian Peninsula. The military campaigns carried out in Morocco obviously received the blessing of the Church, which granted bulls for the Portuguese enterprises. Aside from the assurance of spiritual benefits, the backing of the Church legitimised military action and provided sizeable financial support from ecclesiastical income taxation.⁵ It is important to note that Morocco was the only territory overseas in which the Portuguese monarchs commanded the conquests personally. King Dom Manuel I's project was prominently imbued with 'crusade ideology' and had the support of a series of pontifical diplomas. They were aimed at the submission of the Hintata Emirate of Marrakesh (1501-1525) and the conquest of the Kingdom of Fes.⁶ In southern areas, the strategy of Dom Manuel I aimed for the systematic occupation of a string of fortified places along the Atlantic coast. In some cases, castles were built immediately, such as in *Santa Cruz do Cabo de Guer* (Agadir) in 1505; in *Mogador* (Essaouira) in 1506; probably in *Ben Mirao* (Immourane, between Santa Cruz and the cape itself), in the following year; in Mazagão (El Jadida), in 1514; and in *Aguz* (Souira Qedima), in 1519. There was also an unsuccessful attempt to conquer *S. João de Mamora* (El-Mehdiya), in 1515, as well as the failed plan for the establishment of *Anafé* (Casablanca), back in the late 1460s. These setbacks eventually prevented Portugal from cutting off Fes by sea.

Further south, the cities once controlled by suzerainty treaties were conquered militarily by the Portuguese, Safi in 1508 and Azemmour in 1513, seizing the pre-existing Islamic structures, and then recasting and fortifying them.⁷ In the latter, the treaty had in fact been weakened since 1501, due to irregularities in paying the agreed tribute and some acts of local resistance to the Portuguese presence in the city. The objective was to extend the Portuguese sovereignty from these strongholds towards the hinterland, especially through the vassalage of tribes known as the 'moors of peace' (*mouros de paz*).⁸ Besides paying a tribute, generally in wheat and barley, they were committed to join Portuguese armed actions whenever necessary. The most successful of this sort of protectorate occurred in the Doukkala region.⁹ At its fullest extension, this domain spanned a wide area of poorly defined boundaries between the rivers Oum er-Rbia and Tansfît, reaching the vicinities of Marrakesh inland.

The conquest of Azemmour

Azemmour's location in northern Doukkala was fundamental in reinforcing and guaranteeing the lordship of the 'moors of peace,' whose territory was centred in Safi. Dom Manuel I's 1507 expedition to scout the river mouths at Azemmour, Mamora, Salé and Larache was meant to organise

Portuguese ambition over a series of maritime outposts.¹⁰ In fact, the following year, the first military expedition against Azemmour failed, only to succeed five years later in 1513, on September 3rd.

Then, the city was taken without much resistance.¹¹ Upon the Portuguese approach the inhabitants fled, terrified by the power displayed by the Portuguese forces. Therefore, when the duke of Bragança made his triumphal entrance, he found a deserted city. In the following days, other important towns in Doukkala's countryside were also abandoned by their residents. Thus, the goals of the expedition were achieved, even if without much military engagement.

However, the real events were not reflected correctly in the official rhetoric. As soon as the news of conquest arrived to Portugal, Dom Manuel I proclaimed it as a great military victory.¹² The Portuguese king hastened to spread the news in Europe and in a detailed letter sent to Pope Leo X, the king expressed his conviction that soon it would be possible to conquer all Moroccan territory. In reply, the Holy See promoted grand celebrations in Rome, with fireworks and salvos of artillery.¹³

Meanwhile, in the field, the conquerors of Azemmour faced a more realistic task: the appropriation of a Muslim city and the maintaining of a Portuguese stronghold. Severe measures were about to be undertaken in order to comply with the celebrated dream. Situated on the northern part of the Doukkala, by the border with the Shâwiya region to the north, and about 75 km away from what today is Casablanca, the city had benefited from the economic potential of these two provinces, rich in grain and livestock, plus intense fishing activity, since the twelfth century. Its rôle as a harbour was only undermined after the sixteenth century by the silting of the sea access, coincidentally at the time of Portuguese settlement. At a time when Europe was evolving from late-medieval conceptions to early-modernity, Azemmour presents an example of the understanding of the Portuguese establishment, building processes in Northern Africa and a case study for the reading of the transitional style as far as military architecture is concerned. (Figure 3)

The *atalho* as a settlement operation

After the takeover, the Portuguese found it necessary to re-organise and re-fortify the township. The utmost priority was to address the strengthening of defensible points and limits, adapting some of the pre-existing towers from the Islamo-Arab period and reinforcing the walls with bastions.¹⁴ Clear differences between the propaganda around this military victory and the real human and military resources to keep the place, as mentioned above, indicated that urgent measures needed to be taken. Actually, already in the following year of conquest, by the beginning of 1514, orders were issued to cut back the current number of the military garrison.¹⁵ Therefore, a defensive counterbalance had to be achieved by the efficiency of the built architectonic system, especially a decrease in the urban surface to be held and the length of the perimeter length to be guarded. This operation, called *atalho* (downsizing), was carried out in all Portuguese controlled cities in the Maghreb,¹⁶ where the inherited Islamic cities were reduced in size for better military sustainability.

This technique led to a radical review of the cities, regularising them geometrically, orienting them towards the seaway and reassessing their internal layout.¹⁷

The *atalho* constituted the most important tool of spatial control that the Portuguese applied in the occupied urban assemblages in Northern Africa. This resource implied a reduction of the serviceable area together with a shortening of the fortified circuit by the strategic introduction of one or more new curtain walls in order to narrow down the former Islamic perimeter. It sought the most profitable display of military resources along the walls, due to their scarcity after the recent conquest. As a political consequence, the *atalho* would determine the abandonment and subsequent razing of all the areas excluded in its 'choice', erasing all built structures that could potentially favour an enemy by offering hiding places from which skirmishes and counterattacks could be launched. Hence, a no-man's-land was created, often put down to agriculture and pasturage. The proud rhetorical arguments regarding the conquest of such important Muslim sites had to give way to more pragmatic attitudes of survival in hostile environments.

An *atalho* in Azemmour

This was exactly the procedure undertaken in Azemmour. Being the last important conquest in Morocco, it benefited from the experience acquired from Ceuta to Safi.¹⁸ Immediately after the Portuguese conquest of the city, the establishment of an *atalho* was a serious proposal on the table.¹⁹ The reduction of the urban surface would imply the re-use of several segments of the former walls but also civil and religious buildings, due the shortage of material and human resources.²⁰ This paper wishes to search for that area, looking to dissect the present-day medina of Azemmour, in particular the former Portuguese sector which corresponds nowadays to the Kasbah/Mellah neighbourhood. (Figure 4)

Since the very early days divergent views had been evident among the conquerors about the effective characteristics of this reduction. In any case it would always keep the northern part of the old fortified perimeter, where the former Islamic headquarters must have stood and, above all, the sector closest to the sea, the major communication route to the metropolis. The officer responsible for the area outside the walls of Azemmour (called field captain) and the financial controller advocated the building of a straight wall perpendicular to the river, resulting in a small, protected space, given the likely difficulty in populating the city. The fact that it was almost a non-urbanized area before the Portuguese arrival allowed houses to be erected there in order to accommodate the new European residents. On the other hand, the commander in chief (called town captain) and others advocated a wider loop, including not only that area, but also a part of the medina where some Portuguese had initially established their homes in the immediate aftermath of the conquest.²¹

The debate dragged on for four years, despite the danger that the weak state of defence of the entire occupied city constituted.²² The truth is that, in the meantime, Portuguese residents maintained their homes in the medina, resisting the order to focus on the city's northern area, the *atalho* sector. The

monarch finally opted for the first option in 1517 (the more linear and shorter one), enacting a statute to build the short cut-off wall. The 'Regimento da obra do muro e atalho da cidade dezamor' [Statute of the wall's works and reduction of the city of Azemmour]²³ was approved in Lisbon with such a detailed description that it can still be read in the remaining walled structure of the city. (Figure 5)

The new wall had a linear design that started at the inflection point of the old Islamic wall (where the bastion of *São Cristóvão* [Saint Christopher] would be erected) and ran directly to the former mosque, converted into a church. Here it drew an elbow to the north, marked by the new town gate, running straight again until the wall met the river at an angle, through another bastion. The selected area of this *atalho* corresponded to approximately one third of the original area of the Muslim medina. The materials used also respected the statute. The foundation was built with stone and mud, while most of the curtain wall erected above, including the battlements, was constructed in mud, a curious adoption by the Portuguese of techniques traditionally used in the Maghreb, although these were obviously not strange to them. The curtain wall of the *atalho* was defended by grazing fire from neighbouring military structures and it was reinforced by a battered wall and an external ditch. In fact, the construction of the wall, reinforced by a strong talus, imposed a deep and strategic visual boundary between the protected Portuguese zone and the 'excluded' section of the former medina called *vila velha* [old town].

Summing up, the choice of the area where the Portuguese forces gathered was the extreme north of the ancient Islamic city, closer to the river's mouth, taking advantage of pre-existing segments of walling on the east, north and partially west. The *atalho* dividing wall on the south side drew an imperfect quadrilateral shape which now constitutes the Kasbah/Mellah neighbourhood in present day Azemmour, as mentioned before, roughly one third of the area of the former medina. (Figure 6) Contracts for Azemmour were awarded to the Portuguese brothers and master builders Diogo and Francisco de Arruda, who would have to work closely with the officer responsible for affairs in town.²⁴ The work carried out in the city (1513) and its neighbour *Mazagão* (El Jadida) (1514), 15km to the south, combined to put the brothers Arruda among the most relevant and key master builders of the transitional period as far as military architecture is concerned. In fact, these cutting edge experiences clearly demonstrate the rejection of neuroballistic (tension and torsion) systems and the irreversible embracing of pyroballistic (gunpowder) techniques, a technological revolution.²⁵

Diogo de Arruda had previously had contacts with Francesco di Giorgio Martini and might have worked with him on the fortifications of Naples.²⁶ From the beginning the architectural plans of the Italian master were careful to include new artillery apparatus, assigning it to locations useful for the defence of the fortification. New establishments should take advantage of the natural conditions on site, managing the role of each tower/bastion in a joint action. Actually, this was the practical use of the principles of flanking and enfilading fire, set out in Francesco di Giorgio's *Tratatto di architettura ingegneria e arte militare*.²⁷ The bastions built at Azemmour, custom-made by Diogo and Francisco de Arruda, show a preference for circular shapes. As for their design, it would have been

fundamentally the result of an opinion based on the master builder Arrudas' own experiences in Portugal, most probably with a certain degree of influence from instructions collected in the writings of Giorgio Martini, and by the use of geometrical patterns in the design and building processes.²⁸

The castle: new bastions and gates

Less than three months after the conquest of Azemmour by the Portuguese, some reinforcement works were already being conducted in the defensive system of the city. The existing structures were judged as weak because the pug (loam or clay pulverized and mixed) was considered of low quality. These initial works were pursued for almost a year.²⁹ The debate repeatedly reflected the divergences between those supporting the idea of a simple repair of the pre-existing Islamic fortification (of the retained segments, of course,)³⁰ and those who applauded fresh new construction.³¹ Either way, the focus was on the perimeter of the area defined by the *atalho* reduction, especially its new or former inflections and/or corners. The area rather smaller in wall surface was from then on called *castelo* (castle,) meaning that no separate castle structure was erected as was common in all the other Portuguese possessions in the Maghreb.

The work that was being carried out was vitally needed good quality materials, mainly for erecting the principal structures - the bastions. Immediately after the conquest, there are reports that lime, wood and ceramic materials were being brought from the kingdom, in part from the Algarve, and stone was the only local material to be employed.³² However, since the very early days of the Portuguese presence, it was intended to build ovens to produce an ingredient, lime, important for solid structures. A letter from the Arruda brothers informs us, nevertheless, that the local stone was of too poor a quality for the production of lime and was therefore, only used in secondary works such as that of finishing the top of the walls. They wrote that the foundations of the four strongest bastions were made with lime sent from Portugal.³³

Most certainly, two of the four bastions mentioned by the master builders were those of *São Cristóvão* (Saint Christopher) and *Raio* (Thunderbolt,) but there was also one overlooking the river Oum er-Rbia, on the southeast corner of the castle, and a northern bastion. These last two bastions, due to the lack of original Portuguese names, will be called bastion R and bastion N, respectively. (Figure 7) They were considered to be the most robust elements of the defensive system designed by the Arrudas and thought enough to protect the castle once they were appropriately equipped with large calibre guns in their embrasures.³⁴ In general terms, the *atalho* wall was limited on the countryside edge by the circular bastion of *São Cristóvão* and on its river extremity stood another projecting semicircular bastion (R). In between, the *atalho* wall's intermediate zone was interrupted by a rectangular, less exuberant, bastion called *Vila* (Town.) This was a flanking structure for the remaining segment towards the river. Besides this newly built Portuguese wall, the former Islamic contour received important reinforcement on the north-western corner with the building of the *Raio* bastion, described by the town captain as "*hũa das formosas peças que no mundo pode ser*" [one of the most

beautiful things in the world].³⁵ The northern sector was also fortified through the introduction of another U-shaped bastion with no particular contemporary designation (N). Nevertheless, *São Cristóvão* and *Raio* bastions, both towards the hinterland, were considered sufficient to ensure the city's protection.

***São Cristóvão* bastion**

São Cristóvão bastion presents a cylindrical drum typology with three platforms for embrasures and a distinct topmost feature of balconies for vertical shot.³⁶ Due to its location, articulating the House of the Captains, the pre-existing wall and the new *atalho* curtain, and its peculiar round shape, so different from the other bastioned structures, this bastion is a unique example of Manueline architecture.³⁷ Very solid and compact looking, *São Cristóvão* combines decoration with both atavistic and innovative elements of military strategy. (Figure 8) The cylindrical volume presents an internal 22-palm radius (4.84 m) and an external 31-palm radius (6.84 m.)³⁸ This feature allows this bastion to behave almost as a structure independent of the walls abutting its northern and western sides and, to increase its range of fire due to its projection to the exterior. Nevertheless, it was connected to the surrounding structures, namely the House of the Captains, through access ways that were ultimately intended to link the *chemin de ronde* with the town.

These days, only the upper bastion platform is accessible and allows a better survey to be made. Here, above the two lower levels of gun embrasures, there is a series of quite large bays that introduce the idea of sculpting “huas sacadas como quae todo a rroda”³⁹ [a kind of corbels all around], meaning a wish to furnish the top of the bastion with a sort of machicolated battlement, but not projected far towards the exterior. As there is no description of windows in the letters exchanged with the king, these might be the result of later reconstructions. Therefore, the original drawing would have contained rhythmic corbelled elements all around the bastion in a clearly “retro” vision intended to convey a message rather than really to sustain the notion of ‘drop on the head’ defence.⁴⁰ (Figure 9) The Portuguese castle of Azemmour did not possess a donjon and the location of *São Cristóvão* bastion would have been ideal as a substitute, standing at the crossroads of the *atalho* and the countryside approaching path. However, from 1513 onwards, it would be difficult to defend the concept of a donjon, even though Asilah’s donjon, in northern Morocco, was built only a few years before. There was no point in building high when a technological revolution was taking place. That is why this bastion is not very tall and tries to articulate itself with the adjacent walls, making the Arruda brothers prominent agents of the modernisation of Portuguese military architecture, even if sticking to some plastic values.⁴¹

The simple volume of the *São Cristóvão* bastion houses ranges of embrasures in the two lower floors although those areas are mostly inaccessible today and, therefore, very difficult to study. An archaeological reading of the wall surface indicates the radial distribution of the embrasures, very similar to other bastions in Azemmour, allowing a comfortable area of fire coverage. The embrasures show a subtle design in which the Arruda brothers also looked for aesthetic ends. These bays present

a kind of flat bell-shaped neck, wider in the interior and narrower towards the exterior, which clearly was the right way to design them.⁴² These embrasures would have had roundish vaulting as well,⁴³ and most likely were to be closed by shutters on the inside. *São Cristóvão* still preserves elements that can be identified as fixings for that purpose. (Figure 10)

***Raio* bastion**

Along with *São Cristóvão* bastion, the *Raio* bastion is considered one of the most relevant achievements of Manueline architecture⁴⁴ and it is, indeed, a fundamental structure for the understanding of the transitional style as far as Portuguese military architecture goes. Like the previously described bastion of *São Cristóvão*, it represents the most avant-garde symbol of the use of artillery in the early sixteenth century, allying that capacity with a decorative language in a previously unknown and original combination.⁴⁵ For the *Raio* bastion, there is a detailed description regarding its highly developed fire capacity, able to dominate the whole surrounding city.⁴⁶ (Figure 11) Indeed, this bastion is a very imposing structure. It is the biggest and most remarkable bastion of those that punctuate the fortified Portuguese perimeter. It is formed by simple geometrical forms: two juxtaposed 45-palm (9.9 m) side squares and a semi-circle with the same diameter. The square module generates the height of the bastion and the beginning of a talus with a 41° angle of inclination. Above it, the vertical faces of the bastion show a slight obliqueness, a rather disguised feature intended to add to its strength.⁴⁷ The elevations show multiple solutions: arrow slits on top; lower levels of rectangular gun embrasures,⁴⁸ especially active in the round section of the bastion where they are organized alternately in two platforms of radial fire, thus contributing to complete coverage of the immediate hinterland.

The *Raio* bastion also possesses the same kind of topmost feature as the *São Cristóvão*, i.e., a machicoulated battlement with an exuberant decorative effect. The same comments apply to this solution that actually digs holes in the surface of the bastion rather than projecting corbels or the consoles of a balcony.⁴⁹ They create regular triangular intervals along the parapet. Judging by the idea of Captain Rui Barreto, they would have embraced the whole *chemin de ronde* of the exterior of the bastion, stopping where it forms an angle with the curtain walls.

Other bastions and gates

To the west of *Raio*, the bastion that interrupts the northern curtain wall, which we have called bastion N (see above,) is another imposing yet rather plain structure. (Figure 12) It has a projected U-shaped volume⁵⁰ over the ditch in a classical plan of two juxtaposed geometrical figures: a 19-palm (4.18 m) radius semi-circumference elongates a rectangle. The upper platform that is linked to the *chemin de ronde* seems to be the only remaining firing level. The distribution of slits and crenels is quite regular, alternating loopholes, with very narrow necks for protection of archers,⁵¹ and wider bays. Nevertheless, bastion N could have held other levels of fire through embrasures, as minor details and eroded marks on its sides suggest. This bastion is also particularly important for the understanding of

the role of the talus. Here the angle is 42°, very much closer to the range between 45° and 60° considered advisable to deflect enemy fire.⁵²

Bastion R at the corner of the *atalho* wall and the river wall was erected over a strong talus partially carved in the natural rock scarp. Its lower floor was set at a considerably higher level above the river Oum er-Rbia and, together with an upper floor, contained two firing platforms for gun embrasures. The ruined state of the top of the bastion does not allow a correct interpretation of its layout, although a total of a 42-palm (9.24 m) height for bastion R can be suggested. (Figure 13) Again, the plan is formed by the juxtaposition of a rectangular shape of 33-palm (7.26 m) side length with a 14-palm (3.08 m) radius semi-circle, projected towards the exterior. The gun embrasures would mainly point at the river upstream and along the new *atalho* wall curtain, in a radial distribution commonly used in Azemmour. Although they are partially blocked today, it is possible to reconstruct their original shape. At the base of the bastion, the battered wall was object of a thorough archaeological dig.⁵³ It presents a section formed by two superposed talus-shaped slopes, showing an obvious concern for oblique surfaces and the ricochet effect of possible enemy shooting. (Figure 14)

Besides the four most striking and important bastions mentioned by master builders Diogo and Francisco de Arruda,⁵⁴ there is a fifth one called *Vila* [Town], an intermediate structure that worked as a gate too. It had other designations such as *Sertão* or *Campo* [Field, Countryside], all indicating its connection with the old town and the paths leading to the hinterland. (Figure 15) As a construction, this bastion/gate looks very much like a rectangular tower with the approximate height of the *atalho* wall, in which it creates a serrated edge. Its internal space is designed by two 40-palm (2,2 m) squares, similar in dimension but with different functions. One of them accommodates the circulation between the exterior and interior of the castle, while the other one holds two vaulted gun embrasures that fired parallel to the *atalho* curtain wall that descends to bastion R. (Figure 16) There is another embrasure in a very ruined state, pointing out from the southern side of the bastion. At times, it must have worked jointly with the upper symmetrical bays for the surveillance and protection of this castle entrance. This was the main gate, requiring special attention; the fact that it is organized with an elbow-shaped plan confirms this. In addition, the wooden door was backed by a sliding vertical grid.⁵⁵ However, symbolic meanings were not disregarded. The round-arched passage was complemented by some sort of drapery or flags, held by stone devices that can still be seen next to the upper bays. They would have clearly indicated to the stranger who was in charge inside the walls. If the ditch was finished to its full size in front of the gate, then a drawbridge must have existed during the Portuguese presence.

The last notable structure that can be identified along the castle contour is the *Ribeira* [River] gate. Of smaller dimensions yet describing the same elbow-shaped passage as the *Vila* gate, it opens to the river and to town through round arches. It is still a tunnelled and vaulted structure that recently has lost its imposing location overlooking the river due to the construction of a sidewalk and quay. (Figure 17)

Fire capacity

Summing up, the town's defensive efficiency, in case of attack, depended on the combination of the architectural display with the range of its fire. The castle of Azemmour would act as one, through its embrasures and arrow slits, articulating its architectonic structures with their various levels of fire. The use of gun embrasures in the bastions required special attention regarding their dimensions, so that the targeted area would be co-ordinated with the range possible from the arrow slits. The devices of military architecture put together by the Portuguese succeeded in creating a space that was difficult to approach all around the fortified perimeter.⁵⁶ (Figure 18) Fire could occur not only from bastions. These important points were complemented by different kinds of bays positioned along the wall parapets that linked them. These long linear segments concentrated gun embrasures next to the bastions and loop windows elsewhere for the use of bows and maybe crossbows. Altogether, the system would guarantee a completely inaccessible area at the bottom of the fortress, hence preventing mining and sabotage schemes.

The ditch

To that end also, immediately after the conquest of Azemmour, the digging of a ditch was started. It was mainly carved out of the existing rock, which led to the suspension of the work just four months after its start, due to the difficulty of the task, especially in the northern side.⁵⁷ It was eventually finished two years later.⁵⁸ Today, the remains of the ditch are not nearly as obvious as a barrier as it must have once looked. Being filled up on all sides to a considerable extent also disguises the depth of the battered wall which used to help to form the ditch.

As we have seen before, archaeological work conducted along the *atalho* wall and at the bottom of bastion R has brought to light a section of its design below the original level of the ditch. Co-ordinating this data with comparisons established at the northern wall of Azemmour, as well as at other fortified segments of other Portuguese settlements in Morocco where the same master builders were active, it is possible to make a reconstructive study.⁵⁹ (Figure 19) One can imagine a ditch whose depth is one third of the height of the walls (around 3.3 m). That, incidentally, corresponds to the same measurement obtained in Mourão, Portugal, where Francisco de Arruda had worked a few years earlier.⁶⁰ This measurement corresponds to the section below the counterscarp top and it is an approximate value due to the irregularity of the terrain, particularly close to *Raio* bastion.

A rhetoric message

The work of the younger of the Arruda brothers in the Kingdom of Portugal was known for his involvement with the fortified enclosures of Moura, Mourão and Portel back in 1510,⁶¹ while the elder, Diogo, arrived from Safi where he had coordinated the reform of its defences in 1512.⁶² Even though all these contracts involved new military structural devices, updates and solutions, their later work would prove them sensitive to more expressive Manueline decoration as applied to military architecture. Belém tower in Lisbon and Evoramonte castle are among the best examples for

demonstrating what they were doing.⁶³ And this was to happen in Azemmour too. Beyond technological, urban and military innovations, the Portuguese presence in the city was affirmed through a symbolic rhetoric that would often be more important than the political occupation itself. Oscillating between latent and explicit hostility, the Portuguese monarch desired to show off bastions ornamented with flags bearing the royal arms and the Cross of Christ. This festive vision of billowing flags on the top of the fortified barrier confirmed and emphasised the Portuguese Crown's rights and claims over the conquered territories in North Africa. Besides the machicoulated battlements mentioned above, it is precisely in the bastions of *São Cristóvão* and *Raio* that there are still traces of small sculptures with Manueline decoration, including corded and torso elements (helically twisted, as in with "barley sugar" or Solomonic columns) and half spheres. (Figure 20) Those elements were, in fact, bracings supporting a continuous and regular distribution of flags allusive of the king's arms or of Christianity.⁶⁴ Such display, combined with firing power, would have provoked an effect of fear to potential enemies approaching from the countryside. Cannon shots were fired without a specific target, just to display the gun's power, an action that would send a clear message of a permanent and active state of defence. From a strictly functional point of view, the radial firing platforms alone were enough to control the surrounding field. The combination of the ornamentation at the top and the flag decoration reveals the symbolic message that the Portuguese wished to send outside the walls of Azemmour.⁶⁵ (Figure 21)

How about the inside of the castle? Apparently, a message was also required to be sent to those inside the castle. The word of the king was to be spread by the captain through an ornamented window in the House of the Captains. A typical decorated large bay allowed for the propagation of the crown's orders to the population.⁶⁶ (Figure 22) This building is the most well preserved example of Portuguese civil architecture of the time in Morocco. Its L-shape leans against the southwest corner of the castle, exactly at the angle where the *São Cristóvão* bastion was built. As mentioned above, the two structures formed a designed ensemble in an association that clearly made allusion to a traditional paired palace and donjon of medieval inspiration, but as was also seen before, this was not what actually was done in Azemmour, where pragmatic attitudes prevented the bastion from rising too high. The walls of the House of the Captains were largely bare, allowing for the triumphal display of decoration around the window bays, a typical aesthetic ideal of king Dom Manuel I⁶⁷ formed by curved, counter-curved and trilobate arches, which seem to belong to a definitely non-military programme. This effusiveness was also displayed to the countryside with the opening of ornamented windows to the exterior in a gesture that complements the rhetoric allusions conveyed by the agenda of ornamentation of the *São Cristóvão* and *Raio* bastions. (Figure 23) Nevertheless, the simple civil function of this building can be misleading. The noble house is located along the defensive perimeter of the castle, has thick walls and the bays leading to the exterior could have held guns in case of need. Moreover, these windows might have been protected by closing shutters, revealing a certain mixing of military and civil programmes, between a residence and a watch tower, that can also be detected in contemporary military structures such as the tower of *São Sebastião da Caparica* at the mouth of river Tagus, near Lisbon.⁶⁸ The construction of the House of the Captains was under way

from early 1514,⁶⁹ and the first captain actively promoted it. The erection of other royal controlled buildings was encouraged too, such as cereal and ammunition storage, but little or no evidence has survived to our day.

A town inside the castle

The new town

While in other cities conquered by the Portuguese in Northern Africa there was always a castle separated from the town, in Azemmour the Portuguese occupation is a spatial coincidence between castle and town, in other words, between the military stronghold and the civil sector. The *atalho* outline allowed for the creation of a town within the walled space which accommodated the entire Portuguese population. Therefore, Simão Correia, captain since 1516, devised an intervention for an overall urban plan in Azemmour, organised on several fronts, with special focus on the internal disposition of the new walled area of the castle. The proposal became effective in a letter to king Dom Manuel I, announcing the layout of paved streets for houses with a good threshold and special care devoted to the town's cleansing and public health.⁷⁰ Such a proposal regulated the urban design, displaying a pioneering effort of early modern public health legislation. Moving away from the narrow street system that the Portuguese had observed in their Maghribi conquests, the new urbanism was more attentive to public space, matching the Manueline tendency of the time.⁷¹ Correia's letter to the king insisted on house-building within the castle and house-demolition in the old town. Since the area to become the Portuguese castle appears described as abandoned at the time of conquest, with only some ruined houses,⁷² the re-use of inherited constructions inside the castellated perimeter was probably not a resource, with the exception of the mosque converted into a church. Thus, it seems reasonable to assume that the establishment of the new town was made on almost empty ground or ground with just a few built constraints. If the brothers Arruda were present at the decisions concerning the establishment of the military structures, they certainly must have contributed to the urban experiment, under the patronage of Captain Simão Correia. Given the longer stay of Diogo in the city, his advice would have been decisive.⁷³ Therefore, the team probably developed an urban plan that matched the real aspirations of the Portuguese population of Azemmour.⁷⁴

The Portuguese town was organized in two clusters. (Figure 24) The Captain's House was placed in the upper town; the town's main public open space spread from it to the main church located next to the *Vila* gate. The *rua Direita* (main street) started there and reached the *Ribeira* gate at a lower level. Near the river entrance, another cluster was created that gathered together three mercantile buildings: the commercial factory, the accounting offices and the customs house.⁷⁵ The path set by *rua Direita* led to a certain regularity of parallel and perpendicular streets: a set of elongated city blocks can still be detected in today's street and plot plan. This urban morphology was consolidated during the setting out and expansion of several new establishments and additions to Portuguese cities.⁷⁶ Less than three decades of Portuguese presence in Azemmour were sufficient to instil the rudiments of regulated urbanism, still visible today in the Kasbah/Mellah neighbourhood, the former

Portuguese castle, especially when compared with the contemporary medina, which corresponds to what was the 'old town' under Portuguese rule. (Figure 25)

The old town

In a letter of 1517,⁷⁷ the reference to the old town alludes to another aspect of the downsizing: the demolition of parts of the conquered Islamic city. That part of the city excluded by the dividing wall was considered a threat to the castle, since an attack on the Portuguese stronghold could be launched from the ruined houses and empty streets.⁷⁸ In Azemmour, however, the pre-existing walls were preserved, intended as walls of an eventual farm or even as a large barbican, inside which the cultivation of vineyards, fruit and vegetables could happen.⁷⁹ One of the gates was altered and it began serving as the main exit to the fields outside Azemmour. Named Bab Medina, it is still one of the main accesses to the intramural medina nowadays. (Figure 26) At the geometric centre of the ancient Islamic burgh, the old minaret of the greater mosque was kept, transformed into a lookout post.⁸⁰

However, this plan for the erasing of the suburb was not to be completely executed. By mid-1518, Simão Correia's successor Dom Álvaro Noronha wrote to the king about the destruction of just a few houses next to the external side of the *atalho* wall. Due to this delay, he was inclined towards a more substantial demolition in order to create an embankment along the wall.⁸¹ This proposal would generate a wide lane for a more comfortable circulation of men and weapons. The self-glorification of the captain would go beyond this and he would claim as his the destruction of the old town due to the threat it constituted to the Portuguese castle.⁸² Nevertheless, recently researched documentation questions this assertion. During one of the sieges that Azemmour suffered while in Portuguese hands, in 1530, the Europeans were forced to retreat to the castle compound and lost the old town to the troops of the sherif of Sus,⁸³ which would not have been a void space then. So, one can believe that the plan for the total annihilation of the old town was not fully accomplished. Besides, the walls of the old town were also targeted by the Portuguese rebuilding efforts, towers were repaired, new bastions were erected and curtain walls were reinforced with stone and clay.⁸⁴ Some of these works can still be identified today, namely the very familiar look of some of those structures resembling those of the Portuguese castle; others result from later reconstructions that tried to mimic sixteenth-century Portuguese aesthetics.

The Muslim *continuum* interrupted

The whole *atalho* operation in Azemmour was a short, 28-year old period that interrupted a continuous Islamic presence in the city. The appropriation of former structures by the Portuguese upon their occupation has been mentioned many times in this paper, but it is time now to look more deeply into the level of adaptation that occurred. One of the most important aspects of an analysis of the Portuguese fortifications in Azemmour refers to an understanding of the degree of alteration of the pre-existing structures, not just of the new-built defensive architectural elements.

By 1513, the city had already a long history to tell. While it is only possible to speculate about Azemmour's Roman and even pre-Roman origin, its importance during the Islamic period is historically documented.⁸⁵ In the twelfth century, its commercial connection with the Iberian Peninsula remained active, especially with the port of Cadiz. The city's apogee came during the rule of the Almohad dynasty (1130-1269), a time when the maritime dimension of the Maghreb had increased and ties between the region and the Iberian Peninsula were strengthened. The city provided products like wheat from the Oum er-Rbia valley, and also maintained a connection between the inland cities and other Almohad power centres, such as Rabat and Seville. Thus, Azemmour was a regional capital, with its own governor, at least from the second quarter of the thirteenth century.⁸⁶ While Maghribi naval activities suffered a setback during the Marinid dynasty, reflected in the contraction of some ports, Ibn al-Khathib's description of Azemmour in the mid-fourteenth century gives on the other hand, an image of a wealthy and prosperous city.⁸⁷ Recent archaeological work carried out in Azemmour has led to the identification of remains related both to this description and the implicit contradiction.⁸⁸

On the one hand, curtain walls and rammed-earth towers were detected, describing a mostly circular perimeter clearly beyond the current wall of the medina. (Figure 27) The urban layout of modern Azemmour displays a perfectly visible grain that follows the archaeological evidence. Moreover, this medieval dimension was anchored on a street where the market is still found today and which leads to the sanctuary of city's patron Moulay Bouchaib, a mausoleum of the eleventh/twelfth century. This data indicates that Azemmour had a walled circuit enclosing a larger area. On the other hand, excavations performed next to that wall detected a pottery manufacturing zone, whose artefacts were attributed to the Marinid period.⁸⁹ This discovery helps to date the last stage of occupation to around the beginning of the fifteenth century, approximately one century before the Portuguese occupation. The only contemporary existing visual representation of Azemmour is Braun's engraving in the world atlas *Civitates Orbis Terrarum*.⁹⁰ (Figure 28) It was made after an original early sixteenth century drawing made during a 1507 Portuguese expedition to scout four river mouths, including that of Oum er-Rbia.⁹¹ So, the image is a depiction of the city immediately before the Portuguese military assault. It displays an urban wall interrupted by several towers, surrounding a city with numerous minarets, although clearly exaggerating their number. This drawing and later documentation refer to an urban sprawl similar, if not identical, to Azemmour's current shorter medina, i.e., the same nine hectares.⁹² Summing up, the contraction that the city witnessed, having shrunk from a broader area to a long rectangle along the river shore, must have occurred during the fifteenth-century period of decay. Even though the city the Portuguese were to conquer was of smaller scale, its glorious past, great size and heyday were still referred to in the beginning of the sixteenth century.⁹³

The analysis of the remains of military architecture in Azemmour allows us to stress the superimposition of the Portuguese structures over the Islamic ones, particularly on those segments preserved by the *atalho* operation. Beside the preliminary works carried out in order to reinforce the

former walls, referred to previously, several documents warn of the need for it to be carried out over a longer period, although this paradoxically was not considered to be the best option at the time. This is a sign of how pragmatic the constructional intervention had to be, given the general circumstances of the scarcity of better means. In several segments, the curtain walls are formed by an internal pug wall, most certainly inherited from the Muslim period, to which a stone and mortar wall was juxtaposed, as well as thick talus, during the Portuguese period.⁹⁴ This procedure can still be observed in northern and southern sections where erosion allows the understanding of the building process. (Figure 29) Having this concept of adaptation in mind, it is particularly interesting to see the results of the superimposition of Braun's engraving of Azemmour on to a 3D drawing of the most recent survey of the city. (Figure 30) Even taking into consideration the obvious degree of deformation and fantasy of the early sixteenth-century picture, one can understand and evaluate the level of direct appropriation of what the Portuguese judged as useful for the town's defence. The riverside appears to have evolved from a simple and linear curtain wall to a wall with a serrated plan from which the control of inland river approaches could be administered and guns fired if necessary. The protection of the *Ribeira* gate, and therefore sea communications, was crucial for the Portuguese establishment.⁹⁵

Moreover, this paper sheds new light on the siting of the Portuguese bastions which seem to have been consistently built over the pre-existing military structures foundations. Some of the former Islamic towers were carefully chosen to become part of the Arrudas' master plan. Round edged bastions clearly seem to have evolved by adding to the square shaped towers of the inherited perimeter. It is the new Portuguese portions of these bastions that would provide enfilading fire along the line of defence, thus enhancing the covering of dead ground and allowing the use of artillery. Recent archaeological excavations carried out at the *Raio* bastion prove this theory by exposing a square structure dating back to the Islamic period, with its original pug walls, at least one horseshoe arch and stratigraphic evidence.⁹⁶ (Figure 31) Even the new Portuguese embrasures cut into the former pug, introducing new angles of fire and new design orientations. Hence, one of the most emblematic architectural features of the Portuguese construction work relies on a sensible use of former structures. Signs of uncritical reuse are still present, both in the *atalho* contour and the old town defensive line, the one kept as huge barbican that corresponds nowadays to the medina neighbourhood. On the west side, for example, there are two surviving square towers of the same typology, with similar dimensions and identical ways of articulating themselves with the adjacent walls.⁹⁷ (Figure 32) These characteristics show that the Portuguese strategy accepted their pre-existence and gave them a new military logic.

Epilogue

Azemmour is both a cause and a product of the Moroccan project. On the one hand, the territory in which the city played a fundamental role slowly became a fundamental part of an overseas expansion that would open Portugal to modernity. On the other hand, Azemmour was also part of a new

paradigm, as far as its architectural and urban dimensions are concerned. Military architecture built by the Portuguese after the 1513 conquest clearly shows experimental attempts to adapt itself to the new gunpowder innovations, even if adapting former structures. Following the contemporary avant-garde design of fortresses in Europe, the Moroccan project functioned as a laboratory for new construction. Simultaneously, urbanistic ideas joined rational and Cartesian geometries in its street display, clearly clashing with Muslim urban concepts. Nevertheless, Azemmour's city walls, which ultimately correspond to a new frontier of faith and power, still involved a clearly medieval show towards the hinterland. Non-functional and decorative crowning to the tops of the bastions, adorned with hoisted flags, testify to a chivalric imagery that the Portuguese wanted to convey to the exterior. Inside the walls, the Portuguese nobility was also in the service of this image of the city. The Moroccan project also functioned as a sort of military school for youngsters training to be members of the nobility. Azemmour worked as a perfect base from which to carry out looting of surrounding Muslim communities in the countryside. Raids over neighbouring villages enabled young nobles to acquire fame and profit. Indeed, this kind of practice offered a much more advantageous economical income than the traditional production and trading activities of the city.

However, the Portuguese leadership of Azemmour was short-lived, dismantled by the middle of the sixteenth century as the Moroccan political scene became unified. The takeover by the sheriff of Sus of *Santa Cruz do Cabo de Guer* in 1541 irreversibly shook the Portuguese programme for Northern Africa. Drastic decisions were taken then that involved the voluntary abandonment of three towns and a city. Azemmour was among them and the withdrawal would have to be immediate. The evacuation of this town was a dramatic event because three decades of occupation had rooted some families, who had invested all their possessions on this enterprise. The evacuation was concluded between September and October of 1541. The Jewish community was split between Moroccan towns, especially Tangier; Christian women and children were transferred to Portugal, leaving the men in the defence of neighbouring castle of *Mazagão*, which would become one of the strategic investments of the Portuguese crown which did not abdicate completely from Morocco.⁹⁸

As we have seen, the medina would recover its pre-Portuguese configuration and the present-day urban assemblage continue its expansion towards the countryside. In this sense, Azemmour is an exceptional case unlike the rest of Portuguese *atalho* operations that irreversibly changed the image of other conquered cities. Partly ruined, partly renewed, partly disguised by more than four and half centuries of urban transformation, the Azemmouri military architecture complex figures among the most important for the comprehension of the transitional style between the low middle-Ages and Modernity, at a time when an overseas empire put Portugal at the centre of scientific experimentation and diffusion.

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Notes

- ¹. Among the various motives that led Dom João I, the first monarch of the Avis dynasty, to conquer Ceuta, in 1415, outstanding is the affirmation and consecration of his lineage, branded by the stigma of illegitimacy. He would aspire to play an international role, in such a strategic sensitive area as the Strait of Gibraltar. The decision to keep the city under Portuguese dominion, in spite of the heavy financial and human costs he sustained, is understood as a way to fight the country's isolation, compensating for Castile's continental supremacy. (Farinha 1990)
- ². Rosenberger 2008, 27.
- ³. Ricard 1955, 81-114.
- ⁴. Benhima 2008.
- ⁵. De Witte 1953-58, XLVIII, 683-718, XLIX, 438-461, LI 413-453 and 809-835 and LIII 5-46 and 403-471; Rosenberger 1987, 59-83.
- ⁶. Thomaz 1994, 65-68; Costa 2005, 166-169.
- ⁷. About Portuguese fortification in North Africa, see Moreira, 1989; Correia, 2008.
- ⁸. Ricard 1981, 344.
- ⁹. This controversial character has raised a lot of interest in historiography. Besides seminal works such as Lopes 1897, see also Rosenberger 1993, 21-59; Racine 2001, 32, 67-90; Cruz 2002, vol. III, 39-63.
- ¹⁰. Góis 1949-1955, II, 91.
- ¹¹. Cruz 2009, 45-54.
- ¹². Ibid. The echoes of an atmosphere of patriotic and religious exaltation were noted in the *Cancioneiro Geral*, of Garcia de Resende, a printed collection of poems in 1516, three years after the capture of Azammūr. Among others, the ballads of Luis Henriques to the duke of Bragança link the conquest of the Moroccan city to the future triumphal entrance of his sovereign in the Holy Land, in a clear conformity with the Manueline imperial ideology.
- ¹³. Ibid; Matos 1960, 214-22.
- ¹⁴. Ricard 1940, vol. III, 108. Although called 'bastions' in this paper, a direct translation of Portuguese '*baluartes*', they were mostly gun towers rather than modern and fully artillery structures. See Elb 2000, 371.
- ¹⁵. Published by Cénival 1934, 489-501.
- ¹⁶. With the exception of Ksar Seghir where the inherited area was already rather small.
- ¹⁷. Correia 2008, 353-57.
- ¹⁸. Ibid.
- ¹⁹. *Letter from king Dom Manuel I to Dom João Meneses*, 5 January 1514, published by Cénival 1934, 478.
- ²⁰. Correia 2008, 294-303.
- ²¹. Letters from Nuno Gato (5 Decembre 1513), Dom João de Meneses (1/9 decembre 1513), and again from Nuno Gato (18 Decembre 1513) to king Dom Manuel I, published by Cénival 1934, 455, 463 and 468, respectively.
- ²². The fear is expressed in a letter written by nobles, knights and residents in Azemmour to king Dom Manuel I (30 Septembre 1515), published by Cénival 1934, 762.
- ²³. Published by Cruz 1970, II, 147-48.
- ²⁴. Sousa Viterbo 1988, Vol.1, 46-65.
- ²⁵. Hale 1979, 12.
- ²⁶. Moreira 1989, 106-07.
- ²⁷. Martini 1967.
- ²⁸. Sousa 2008, 95; CID 2007, 284-85.
- ²⁹. *Letters from Nuno Gato and Dom João de Meneses to king Dom Manuel I*, 5 and 01-09 Decembre 1513, published by Cénival 1934, 455 and 463.
- ³⁰. Letters from Nuno Gato (18 Decembre 1513), Vasco de Pina (30 March 1513) and from Francisco and Diogo de Arruda (31 March 1513) to king Dom Manuel I, published by Cénival 1934, 468, 522-23 and 526-27, respectively.
- ³¹. *Letter from Nuno Gato to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 532.
- ³². Due to its scarcity too, some stone shipping was sometimes sent from Portugal. *Letter from Francisco and Diogo de Arruda to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 526 and 528. Also see the missive from Nuno Gato to the monarch, 31 March 1514, published by Cénival 1934: 532.
- ³³. "o mais e mais forte, que são os alicerces de quatro baluartes, fazemos com cal que de Portugal veio" [the stronger structures are the foundations of four bastions, which are built with lime that came from Portugal]. *Letter from Francisco and Diogo de Arruda to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 525-529.
- ³⁴. *Letter from Rui Barreto to king Dom Manuel I*, 21 February 1514, published by Cénival 1934, 489-501.
- ³⁵. Ibid.
- ³⁶. *Letter from Nuno Gato to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 530-533.
- ³⁷. Moreira 1989, 132.
- ³⁸. In this paper, we translate as 'palm' the ancient Portuguese measure of '*palmo*' (22 centimetres) which corresponded to the width of a man's spread fingers.
- ³⁹. *Letter from Rui Barreto to king Dom Manuel I*, 21 February 1514, published by Cénival 1934, 489-501.
- ⁴⁰. Hale, 1979, 12.
- ⁴¹. Moreira 1989, 132.
- ⁴². Nova História 2003, 362.
- ⁴³. Cid 2007, 225.
- ⁴⁴. Moreira 1989, 130-31.
- ⁴⁵. Lopes 2009, 85 and 125.
- ⁴⁶. "(...) que sujeita toda a cidade (...)" [dominating the entire city]; "(...) uma vista que não possa ninguém chegar ao pé do baluarte (...)" [a view that prevents anyone from getting closer to the bastion]. *Letter from Nuno Gato to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 531.

- ⁴⁷ The use of this strategy can also be observed in several Francesco di Giorgio Martini's drawings (Martini 1967; Nazzaro; Villa 2004).
- ⁴⁸ This type of embrasure elevation, "de vanguarda do ponto de vista militar" [a vanguard work for military purposes] can also be spotted in other Portuguese fortresses such as Portel and Belém Tower. (Moreira 1989, 135).
- ⁴⁹ One can observe one previous application of this feature in Porto de Mós castle, in a way that may have inspired the Arruda brothers but it has not the exact same conformation. The bottom of Belém Tower's échaugettes has the same kind of miniature corbels. (Moreira 1989, 131) In that sense, the drawings by Francesco di Giorgio Martini draw a topping for fortifications that is similar at Porto de Mós. It is not a machicolated battlement, but an evolution of this feature with a similar function. However, they merge with the body of the bastion. (Martini 1967; Nazzaro; Villa 2004), as observed in the 'retardataire' tower at Mondavio for example. These bays existed in the original tower of *Mazagão* castle (*Torre da Boreja*) too, also a work by the Arruda brothers built in 1514 (Correia 2008, 363).
- [Editorial note:] See the Castle Studies Group Journal no 24, 2010-11, p.240, for a suggestion that the lack of decent building stone influenced this design.
- ⁵⁰ Correia 2008, 363.
- ⁵¹ This kind of deep chamfer allowed the shooter to be protected while enabling him to get closer to the outer face of the wall. This configuration was an evolution from arrow slits to gun loops and, eventually, leading to more developed splayed necks and the full design of a gun embrasure. (Cid 2007, 205).
- ⁵² Mora-Figueroa 2001, 651.
- ⁵³ This study belonged to a broader research project FCT PTDC/HAH/71027/2006 called "Portugal e o Sul de Marrocos – Contactos e Confrontos, séculos XV-XVIII" [Portugal and southern Morocco: Contacts and Clashes between the 15th and 18th centuries, whose main researcher is Maria Augusta Lima Cruz. It also followed the archaeological mission (coordinated by André Teixeira and Azzeddine Karra) and the architectural study on the Portuguese-Moroccan heritage in the region Doukkala-Abda, established by a protocol established between the University of Minho, CHAM of the Nova University at Lisbon and the *Direction du Patrimoine Culturel*, Morocco, in 2008.
- ⁵⁴ Letter from Francisco and Diogo de Arruda to king Dom Manuel I, 31 March 1514, published by Cénival 1934, 525-529.
- ⁵⁵ This kind of door display was well known by the Portuguese who had already developed this sort of knowledge during the Christian Reconquest. The space between the grid lock and the wooden door could be used to trap enemies. (Gil 1992, 229).
- ⁵⁶ Lopes 2009, 167-173.
- ⁵⁷ *Letters from Nuno Gato* (5 December 1513), *Francisco and Diogo de Arruda* (31 March 1514) and again *Nuno Gato* (31 March 1514) to king Dom Manuel I, published by Cénival 1934, 455, 527 and 531, respectively.
- ⁵⁸ The *Letter from Vicente Rodrigues Evangelho to king Dom João III*, 10 April 1530, published by Cénival et. al. 1946, 511, refers to the existence of a ditch next to House of the Captains.
- ⁵⁹ Lopes 2009, 131.
- ⁶⁰ Monteiro 1999, 93.
- ⁶¹ Sousa Viterbo 1988, I, 55-59.
- ⁶² *Livro desbaratado do almoxarife de Safim Lourenço Mendes em que se carregou a despeza que fez com as obras da d.^a cid. no anno de 1512* [Book by Safi's ware keeper Lourenço Marques regarding the city works in 1512] - ANTT, Núcleo Antigo, nº 768, fls. 55-59v.
- ⁶³ Moreira 1989, 130-131.
- ⁶⁴ *Ibid.*, 132.
- ⁶⁵ Hale 1979, 38.
- ⁶⁶ Correia 2008, 309.
- ⁶⁷ Moreira 1989, 130.
- ⁶⁸ Cid 2007, 222.
- ⁶⁹ *Letter from Rui Barreto to king Dom Manuel I*, 1 April 1514, published by Cénival 1934, 538.
- ⁷⁰ *Idem.*
- ⁷¹ Correia 2008, 305-306.
- ⁷² *Letter from Rui Barreto to king Manuel I*, 21 February 1514, published by Cénival 1934, 496-97.
- ⁷³ "Pagamentos à gente de ordenança e aos trabalhadores das obras da cidade e do castelo" [Payments to the workers of the city and castle], 1514/1516 - ANTT, Núcleo Antigo, cód. 765, fls. 107, 117, 125v, 134, 154, 175, 197, 207).
- ⁷⁴ *Letter from Rui Barreto to king Manuel I*, 21 February 1514, published by Cénival 1934, 496-97.
- ⁷⁵ *Letter from Simão Correia to king Dom Manuel I*, 3 October 1516, published by Cénival, P. et al. 1939, 37-40.
- ⁷⁶ See Trindade 2008.
- ⁷⁷ *Letter from Simão Correia to king Dom Manuel I*, 3 October 1516, published by Cénival, P. et al. 1939, 37-40.
- ⁷⁸ See *letters from governor Dom Álvaro de Noronha to king Dom Manuel I*, 18 April and 18 May 1520, published by Cénival et. al., 273-74 and 240-42, respectively.
- ⁷⁹ The old town should be [destroyed and erased; vineyards, fruit orchards and vegetable gardens were to be installed, and all gates should be blocked] "(...) derribada e chã e feito nela muitas vinhas e pomares e hortas e (...) da parte de dentro todas e as portas cerradas (...)". *Letter from Simão Correia to king Dom Manuel I*, 3 October 1516, published by Cénival, P. et al. 1939, 37-40.
- ⁸⁰ *Letter from Simão Correia to king Dom Manuel I*, 3 October 1516, published by Cénival, P. et al. 1939, 37-40.
- ⁸¹ "(...) uma rua larga ao longo do muro (...)" [a wide street along the wall]. *Letter from Simão Correia to king Dom Manuel I*, 3 October 1516, published by Cénival, P. et al. 1939, 37-40.
- ⁸² *Letter from Dom Álvaro de Noronha to king Dom Manuel I*, 18 May 1518, published by Cénival et al. 1939, 240-41.
- ⁸³ "(...) alcáceres que fycaram na vyla velha, que avya muitos (...)", [there were many local chiefs that remained in the old town]. *Letter from Vicente Rodrigues Evangelho to Dom Manuel I*, 10 April 1530, published by Cénival et al. 1946, 511.
- ⁸⁴ *Letter from Francisco and Diogo de Arruda to king Dom Manuel I*, 31 March 1514, published by Cénival 1934, 527-28. In a letter to the king, sent from Azemmour on 16 June 1514, the building of the wall was not considered too fragile to protect the city. Mentioned by Cruz 1967, 52.
- ⁸⁵ Villes et Tribus du Maroc 1932, 24-28.
- ⁸⁶ Picard 1997a, 119-20, 156-57 and 172-73; Picard 1997b, 75-96.
- ⁸⁷ 'It rules all from above. Its minarets and its towers watch the river, which ensures its wealth, as well as the neighbouring sea. Its stores are filled with everything to feed everyone. Its stocks are full with every sorts of meat. People are rich and clothe themselves from their labour. Houses are elegant. And shad is a fish like no other' (Brahim, B 2008, 24).
- ⁸⁸ See note 53.

⁸⁹ Karra; Teixeira 2011, 177-90.

⁹⁰ Braun; Hogenberg; Novellanus 1572.

⁹¹ Góis 1946, vol. II, 91.

⁹² Correia 2008, 292-294.

⁹³ Fernandes 1938, 28.

⁹⁴ In a letter to the king sent from Azemmour on 18 April 1520, Dom Álvaro de Noronha recorded that "(...) o muro deste castelo e por não ser reparado a lugares, porque me, Senhor, parece que foi, Senhor, aquafelado a lugares que ficava uma obra debaixo (...), caiu um pedaço. (...)" [because the castle walls were built over former structures and were not being properly maintained, a part of it has collapsed]. (Published by Cénival et al. 1939, 274).

⁹⁵ Lopes 2009, 91.

⁹⁶ This observation results from the archaeological work carried out by the research project mentioned above; see note 53.

⁹⁷ Lopes 2009, 147-149.

⁹⁸ [Editorial note:] See John Bury: *Benedetto de Ravenna* in FORT 22 for the later history of Mazagão/El Jadida.

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