Filipe González
(edited by)

Cultural Migrations
CONFERENCE PROCEEDINGS

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Preface

Filipe González

Lisbon School of Architecture.

The Mediterranean Sea, the *mare nostrum* of the Romans, has always been more than a body of water surrounded by land. It has been a bridge between civilizations, a cradle of cultures that met, mingled, and evolved on its shores. From this pluralistic melting pot, peoples once set sail towards the unknown – towards the Iberian *Finisterra*, where the known world ended and mystery began.

It was this Mediterranean heritage, brought by Phoenicians, Greeks, Romans, Moors, and many others, that shaped Lusitania and, subsequently, Portugal, as a profoundly transcultural nation. Lisbon, the *Olisipo* of Ulysses, is itself a testament to this encounter of cultures which, through a spirit of tolerance, transformed diversity into unity.

It is in this context that we once again host the RIPAM Meeting – this time in Lisbon, the very *Finisterra* that once represented the edge of the known world and became a starting point for new worlds. A symbolically perfect place to reflect on Mediterranean architectural heritage and its migrations, the central theme of this ninth edition.

Held at the Lisbon School of Architecture, University of Lisbon, RIPAM9 held particular significance as it was the first event of its kind to be held in a hybrid format (in-person and online) following the most critical period of the COVID-19 pandemic. Initially scheduled for November 2021, the meeting successfully took place on March 23-25, 2022, thanks to the commitment of all involved.

The opening session was honoured by the presence of Professor Carlos Dias Coelho, President of the School, His Excellency Othmane Bahnini, Ambassador of the Kingdom of Morocco to Portugal, the Secretary-General of RIPAM, Professor Mounsif Ibnoussina, and the Conference Chairman,

Professor Filipe González, who welcomed both in-person and remote participants.

In addition to the technical sessions, the programme included cultural visits to Lisbon's city centre and the Mafra National Palace, as well as a gala dinner at Casa do Alentejo, moments that fostered networking and dialogue among experts from various countries.

In an era of discussing the colonisation of Mars, it is important to recall that it was from this small territory by the sea, with its Mediterranean matrix, that voyages departed to rediscover the world. It is this same matrix that guides us today in the study and preservation of a common heritage that continues to migrate and influence cultures.

This edition of RIPAM once again confirmed that intercultural and intergenerational dialogue builds the necessary bridges for a common understanding of the preservation of our shared architectural heritage.

Committees and Acknowledgements

A special thanks to all members of the RIPAM Steering Committee, representatives of the nine editions held to date, whose experience and dedication have been fundamental to the continuity of this network.

We also recognise the valuable contribution of the members of the Scientific Committee, who ensured the academic quality of the presented papers.

Finally, a word of gratitude to the Lisbon School of Architecture, University of Lisbon, the Embassy of the Kingdom of Morocco in Portugal, and the Directorate-General for Cultural Heritage – Mafra National Palace for their indispensable support in making RIPAM9 a reality.

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Ideology in representation: the traditional Algarve chimney and the Portuguese New State

Santos Lydia

Abstract   Stretching from 1933 to 1974, the Portuguese New State had a clear ideology that rippled throughout every aspect of daily life. The State's focus on tradition even reached as far as to influence the way the perceived traditional architecture, and paved the way to the Algarve chimney's position as the quintessential representation of the local architecture even today. This paper aims to reflect how this close association developed, between the chimneys in Algarve and its local architecture during this specific time period, as well as taking a closer look into the types of descriptions made of the local chimneys. Considering iconographic depictions as well as written descriptions of these architectural elements. Along with key moments in which the chimney was included in specific moment that the New State promoted, like the Portuguese World Exhibition and the opening of the Folk Arts Museum in Lisbon. The relevance of this investigation for RIPAM 2022 resides in the cultural aspects of the chimney as an architectural element. This because of the relevant part it played in the lives of the locals who owned one, as well as the significance of the chimney for the New State government who saw it as an element that was very much aligned with its ideology and vision for Portugal in general.

As for methodology, this essay will rely on different types of literature produced either during the aforementioned time period or written about the same. Previous investigations have shown how important it is to take an inter-disciplinary approach to the study of vernacular element such as the chimney, and this will also be applied in this case. Focussing mainly on works dealing with traditional architecture, as well as some of the different cultural projects from this time (such as the aforementioned world exhibition, as well as the contest for the Most Portuguese Village of Portugal). Reference to other types of iconographic materials will also be included, such as promotional photographs and posters as well as documentaries of the time.

Keywords: traditional architecture, chimney, Algarve, dictatorship, New State.

Introduction

The 20th century in Portugal was a time of large successive changes, having the country experience regicide, the abolishment of an approximately 800-year-old Monarchy and transition into a brand-new and quite unstable Republic, only to be turned over again and having a military, and later a civil dictatorship being implemented in the country all within the first half of the century. It will be the last of these regimes mentioned that this essay will focus on, the civil dictatorship led by Dr. António de Oliveira Salazar, prime-minister for a large part of the duration of the *Estado Novo* (or New State). More that focussing on the general policies of the regime or even examining the different personalities involved, the goal of this essay is to demonstrate how a specific policy and concept led to the chimney being considered one of the defining elements of traditional architecture in the Algarve. Tradition was an important focus during this period, with the aim of maintaining the *status quo,* as such the delicately-decorated chimneys of Algarve would become one of the celebrated aspects of rurality, present in different types of incentives promoted by the regime.

Previous studies have been done about the New State period, its emblematic characters and policies. But the analysis of the chimney of Algarve is currently in less advanced stages. As an integral part of the cultural landscape of the region, and being an element considered so vital that "it seems

like the house in Algarve is only a pretext for the Algarve's chimney"[1] to be constructed or placed, the relevance of studying this element and relating it to different areas of knowledge is paramount. Especially when we consider the dwindling numbers of the traditional chimneys in the last few decades, the need to document the existing examples and raise awareness to the importance of preserving this heritage at this time is pressing.

1. New State concepts, ideology and relation to the notion of tradition

Before delving into the topic in question we must first somewhat establish what the New State (1933-1974) stood for. This is clearly defined in the 1933 Constitution that marks the start of this period in Portuguese history. The document in question defined a few key elements that make up the back-bone of this regime and that would be necessary in restoring the *soul* of Portugal, which was considered an important goal by the regime. Namely the concepts of 'nation', 'territory' and the importance of the 'empire' and corporatism in society (this last one much inspired by what was the norm in Mussolini's Italy) were the main elements included in this document. The emphasis put on the concept of empire is a quite interesting one, as this notion of empire is based on a supposed essence of the country, a historical prophesy almost, to be fulfilled during this period of the 20th century that explains and supports the existence of the regime itself. As mentioned by anthropologist Luís Cunha: "the importance of history, empire and a perennial ancestral popular culture constitute the axis of a symbolic system, from which an origin is established and a course is set"[2] [Author's translation]. Corporatism was also considered

a very important aspect for the regime, as this would avoid a society made up of individual citizens and promote a society made up of clusters of individuals grouped together in corporatist institutions (with diverse functions such as cultural, social, or economic goals) wherein these individuals could practice their political duties. Hence creating a certain parallel system to the regime while remaining connected to it and its ideals, and at the same time avoiding possibilities of thinking for oneself or people assembling without it being sanctioned by the regime (as the right of assembly was limited during this period). As for the concepts of nation and territory, these two ought not to be confused, as territory refers to the actual physical land that composed the nation (meaning continental Portugal and it's archipelagos as well as the colonies in Africa, Asia and Oceania, and possible additions that might occur at a later date). Thus as territory refers to the actual geography, the idea of nation is connected to the people, as a "socio-historic entity"[3] [Author's translation]. From the definitions of these concepts in the Constitution of 1933 we can infer the importance of historical continuity to justify some of the actions taken in future instances, like the restrictions implemented on voting (an act that legitimises the regime itself by reflecting the people's will, however, elections during this period were controlled in many ways in order to guarantee victory to the desired candidates or parties)[4].

The New State defended that the decades of liberal Monarchy, and the first years of the Republic in Portugal had caused a significant chasm between the Portuguese identity and its reality. As such, it was seen as of the utmost importance to mould the collective mind of all Portuguese citizens with a vast programme of incentives to be developed in education and culture to inculcate

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[1] Franco, 1932: 25.
[2] Cunha, 2001: 21.
[3] Paço, 2008: 14.
[4] Ferreira, 2006: 197.

the Regime's approved mentality. This could only be achieved with the creation of the Secretariat of National Propaganda in 1933, or *Secretariado da Propaganda Nacional*, often shortened simply to SPN. Created by the prime minister at the time, Oliveira Salazar, and led by António Ferro, the SPN would be crucial for the development and implementation of what would be called the *Política de Espírito* (loosely translated as Soul's Policy). Among other attributes within this policy, one stands out for the topic at hand, which is the emphasis on rurality, which was characterized as "the true Portuguese identity factor, and the great element of order and stability"[5] [Author's translation]. The concept of a joyful society, despite its modest living situation was praised, and would be put to use in all types of state-run propaganda that was developed during this time. The development of this policy was not just done with the purpose of controlling public opinion, the true endgoal was to mould the Portuguese people into new idealogical values, therefore creating an entirely new mentality and returning to rural harmony as the country had once lived in before the country's identity was warped before regimes that preceded the New State. This moulding of society would be implemented in the initiatives of the SPN, which acted in the areas of information, culture and the occupation of leisure times. Initially these incentives would be aimed at Portugal's vastly rural population (we must highlight that in the 1930s, Portugal's literacy level was at circa 40%)[6]. At a second stage (from the mid 1940s onwards) these incentives would become more focussed on the urban population, who enjoyed higher levels of education as well as higher median incomes that they could invest in the cultural incentives organized as well as delve into one of the main activities to develop and progress: tourism[7].

The Portuguese New State's ideology played a large role in the construction of the image of traditional Portugal, even as we still know it today[8], and a large part of this carefully crafted image originated in the Portuguese World Exhibition, held in Lisbon in the year 1940. For the topic of this essay, one of the elements of this Exhibition is particularly relevant, namely the reconstructions made of traditional Portuguese houses for each one of its continental provinces. In the reconstruction of Algarve's houses, we can see that the region's rural architecture

Post card with representation of the traditional Algarve house, made for the Portuguese World Exhibition

Source: www.museuvirtualdalusofonia.com/galeria/casas-do-algarve/

[5] Paço, 2008: 58.
[6] Paço, 2008: 52.
[7] Pires, 2003: 41.
[8] Ribeiro, 2017: 289.

was depicted, again as rurality was seen as a great virtue. Algarve's reconstructions included immaculate white-washed houses with "chimney's with cut-out decorations showing an implausible level of innovation, where motifs are never repeated"[9]. It is noteworthy to mention that this preference given for the rural aspects was of course not coincidental and not only done for the southern-most province. In general, an interesting parallel can be found in the representation of all the different regions of the country and the vision of the *Política de Espírito*, namely in the promotion of the arcadian way of life of these regions, present in the depictions made at the exhibition, and afterwards in this same reference being made in touristic propaganda made for different locations within the country. This quality was even seen as one of the key-features of entire the country[10].

2. The materialization of the *Política de Espírito* into new developments

Much of the work that preceded the aforementioned Exhibition assisted in the formation of the Folk Arts Museum, located in the same area of Lisbon as where the Exhibition stood previously. Opening its doors to the public in 1948, holding a collection of pieces acquired by the SPN (who had also been organizing ethnographic expositions, within but also outside of Portugal, since 1935[11]. Organized into different sections encompassing the different provinces, the space representing Algarve included several essential traditional items (from the inclusion of almond trees decorated with paper flowers, as well as wicker baskets, typical foot wear, local sweets, among others) and of course models of the traditional architecture. In this compilation of local *Algarvian* items four

replicas of traditional chimneys where also included, this way giving us the inclusion of chimneys as elements to represent Algarve as a whole. Although the investigative ethnographic work done for the Exhibition as well as for the Folk Arts Museum was very much pioneered by the SPN at the time, much of it emphasized the aspects the New State preferred (again the rurality and picturesque aspects of the country) in order to present Portugal as almost a utopian and perfectly obedient nation. Nevertheless we must not forget that the invention of tradition for the purposes of identity is neither a new concept, nor a concept associated merely with authoritarian regimes, as was defended by Eric Hobsbawm and Terrance Ranger in the 1983 publication *The invention of tradition*, but an especially useful tool when talking about a period of rapid social transformation, as is the case with the first half of the 20th century in Portugal, thus calling for a "historical and cultural continuity [without disruptive moments, like a transition from a democratic to an authoritarian regime] legitimises the present"[12] [Author's translation].

More than seeing the Portuguese World Exhibition and the establishment of the Folk Arts Museum as isolated acts, we need to consider them as part of the process started by the New State to create a new sense to what being Portuguese meant. An entire policy was set up to create unity on a national and social level, however we have to mention that this process does have its precedents even before the dictatorial regime started in Portugal[13]. Adding to the two events mentioned previously, we must also address the 'Most Portuguese village of Portugal' contest, held in 1938. An event that actually preceded both other events mentioned, but does close the cycle of moments that definitely show the narrative that

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[9] Ribeiro, Aguiar and Costa, 2005: 139.
[10] Pires, 2003: 17.
[11] Oliveira, 2018: 3-4, 14.
[12] Pires, 2003: 28.
[13] Oliveira, 2018: 6.

Close up of the mural "Colourful Algarve" on display in the Folk Arts Museum

Source: www.matrizpix.dgpc.pt/MatrizPix/Fotografias/FotografiasConsultar.aspx?TIPOPESQ=2&NUMPAG=1&REGP AG=50&CRITERIO=algarve+colorido&IDFOTO=121030

Four examples of chimneys shown to represent Alte

Source: Menezes, A. (Director). (1938). A aldeia mais portuguesa de Portugal (Documentary). SNP – Secretariado Nacional de Propaganda

was desired at the time. The goal of this particular contest was to find the most 'authentic' village in the country, following a particular set of rules created by the SPN, where the contestant for the Algarve province was the village of Alte. Noteworthy to this contests' entire process was the fact that the jury's visits to each contesting village were accompanied by journalists and even a documentary crew, who meticulously described the entire process for posterity. Included in the descriptions of the Algarve region we can find mentions to the *Moorish* heritage present in the province, which gave it an exotic and fantastic element[14] and aided the natural charm of its simple inhabitants. In the documentary produced during this process, we can find an excerpt in the depiction of the Algarve's contestant, where for approximately 20 seconds different examples of local chimneys are depicted (in total, eight different chimneys are shown in this time span). Again showing how powerful the image of the chimney was in terms of being a characteristic element of the village (and as a consequence, of the region) as well as a representation of rurality.

3. How the chimneys in Algarve relate to the New State's concept of tradition and rurality

It's in this construction of a new national identity that the Algarve's chimney becomes relevant as a perfect candidate for a representative element for this southern-most region. Its privileged location on top of the traditional homesteads (frequently, if not mostly) in the rural hinterland of the province made the association to the virtue of rurality quite simple. But besides being considered as part of traditional architecture, the chimneys could also be considered as elements of folk art, seeing as they so frequent-

Advertisement to the book "Algarve" (1948) published during the New State period by SNI Books

Source: www.flickr.com/photos/biblarte/36910286972/in/ photolist-RjqiNa-SnrpUD-fr4fqu-jq6Yne-jq8Qgd-jq7ksw-jq7kYw-jq5mAt-XTEFsW-jq8Jxj-Snpt3r-jq723p-SuQog5-jq6XsZ-jq5rLi-re5Mpi-SnoVug-YeCSo9-XT

ly included elaborate decorative elements, and represented the adaptation of local tastes with the available traditional constructive materials[15] (namely clay, roof tiles, pieces of floor tiles or bricks). We also must call attention to the special relationship between the locals and their chimneys, seen as an important part of their homes, an integral part of it as well, reflected in the frequent practice of white-washing the chimneys, as would be done for the entirety of the outside of the local houses. This frequent habit shows the pride the locals took in having a perfectly clean house (and chimney), even though

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[14] Félix, 2003: 13.
[15] Associação dos Arquitetos Portugueses, 2004: 293-358.

the chimney's function is to rid the house of smoke produced either in the cooking process or in the fires used to heat the houses, and as such it would be prone to dirtiness from this same smoke. This is just one of the ways we can see how the locals interacted with their chimneys and integrated them into their household activities (i.e.: "the inside of the chimney presents the same cleanliness as the rest of the home. As for it to not turn black, the women will white-wash them on Saturdays"[16]) [Author's translation].

As mentioned, we must not forget that the chimney in Algarve, despite is often intricate decorations, actually had a practical function in expelling smoke from within the houses. The fact that there can be differences in terms of how the chimney is constructed, and differences on structure on the outside or inside of the house also shows how adaptable it needed to be to the necessities of the household it served. In fact, alterations could be made in every part that constitutes the chimney system, and it's construction would also be influenced by the construction of the house where it was included (number of floors, size, height of the ceilings, types of roofing, among other factors). To clarify, the different parts that constitute the chimney are (from bottom to top):

1. The place where the fire would be made (which could be a designated corner of the room, having the fire be made on the room's floor, or an actual stove or furnace, which could all be of different dimensions and configurations). It is important to distinguish these two possibilities to the location of the fire: on the ground or on a specific (cooking) structure made to house the fire;

2. The ventilation element, that would be the transition between the interior and exterior of the home, a pyramid-shaped exhaust shaft generally built out of stone with an opening that would taper the closer it got to the ceiling. It was common practice to have a spit inside of this construction where sausages and other meat products could be smoked. This structure is of course the predecessor to the kitchen hood or exhaust hoods we have today;

3. The actual chimney that would allow fumes to be expelled and would be a continuation of the ventilation element, of which the appearance can vary greatly in the Algarve.

As the variety of chimney typology is often mentioned in descriptions of the same[17], it becomes relevant to distinguish between the key sorts of chimneys. In general we can distinguish three main varieties of chimneys: those with apparent grids, those with hidden grids and those made using moulds. Within these broad typologies we can of course also classify chimneys as for their base shape (meaning circular, rectangular, hexagonal, octagonal, square, etc.), or even the materials with which these are constructed. However, for the best analysis of the different sorts of chimneys, in previous studies it was established that the best characteristic to consider would be the type of grid it included, as considering this element allows for the most homogeneous group of examples to be compared among all the chimneys registered throughout the region, this way facilitating the analysis of construction techniques, date of construction, and geographical distribution of similar examples.

4. Types of chimneys and their representational role

At this point it is pertinent to clarify that the specific type of chimney often represented as being the most traditional in terms of representation (i.e. the typologies we frequently see photographed, or even included

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[16] Prista, 2014: 111.
[17] "Most particular to note are the Sotavento chimneys, none being exactly the same" (Stuart, 1941: 40).

17

Chimneys with apparent grid
Source: Author's own photograph

Examples of coats-of-arms that include chimneys as a heraldic element

Source: Ferreiras: www.jf-ferreiras.pt/ordenacao-heraldica. Guia: http://freguesiadaguia.pt/conteudos.php?id_ct=12. Boliqueime: www.freguesiadeboliqueime.pt/ordenacao-heraldica. Almancil: www.almancilfreguesia.pt/ordenacao-heraldica

in the coats-of-arms of different local parishes[18]) is the chimney with apparent grid[19]. The base shape of this chimney can vary greatly, but seems to favour variations on the square or square-inscribed shapes (hexagons, octagons, circles or squares with bevelled edges) as these appear more often than rectangular shapes or variations. As for the grid work, this is where the artist's creativity can shine through, making use of materials like roof tiles or bricks to form different geometrical patterns of great intricacy. In terms of the patterns on the grids we often observe V shapes, inverted V's, circles and semi-circles, and in more simple cases the placement of tiles straight up at close proximity. The variation among the types of grid work allows us to also specify if the grid-work itself is simple or complex, allowing for the formation of sub-categories within the chimneys with an apparent grid. This type of chimney, along with the *açoteias* (flat roof-tops) and *platibandas* (platbands), would make-up the triad of traditional architectural elements in the Algarve.

Being that the chimney with apparent grid is the one most often represented, we cannot forget to consider the other aforementioned types of chimneys. For example, the chimneys with hidden grids were also very much part of the representation of traditional Algarve during this New State period, namely in the depiction made of traditional houses in the Portuguese World Exhibition, where these types of chimneys were included as shown in the following description: "The reconstruction of a housing agglomerate, typical construction of Olhão, with villas with flat roof-tops (*açoteias*) and crowned with its characteristic chimneys"[20] [Author's translation]. Also it's noteworthy to highlight the use of the term 'character-

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[18] Images of chimneys can be found in the coats-of-arms of the parishes or Guia and Ferreiras (included in the municipality of Albufeira) as well as Boliqueime and Almancil (part of the minicipality of Loulé). For refference, all of these parishes are located in central-Algarve.

[19] As an example we can refer to the pictures included in Algarve by A.H. Stuart (1941).

[20] Ribeiro, Aguiar and Costa, 2005: 139.

istic chimneys' for the city of Olhão, which is indeed often associated with the presence of chimneys with a hidden grid. As the denomination suggests, the chimney's grid is in these cases simply protected by pieces of tile placed to the sides of the chimneys, hence (often) forming a cube shape at the top of the chimney that will protect the grid from adverse weather conditions, like rain or wind, and this way improve the ventilation of said chimney. Some authors suggest that "the chimney with apparent grid has its origin in the chimneys with hidden grid, to which the surrounding walls have been removed to expose the grid, gaining thus the decorative wealth of the varied artisanal white-washed grids, although harming its functionality [in expelling fumes from the house]"[21] [Author's translation]. Following this train of thought we can see how structural changes might have been made to promote creativity and individuality with chimneys. However, the inverse evolution might also have occurred, with the surrounding pieces of tile being added later on to protect the grids of the chimneys and allowing for a higher level of efficiency. In terms of dates of construction, we can observe chimneys with and without apparent grid co-existing in the same time-frame, having both being present as early as the 19th century. In terms of the geographical distribution, particularly for the chimney with hidden grid, it's most often associated with the area of Olhão, as mentioned before, as well as with the village of Monchique, located in northern Algarve. However, we must mention that even though there's a higher concentration of this type in the aforementioned locations, the chimney with hidden grid can also be found outside of these two spots.

As for the last type of chimney mentioned before, the ones made with the use of moulds, these are characterized as being made with the use of clay (and in more modern times, cement) instead of materials

Chimneys with hidden grid
Source: Author's own photograph

like limestone, tiles or bricks. The moulded chimneys could be made by potters in their workshops instead of being made on site, and the use of this pliable material allowed for a higher level of creativity to be applied during the manufacturing process. The moulds used could be simple shapes made out of metal or even paper that the potters could use to mark the desired shapes onto the clay, before cutting these shapes out, revealing the intricate patterns they (or their patrons) sought after. The use of moulds sped up the process, and allowed for the decorative shapes used to become more defined, less crude and more complex. Besides that, the use of moulds and the transferral of the work from the building-sites to potter's workshops allowed for the production of larger quantities of chimneys as well as the mass-production of these (in a ready-to-buy type of way). That being said, we should not belittle this type of chimney, as it is currently the type with the most diverse geographical presence across the region, being found in every municipality analysed in Santos (2021), and also in being one of the types of chimney most frequently registered in the same study. Also, even though its production might be adapted to modern times with the use of other materi-

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[21] Associação dos Arquitetos Portugueses: 2004, 354.

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Moulded chimney
Source: Author's own photograph

als or techniques than might be used in the 18th or 19th centuries, the patterns shown in the grids are of course inspired in the motifs used in centuries past. Here we have a simple adaptation and improvement of the production which doesn't make this type of chimney any less important or valuable than the other two types mentioned before, it makes it simply different.

In conclusion

As an element of traditional architecture closely associated to one specific region of the country, with a development that crosses different centuries and whose existence predates the establishment of the New State, the chimney represented a most ideal as-

pect, very much praised by the regime, rurality. This because of the reality of Algarve in general, not being a region with large urban development at the time, and of course also due to the fact that as an addition to a construction we most often can observe this type of chimney in rural houses, either large or small constructions, for poorer or more wealthy families, in broad strokes the chimney would be present in some form or another. Of course the more elaborate the construction of the chimney the more expensive it would become, giving it the possibility of existing as a status symbol for those who could afford it, hence allowing for diversity within the types of decoration included, at this point we also need to keep in mind that more than functional elements these chimneys could be considered folk art or traditional art (which itself reflects the tastes of the time as well as the trends in high art, as well as the consequence of the local traditions, materials and historical contacts established throughout the centuries). Often included in written descriptions, visual works and even exhibitions, including ones sanctioned by the government itself like the Portuguese World Exhibition of the guidebook simple titled *Algarve* written by A.H. Stuart and published by SPN Publications. All of the attention given to this architectural element paved the way for the image that we currently still have nowadays, of the chimneys in Algarve having this almost lace-like decoration as well as the value it presents in terms of local heritage, and in short as an element to preserve and protect for future generations.

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From the Great synagogue of Algiers to Jamma Lihoud, architectural monography of a centuries-old building

Naouel Nessark

University of Bordeaux de Montaigne Bordeaux France.
University of Biskra Algeria.

Abstract   This article proposes a monographic study of the great synagogue of Algiers. An important architectural and symbolic construction, which is not only representative of the changes experienced by the Jewish community and their places of worship after 1830, but also of the contradictions of the colonial administration toward them. The monumental character, the use of many elements of the local architecture, and the Moorish style, have made of it a singular building in this middle of the Algerian nineteenth century imbued with the Parisian inspiration on architecture. Designed in an Arabian style, on a plan close to the plan of the traditional North African synagogues, the building was converted into a mosque after independence, without major consequences on its formal appearance. The communication proposes a detailed analysis of the spatial context, of this conversion.

Introduction

The Grand Synagogue of Algiers has symbolic significance for several reasons. It is very representative of the changes experienced by the Jewish community and their places of worship after 1830, but also of the contradictions of the colonial administration vis-à-vis them. Its construction was planned in 1837 to compensate for the demolished buildings, but the project was materialized many years after. The location of its was a longstanding issue, as were funding issues. Apart from the architectural analysis of the building, the article focuses on the historical context and social influences that surrounded the design of the project. It is based on the analysis of its shape, its spatial organization and its aesthetics. Our objective is to explain, the connections that have been made between innovation displayed by the authorities and traditional pattern of pre-colonial North African synagogues. The aim is not only to shed light on the architectural history of the colonial period, but also after independence. In fact, the question of conversion and the changes brought to the building by becoming a mosque is the second part of this article.

1. History of Construction of the Great Synagogue

Despite the renewed interest observed in recent years in the architecture of the colonial era in Algeria, the great synagogue is absent from scientific productions. Indeed, except for the work of Dominique Jarrassé, no research is conducted on this building. Based on the meticulous research in archives and architectural analyses, this first part retraces the history of implantation and the first architectural proposals.

1.1. Establishment of the Great Synagogue

The first proposition was a piece of land near the Place de Chartres in 1840; it was subsequently transferred to the land occupied by the lions' barracks. This change is explained by the refusal of local representatives to see a building intended for the natives on a newly created main square and artery. Opposition was quickly expressed even for the new site of the lions' barracks, one of the council members felt it was regrettable that such a beautiful site was des-

tined to host a synagogue. The proximity to Bab Azzoun Street made the prospect of building such a visible synagogue unthinkable. The construction project was then temporarily abandoned. In 1844, another piece of land was proposed, it is that of the old Moorish house located on the street of the revolution. The house was used as a temporary barracks. But the minister proposed a new location because the military could not get the site back. Land occupied by vacant federal buildings, is then proposed near the impasse Orali. The smallness of this land quickly eliminated it. The same year a commission composed of the notables of the Jewish community of Algiers is constituted to find the ideal ground, "*four hypothesis are envisaged including that of transforming the mosque of La Pecherie.* The option of reconverting a mosque that corresponded to churches at that time, is mentioned for the first time for synagogues. However, to alienate the Muslim community once again, by converting the largest mosque in the city, and providing such a visible location for a synagogue was not feasible for the authorities. The choice finally came across the site of an outdated mosque, located near the new Place Randon. This piece of land, proposed by the military, was quickly agreed upon for several reasons; both in the Jewish quarter, far from the main axes and sufficiently visible in the urban fabric by constituting the wall of a public square, something that was unthinkable until then. The choice to build a synagogue on the site of a mosque symbolically materializes the change of status of Jews vis-à-vis Muslims. The slowness of the choice of land of the Great synagogue tells us perfectly about the difficulty of the Jews to make admit the construction of their temples. However, it was supposed to be a compensation for all the submitted expropriations and demolitions.

1.2. Early Architectural Proposals

Giauchain designed four projects not accepted in 1838. The first proposal, with a total area of 441 m², could hold up to 1300 people, consisted of a prayer room for men, a platform for women and swimming pools. The second project in an area of 351 m², can accommodate 1000 people. The third project, covering almost 472 m², is designed for more than 1400 people. Finally, the fourth and final project is more in line with the architect's expectations. Designed for more than 1100 people, it spreads over 371 m², occupying almost the same area as the second project. These projects were quickly abandoned in 1839, because this site was not retained. The architect, who had designed these projects in a neoclassical style, had proposed another not accepted, on the site of the old barracks in a rather neo-Gothic style. In 1844, Giauchain drew another project on the Rue de la Révolution in the marine district. The project was designed in an Egyptian Revival style with papyriform columns with open corolla, and winged sculptures under the law tables. This project is certainly the first to send Jews of Middle Eastern origin. The project fell far short of the expectations of the Jewish community and its aspirations to have a building worthy of all its losses. Algerian liberal architects very probably mandated by the newly installed consistory proposed new projects around 1847. Léon and Rochet had drawn up a sketch for nearly 1,600 people, 1,000 men and 600 women, on the plot located at the Orali impasse. The authorities had not accepted their project.

In 1848, Ravoisié had in turn drawn a proposal on the same ground. The inclination towards an Arabian style for the synagogue is expressed for the first time in this project. The project takes up the characteristic features of the North African synagogues with a plan centered around the Tevah and in the back the wardrobe of the Torah. It still adds a space for women in gallery upstairs. This project will undoubtedly have an influence on the final project of the great synagogue and on the architectural choices of the final project, designed towards the end of 1840.

Figure 1 - Main façade of the synagogue of Algiers

Figure 2 - View of the Holy Ark
Source: IAU Archive

2. The final project of the synagogue

The architect of the civil buildings Viala du Sorbier designed the final project of the great synagogue, by the end of 1840. The shape was a square overhanging a central octagonal dome and four small domes in the corners, could contain 900 men and 200 women. The influence of Ravoisié's project and the architect's familiarity with Islamic architecture after the rehabilitation of the mosques of Tlemcen, according to Jarrassé[1], may justify this choice. As for the doors and windows, the architect had opted for horseshoe arches resting on twisted columns and bordered by green and white ceramic. Under the dome and its cornices, openings reminiscent of the shape of the tables of laws were lined with stained-glass windows to sift the light inside.

2.1. The interior of the synagogue

The building is a square with an irregular octagon in the center with four long sides opened by poly-lobed arches. The entrance is oriented towards the East and not the Holy Ark, which faces it directly. It must be emphasized that the orientation towards Jerusalem is only a recommendation and not an obligation that would invalidate the edifice. No doubt, the desire to open it on the square had taken precedence in the mind of the designer. Moreover, during the 19th century many synagogues built in France were not oriented to the East. The Great Synagogue of Victory is oriented towards the North and the Sacred Heart church according to Dominique Jarrassé. The internal spatial distribution is inspired by that of the traditional North African synagogues centered around the *Tevah*. The most remarkable element in this synagogue is the refinement of its interior decoration, which is steeped in Moorish references. A stalactite arch surmounted the holy arch; the eight ribs of the vault and the windows that illuminate it were adorned with stucco embroidery and chiseled plaster. The stone carvings were the work of Jean-Émile Latour. The same artist was in charge of harmonizing the decorations of Saint-Philippe Cathedral. There are also similarities in the interior decorative elements, particularly in the domes, edges and borders. It seems rather logical that the two most im-

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[1] Dominique, Jarassé, Orientalism, Colonialism, and Jewish Identity in the Synagogues of North Africa under French domination, Art Judaica. 2011. P. 1-22.

portant religious buildings built in the same period, have a reciprocal influence in terms of decorative elements. Paul Alfred Magdonel made carvings on wood[2]. In another register, the synagogue contained important objects and relics, among which there are "sepharim", one of which dates back to the 15th century, objects belonging to rabbis Barchichat and Duran, were also kept in the tabernacle. Marble and steel commemorative plaques were hung around the pulpit. They bore the names of the Jewish soldiers who died for France, just opposite were those of all the benefactors of the community who worked for the building of the temple[3].

Although many similarities are remarkable with the traditional synagogues of North Africa, the beginning of the process of francisation of Jewish places and their places of worship is also evident. The complexity of this project, combined with administrative and especially financial barriers, delayed it for nearly two decades. It was inaugurated on September 19, 1865. The synagogue was, but its capacity remained lower than all the demolished ones. To compensate and offer decent places of worship, many other projects for the construction or developments of synagogues were begun.

The Great synagogue of Algiers, by its monumental character, is one of the most important built in Algeria. It is also, unique by the re-appropriation of certain elements of traditional North African synagogues in particular, the centered aspect of the plan. Generally, on facades, the Moorish language continued to be widely used. The windows often had a shape reminiscent the forms of tables of law. They were often paired. The predominance of the twisted columns in particular to mark the Holy Ark is also a constant element that probably refers to the temple of Jerusalem. Although it remained an external dressing, the choice of orientalism for the Algerian synagogues, according to Dominique Jarrassé, is the continuous mental projection of the Jews on the side of the colonized. Semitism through Orientalism works in the same way in the mentality of administrators and architects as in metropolitan France. As simple as it was, there was confusion of indigenous culture; the synagogue that represents them was assimilated by its architecture to the mosque… However, vis-à-vis the Arabs, they are francized and their synagogues usurp forms that do not belong to them[4]. This use of elements of Orientalist architectural language has remained superficial, an exterior dressing that contrasts with the radical changes made to the interior. The latter is deeply marked by metropolitan influences. The monumentality, the basilicale plan, the arrangement of the benches, the introduction of the organ as well as other musical instruments, and the stands for women are all elements borrowed from other architectures.

3. The Great Synagogue as a mosque

The only synagogue converted to a mosque is the old Randon Square, which became the Ibn Fares Mosque just after independence. Located on Arbadji Abed Street, the building gave its name to the whole neighborhood which became Djamaa Lihoud or Jewish mosque. After independence, the legal manuscripts and various silver religious objects belonging to this synagogue were classified as national heritage and the synagogue converted into a mosque.

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[2] Claudine Piaton; Juliette, Hueber Boussad, Aiche, and Thierry, Lochard, Algiers - City and Architecture 1830-1940. Algiers. 2016. P. 98.

[3] Paviot Marcel, October 24th 1951, a brief history of our shrines "the Jewish temple Grand Rabbi Bloch", in the echo of Algiers Archives of the Diocesan Studies Centre – glycines Algiers. 270-96, AAJ. 01 (4).

[4] Jarrassé Dominique, 1997, une histoire des synagogues françaises entre orient et occident, éditions actes sud. Paris. P. 254.

3.1. Pre independence deterioration

The first chapter of this process began before independence when it suffered a sacking attributed to the FLN in the w ake of the demonstrations of December 11, 1960, but which is probably the work of supporters of French Algeria. The deterioration was substantial on both the furniture and the building itself. A symbolic ceremony was organized the next day to bury the destroyed objects near the Rabbis of Algiers in the cemetery of Saint-Eugene. The building probably did not regain its previous influence until its reconversion in 1962.

3.2. Conversion into a mosque

Originally built on the site of a mosque, the synagogue was quickly claimed and reco vered. In this conversion, the building has not undergone any significant modification except the addition of an octagonal minaret. The configuration of the synagogue and its Moorish architecture greatly facilitated its conversion. The women's prayer space has retained this function; this one is located at the height of 5.05 m. An intermediate wooden floor, at the height of 2.94 m, is added below to increase the capacity of the prayer room for men of about 240 m². The height under the dome of the building is about 18 m. A library and a Maksoura or imam's office are located on the western façade; these spaces are 25 m² each. The mihrab, meanwhile, is leaned against the old main gate of the synagogue. The old rabbinical school, underlying the building on the South-West side, which had long been abandoned, was recently converted into a Koranic school. During the 70s and 90s, the mosque had undergone renovations to seal the domes with bituminous felt. Other fit-up and maintenance work was carried out during the same period. A new restoration operation is planned shortly, especially since the recent closures due to the pandemic have accelerated its degradation.

Figure 3 - The deterioration of the Great Synagogue in 1961

Source: www.morial.fr/communautes-et-traditions-3/ synagogues/949-la-profanation-de-la-grande-synagogue-d-alger.html consulté en décembre 2021
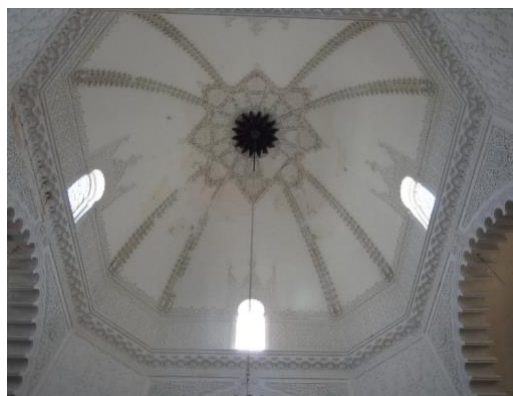
Figure 4 - Interior Ornament
Source: Author

3.3. Current Building Condition

Today cracks are visible, the coatings are detached inside and outside, and traces of moisture are visible even at the level of the dome… On another register, since the 1990s, it was recommended to carry out a historical study and more in-depth surveys to restore the missing elements of the history of the building and for a better architectural knowledge of it. It should be emphasized that during our investigations we learned that traces of its former synagogal function could remain behind the South-West wall, which initially housed the niche of the holy arch. We have no way of verifying the veracity of that information. The completion of surveys and

the search for these traces and their preservation can only enhance the architectural and heritage value of this building.
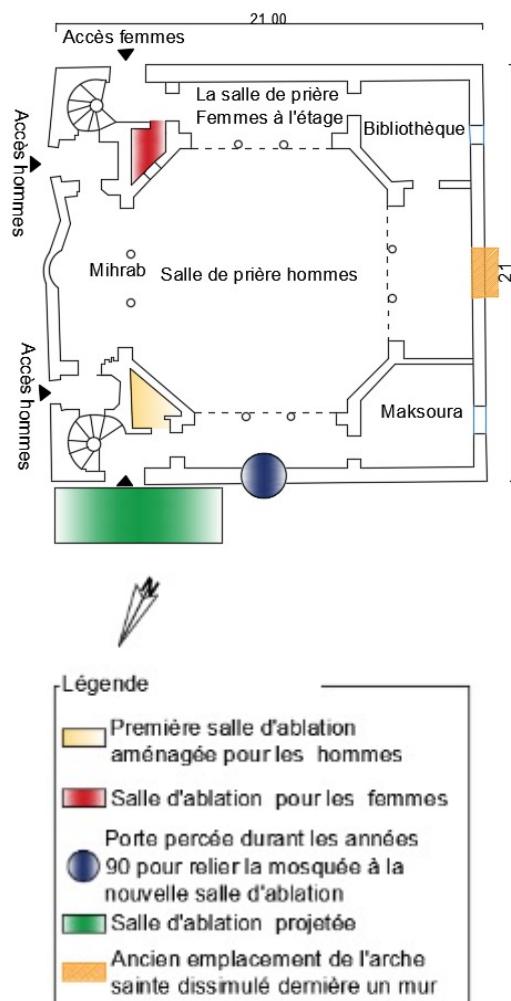
Figure 4 - Schematic reconstruction of the mosque plan
Source: Author

Conclusion

The Great synagogue built during the nineteenth century in a style combining a desire to break with pre-colonial synagogue. But the dichotomy of visibility/discretion has

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governed all its construction process. This situation was hardly different in architectural terms. The external aspect of the synagogue was heavily influenced by Moorish influences. The Spanish origins in particular, of the organizers of the Jewish community of Algiers, can explain in part, the option of the architects for this Moorish dress. They remain, however, very characteristic by their monumentality and by the many changes brought about inside; introduction of the organ, adoption of the basilical plan and especially creation of a space for women. Beyond ideological questions, this building halfway between mosque and church is very representative of the situation of Jews at the time, in search of European modernity, but attached to their cultural and social origins. Today, synagogues and our entire architectural and urban heritage are in a state of perilous disrepair.

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Transition spaces: Elements of space hierarchy. Case of the patio of the courtyard house in the southwestern part of the Mediterranean basin

Y. El Haouzali

CIAUD, Lisbon School of Architecture; Universidade de Lisboa, Portugal

F. González

CIAUD, Lisbon School of Architecture; Universidade de Lisboa, Portugal

Abstract   The design and delimitation of interior and exterior spaces and the definition of the relationships and articulations between them have always been a human necessity. Spatial transitions help meet this need and are essential elements in every design. The Mediterranean basin presents an architectural and urban diversity that manifests itself in the use of spatial transitions. This article focuses on the definition and specificities of transition spaces. By taking into consideration these elements along with the social structure, the cultural and climatic specificities in the southwestern part of the Mediterranean basin, it presents the patio of the patio house as an example to highlight the potential of transition spaces.

Keywords: Transition space, Space hierarchy, Courtyard house, Mediterranean basin.

Methodology

A descriptive and qualitative methodology was adopted for this research work. Library methods wereused for the data collection. A descriptive analytical method was used to study written documents. The content was analyzed and contextualized in relation to a summary of studies related to the patio as a transition space.

1. Introduction

We spend time transiting from a space to another without realizing the presence of transition spaces. They exist in both urban and architectural scale and can represent large ratios. Therefore, they have the potential to influence the user's experience significantly. Transitional spaces take different forms. They may have clear boundaries or overlap with spaces they articulate. In addition to being a support for circulations,

they can play an aesthetic role and contribute to improving the attractiveness and comfort. Transition spaces have for the most part a multifunctional role and are the support of social interactions, in both urban and architectural space. Thus, problems related to architectural or urban space can be addressed in part or fully by taking into consideration transition spaces and there relation to social logic, patterns, interconnections, collective and individual memory (Alvarez et al., 2020).

2. Space hierarchy necessity

In order to apprehend transition spaces it is necessary to address how space is organized. Humans has a consciousness and a representation of their body and an ability to imagine and project themselves in their environment and interact with it (Cousin, 1980). Between the body and this environment, there is a series of bubbles (Hall, 1982) that are constantly surrounding and conditioning

the relation to the environment. They cover from personal or intimate space to public space. Given this innate structure and driven by the need to intervene in their environment and define their territories (Jürgenhake, 2006) humans creates limits and transitions that permits joining two opposite spaces.

This opposition can be between public or private, inside or outside but also inside the same interior space by taking into consideration an additional duality (Fig. 1).
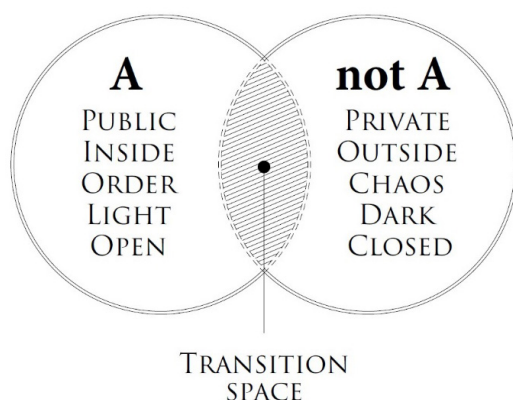
Figure 1 - Space duality in transition space articulation

Source: Graphics: Author's drawing

Theoretically, there is at least as much or more transitions possibilities than entities in a given environment. Analyzing the boundaries that separate spaces and nature of transitions and interactions between them is a key element in understanding space hierarchy.

3. Transition as a threshold or interface

A transition regardless of its scale or dimension is an in-between an origin and a destination that can take the aspect of a threshold, which is associated with a target value of an attribute, a characteristic or a parameter. (Bhonsle, 2010) A threshold can also be defined as the starting of an even. In space representation, it is a zone that is different from a boundary; it is an opening in a boundary allowing spaces to connect (Baweja, 2015). A threshold consists of a horizontal surface constituting a support when passing between two communicating spaces. It can be a recognizable part as it is generally treated with a differentiation in terms of use of materials and textures but also in the change in high it induces, which is associated in architecture with the idea of a transition from between an outside and an inside. A transition can also take the form of an interface between two opposite zones. The most common and important one in a building is the façade. It plays the role of interface between outside and inside and private-public or even interior interface. Ultimately, interfaces between architectural forms are a key element in the perception and understanding of urban fabric. Facades as interfaces have the potential and thus should offer a multitude of possible states, links and relations (Jürgenhake, 2006). They also carry and display the cultural and environment dimensions in which they are integrated.

4. Transition as a space

According to definitions, a transition is an intermediate state between two realities or conditions in time and space (Harper-Collins, 2019). This implies that the transition shares some common characteristics with the entities it links. Similarly, a transition space can be considered as an independent buffer zone constituting an articulation permitting the connection between two or more spaces. They are an intermediate ambiguous field appearing between a duality of state. Transition spaces consists generally of corridors, patios, halls etc. On timely basis, these spaces are partially occupied, as they are not the main components. But still, they have the particularity of providing a preface to perception of architectural space. They live in the sequence of what lies in the past, present,

and future in the expectation of what is to come (Boettger, 2014). The transition space follows a ritual logic first described in ''Rites de Passage'' (Van Gennep, 1909) which takes place in three main steps: The first one is the separation it is a phase were an entity detaches itself from its initial environment. The second is liminality; it is a challenging phase implying profound changes and metamorphoses preparing for the new state. The last one is the reintegration or reincorporation, which is a readmission in a similar to the initial dimension with a different state (Fig. 2).
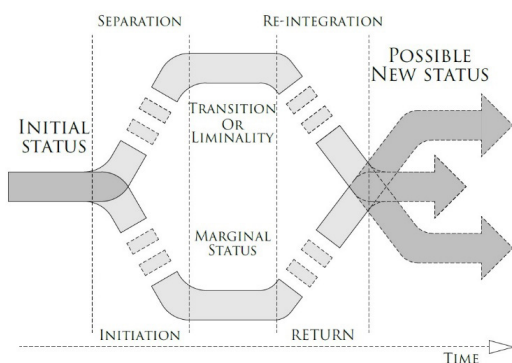
Figure 2. Process and the different stats during a transition

Source: Graphics: Author's drawing

In other words, a good transition space permits to the user the be aware of its transiting state and allow him to stop for a moment and have a knowledge of all the possibilities offered to him to then be able to choose and decide where to go next (Eleb Harlé, 1993).

5. Transition space as support of intervention

The creation of transition spaces is inherent to the design of space. This kind of spaces always had important role in past and recent architecture; they are a subsystem,

which must not be neglected (Alireza & Marzieh, 2015). They often include changes in lighting, direction, senses, surfaces, levels, scale, link nature (physical/visual) among others.

As seen previously, their first role is to ensure circulatory functioning by connecting spaces and allowing passage between one and the other. They can be categorized following specificities that ranges from ordinary circulations to emergency routes. There are no principals limiting the use of transition space. They are flexible spaces that offers a wide range of possibilities. This includes fulfilling an organizing role by constituting supports that permits the integration of notions of hierarchy and priorities related to architectural types of spaces they are connecting. Transition space contribute also to handle fundamental needs in an architecture. They can constitute extensions that protects from outside environmental condition like sun, wind, rain etc. and in the meantime allowing the right amount of lighting and airflow. They permit a direct relationship with the environment while being protected from it. This extends to the relation to other individuals. In fact, transition spaces constitute supports that can ensure individual need for privacy and security. In a larger scale, transition spaces can be strategic vectors and supports of transformation that can be spontaneous or planned. They represent flexible spaces that permits expansion and retraction that absorbs changes in densities and the evolution of needs in terms of space occupation. They constitute a support of interventions that aims toward more sustainable designs (Benigni, 2014).

An architecture without integrated transitions in the design process would be a continuous and monotonous space. Transition spaces enrich the user experience and constitutes creative linking elements that can make the space full of vitality and human touch (Qi & Kong, 2021). These spaces have the potential to enrich the user experience by being used as events marking in the overall journey through a project.

6. The patio as transition space

The use of transition spaces is more common in Mediterranean countries. These spaces takes multiples forms ranging from balconies, loggias, terraces to patios (Eleb Harlé, 1993).Women's mostly occupied those ones while exterior transition spaces at the urban scale were more for old people and children according to the same author. Uses of transition spaces in the Mediterranean basin nowadays had evolved and undergone some changes as in other regions. Evolution of customs and differing rites according to social parameters and specificities influences these changes. The definition and the study of notions of transition presented in the previously in this work constitutes a foundation to understand transition space in their context. The following part studies the uses and roles of the patio in the courtyard house in the southwestern part of the Mediterranean basin.

Historically, courtyard houses were built in various cultures and have existed in greater numbers in the past. The courtyard was considered an extension of personal living space, and viewed as the centerpiece of the house. Remains of open central spaces were first recovered nearly 6000 years ago in Mesopotamia, and had also been found in Pharaonic Egypt as in the Indus Valley and as far as China (Abdulac, 2011). In the Mediterranean basin the Greek house with its two variants Pastas and Prostas domain and will later be sophisticated by romans who will add a second courtyard (Almansa, 2011). In their expansion, romans conquered new territories where the courtyard house was already in use which lead to an enrichment of the concept of the courtyard house around the Mediterranean basin. This transfer of knowledge and techniques related to the courtyard house intensified also in the ouster part of the Mediterranean basin in the era of conquests opposing Islamic and Christian world in the northern part of African and the southern part of the Iberian Peninsula. This region had great economy

and a rich culture where the mixture between pre-existing Roman architecture and Moorish influence gave the foundations of the Mediterranean courtyard house, as we know it nowadays. In this cultural context, the courtyard was set to maximize family privacy from the outside world. Such privacy is highly prized, conforming to Islamic cultural norms (Fig. 3).

Figure 3 - View from a Moroccan patio
Source: Graphics: Author's photographie

The patio as transition and articulating space have an organizing role in terms of privacy and hierarchy. The entrance is connected to the patio with no direct visual link and leads first to reception spaces. The family and private spaces follow after. The patio ensure also a vertical communication between the different levels and that all spaces have a direct link to the outdoor space.

The patio have also a spiritual role. It is the major source of natural light sym-

bol of the truth and the divine. It is also a window between the earth and the skies. A window on the universe, which generally carries and display the best of art and ornamentation. Thus, the patio with its internal facades is in a complete contrast with the outdoor ones, which are simple and have minimum openings. The patio plays also a social role as it is the main space where families gather and where important rites takes place and where events are celebrated. Last but not the least, the courtyard architectural type transforms a one or two facades building into a four solar orientations architecture. (El Harrouni, Ben Aicha, & El Harrouni, 2018) In this configuration, the patio constitutes a living space that has generally a water basin that tempers and humidifies the atmosphere while the vegetation in the patio and the surrounding galleries provide a protection from sun and rain. The large windows opening toward the patio permits a continuous refreshment and circulation of the air.

7. Conclusions

Transition spaces are special spaces and unique opportunities that can be used as a support of intervention to enhance users experience by responding to more than the simple linking function. Therefore, they should not be considered as optional spaces but more as elements, that can allow fine-tuning of the relation between two spaces. The example of the patio as a transition space in the ouster part of the Mediterranean basin showed that these spaces can carry many important roles like organizing, social, spiritual, and climatic ones. In our era of super modernity, we tend to produce more and more structures and spaces dedicated to passage or non-places, it is therefore fundamental to question our way of producing space and what role we assign to transition spaces.

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Architectural and urban heritage in the eyes of three future architects

S. Gallouzi, M. Fakhfakh

National School of Architecture and Urbanism; University of Carthage, Tunisia

Abstract   This is a comparative study of three architectural dissertations from the National School of Architecture and Urbanism of Tunisia. It aims to identify the key factors that these future architects take into account when working on urban or architectural heritage. Through this work, we communicate the tools that these students use and the solutions they propose for heritage's preservation. By analyzing these students' architectural dissertations, we outline an approach to the supervision of heritage work in architectural education. We outline our position on heritage where the sustainability of its preservation is a priority. We conclude by stating some parameters that architects working on heritage, in our opinion, should take into account.

Keywords: Heritage, architectural dissertations, tools, positioning, supervising.

1. Introduction

In Tunisia, the last step of the architectural studies curriculum before the professional internship is the preparation of the architectural thesis in which students prove their ability to construct a spatial problem and its resolution. This article presents a study of three architectural dissertations on urban and architectural heritage, which the authors co-supervised. Through a comparative analysis of the students' questions, approaches and results, we identify the key parameters of our method for supervising architectural dissertations on heritage. Our goal is to provide a tool to assist architecture educators and practitioners wishing to work on architectural and urban heritage. Working on three different heritages, each dissertation we present exposes a singular posture towards the heritage it studies. In conclusion, this study presents a set of parameters for any work on architectural or urban heritage in order to capture its complexity.

2. Study's Methodology and steps

Under separate headings, we present each architectural dissertation by focusing on the spatial context it deals with. Four steps structure each presentation:
1. Presentation of the student's questions in or-der to extract the objectives of architectural dissertation that we present.
2. Exposure of student's position he/she takes in concern of the heritage he/she deals with.
3. Analyzing student's work following a grid of three parameters. The first is the tools of analysis and understanding that student adopts. The second one is the synthesis he has elaborated. The third and last parameter is the result of architecture's brief, i.e. the project he/she proposes.
4. Identification of key parameters that student has taken into account in his/her work.

By comparing results of each analysis, we identify constants in our supervision approach and discuss its effectiveness. We specify that the first two architectural memoirs we present concern a part of the built and urban heritage of Sfax, capital of

southern Tunisia. The third concerns Kesra, a Berber village located in the northwest of Tunisia. Before presenting the analysis of the first two architectural briefs, we briefly present Sfax in its morphogenesis and its urban structure.

3. Sfax, capital of southern Tunisia

Sfax is located on the eastern coast of Tunisia, about 270 kilometers from the capital Tunis. It is flat and has an urban fabric structured by communication axes in spider web. The Mediterranean Sea and the beginning of the Gulf of Gabes border it to the east. On the continent side, governorates of Gabes, Sidi Bouzid, Kairouan and Mahdia limit it. The city has 1 018 341 inhabitants for an area of 7545 km^2. Sfax is the second city of Tunisia. Its radial structure in spider's web has three crowns.
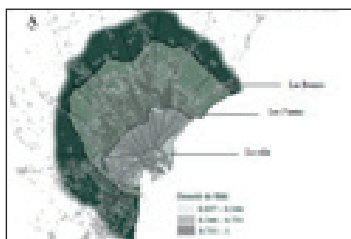
Figure 1 - Crowns of Sfax's city, by E. Ben Arab

Sfax has a port which creation goes back to 849 after JC. In 1886. The French developed it into a commercial and industrial port. Currently, it is a medium-sized port with nine quays totaling 2589m in length. In the IXth century, the Aghlabites built the medina of Sfax with its ramparts. It constitutes the first historical core of the city. Around this core, and from "Beb Bhar", the sea gate, the French colonists built the European city of Sfax in the beginning of the 20th century. It is that what constitutes the first Sfax's crown. In the XVIIIth century, the second and great crown of Sfax is

emerging. It is that of J'neins. These are agricultural lands, which shelter houses called "Borjs". The third crown of the city is that of agricultural land that the Sfaxians call "Bouras". It extends over a radius of 65 km to the north, south and west and where we find mainly olive and fruit trees.

Figure 2 - Evolution of the urban fabric of Sfax, by E. Ben Arab

4. Analysis of architecture memoirs

4.1. Memoir 1: Spatial staging of a place of memory, the European city of Sfax between flashback, present and fiction

4.1.1. Presentation

An intrigue linked to the student's memories of Sfax's European city, where he grew up motivates this work. The student seeks to retrace the life of the neighborhood of his childhood as the writer G. Khayat told it in his books. He wants to capture its main characteristics to transcribe them in a project that would ensure the link between the past and present of the city to its future. For that, he seeks to understand what qualifies a place of memory and what role it may play in the future of a city like Sfax. The industrial site of the CPG (Compagnie des Phosphates de Gafsa), facing Sfax European city on one side and the sea and the commercial port on the other, particularly holds his attention. We specify that French colonists created the CPG in 1897 to ensure the export of Tunisian phosphate. In August 2019 and following the mobilization of Sfaxians,

the CPG Sfax ceases to operate after polluting the atmosphere and the coastline of the city. Concerned about the future of his native neighborhood and that of its built heritage, the student asks three questions:

- In what ways can we resurrect the site of the CPG, a place of memory and urban scenes that has marked the collective memory?
- How to give back to the CPG site its role of actor in the dynamics of the city?
- What architectural and spatial staging could renew the urban links between the industrial wasteland of the CPG, the European city of SFAX and the maritime façade of the commercial port?

4.1.2. Position of the student in relation to the heritage on which he works

The student's position is that of an architect who bases his work on three elements. The first is the memory of the place through its spatial components (traces of the past and built heritage). The second is about scenes of life of Sfaxians through history, stories and testimonies, thus making nostalgia appear among the foundations of his work. The last element includes the present components of the site and its potential to build the future of the place.

Nostalgia for the past motivates the student's quest to understand what qualifies a place of memory. He bases this quest on narrative and fiction with the novels of G. Khayat. He devotes much of his reading to the author's account of the place and his memories. He, also, calls up his own childhood memories as a former inhabitant of the same place. He follows traces' buildings of Sfax European city during the colonial period and just after. The student detects the potential of the industrial site of the CPG and chooses it as a context for an architectural intervention. Adopting the approach of a filmmaker, he looks for sequences and framings. He chooses shots where the future life of the site unfolds in the spatial scenes he imagines.

4.1.3. Analysis of student's work

4.1.3.1. Analysis and Understanding tools

In this architectural memoir, there are two levels of analysis and understanding. The first concerns the identification of places of memory according to their characteristics and the modalities of their recognition. The second concerns the site of architectural intervention and the apprehension of its material and immaterial components.

For the first level, the student conducts:
1. A scenic reading of the space based on the built traces of the past. Through spatial framing and narratives, he restores the life experience of the place.

Figure 3 - The path to Wiriot beach, by W. Ben Azeza

2. A quest to understand collective memory, first as a process where space and time are interrelated, then as factors involved in its construction. For this, the student refers to the French sociologist M. Halbwachs (Halbwachs, 1997).
3. A quest to understand how an architect could design from memory, his own and that of others. To that, the student refers to the work of L. Barragan who stages places of memory.
4. An action to understand how to read a city. The student finds in the book of the architect A. Rossi "L'Architecture de la ville" (A. Rossi, 1966) an explanation of the urban fact. He extracts that the first element of the urban fact is the built heritage. He understands that giving life to this heritage is always possible if we consider it as one of actor of the dynam-

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ics of the city and of its perpetual transformation.

A quest to understand more about what makes places of memory what they are. Drawing on the work of the historian P. Nora (J. Guillon & al sous la direction de P. Nora, 1997), the student understands that a place of memory is made of material and immaterial elements. The first relates to the urban fact and the second to the collective memory. From these actions, the student builds a protocol for identifying places of memory. It bases on five criteria: 1. A place that provides the memory of common experiences; 2. A place with material traces of the past; 3. A place in constant transformation; 4. A place with varied spatial sequences; 5. A place with a primary element that is capable of accommodating a new spatial interpretation.

For the second level, the student analyses the spatial context in which he intends to intervene. By making them go through the criteria of the previously established protocol, the student identifies the places of memory of the district. He thus chooses the place that best corresponds to these criteria.

At the beginning, the student tries to understand the morphogenesis of his city Sfax. He presents the following synthesis:

Figure 4 - Morphogenesis of the European city of Sfax by W. Ben Azeza

To find the tools that allow him to frame the urban scenes that best capture the memory of the place, the student crosses different data. He begins by referring to the urban development plan of the European city of Sfax after the war (World War II). He consults the memories of G. Khayat and the works of historians on the European city of Sfax. He relies on works that deal with the history of cities in general and on the film Inception by Ch. Nolan (Inception, directed by Ch. Nolan, 2010) which closely links the human imagination to the urban space in its various sequences.

4.1.3.2. Student's synthesis

The student agrees that a mirror effect between the past and the present time would be conducive to imagining the future of the place. The crossing of data and various references leads him to use the urban transect. He finds a way to synthesize both the urban components of Sfax's European city and the system of relations that articulates them to each other. Thanks to the technique of compositing, he creates three transects where urban structure of current place appears linked to its past state. We present the third of these transects because it highlights the site of intervention of the project.
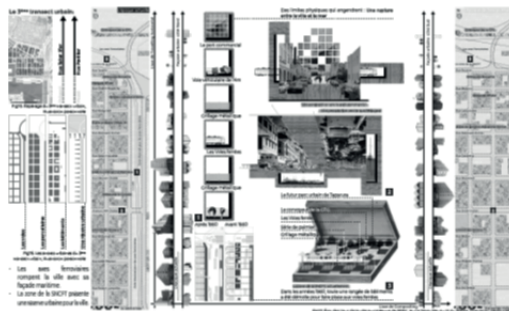

Figure 5 - Inventory of the European city of Sfax: Tahar Sfar Street over time, by W. Ben Azeza

This overlay of the state of the place over time leads student to note the negative impact of urban break between the European city of

Sfax and its sea front. He understands that CPG' site participates for much of that rupture. He concludes that to find the components of the lived of the place of former days would be a guarantee of a better future for the city.

4.1.3.3. Student's Project

Wishing to create a dialogue with the built trace of the past, the student proposes to give back to the site its capacity to generate a part of the collective memory of Sfaxians. He recovers and composes with the elements of the phosphate factory to stage a footbridge that offers a panorama on the European city of Sfax and its sea front. It establishes creative cultural activities, places of sharing and common life.
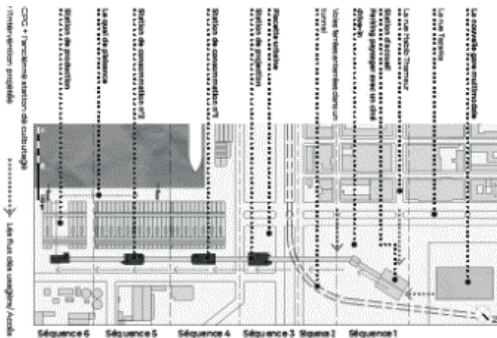
Figure 6 - Factory of memories, a walk in the European city of Sfax, by W. Ben Azeza

4.1.3.4. Key parameters of architecture memoir

1. Nostalgia as the primary motivation through the narrative, that of the individual's memory and that of the collective memory.
2. The use of the tools of cinema, such as plot, fiction, sequence, scene plans and framing. These tools allow us to apprehend the components of the studied heritage, its structure as a material entity but also as a system of relations articulating it to its immediate context and especially to the present time. This helps to imagine the future of the place.

3. The urban transect, thanks to compositing, allows the student to highlight the relationship of the place to time. It is indeed what allowed him to make the link between the built traces of the past and the perception of the place today. The student calls this the mirror effect between the past and the present.
4. Considering the CPG factory as an urban connection element between Sfax's European city and its seafront, the student did not limit himself to give it life or to rehabilitate it. He makes it a factor of urban revitalization. According to L. Veldpaus & al. (Veldpaus & al., Urban Heritage: Putting the Past into the Future, the historic environment, Vol. 4 No. 1, April 2013) argue that heritage preservation is only sustainable if it manages to integrate it into the urban development of the city. We conclude that this is what the student has done in his work.

4.2. Memoir 2: The reactivation of an endangered system

4.2.1. Presentation

What motivates this second architecture dissertation is the fear of losing the studied heritage. The student thinks that the J'neins of Sfax are in danger but do not sink into oblivion yet. She notes the urban sprawl to the detriment of the perimeter of the J'neins of Sfax and observes the rupture of the current urban landscape of Sfax with the architecture of the J'neins. She claims that this rupture constitutes an obstacle to a healthy, balanced and sustainable development of her native city Sfax. The student wishes to preserve the J'neins that are part of the collective memory of Sfaxians. She affirms that they represent a singular way of life which risks to be lost if it is not preserved. She sets as the primary objective of her work the reactivation of the J'neins because it is this action, according to her, that will ensure their preservation. She is interested in the way of life of

the J'nein and the family life that it shelters. She also focuses on its morphology and spatial components. The student proposes a vision of what the J'nein of tomorrow might be. To do this, she asks three questions:

- What does the J'nein represent? How has it evolved?
- To what extent, would the reactivation of J'neins, is useful? What would be the concepts and tools?
- What type of intervention can we think to serve the regeneration of the J'nein?

4.2.2. Position of the student in relation to the heritage on which she works

The student considers the J'nein as a complex system. In addition to its material components, which are the Borj (the dwelling of the large family that owns the J'nein), the agricultural land where it is located and the Tabia (a plant fence of prickly pear trees) that borders it, the J'nein is a place of social interaction. It offers a singular life experience and generates a specific knowhow. A system of relationships links these components together, which in turn maintain a relationship with the external environment of the J'nein. This consideration places the student on the side of the researcher whose primary objective is the understanding of the object he studies in order to extract tools for its reactivation. She attests that the J'nein is a system that risks disappearing for lack of a strategy to preserve it. Wishing to participate in the implementation of such strategy, the student devotes a large part of her work to demonstrating that this system is in danger. She takes a scientific look at the J'nein and inventories its components. She seeks to define its value in order to use it as a basis for her proposed preservation project.

4.2.3. Analysis of student's work

4.2.3.1. Analysis and Understanding tools

First, the student seeks to understand the urban evolution of the city of Sfax through

time. To do this, she reads the history of its urban development and crosses different documents of urban planning by relying on H. Dalala. (Dalala, 1995) and A. Ben Nasr (Ben Nasr, 2003). This allows the student to examine the first development plan for the city of Sfax, which dates back to 1920, the 1943 development plan for Sfax drawn up by Zehrfus and Dianoux, the 1977 master plan for urban development in Sfax, the 1995 master plan for urban development in Grand Sfax and the 2003 development plan of Sfax. Through a comparative reading of these documents, the student shows how urban expansion is occurring at the expense of the J'nein crown in Sfax.
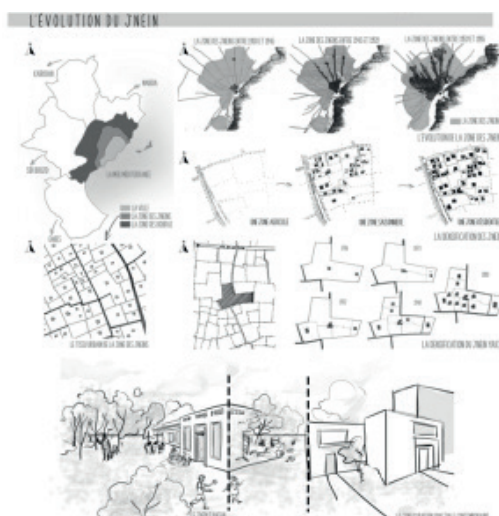
Figure 7 - J'neins' evolution over time, by E. Ben Arab

The student bases her analytical reading on the urban development plans of the city of Sfax relating to the crown of J'neins. The three plans that she presents relate to the periods between 1900-1945 for the first, 1945-1959 for the second and 1959-1985 for the third. She presents for each period the configuration of the J'neins, which corresponds to it. This observation allows her to prove the fragmentation of

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the J'nein and by the same to affirm the risk of its loss. She then analyzes the evolution of the Borj, which is the dwelling of the J'nein.

The Borj is a family house characterized by the cohabitation of big family in conviviality. Grandparents, children and grandchildren live there together and take care of the maintenance of the land and the harvesting and even the processing of the fruits and vegetables they plant. J'neins has developed a unique way of life and knowhow that led to a thriving agriculture. Among these knowhow, the most known of the Sfaxians are the traditional pastry, the Sfaxian culinary art and the system of water management through the wells, the Majel (rainwater recovery tanks) and the Fasquia (a system of three basins to ensure the purification of rainwater).

Then, thanks to aerial photos, the student compares the state of some J'neins before and after their parceling and gives below an illustration:
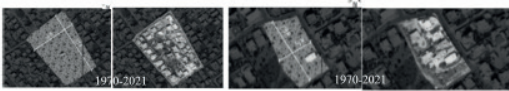
Figure 8 - J'neins transformation, by E. Ben Arab

At the same time, the student conducts an analysis of the activities and lives of the residents of J'nein. Referring to her own childhood memories, drawing on a variety of references such as stories, artists' drawings and a movie (L'homme de cendres N. Bouzid, 1986), she communicates the variety of activities and resources that J'nein offers.

4.2.3.2. Student's synthesis

By way of synthesis, the student presents the J'nein system with its material and immaterial components.
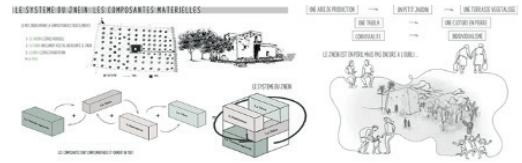
Figure 9 - System of the J'nein, by E. Ben Arab

The student then presents a series of recommendations that she believes could lead to the preservation of J'nein and, more importantly, its reactivation. She recommends reducing urban densification in the J'nein neighborhood by limiting its fragmentation into small lots. She suggests the elaboration of a new development plan in this sense. She concludes that the preservation of J'nein would only be sustainable if we reactivate the system that it is. This is possible, if we consider the range of functions and uses that the J'nein houses and allows. Based on the food self-sufficiency that the J'nein offers to its occupants and the variety of agricultural and crop-processing activities that it houses and can accommodate, the student presents the functional mix as a potential framework for its reactivation.

4.2.3.3. Student's Project

To support the idea of functional mix, the student refers to the "New Urbanism" movement and its advocates. Through the example of the Bicocca district in Milan and the Islands Brygge district in Copenhagen, she shows how functional mix can ensure urban sustainability. It guarantees, according to her results' work, a dynamic and sustainable urbanism. To reactivate the J'nein, the student proposes to develop activities within this place and to add new ones. The idea is first to open new horizons to this system in order to evolve functions it hosts and to adapt them to today's needs. Secondly, to develop the relationships that the J'nein establishes with its environment. For her project, the student chooses a J'nein in the process of breaking up and presents

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a counter-project. She proposes a new way of living in the J'nein. She considers the Borj as the core of a group of dwellings sharing common spaces and benefiting from private spaces. Each dwelling has its own entrance and benefits from a water supply from the collective rainwater recovery tank. The Borj becomes a guesthouse where residents experience the life of the J'nein. Planted again, the J'nein regains its agricultural role. The families who live there have a space to process their crops and can offer training in this field to those who request it. The street frontage houses a space for displaying and selling the products of the J'nein. The student the J'nein to visitors to spend some time with a group or even alone. Here is her project:
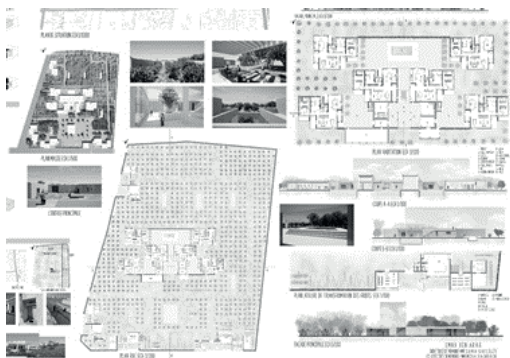
Figure 10 - J'nein's reactivation by E. Ben Arab

4.2.3.4. Key parameters of architecture memoir

1. The fear of losing the J'nein as a system of material and immaterial components as motivation for this work.
2. J'neins' preservation as heritage will only be sustainable if we reactivate the system that it is.
3. Analytical reading of the history of J'nein as an urban component and demonstration of the danger of its loss.
4. The functional mix is the generating concept of the project. It is what ensures, according to the student, the reactivation

of the J'nein and by the same token, its preservation.

4.3. Memoir 3: An urban and architectural reading for the rebirth of Kesra El Olya

4.3.1. Presentation

This architectural memoir bases on an observation. The Berber village of Kesra is among the oldest in Tunisia since it dates back to the Numidia kingdom. It is also one of the best preserved, perched atop the mountain "Jebel Kesra" at 1100m altitude in north-western Tunisia. It has several natural water sources that flow from the mountain and a waterfall in its center. This village has a well-preserved landscape, tangible and intangible heritage, but it is in economic and social distress.

Figure 11 - Kesra's presentation by S. Thabet

The student notes that visitors to Kesra flock from everywhere and that only the landscape qualities of the village attract them. Kesra is devoid of urban facilities and reception structures except for a small tourist circuit, a guests' house and a museum. From this observation, the student wishes to revive Kesra El Olya by highlighting its tangible and intangible heritage potential. For that, she asks:
- What spatial intervention in Kesra El Olya to make it rise from its ashes?
- What urban and architectural solutions should we propose to ensure the rebirth of Kesra El Olya?

4.3.2. Position of the student in relation to the heritage on which she works

The student admires the landscape and the natural potential of Kesra El Olya. She

notes that the built heritage of the village is abandoned despite its good state of conservation. She finds it unfortunate that the artisans of the village do not have spaces for the manufacture, exhibition and sale of their products. The position of the student in relation to the heritage that she treats results from a fact of contemplation and that of a reflected observation. This duality guides her to develop an exploration action of Kesra El Olya. She leads it first on the historical, social and economic level to approach it at the end on the spatial level. Her reading of the place bases on its landscape, natural, agricultural and built wealth and on the knowhow of its inhabitants. Through her work, the student wishes to make sure that Kesra Elolya is reborn in a way that exploits its riches. As a future architect, she believes that spatial action at the urban and architectural level can contribute to this.

4.3.3. Analysis of student's work

4.3.3.1. Analysis and Understanding tools

First, the student conducts a landscape reading. The village of Kesra has a rich and varied fauna and flora. The national agency for environmental protection classifies it as a zone sheltering specific species of ecological and economic value. The village is one of Tunisia's major forest reserves.

In a second step, the student analyzes the built heritage of kesra that she says is in distress. A large part of this analysis bases on photos that she has taken of the place. With her camera, the student conducts a sensitive reading of the place where framing and sequences tell the evils of the built heritage (abandonment, pathologies and encirclement by new constructions).

Figure 12 - Pictures of Kesra, by S. Thabet

The vernacular architecture of Kesra is rooted in its mountain. Some parts of the buildings are cut into the rock. Kesra has a fortress that the inhabitants call El Ksar and that dates back to the Byzantine period. There are Punic tombs and Roman rock engravings. The vernacular architecture of Kesra is rooted in its mountain. Some parts of the buildings are carved into the rock. Kesra has a fortress which the inhabitants call El Ksar and which dates from the Byzantine period. There are Punic tombs and Roman rock engravings. The student explores the vernacular architecture of the village and analyzes its building system.

Figure 13 - Analysis of the vernacular building system of Kesra, by S. Thabet

The analysis of the architectural context of Kesra that the student conducts also touches the current mode of construction. She takes a critical look at it and deduces that the materials used (cement, concrete and hollow bricks) and the resulting architecture are not consistent with the heritage value of Kesra.

In a third step, the student analyzes the socio-economic context of Kesra. She highlights the agricultural wealth of the village, known for the variety of its figs, its olive trees, its honey, its cereals, its aromatic and medicinal plants, its herds of sheep and goats… She proves the singularity of the inhabitants' knowhow in weaving and pottery.

To conclude her analysis, the student uses the SWOT grid to sift through the results of her analysis. She identifies Kesra's strengths, weaknesses, opportunities and threats.
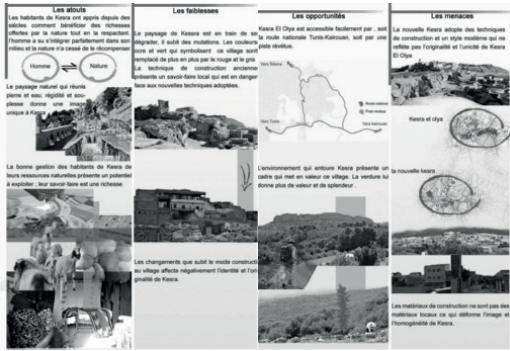
Figure 14 - SWOT analysis of Kesra, by S. Thabet

4.3.3.2. Student's synthesis

Following this, the student announces that the rebirth of the kesra El Olya necessarily implies the enhancement of its material and immaterial heritage. She thinks that a project that is both urban and architectural could contribute to this. She admits that the definition of this project requires a more detailed analysis of the village. For this, she undertakes the tourist route of the village and explores it with an architect's eye in search of areas of support and anchorage. She identifies sequences where she could intervene and argues their choice.

4.3.3.3. Student's project

The student proposes the development of an urban route, the culmination of which is an architectural project. The route is part of the tourist circuit of the village. Its main stations are the entrance to the village where the student offers a reception, information and orientation space for visitors. She makes the space in front of the waterfall a halt partly anchored in the mountain. Urban stairs currently leading nowhere, lead to an urban window overlooking a captive landscape panorama. At the end of the route stand six vernacular houses transformed into production, exhibition and sales space for the village artisans. The student reframes landscape scenes with lightweight rock-anchored structures and earthen architecture

that subtly blends into its context. The student bases her project on different references that she analyzes and draws a synthesis, thus giving the project its uniqueness.

Figure 15 - Two sequences of the urban route, S. Thabet

4.3.3.4. Key parameters of architecture memoir

1. An admiring posture associated with a thoughtful observation of Kesra motivates the present work.
2. A sensitive and landscape, urban and architectural analysis is the basis of this architectural dissertation. This leads us to affirm that the intervention in an environment such as Kesra requires the apprehension of its complexity, hence the use of a multiple analytical approach.
3. A SWOT analysis allows the student to define intervention's strategy to ensure the rebirth of the village of Kesra El Olya.
4. A sequential reading of the tourist route leads the student to define her project and the zones of her establishment.

5. Comparative analysis of student work

The comparison discussed here concerns what is common to the works analyzed and what differentiates them from each other. For commonalities, we note:
1. A set of four parameters grounds the work of each of our students, which are their motivation, the posture the student adopts, the tools of analysis they use, and the way they look at the heritage they study.
2. The analysis tools of each student depend on the posture he adopts towards the studied heritage.

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3. The analysis of our students takes a demonstrative aspect. All the analyses carried out aim at understanding where the interest of the studied heritage lies in relation to its spatial and social context. Indeed, we think that the understanding of the relation linking the heritage to its environment guarantees a sustainable valorization.
4. The value of the studied heritage depends on its history, since our students draw from the history of the place and adopt a scientific and rigorous approach in this sense. This value also depends, in our opinion, on the experience of the place, on the memory and activities of the individuals who lived there in the past and of those who perceive it or live there today.
5. The three works we present result in projects where architecture is connected to its present but also future environment, that of the heritage and that of its urban context.
6. The sustainability of the preservation of heritage is a common concern to the three projects presented.

What differentiates the three architecture dissertations analyzed is:
1. The posture that each student adopts towards the heritage that he/she studies. The first student looks at the European city of Sfax like as filmmaker, the second considers the J'nein as a complex system and the last one admires the landscape of Kesra and contemplates its built and cultural heritage.
2. Each student uses the tools that best serve his approach. The first one relies on cinema and its tools. He uses the urban transect with the compositing technique to communicate his synthesis. The second student uses the tools of systemic analysis and schematization for her synthesis. The last one uses the SWOT analysis grid and draws her synthesis. Our contribution as supervisors of these works is to help our students to structure them and to direct them towards the references and tools most adapted to their

positions and sensibility. We specify that we have previously experimented with these tools and that they have given satisfaction.
3. The communication of the results of the analysis of each work depends on the sensitivity of the student and his skills. We note collage for the first, schematization for the second, and photomontage and drawings for the last.

6. Conclusion

This study allows us to attest that working on a built or urban heritage, requires the architect to position himself in relation to this heritage. It also requires taking into account the context in which it is inscribed. Beyond its history, its morphology, its material components or its current pathological state, it is necessary to consider the urban or architectural heritage as a place lived and perceived in the past, in the present and in the future. The current study shows us that rehabilitating, reconverting or restoring a heritage will only ensure the durability of its preservation if we put forward its relation with the future of its context. It also teaches us that the fragmentation of large vacant lots in a city is not the only solution for their recovery. Their integration into the economic, urban and social dynamics of their context is more promising. This study shows that it would be beneficial to consider heritage in its material and immaterial aspects as a resource for local development at the urban, social and economic level. Finally, we can say that the work on heritage, for architects, does not rely only on usual tools that are survey, classification, drawing, photography or even 3D scanning. Referring to other disciplines than architecture, archaeology or urbanism can help us to have an innovative look on the studied heritage. We think that there is a great field to explore for architects in that sense.

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Forms of Mediterranean Housing in the Pearl River Delta
From the S.S. Patris II to other seas

N.A. Galliano

Center for Innovation in Territory, Urbanism and Architecture
Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal

Abstract   The present paper proposes to settle a comprehensive understanding of the first statement of architectural modernity in the field of modern housing, built in the Pearl River Delta, precisely in Macau and Hong Kong, as experiment of Modern Movement's and Mediterranean's ideas in Asian territory. This essay intends to present Macau's Rainha Dona Leonor Housing Block and Hong Kong's Marks I & II Housing Blocks; inaugural residential buildings of Modern Architecture, that were not valorised, conserved or considered as heritage pieces; and, as consequence of economic reasons, are disappearing. The achievement of such goals is to be developed through a comparative analysis between the two architectural examples of the urban areas on focus; in order to derives, in one hand, an amplitude equation of the materialized Mediterranean theoretical matrix adopted to respond to complete different social latitudes; and in the other hand, to identify the variations between the solutions of housing typologies, collective spaces, spatial distributions and technical systems (facade and cross-ventilation). This classification needs to consider contextual factors, concentrating not only in the understanding of the proposed case studies, but also on the problematics and potentialities, in order to recognize their role in the generational cultural migration that characterized the Mediterranean condition. The present survey aims to document and value inaugural housing works of other seas, that show the adaptation of Mediterranean approaches to a different culture, climate and environment, establishing the foundations of future unique urban frameworks. Considered as heritage's architectural pieces endanger of fade over time, their interactions with public interest, memory, history and local characteristics deserve further consideration.

1. Introduction

Along 1933, the 4° *Congrès Internationaux d'Architecture Moderne* (CIAM) was taking place over the Mediterranean Sea, on board of the cruise *S.S. Patris II.* While sailing from Marseille to Athens, the European Architecture's pioneers were sharing and establishing the principles of a nitid change that was forthcoming along the built environment. New social, political and cultural needs were demanding the adoption of an innovative architectural paradigm which could respond to the future worldwide challenges. Modern Architecture stabilized her role in the European scenario, in the first half of the 20th century, proposing a new architectural matrix, showing solutions regarding "design from the cup of coffee to the urban plan" (W. Gropius) (docomomo international 2013).

The process of modern urbanization in East Asia, in terms of urban planning and architectural language, has been developed mostly under the guidance of Western planning models, principles and practices, including few adaptations and revisions to meet local circumstances (Rowe 2005). During the 2nd half of the 20th century, the challenges of rapid modernization and explosive regional urban growth in the Asia-Pacific raised incredibly fast and under extreme density conditions (Lampugnani 1995). The case of the Pearl River Delta's architectural reality presents a unique urban development, characterized by the introduction of the Modern Architecture paradigm in response to local social and political

latitudes. Macau and Hong Kong stand as unique examples in the Asian Scenario in terms of Urban Development; the historical introduction of the architecture of the West in East territories in the past centuries, followed by the rise of modernism in the 50's highlight their close relation with the Mediterranean language.

Macau's Rainha Dona Leonor Housing Block and Hong Kong's Marks Housing Blocks, as first statements of architectural modernity in the field of modern housing in each area, settle the inaugural characteristics of the forthcoming residential urban development. The projects under analysis, characterized by the adaptation of Mediterranean techniques and modern architectural characters, display the turning point that started a regional urban generational growth. Required to respond to different social forces and appeared under different urban scales of intervention, the two examples represent a fundamental occasion to better understand the evolution of the urban framework which settle up the present built environment of those city-states. Rainha Dona Leonor Housing Block and Marks Housing Blocks, already declared as architectural heritage pieces in danger, contemplate the ground of cultural migrations of the Mediterranean matrix adapted to different climate, cultures, and scenarios of others seas (Quili Xue 2016, Leão 2020).

2. The case of Macau

Figure 2 - Bloco Rainha Dona Leonor, 1961, Macau

Macau, former Portuguese colony in the Pearl River Delta, because of his particular geographic circumstances, his specific history characterized by the Portuguese presence, his close relationship with Europe and strong proximity to China, reflects the development of a contrasting architectural case study. Divided by two cultures, and simultaneously liked to both, Macau, marked by casinos and game's economy,

identifies the transition from old European villa in the South China Sea, to a modern exceptional urban centre. In this region, Modern Housing has been introduced principally by the government's action, with punctual interventions and architectural singular experiments, destined to government's users or public services' workers.

Rainha Dona Leonor Housing Block, designed in 1958/59 by Architect José Lei and his Hong Kong based practices, and inaugurated in 1961, is the first high rise residential building in Macau and a unique work of art embodying the adoption of Modern postwar principles and Mediterranean ideals of the epoch (Leão 2020).

The building under analysis is a single block experiment, destined to government's employees. As the first gest of verticalization in the centre of the city, with 45 meters high facade and a total of 13 storeys, it represented a symbol of modernization and the future prospects.

The project footprint occupies an area of 315 m² of the total plot of 515 m², and is characterized by a rational space distribution in plan and section. The interior is distributed in 24 residential units in duplex typology, and a typical street-facing retail on the ground floor.
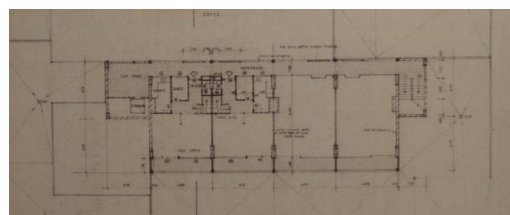
Figure 3 - Floor Plan Layout, Bloco Rainha Dona Leonor, Macau

Rainha Dona Leonor Housing Block's vertical distribution was provided by two cores located in the opposite short-sides of the rectangular perimeter; one furnished of walk-up stairs, and the other equipped with an elevator (first residential lift equipment in Macau) (Leão 2020).

Apartment's access was made by an exterior common balcony/gallery which walk along the interior long perimetral line of the building; and provided to each unit the benefit of natural cross-ventilation. A minimum convenient area was given to circulation, services and installations; those elements were always kept in the interior side of the flats, with the intention to bring maximum profit to the available space for living use functions.

The facade, with the adoption of an elegant set-back on the principal line, sets his balconies in double height. Using this approach, the architect expresses a straight relationship between interior and exterior, showing the duplex housing solutions, and providing to each unit an external walkway/veranda on every second level. In addition, progressive and convenient sun protection fixed systems were integrated to the facade along the storeys, in response to the hot and humid subtropical climate.

Figure 4 - Façade, Bloco Rainha Dona Leonor, 2018, Macau

By the analysis of the project's architectural concept and his applied techniques, can be observed a strong proximity to Le Corbusier's masterpiece Unité d'Habitation de Marseille (La ville Radieuse - 1952). A similar duplex units formal design, within various innovative elements as fixed brises-soleils and cross ventilation solutions, already studied and experimented by the French architect, were a clear inspiration for José Lei in the examinate building.

The application of new construction technologies, as well as the adoption of materials as concrete, steel and glass, gives to Rainha Dona Leonor Housing Block a strong character of innovation. The exposed concrete white painted structure marks the rhythm of modular units in an assumed manner; and it creates an orthogonal grid representing a plain minimal aspect of modern functionality.

During the 20th century in Macau, the housing production clearly reflected a Sino-Portuguese hybridism. In the first half of the century, a deep eclectic taste was reflecting the meeting of cultures between East and West (Tostões 2010). Meanwhile, the progressive use of iron, and later, concrete in construction, stimulated the application of a new grammar capable of developing a new design pattern. A functional architectural language characterized by verticality and geometric marking of the volume, from Rainha Dona Leonor Housing Block on, constituted a remarkable modernist set.

Figure 5 - Bloco Rainha Dona Leonor, 2018, Macau

As it's happening in the most of the existing cases of Modern Architecture in Macau, Rainha Dona Leonor Housing Block presents today a very poor state of degradation, aggravated by numerous significant modifications. Economic considerations override the heritage value of this architectural masterpiece in Macanese urban scenario, and probably, within a short period of time, it will disappear.

3. The case of Hong Kong

Figure 6 - HKHA annual report, 2018, Hong Kong

The case of Hong Kong, former Asia-Pacific's English concession located on the opposite side of Macau, on the Pearl River Delta, reflects a unique urban development, characterized by the introduction of Modern Architecture in response to the historical social and political latitudes.

Hong Kong area, during the first half of the 20th century, was hit by an uncontrolled cross-border immigrants flew; the population exploded from 600,000 people in 1945 to three million people in 1950. The short available land of the mountainous island was mostly occupied by improvised shelters and unorganized areas (Quili Xue 2016).

Mark I and Mark II Housing Blocks projects were part of an urban resettlement proposal, and consist into the first architectural materialized answers to the refugee's demand. Marks Housing blocks, designed by the Hong Kong Housing Authority (HKHA) in 1954, are the first design models used in the mass reproduction of the inaugural public housing plan, and represent substantial modern characters (HKHA 2021).

Around 140/150 Mark I Resettlement Blocks has been build up and reproduced, in Hong Kong Area, from beginning of 1954 until the mid-1960s (HKHA 2021). Similarly to post world war Modern Movement's European urban planning, functionality, speed of construction and coordination of a limited construction cost were the set-up objectives to achieve.

Mark I buildings were mostly following an H-shape configuration, with two principal storerooms wings spaced 10 meters apart from each other. The housing structure was made by six storeys walkup concrete construction. In each floor were distributed 64 domestic units; in some cases, the number of units has been extended to 84. There were 384 flats in each block. The floor plan is horizontally organized by back-to-back units, related by exterior access via a common balcony/gallery which walk along the external perimeter of the building. The vertical distribution is driven by four cores of staircases located in the interior side of the end of each wing. Respectively, every flat consists in a single-room unit of about 12 m² of available space. Each room was provided of an opening hole in the central partition wall, to assure natural crossventilation. This natural refreshing character, in addition to the horizontal distribution made by public balconies, and seen the global dimensions of the intervention, let intend the fact that privacy was minimal. The interior living space is small for a random accommodation of five or more people. By the adoption of beds as a basic module, it is hard to think about the organization of four beds into a room. Those space characteristics let alone other "home" functions; but even in this minimum living condition, the low-cost functional housing plan was apporting comfort to residents which originally lived in slums, or squatter areas (Quili Xue 2016).

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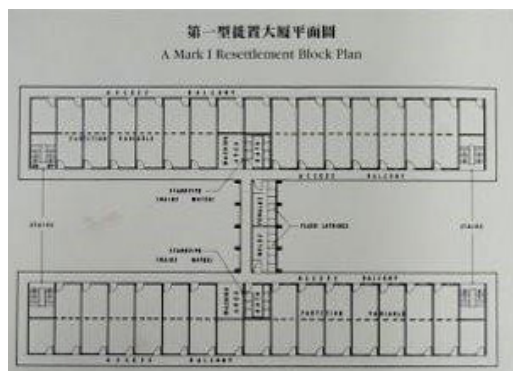
Figure 7 - Floor Plan Layout, Hong Kong

The full concrete structure soul of the construction remains "naked" in the facade, creating a symmetric grid, guided by long horizontal lines. As in the exterior case, the interior spaces were not treated, presenting unplastered concrete walls and floors. Household facilities in the resettlement blocks were limited. Basics services, sanitary facilities, and the access to water, were shared and settled in a central position in every floor; their location corresponds to the link between one housing wing and another. Storages and depository spaces were conventionally located in a central area of each volume's floor. Cooking activities were normally happening along the external corridors. Flat roofs were accessible and usually used for shared entertainment; in some cases, those were location of primary schools or leisure structures.

The overcrowded living circumstances and the high density were normal characteristics of the Mark I blocks.

Mei Ho House is one of the not many surviving examples of Mark I resettlement blocks, commemorating seventy years of Hong Kong public housing history (HKHA 2021).

After some years of adoption of the Mark I solution, reasonable modifications had to be considered to improve user's living condition. The following redesigned type of interventions were called Mark II resettlement blocks. Likewise to the hasty construction of the first batch of resettlement housing in 1954, the Government made ongoing efforts to improve design and facilities. The Mark II blocks were built under a similar concept of the MARK I with only slightly differences. The addition of one or two floors to seven or eight storeys' buildings has been adopted in order to increment the number of flats in each block. The vertical distribution's nucleus changed the position, from the lateral interior core of the wings to the outside before open perimetral area. Those staircases blocks were connecting each other providing an innovative external image of the building and, consequently, contributed to a better accessibility to the flats with a new internal distribution. Located at the end of the two arms, the staircases were ventilated and composed by a perforated concrete block screen wall. This introduction closed the H shape into a Chinese character "日" (sun) shape and generated two large internal courtyards.

Figure 8 - Mei Ho Housing Block, 1956, Hong Kong
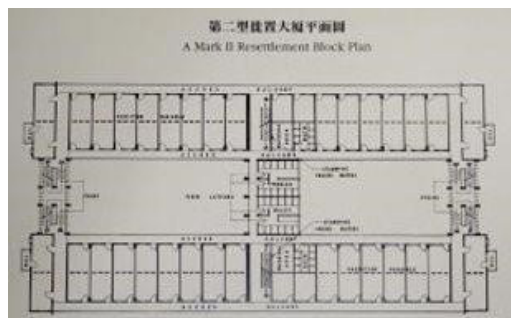
Figure 9 - Floor Plan Layout, Hong Kong

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The space at the end of the two wings, in place of the location of the Mark I's staircases, was occupied by two new end-bay apartments, for a total of eight units. Those different spaces were hosting larger families and combining better living conditions: 28.8 square meters per unit, private kitchen, water taps and an external faced balcony. The ground floor has been converted into shops, markets and storage areas. The "domestic" criteria and scale of the rests of the spaces were mostly maintained, in exception of the provision of more communal central bathing slots. Despite the non-ideal living circumstances, the Mark I and Mark II projects provided a better hygienic solution and a fire and typhoon proof construction to Hong Kong's inhabitants. By the end of the 1970s, in order to bring better condition to their users, the Hong Kong Housing Authority proposed a pilot scheme project treating the refurbishment of Marks's units. The construction of Mark I and Mark II has been suspended during 1964; in total were built 240 social housing intervention of this kind (HKHA 2021). From the beginning of 1956, following a change of regulations allowing building heights to reach from ten to twenty storeys, a new architectural generation of vertical high density living came into existence.

4. Conclusions

Rainha Dona Leonor Housing Block and Marks Housing Blocks represent the moment of post-war transition that Macau and Hong Kong were living. They appeared in response of complete different social contexts and over contrasting urban scales; but by looking to the two projects, the adoption Modern Movement's basic principles and theoretical fundaments of Mediterranean techniques can be clearly recognized as a common denominator. Those emerging forms of inhabiting space in contemporary urban territories, represent the result of unique social requirements combined with the cultural migration of the Mediterranean condition.

The examples under analysis were made by horizontals bands of a continuous balcony running around the whole block. Flat roofs were accessible and normally used for shared entertainment or services locations. The facades were raw, clean and undecorated, with structural materials protagonists of the functional skin scene, showing flexibility and a straight relationship between interior and exterior. The interior orthogonal distribution of standardized modular units generates a modern rational grid. The architectural plan was designed and organized looking to maximise technical efficiency and availability of living spaces.

Studied and designed as "machine for living", Rainha Dona Leonor Housing Block and Marks Housing Blocks were architectural experiments in the Pearl River Delta representing a turning point for the urban conception of the area. The modernist method of designing housing with little decoration was efficient and effective to produce housing in a short period of time, providing helpful neighbourhoods and good construction solutions leading in the best possible way to the local weather conditions. The built environment produced after the World War II, in the Pearl River Delta, represent one of the first steps made by Asian Modernism in a region of meeting point between East and West. Due to a tide of redevelopment guided by high commercial profit and the economic uncontrollable growth, the buildings built up during the 1950s/1960s have been, or are being, replaced by a new generation of skyscrapers; some of them stood for not even 30 years. This modern heritage deserves further consideration. A clear contribute to the architectural history of this period need to be realized.

The present paper has the ambition to reveal pieces of unique design and development, to provide and valorise new heritage references inspired by a Mediterranean architectural soul; but also, to enrich discourses as aesthetics of high-density environments or the city-state urban grow.

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The modernizing process of the Pearl River Delta includes cultural migrations of Mediterranean influence. A common Modern Architectural matrix created a unique urban framework which should be better understood and valorised.

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The convent of São Francisco do Monte in Viana do Castelo (Portugal): an integrated digital survey for the understanding of the architecture and its landscape

F. Cioli, A. Cottini

DIDA, Department of Architecture; University of Florence, Italy

Abstract   This paper deals with the first results of one of the significant case studies to be deepened within the European project "F-ATLAS, Franciscan Landscapes: the Observance between Italy, Portugal and Spain". The project aims to study the Italian-Spanish-Portuguese Franciscan Observance network to define an "Atlas" of documentation and knowledge for conservation, protection, and promotion of this Cultural Heritage. The convent of São Francisco do Monte in Viana do Castelo is one of the first three convents funded by the *Ordo fratrum minorum* in Portugal. The analyses aimed at investigate the evolution of the religious settlment to build a three-dimensional database. The case study has been deepened by an integrated digital survey: Aerial Photogrammetry and Terrestrial Laser Scanning and Photogrammetry, to document the current state of conservation and to investigate the traces of the past and the relationship between the complex and the surrounding landscape.

1. Introduction

The research is part of the three-year European project F-ATLAS (Franciscan Landscapes: the Observance between Italy, Portugal and Spain), winner of the JPI-CH 2019 call and started in July 2020. The project aims to develop methodological protocols for the management and dissemination of the tangible and intangible cultural heritage of the Franciscan Observance settlements (Bertocci, 2021).

Franciscan Observance architecture is chosen as an emblematic example of coexistence between architecture and territory, reflecting an essential part of European culture. In particular, through the study of bibliographic and archival sources, the inspection and census of each complex, and the creation of integrated digital survey campaigns, the project aims to investigate the close link between the architecture of the Observance and the territory, underlining how the places of the Franciscan presence have marked cities and countryside, "forming an inseparable part of history, of civil life and have an impact on the physical image of the territory" (Pellegrini, Paciocco, 2001, p. 124).

The preliminary investigations, which began in July 2020, aimed at identifying a series of case studies in Italy, Spain and Portugal, which constitute an essential testimony of the connection between architecture and the 'Franciscan landscape'.

The project, now halfway through its three-year program, has led to numerous survey campaigns and the documentation of ten convents. In Italy, the convents of San Bartolomeo in Foligno (Bertocci, Cioli, Ferrari, 2022), the Sacro Speco in Narni (Cioli, Lumini, 2021), the Eremo delle Carceri in Assisi (Bertocci, Cioli, Cottini, 2020), the Basilica of Santa Maria degli Angeli and the Romita di Cesi have been detected. In Spain, the convent of Castell Monestir de Sant Miquel d'Escornalbou in Tarragona was surveyed. Furthermore, in Portugal the survey concerned the convent of Santa Maria da Insua in Caminha, Santa Maria de Mosteirò in Valença and Sao Francisco do Monte in Viana do Castelo.

These surveys are aimed at developing the two-dimensional drawings and three-

dimensional models necessary for the subsequent phases of investigation concerning the definition of invariants in the architectural typology, the study of the state of conservation, and the evolutionary stages concerning the dynamics of historical-political affairs that have affected the three countries and religious orders.

2. The convent of São Francisco do Monte: history and development

The Convent of São Francisco do Monte, located in the municipality of Viana do Castelo in Portugal, dates back to the end of the fourteenth century and was one of the first convents of the *Ordo fratrum minorum* in the country. The foundation dates back to 1392 (Gomes Texeira, 2010 p. 165), with the construction of a primitive oratory, on the initiative of the friar Gonçalo Marinho (†1400), near a source of water. The building was subsequently enlarged with a small convent area, and in 1568 the complex was integrated into the Capucha Province of Santo António, becoming a convent in which a novitiate was established. In 1584 work began to construct a new wing of the convent, making a cloister and a dormitory. In 1590 the original church was rebuilt with a high choir. The complex was interested in several extensions that followed one another until 1612, when the friars were transferred to the more central Convent of Santo António dos Capuchos (Viana do Castelo), thus reducing the site to its original function as an oratory. However, this did not stop the evolution of the complex, which through significant donations was continually enriched with works of art and awards. In 1759, the construction of twenty dormitory cells, a library, and an inn were completed, and on 22 December 1752, the building took back the title of 'convent'. In 1785 the chapel of São Pedro de Alcântara and the access galilee to the church were built. In 1834, the convent was abandoned with the extinction of religious orders and the alienation of church property by the liberal state. In 1850 the church was donated to the Parish of Santa Maria Maior, while the convent was bought at public auction by the Viscount of Carreira. In the 1920s, the complex was

Figure 1 - Aerial view from drone of the monastery of São Francisco do Monte

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inherited by Maria Luisa De Castro Feijó, who hired a custodian to take care of the place until 1966, its definitive abandonment. During this period, the convent entered a long period of decay. In 1987, the last owner donated the convent's property to the Santa Casa da Misericórdia in Viana do Castelo, which sold it in 2001 to the Polytechnic of Viana do Castelo. Despite the interest in this critical monastic complex, which led to some structural consolidation and safety measures in 2007, the building is nowadays in a state of neglect (SIPA).

The ruin, part of a large wooded area of pines and eucalyptus crossed by hiking trails, strongly characterises the landscape, transforming the entire environment into a 'mental landscape', highlighting its historical depth and temporal dimension (Fiorino, R. Pila, E. 2014).

Access to the complex is through a high arched portal with a cornice based on two Doric columns, surmounted by three statues: San Francesco, San Pedro de Alcántara, and Sant'Antonio. Two chapels on the left overlook the entrance patio (fig. 2-1), one dedicated to Santa Maria Madalena (fig. 2-2) and the second to São Pedro de Alcântara (fig. 2-3). Both in poor condition, they had a gable facade with a round-arched portal supported by Tuscan pilasters. On the opposite side, along the church wall, is the small chapel do Senhor da Prisão (fig. 2-4) (Torres Monteiro, 2018). Based on the historical documentation, the territory owned by the convent was characterised initially by the presence of numerous seventeenth-century chapels inserted within a path marked by fountains and drinking troughs.

The two main entrances to the complex also overlook the patio. The first in Galilee (fig. 2-5), where the Senhor dos Passos chapel (fig. 2-6) is located, leads to the church through a door built in the 18th century, and the second entrance with a monumental arch leads the convent. There are three other secondary entrances along the perimeter of the building. One on the back, probably intended for horses, given the presence of metal hooks

Figure 2 - Functional diagram of the convent. The arrows indicate the main and secondary entrances. The numbers with the description of the functions are given in the text

on the wall and several drinking troughs, one on the side of the refectory and one on the western side of the complex.

The church (fig. 2-7), with a longitudinal plan with a single nave, has four shallow side chapels – framed by round arches supported by Tuscan pilasters – and a presbytery (fig. 2-8) narrower than the nave and of older construction. The two chapels closest to the triumphal arch, dedicated to the Senhora do Rosário and to São Boaventura, were decommissioned and replaced by wooden structures with the angled altarpiece, the two devoted to São Gonçalo (Gospel), and Sant'Antonio (Epistola) remain. The main facade on the western front is flanked on the left side by the quadrangular bell tower (fig. 2-9) built in the eighteenth century and is completely covered with vegetation; the large arched window of the high choir remains visible.

The convent develops around a quadrangular cloister (fig. 2-10). Some smooth pillars with Ionic capitals and a portion of the

balcony on the upper floor remain today. The confessional room (fig. 2-11) and the ancient chapter house (fig. 2-12) are located on the west side of the cloister. On the east side, along a corridor called '*via sacra*', is the sacristy (fig. 2-13), the presbytery, and the morning staircase that led to the dormitory on the upper floor. Further east is the new chapter house (fig. 2-14), connected through a large atrium to the outdoor patio. Further north is a large room that served as a refectory (fig. 2-15) and the kitchen (fig. 2-16), characterised by a high fireplace and various rooms used as warehouses and washbasins. On the left is the '*De Profundis*' room (fig. 2-17), connected to an entrance area with the hooks for tying the horses (fig. 2-18). Towards the south, there is a corridor with a small chapel and the 'regular' staircase (fig. 2-19), which led to the upper floor where the dormitory was located. All the second floor and the rooftop are disappeared, but it is still possible to figure them out by investigating the historical sources and the traces on the masonry.

3. Digital survey campaign

To understand the connection between the monastic complexes and the surrounding landscape, the F-ATLAS project's provides accurate digital surveying operations, obtaining metric and morphological data and information about their conditions. The methodology foresees the integration of aerial and terrestrial instruments such as laser scanners, drones, and reflex cameras. The laser-scanners data provide a 3D point-cloud with morphological and dimensional characteristics of the architectural objects and the landscapes; drones and reflex cameras are useful to obtain complete photographic documentation of the conventual complexes and for the application of photogrammetry techniques, such as Structure from Motion (SfM), to obtain textured 3D mesh models.

In this specific case study, the ruinous state of the convent required a methodo-logy to acquire the architecture and the surrounding landscape, avoiding the obstacles of the vegetation and high altitudes. The survey was carried out integrating different techniques: Aerial Photogrammetry (with a DJI Mavic Mini drone), Terrestrial Laser Scanning (with a Faro Focus M70) and Photogrammetry (with a Nikon D610 reflex camera). The aerial acquisition enabled the identification of structures and vestiges – wholly or partially hidden by the vegetation – from a high point of view, and give a global view of the entire complex and its surroundings; the terrestrial acquisition allowed a closer survey of the existing structures and the surviving decorative system. The integration of these techniques provided accurate and reliable metric data, which are helpful for bidimensional drawings and 3D models with different scales (e.g., technical drawings, virtual tours, etc.…) and for further analyses on wall stratigraphy and construction phases.

3.1. Laser-scanner survey

The convent of São Francisco do Monte, together with its landscaped surroundings, as well as other monastic complexes of the Observance, can be defined as a 'cultural landscape' (UNESCO, 2021, p. 22), a union between the work of nature and humankind, where culture acts through natural elements to define a place that is a well-balanced synthesis of these two elements, expressing a long and intimate relationship between peoples and their natural environment.

The laser-scanner survey campaign was carried out in June 2021 and covered all the main internal areas of the convent and the external perimeter. The total acquisition of the complex required 122 scans made with a Faro Focus M70 with the given RGB colour overlay through the HDR cameras equipped by the instrument (fig. 3). The result of the documentation campaign is a highly descriptive 3D point cloud

Figure 3 - General plan from point-cloud with indication of the stations of the laser-scanner survey

that, integrated with the photogrammetric models obtained from high-altitude photogrammetry, returns the image of the convent of São Francisco do Monte, allowing the development of further in-depth investigations also related to the evolution of architecture and landscape.

The survey campaign took place over two days. For this reason, it was necessary to plan the number of scans concerning the acquisition resolution and the related times. The outdoor environments were acquired with a 6.1mm / 10m, while the indoor scans were 15.3mm / 10m. The acquisition was designed to ensure the closure of a fundamental polygonal to control reliabil-ity and secondary polygons to verify the internal environments, freeing the architectural complex and its sub-components from the landscape system. The purpose of this documentation campaign is to create the canonical 2D graphic drawings at a scale of 1:50 necessary to develop the subsequent investigations envisaged by the project and to define, through the representation, a framework of metric and morphological knowledge helpful in understanding the complex and to the development of comparisons and links with other investigated case studies, through the analysis of the masonry stratigraphy and of the evolutionary phases.

3.2. Photogrammetric survey with Structure from Motion technique

Parallel to the laser-scanner survey, ground and aerial photographic acquisitions were made. For the former a Nikon D610 SLR camera with 12-24mm lens was used, for the latter a DJI Mavic Mini drone. As highlighted in the previous paragraph, the time available for survey operations was two days – so attempts were made to concentrate the photographic campaigns in the hours of the day with more favorable lighting conditions. To obtain good results it is appropriate that the photographs used for photogrammetry with SfM technique (Structure from Motion) do not present shadows too sharp and have an exposure that allows to use appropriate parameters for shooting (low ISO, low focal ratio, short exposure time). The conventual complex is positioned with the west side facing upstream and the east side downstream, and is surrounded by a forest with high vegetation along the north, west and south sides. The vegetation on the east side is lower, while the walls of the entire complex, without any roof, are mostly covered with climbing plants. In light of these considerations, it was decided to concentrate the photographic operations in the first half of the day, preferably at times when the sky was covered and global lighting was therefore widespread. Due to the short time available, some acquisitions with reflex instrumentation were completed shortly before sunset – the lighting conditions, while not allowing to keep the ISO values and the focal ratio low, were however favorable in terms of softness of the shadows.

The photographs taken from ground and air were aimed at capturing sequences of images to be used with specific software for SfM technique. In particular, the photographic sets acquired from the ground were concentrated on the outer perimeter of the complex and inside the cloister and the church. An attempt was made to take photographs that framed the walls in their entirety, approaching as closely as possible, even though the dense vegetation was an obstacle. The photos acquired from the ground have also served to document some significant details of the convent, such as the capitals of the cloister, the coat of arms of the entrance patio and more generally the vestiges of the decorative apparatus – which would hardly have been acquired with sufficient detail through laser-scanner or photogrammetric survey. Using the photos taken from the ground it will also be possible to elaborate assessments on the state of conservation of the walls of the convent. The photographic acquisitions from drone have allowed to obtain information on all those parts of the convent complex not reachable through the ground photographs alone, both because of the strong presence of vegetation and the height of the walls. With the drone it was also possible to obtain general images and videos of the conventual complex and the surrounding landscape, useful to analyze the relationship between the architectural object and the environment in which it fits.

In total, around 530 ground photos and around 1300 aerial photos were taken.

4. Data elaboration

The acquired data were processed separately in a first phase, and where necessary integrated with each other in a second phase, in accordance with the research objectives. As stated in the initial paragraphs, the objectives of the F-ATLAS project are in fact linked to the documentation, management and enhancement of the tangible and intangible cultural heritage of the Franciscan Observance. In this context, the tools offered by integrated digital survey are a valuable support for the graphic representation – two-dimensional and three-dimensional, at various scales of detail – of architectural complexes and the surrounding landscape. These representations of the selected case studies will serve as a basis for further analyses of architectural typologies, the state of conservation of buildings and

stratigraphy, and will also be used for promotional purposes.

In the specific case-study, the collected data were processed in order to obtain a 3D coloured point-cloud and 3D textured mesh models to be used for two-dimensional and three-dimensional graphicisations, and some images and short videos to be used in the website and social media of F-ATLAS project.

4.1. Data elaboration for architectural analyses

122 single scans were obtained from the laser-scanner survey, which were recorded in a single point-cloud through the Leica Cyclone software. The point-cloud provides reliable metric data and features the colour data acquired by the integrated camera of the laser-scanner instrument.

The cloud can be cleared of superfluous data such as tree foliages or other elements not belonging to the architectural object, to obtain a view as clean as possible of the wall surfaces. The point-cloud can also be used to obtain 2D drawings of plants, sections, elevations and axonometric cutaways. These images are imported into drawing and modeling software, such as Autodesk Autocad or Rhinoceros, to provide metrically reliable

Figure 4 - Data elaboration with Agisoft Metashape software: first ali-gnment of the images taken inside the cloister – point-cloud and mesh have not been calculated yet. The shooting positions are visible, a Nikon D610 with 12mm focal was used

support for creating dimensioned technical drawings or 3D NURBS models. The former may have a scale of representation ranging from that of landscape to a more detailed as the 1:50 – are for example used to represent distributive plans and maps of degradation and superficial lesions. The latter are an effective way to visualise the conventual complex in three dimensions and to break it down into its essential volumes to represent, for example, the construction phases of buildings.

At the same time as the processing of the data obtained from the laser-scanner survey, photographic data from reflex and drone were processed. The photographs were catalogued according to the environment in which they were taken (e.g. aerial photos, external patio, cloister, south facade, ….) and imported into the Agisoft Metashape software. The individual sets were processed separately within the same file: the software recognises the shooting positions of the photographs, aligns the images, creates a point-cloud and three-dimensional textured mesh models. Mesh models are referenced based on the laser-scanner point-cloud, so that they have the same scale and orientation in space. Three well recognisable points are identified on the mesh model, to which are assigned "markers", whose coordinates are modified in order to be equal to those of the three homologous points belonging to the laser-scanner point-cloud. Mesh models are then combined into a single overall model.

From mesh models it is possible to obtain orthomosaics of the facades of the architectural object, that is orthorectified images of the walls. These images are used together with point-cloud data to create two-dimensional representations of plants, elevations and sections, adding information about the colour and texture of facade surfaces.
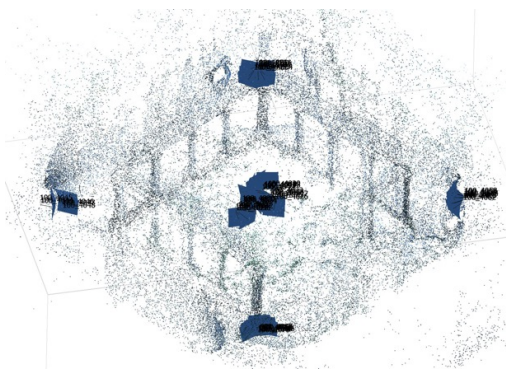
4.1.1. Data integration

When necessary, the processed data can be integrated with each other to obtain further products.

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In the specific case-study, the laser-scanner point-cloud was combined with the photogrammetric models in a single three-dimensional model: the laser-scanner point cloud, after being decimated with the Autodesk Recap software in order to reduce the number of points, was imported into Agisoft Metashape. Here, using the "markers", it was aligned with the point-clouds obtained from photogrammetry and the overall point-cloud was subsequently processed in order to obtain a textured mesh model. The resulting model, combining data from laser-scanner, reflex and drone, has a much smaller number of gaps than the previous models and is therefore a three-dimensional accurate representation of the convent and the outbuildings. It will be used to obtain a 3D printing of the architectural object and can be uploaded to specific web platforms for the display of 3D content.

4.2. Data elaboration for dissemination

As stated above, some of the images and videos acquired during the in situ survey phases are used for dissemination and advertising purposes on the F-ATLAS project's website and social media channels. For this purpose, part of the two-dimensional and three-dimensional elaborations are also used, since they present a certain communicative immediacy as well as being supportive of architectural analysis.

The aim of the dissemination of this Cultural Heritage is to make it known to the non-academic public, as it represents a significant heritage in both religious and landscape terms. The advertising of this Heritage – which in this specific case is in a state of ruin and is accessible only through paths not indicated by the local billboard – can lead to its enhancement through adequate conservation and inclusion in the tourist and religious routes that connect the Franciscan places in Europe.

5. Conclusions

The use of integrated digital survey techniques, combined with the study of bibliographic and archive sources, provides a reliable support for the architectural analysis of historic buildings. The data collected in the convent of São Francisco do Monte have been included in the database of information related to the research project F-ATLAS and will constitute a database accessible and updated over time. The data of this database are of different nature and large in terms of digital space, it is therefore essential to establish *a priori* the purpose of use and discretise accordingly the data.

In the specific case, the aim is to obtain two-dimensional and three-dimensional metrically reliable representations that are to support further studies on the conservation status of the surfaces and more generally of the conventual complex, and that can be taken as a reference for the study of the construction phases, also through comparison with archival graphic sources.

The images, photographs and videos produced are also used for the purpose of dissemination and advertising on the website and social media of the project, so as to draw the attention of the non-academic public and tourists to this Heritage that, in this specific case, is in a state of ruin and is difficult to access.

Credits

University of Barcelona (PI Maria Soler Sala), and the Portuguese Catholic University of Lisbon (PI Maria Filomena Andrade).

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The Ecologial Footprint of Being

Ferreira, Rúben Manuel

Faculdade de Arquitectura Universidade de Lisboa (FAUL), Lisbon, Portugal,
rubenmanuelferreira@edu.ulisboa.pt

Abstract   Housing comfort is achieved by architecture atmospheres. When thinking about Cultural migrations and the matrix of belonging into the Mediterranean condition, how is associated with a comprehensive inscription about space, place, and memory is important. An immaterial value, not just an invisible artefact, but also as heritage and technique.

A space results from rationality and design defragmentation within an aesthetical assemblage of principles, tendencies, and contemplations. Cannot be casted away from the origin (the place) and the user, who allows metaphors to gain build as a foundation. Ecological grounded identity also composes place. Landscape, ethics, purpose, and value of space are in permanent interaction with human senses and sensibility, and for that reason, humanized in that appropriation.

Time interferes with perception. When "returning" to a reserved place of imagination, where past has built meaning, the ancient became actual and contemporary, routine along space several alterities, forms, functions, and purposes. And then the ancient house is adopted, as a piece of immaterial cultural comfort, as the Norwegian cabin, the Japanese cabin and the American cabin are, something that stays behind but also upfront, where return is completion, because regular and sustainable for several reasons.

How these "produced" spaces are heritage but also contemporary material to dispose in an in-transition scenario reality related to architecture and inhabiting environments, where migration movements are frequent, certainty less frequent and a need for stable atmospheres in architecture a providing urgency to enhance sense of being and belonging (in place).

This communication proposes to interpret these reasons under material availability context, need and spreading performance from the cabin and produced space in place. COVID-19 has become unexpectedly one of these reasons. Not only.

Singularity (from exquisite), material culture, affecting urban integration as important perspective to understand a conceptual value, its diversity and ability to contemplate change. Atmospheres, ecological patterns, Nature in pure condition, principles recovered by a recognition about safe space, place, house as shelter, when comfort is achieved, heritage values create memories, and a certain visual perspective and inherited personal value is settled.

Which footprint is constituted by this value and how it influences time, space, and function. How heritage vernacular product is an argument, how urban experience is complemented by it and even re-enforced by this completion. How the cabin is device, ancient practice, or just emblematic source, from origin, transforming itself as resource and something undeniable centered on being, in Nature (and landscape). And framing an urban integration that dispatches principles, suggestions, and dispositions about a livability in transition, from one place to another.

It is expected to propose readings from findings about placement, architecture atmospheres grounded material and enhancing performance for architecture features when applied in transition – and following the Cultural migration material and the matrix of belonging to the Mediterranean condition.

Keywords: Atmospheres in architecture, Sense of being & belonging, Architecture in Transition, Human ecology.

Introduction

An actual condition about the Mediterranean is in discussion. How to address movements (migration) from African Northern Countries. How to integrate and create an acceptance about this integration in European countries matrix. How to create a space that opposes the actual disruption happening, in both "margins" of this Sea. How architecture features are a solid ground to face these problems and study the impacts, individual and collective, from which is possible to establish principles and address ideas that are, at a larger scale, a problem about urban development, urban integration, creation of source material in the origin (from where people are departing) and where they are arriving, that also includes landscape, Nature, and material (physical) and immaterial values.

Because the Mediterranean condition is wide in cultural values, historical background and organized as a venue for those who see the Western cultural "landscape" from the outside, a reading about something to aspire, and experience. And this is perfectly fair. Specially if economic value for those who try this venue is low and there is no expectation for improvement from their side, in their actual conditions. The eventual "sophistication" available in Europe "lifestyle" is, nevertheless, resulting from acceptance and concessions, but also from a constant and strong discussion among those countries who are included in this Mediterranean region at large (European Comission, u.d.). And all, in general, that have a voice in Europe (North and South).

If regional features, based in the material that is produced above borders, conflict controls and culture are resulting in a certain condition from which many are aspiring to experience, there are several layers of informative cultural and social issues to consider. These aspects cannot be placed in collective memory as a menace from the exterior to the interior, or something that is just recurrent and occurring with no other perspective in place just to deal with the consequences. Those in movement cannot be seen depending on underground strategies that create ruptures. Or be used as biographic material to feed filmography, literature and "artistic" manifestations in general, with no other result then a discussion with no measures applied in practice. Even if these artistic manifestations, for example, are acute reflections, sometimes well intentioned about themes like migrations, social justice, or problems experienced by individuals who do not control anything when changing places, something as to be done above this narrative.

It is shameful for the Mediterranean condition that so many are aspiring to understand, to have to deal with this kind of rupturable events, and to be reminded, in the collective imagery, how fragile life can in fact be, how easy is to be included in an undesirable "network", or to continue linked to these kind of events without any plausible solution. The recent Covid19 pandemic reminded all those who live in this region, but also in the "North", about how easy is to establish rules and principles that create even more ruptures along borders, "biogeographical" dispositions, and Western cultural basis across time.

This article is, by these means and context, an opportunity to discuss these questions and address this problematic, having into account some cultural material that is common to all humans, as individuals and as part of a collective group. Related to the experience of space and place, architecture atmospheres and how certain regions still must be read and developed within their assets, even if they differ from the Western cultural imagery. Being part of a "grid", something that cannot be ignored, not only by historical justice principles appliance, but also because place, space, landscape, urban development, and urban areas, are at the core of this problematic, they create a certain economic context, that derives from aggressive implementations and discussions along countries and the European region in

general, that need to be seen as implicative "shadows" creating much resistance. While discussions about architecture role in life can be seen as a luxury framework, the feed about memory, place, space, and ground, for those changing places just something not relevant because basic needs are at stake, from a conceptual approach and perspective, these also need to be understood, addressed, included in the equation, and considered as relevant. This confirmation is the most important thing to do, when reading the contemporary placement of the Mediterranean condition, since it must accommodate more then was expected – and the ability to do so is far less explored, expanded and upfront available.

A study about the cabin, or hut, in its conception, placed in landscapes, is then of importance to read these sensibilities and treat them or consider them as such in a diverse cultural (of borders) conception. Home is something every person needs, aspires, imagines, and recollects as part of a personal imagery that is somehow immaterial in materiality, but much more real and present in the social and physical realm – about the body and body insertion in the landscape, place and space, and urban environment, alongside a combination of factors like economic needs, proper house availability and natural restrictions to implement an ideal of urban link with landscape and Nature. And the cabin, if we think about the Norwegian example, has a deep connection with living the city and the place and space, but also the landscape and Nature. If we are to consider these principles, is also of real importance to read this example alongside other the American and the Japanese.

The American log cabin has is roots based on the English cabin myth, even if also influence by the Scandinavian model (Hoagland, 2018). The Japanese cabin, "Minka", a farmhouse (from 1734), which translated means house of the people, has is roots based on traditional Japanese construction principles (Nakagawa Take-

shi, 2006). And the Norwegian cabin, has is roots based on an inescapable experience from returning to basics, a simple life, along architecture traditional principles (Butenschøn, 2018), to enhance this linkage.

All three have in common a vernacular expression, building using design materials typology, choice that complies with placement in a natural environment, in contrast with urban settlements. The cabin works, therefore, as an actual defense mechanism from contemporary fuss. Even if before was just a place to live. By these osmoses, an aesthetical disposition is then available, not only discovered when experiencing the interior cabin space, but when contemplating an outside exterior framework, where beauty is placed and exposed as a fragment to ensure healthy living (Parsons, 2008).

This aesthetical condition has a persuasive language and subsequent narrative. It has to do with nature preservation, nature configuration and nature as source, not only resource. Admitting its value and practical benefits, as the bath along trees, very common and a recommended medical practice to do in Tokyo city center, and it's in and outskirts parks (Li, 2018). Nature is medicine. The walk-through natural space defined by landscapes, paths, shadows, light filtered by the environment. Textures. The use of housing space delimited across that boundary and its limits, is an important feature, as the walk itself. The cabin will then permute this scenario with a completion methodology.

Similar examples, different departure and historical backgrounds. Not only because located in three different continents. Cultural narratives, visions about architecture principles, and approach to life, are different in each cabin type, even if the purpose is basically to return, or return to where is possible to exist differently. One other important link between these three examples is the construction feature. The traditional cabin can be a heavy log disposi-

tion, with a densified appearance. A solid structure. Walls, celling, gardened roofs. Or a space with no range at all, no area limits, technology purging any sense of tradition. The alone dispositive that must work with a certain performance is real. Tradition interpretated, re-configured and presented with a new design, is real. But what is here in analysis is specially the ancient type, heritage issues and a contemporary vision about the theme will be also presented. Making plain assumption that a cabin is an ecological niche.

The Japanese example ("Minka") is very elegant in layout and has a focus deployment and starting point. The structure itself as visible impressive frame that almost disappears after the construction/house is ready. If in the American and Norwegian examples, there is a solid foundation with the place, the vernacular Japanese cabin has a placement flexibility that makes its design amazingly transparent, because this structure can be nonetheless just support for ceilings, walls and panels, but is also space producer, who lifts up the in between metaphor (Minka: A Farmhouse in Japan, 2011). The middle space. Being possible to pack everything to create a new adaptive housing model. Or just let the logs become old, fused with the landscape atmosphere. As presented in the article, contemporary solutions can take some construction details from the heritage background and re-interpret these among a new living.

Yet, adaptability, mentioned by Tanizaki when considering the difficulties of technical installations in Japanese houses, is a problem (Tanizaki, 1999, p. 9). The Japanese house has a delicate perceptional setting. The language of space (Lawson, 2001, p. 6) here, even if universal, denotes a crucial aesthetical and specialized attribute. Space communicates in a semiotic but also formative language, that reports to autonomous ancient practices, like craftsmanship and hand sculping design (Kjetil Harket, 2019). Norwegian cabin example

links to these practices, being the example the other two are compared with. The argument will be then to explore and understand which devices these cabins are creating an impressive image in those who use them. How their heritage value has a common narrative and immaterial value, ready to be perpetuated by new models for cabins, that in 2022 are even larger in area and compartments, contradicting original perceptions and designs. But very practical since COVID-19 pandemic, because their inhabiting promotes isolation, protection from exterior (urban) elements, which, can be argued, maybe have had a big positive impact in the majority of those adopting this "go to the cabin" ("å dra på hytte") way of living.

Not only, the Mediterranean condition (International Organization for Migration, 2020) will have to acquire a new dimensional perspective that sees and reads the Mediterranean Sea and Region in its global perspective and not as two sides of an equation that are different and apart. If problems about living in these areas, for locals and non-locals, are addressed in such a way in the collective memory, the individual one and impacts in cultural features – like the idea of house, home (in several regions, Mediterranean and African), availability in housing and architecture atmospheres that enhance or decrease this completion in a competent and reliable direction – from source, from origin, to everywhere else –, have to be applied. These features must at some point go ahead of cultural barriers and increment participation in the process of adaptation. When reading regions where climate change has more deeper impacts, this need to be seen as an opportunity for completion, integration, and evolution along side effects. Architecture, and architecture atmospheres can center the individual and collective, creating a more dynamic expansion and source. And assuming these regions as what they already represent for the Western living model.

1. "Hytte" as Natural ecosystem among ecological space

I have three chairs in my house; one for solitude, two for friendship, three for party[1]. (Butenschøn, 2018, p. 193)

No electricity, no taped water, no bathroom in the main building, but separated outside, are features common to a Norwegian original cabin. A house alone in the landscape, a group of small buildings, some placed outside the main building, already a social space, consolidate regular returns and presences. This typology can create an internal patio interfacing all spaces. Summarizing, a set of small constructions, or compartments, arranged design creating an internal, transformative patio accommodated by this disposition. Bedrooms, bathrooms, kitchens, or collective rooms or living spaces.
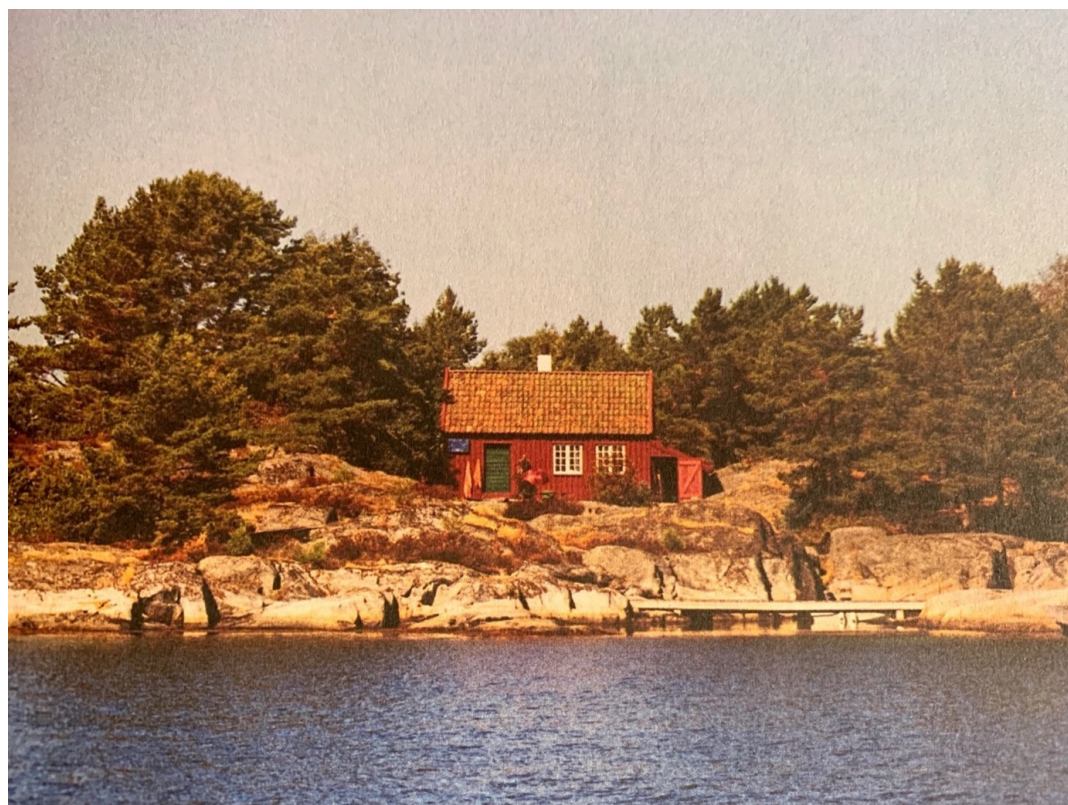
Figure 1 - © Peter Butenschøn, cabin in Beltsholmen, Brekkestø – general view. BUTENSCHØN, Peter, Husimellom - En reise i norsk arkitketur (A journey in Norwegian architecture), Forlaget Press, Oslo, 2018

[1] The chapter "Enkelt", Simple, in English, begins in the book written by Peter Butenschøn with this quotation from Henry David Thoreau. However, the word "party", at the end of the sentence, in the original version, was translated "selskap", in Norwegian. Which has a wider significance. Not only reflects an idea about joining a party, maybe sharing a table, but opens the spectrum that is captivated by the English word "society". The author wanted to give meaning about not only having friends over to have a meal, but an extended approach that stands for establishing a real friendship, above from surface, achieved within Nature atmosphere scenery.

1.1. Inhabiting & sense of self appropriation of place and space

Whether this cabin is located on the mountain, or close to the water, by the beach, therefore at a lower altitude, whether is just an isolated simple house, or a more sophisticated building, the principles are the same, and in the second case probably will not have enough area or compatible design to be considered a permanent place to be. Its significance is based on an ephemeral use. The hyperbolical time of being that implodes references and subject's modernity to a fast forward pursuit, requires technology and efficiency, technical and visual. When this happens, and *cabins* are sold as main houses, the traditional side of its integration in popular Norwegian culture is, in part, differed, can be argued. Even if the system which belongs too is the same, there is a difference, that does not match its internal significance as midpoint in a balanced life. In proportion, quality, and apprehension of space in public urban culture, cultural heritage at one side, changes. Not only because performance relates to architectural solutions reflecting today's technology, but also size, search for exclusivity and a resulting duty for urbanization where, before, that demand didn't exist. Contact with Nature, the original purpose, and relief, to return to an original device of inhabiting being, is transferred for this look related to social performance, can be argued – based on price, disposition, environment. Urbanization reflects principles, but the example, a Norwegian cabin is here a space that is connected to an easier life, physically away from urban life, with different perceptions, requirements, and a full purpose to address the issue among leaving for, having the city and another routine at ones back.

The following comment/quote is made based on that difference. Is important for the sake of contextualizing a transformation happening and for gathering eventual conditionalities.

With one home in Oslo and one in Nesodden, I fortunately have the opportunity to live out several aspects of myself […] In the city, I cultivate the urban and social. […] At Nesodden I have time to enjoy surroundings. […] It makes it possible for me to endure life in the city better. (Eli Støa, 2010, p. 2)

An interest assertion is reached by researchers:

This, which can be described as a "compensation theory", that we compensate for lack of qualities in our everyday environment by going more to the cabin to experience silence and closeness to nature, is something we investigate in this project. If the densification strategy, which is based on the desire for reduced energy use for transport and heating of buildings and thus a more sustainable urban development, leads to more people leaving the city in their spare time, it is not obvious that the total effect on the environment is beneficial. (Eli Støa, 2010)

Another assertion can be drawn about urban "densification" and the narrative under this comment. The fact is that the narrative is placed as a reflection for social purposes, but it is made from the original cabin interaction performance. So, it is undoubtable based in the cultural aspects related to the cabin as a device, and this cannot be drawn among variable assertions, but just among the origin. It is cultural heritage perception from memory, among an historic comprehensive gesture. One cannot dissociate one from the other, one cannot be dissociated from both. So, urban development continues in the city as it must, with no constraining's from the purpose because that is required, for progress's sake, but the personal narrative changes, adapting social needs, or social availability. This does not change the fact that a Norwegian cabin is a place of exceptional exclusivity at the core of its performant atmosphere, and the city does not have be seen as place of stress to Evoque another atmosphere contextualizing this predictability. Bad urban design or atmosphere (spatial, morphological) does

not compensate one and other. The cabin makes sense as the place where exists, at the distance from the city where exists, along a group of principles which make its use stable. The city also, whatever urban design it offers, but the perimeter suggested by the cabin location, creates a symbolic link among spatial cognition.

1.2. Space construction – aesthetics and Nature in type/typology/tradition

Several of our informants are concerned that cabin should not be too large. For some, it is even pointed out that should be small, because this saves work when it comes to both cleaning and maintenance. Several of the cabin examples show that a small area does not have to go at the expense of ordinary "cabin pleasures". Smaller

areas will provide environmental benefits both because it requires less resources to build and because less energy is also required for heating. If you do not have unlimited heating capacity, a small cabin in the winter can be more comfortable than a large one. Cabin size can also be an important factor in terms of reducing landscape encroachment. These are challenges and opportunities for planners, landowners, architects, and cabin manufacturers. Although the cabins now being built indicate that people want larger cabins with high technical comfort and are not very concerned about the environmental consequences of this, there are elements in our material that are more promising when it comes to the environment. This goes among other things on the importance of "simplicity" (*enkel*) and the fact that more informants seem to be less preoccupied with large cabins than what current cabin construction suggests. The fact that people's relationship with cabins is a complex phenomenon in

Figure 2 - @ Peter Butenschøn, cabin in Beltsholmen, Brekkestø – detail trees. BUTENSCHØN, Peter, Husimellom - En reise i norsk arkitketur (A journey in Norwegian architecture), Forlaget Press, Oslo, 2018

Figure 3 - @ Peter Butenschøn, cabin in Beltsholmen, Brekkestø – kitchen view. BUTENSCHØN, Peter, Husimellom - En reise i norsk arkitketur (A journey in Norwegian architecture), Forlaget Press, Oslo, 2018

continuous change, may mean that there are also opportunities to influence the content of Norwegian cabin culture. Perhaps it is possible to construct new forms of "normality" in the cottage sector through innovative architectural solutions. An example of this is Stokkøya sjøsenter (Østlandet/Eastern Norway), a concept with compact and area-efficient cabins and with the restaurant "Strandbaren", which serves as a meeting place for cabin people and locals. In addition, there are hotel rooms with space for guests. The project was first met with skepticism but has become very popular and has received a lot of positive attention both nationally and internationally. Realization of such innovative examples, for a more sustainable cottage culture, by influencing the general perception of good cottage qualities, can have a positive effect far beyond its own direct contribution. (Eli Støa, 2010, pp. 12, 13)

This long quotation feeds the argument that immaterial values are also material, physical, but as a side effect. Because they change tautology and appropriation in social culture, without being really affected. The main event here, "å dra på hytte" (to go away to the cabin), second home, weekend house, recreational house, all designations referring the same conceptual entity afar, happens, independently from social status. One way or another, everyone will do it, either owning, renting, or borrowing a cabin, within their own personally conditions. That's why an architectural interpretation is so important on this invariant and conceptual national self-awareness: to place a discussion on the object itself is the best to intendedly understand its meaning. The

Figure 4 - © Peter Butenschøn, cabin in Beltsholmen, Brekkestø – detail net bed placed in trees about the simple life. BUTENSCHØN, Peter, Husimellom - En reise i norsk arkitketur (A journey in Norwegian architecture), Forlaget Press, Oslo, 2018

cabin makes sense as an object to help experience an atmosphere in Nature, but only makes sense and completes its purpose when dilated from the urban spectrum, from the historical view of urban design development. Memory, shelter, protection, house in a system of houses, sustainable existence and landscape model because inserted there.

Can be argued: "hytte" is an *habitaculo* with a certain performance and atmosphere contemplating Nature. The cabin is a main object to apprehend and take care. Mobility strengthens interaction. The argument can be placed positioning the symbolic return to an origin, being the cabin a place where all compromises are trashed away. In the cabin the origin of origins is made zero, restart mode and beware of any event, the origin is there to offer that perceptional input suggesting re-formation. There is a commitment, but with the process of re-placement. The way/path to the cabin, mobilizing body and thought, that can take until 300 km or more, is also referential for memory, method, and structure to frame this action. The shelter is shelter afar, the city is city afar, both secure a social permanent activation, both are part, can be argued, of this mechanism to maintain existence at a stronger/coupled degree. Life is difficult, and knowing the work needed to imprint a sort of quality on this parameter of living the best way possible, that path-place-path equation produces harmony and makes existence much more bearable.

1.3. Simple life & life as an ecological step up for better living

The apology of being, among this combination, is clear about every aspect of Peter Buttensschøn words when revealing an everyday life in the cabin.

Norwegian simplicity may eventually become a national myth, a picture for an innocent uto-

pia, but has left a lasting mark on building customs. It was a useful myth, it promoted social decency and economic restraint during the construction of a new society after the Second World War and followed insecurity. Ornaments, strong colors, expensive materials, swollen upholstered furniture and large rooms belonged to the cities and the bourgeoisie. It produced memories of a self-asserting aesthetic from land further south, with nobility, upper class, and old money. As soon as we could, we Norwegians went out to the cabin in the country, out towards the sea gap or up in the mountain and cultivated the down-to-earth and predictability distance to everyday life. We got an architecture for leisure, for life out in Nature, with houses that stood in style of woodcutting and water-bearing, paraffin lamps and log chairs in pine, with the coffee pot in the fireplace and crispbread with brown cheese straight out from the kitchen counter.[2] (Butenschøn, 2018, p. 193)

Architects use the past as creative tool, even though present matches authenticity about a singular complementary element, crossing both times for qualitative details. This return on origins allows a stronger comeback. Traditional contact with natural environment, an aesthetic experience that values the circle around, value given by an assumption about identity, helps research a place of existence, not only at the physical stare, also at a deep inter-collected degree. So, the Norwegian cabin is not only an architectural device, but also result from an organized symbolic system present in the morphological compass of being/making sense. A field and ground who builds an atmosphere, and a grid. This creates a perplexity, on that fringe of knowledge for architectural historical values that should be appreciative of human condition. Place of belonging immersed in architectural principles that could be served as a methodology within several allotments: proportion, social and emotional support, flexibility, elegance, design, consistence, and time. Space/shelter

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[2] Free translation from Norwegian, Rúben Manuel Ferreira, 2020.

in its natural/artificial, systemic/systematic etymology. Space that is safe and proportionally agreeable. A cultural continuity.

In the innermost setra[3], Ramstadsetra, farmer Lars was in pain to keep the houses in good condition. It was located two hours walk from the nearest road, so he thought it was okay for this student from the city to come in, settle down and grab a roof. Lars drove in some materials on a sled in the Winter, in the Summer the rotten logs were replaced, the roofs sealed, and we made the house habitable again.[4] (Butenschøn, 2018, p. 196)

An aesthetical experience in the territory and landscape, is material for self-preservation. Physical space. "Space of scent". (Pallasmaa, 2005, p. 55) Because silence has the *fragrance* of memory and association. "Space of touch" (Pallasmaa, 2005, p. 56). Because texture connects with cultural heritage. Temperature of being. Stones spread around, building the already built landscape of memory. A Scale of Memory, it can be argued, with a strong geological connection, forwarding reminiscences to Jan Feuchen artistic work in *Columna Transatlantica*, where punctuated sculptures of white distorted marble columns were landed in the landscape along the Atlantic Road, between Vevang and Karvag, in Norway.

As with Smithson's geological perspective, the mentality hovering above Freuchen's ambitious approach involves a Space Age mentality. It belongs to the same visual regime as the omniscient satellite, in wich the photographing of the earth becomes an expression of the way human beings conceive of their place in the cosmic order. In this case, the modern, technological perspective of the Space Age also has similarities to the cartoonist's graphic depiction of surfaces – in fact, the satellite image will not be able to distinguish between the real ruin and the fabricat- ed one. Ruins belong to the near-sighted gaze of the archeologist. If *Columna Transatlantica* strives to be a picture of the earth as

seen from above, it also represents the long-distance shot that renders all forms abstract – the perspective that, instead of textures, perceives lines, geometry, and beautiful patterns; and that, instead of function, sees ornament. The columns affirm the line, which has historically been regarded as the artist's most important tool, as something charged with endless layers of meaning. (Freuchen, 2015, pp. 41, 42)

Meaning cannot be dissociated from context. Atmospheres of space, a house is a system of activity, a sustainable model inducing production of memory, compilation in layer information cubes, to extrude this idea as a metaphor, is tracking apparatus for an "embodied experience." (Klaske Havik, 2017) Is therefore, dependent of individual interpretation, but applied at the collective image. Architecture of self, architecture of being. Architecture as an open curtain between reality and time past future mixed. Shelter while place of belonging and intricate geometrical typology.

In a total freedom of thinking and action, the architect uses and reuses the materials of the history and of modernity, he manipulates them, convinced as he is that every contemporary intervention is part of a transforming historical process, that for its very nature may not be restricted or disabled by a sanctifying praxis aimed to freeze the past by limiting or preventing its relation to the present. (Bottero, 1999, pp. 29-30)

2. Norwegian decompression versus American and Japanese cabins

Perceptional material like this is intense because the atmosphere was shaping memory. Wood, beams of wood, an ancient design and surfaces versus textures combining a feeling of comfort. The Japanese ancient cabin (Nakagawa Takeshi, 2006) is a great fit to enclose two dimensions about

[3] A bond, to bind, ligament – Wisdom Library, Sanskrit dictionary (www.wisdomlib.org/definition/setra).
[4] Free translation from Norwegian, Rúben Manuel Ferreira, 2020.

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the ability to create space. First, organizing a structural mark in the place and territory, with a quiet but substantial compound of layers that cross several themes and interactions among self-imagery. Second, organizing space inside that compound, respecting the rules for construction, exemplified by the ability to dismantle the house and provide transportation for a subsequent re-construction. A flexibility that denotes a certain quality, it can be argued. Making possible to build a clean sheet like a new canvas. Those beams are good enough to be reconsidered as pieces to produce space and atmospheres, and so they did. Comments about "beautiful aroma" (smell of the Earth, the woods, the smoke) are very interesting to center this discussion about the "structural" effect and resulting architectural space.

I felt life, very healthy life being led in that space. (Minka: A Farmhouse in Japan, 2011, p. 02:23)

It can be argued about the language this house had, and that was noticed. (Lawson, 2001, p. 29) It secured a measuring about time. That passage (from 1734) or intersection was a like reassuring effect that legitimized the transference from one place to other as a real possibility. The time machine is here a metaphor about how material structure and design (vernacular) can reenforce being, and a lasting construction for a Human Ecology of being. One cannot be more sustainable than this. "Farmhouses are dark", said the interviewed. (Minka: A Farmhouse in Japan, 2011) Those high ceilings, monumental cross beams, hooks, and textures where material and knowledge in pure state producing a qualified space. The structure wasn't yet done in its timeless continuity, as if it was said that the time for it to be placed in the plot of terrain, across the landscape, wasn't yet there. Another house was to be built and perpetuate that vernacular tradition. Another being was to be pushed off from those interstices and reflect over new needs and a purpose, the most important factor here, to not let a house that said something and meant something, become dirt or just
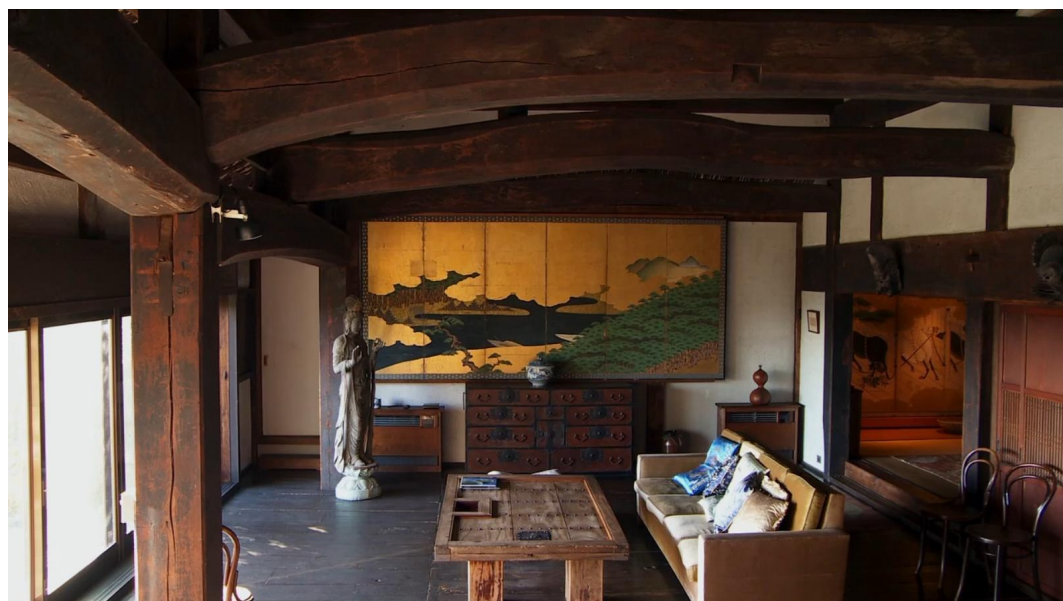

Figure 5 - Still from the film Minka: A Japanese Farmhouse. Image courtesy Davina Pardo & Birdlings LLC) (https://gwarlingo.com/2013/minka-japan-farmhouse-roderick-takishita/)

Figure 6 - @ Satoshi Ikuma. Contemporary Minka, Asakura, Japan. General view. THTH architects (2013)

Figure 7 - @ Satoshi Ikuma. Contemporary Minka, Asakura, Japan. Interior kitchen area. THTH architects (2013)

ashes. That space had much more to configure and to help settle, yet.

So, at this point, location becomes very decisive. Which factors could work, or not, to place a structure and build a new house are among the lastly sustainable strategies that are available to implement when ponderation for sustainability, landscape insertion and connection with place work for a better performance. (Mollison, 1979, p. 9) Interaction for both the construction, crossing views and amenities, spaces in contrast with a new urban use, since the house was before placed in a farm, are therefore a proposal for a new system, based in the previous one. The reachable place to stay, and be, was achieved by a setting of considerations, that resulted in choosing the place to land the house. The process, again, can be complex as buying the house itself. (Roderick, 2008, pp. 123-124) Something that can be seen as also decisive when building a contemporary house from scratch (Figure 8, 9), having basic principles which existence cross a timeless window, letting a heritage feature ground the work of composition an architectural plan, project, and spatial informal development, not only in a family adequate layout, for adequate functionality, also singular in an arc of knowledge that is sustained to spread the cultural artefact by metaphors. It is not kitsch, not even a cultural

appropriation. Is a comprehensible arrangement to introduce the theme for a contemporary existence and spatial usable layout.

2.1. Human appropriation of landscape: comparing urban settlements off-in city

In every house of every single childhood, first, then adulthood, a space of renovation is a harmonious coalescing book of informal atmospheres of being, allocated with a consecutive collection of goals, dreams, and impairments common to each user, who retrieves any sense of insecurity. Replaced by a more synthetical interpretation of each child's/adult self. Thanks to this condition, that foresees interior, exterior and an association between both as the "surface" of principles to exist, not only as an abstraction from any idea. The materialization always clashes with reality about specific conditions, perceptions, and ways to customize the experience. Place, light principles, building principles, even if some only fit in an individual ability to create method, are also background dependable. In this interaction, they are first and foremost abstract. But precise. Not a formula but involving an aesthetical quality that is foundation and key (type interior, typology, model), for wariness issues. A tree, the forest, confronting the city,

have equal proportional value, as stated before, because, it can be argued, are incorporated in a system as inter-connective/interactive links. Well-being enacted by a visual/architectural/design completion: space, in its comprehensive denotation.

Space sometimes denotes severe conditions, that a central heating system, or coaling natural system can work to amplify comfort. Atmospheres are in this referenced stage a combination between coping with the performance of the building and the spatial metaphor, that in this case is much more important even if in the cold.

Yochan chose to sleep on the second floor on a hastily built bed of raised tatami under the eastern eaves. Part of it was open to the sky and on occasion snow drifted onto his electric blanket, creating a mood of sweet nostalgia for Shirotori and the mountains. Weatherby called it the best part of the house. Electric blankets would be in demand during the winter months as cold descended on the newly built minka, for I could not afford the central heating system I wanted. Instead, we relied on gas delivered in large cyl-inders to feed the cooking stove and the large triangular gas heaters bought under the foolish impression they would, or could, warm the cavernous interior. (Roderick, 2008, pp. 123-124)

This is a paradigmatic reference when a house cabin is much more than just walls, ceilings, and spaces (Figure 5-7). An anatomy of space and place is also built when the process of dismantling and reassemble is also space of memory and departure. Stamps, in this case, the timeline of being, something that cannot be separated from the house itself, the place and the consequent belonging feature. This mountain where the cabin was placed again (Great Pick, Kamakura, Japan) is now narrative for and with the place.

Locality is what, then, makes sense highlight in an ecological approach for a housing cabin experience completed, inserted in a preserved landscape. A cabin as a shelter produced by local craftmanship, using local materials and crafters specialized (carpenters) to build what can be seen as a genuine first/"*primo*" space of being. A center. Where children are allowed to learn, to be compli-

Figure 8 - Unknown author. Japanese cabin (Minka) interior space with structure (https://i.pinimg.com/originals/2d/7a/a4/2d7aa4e66 277c4369bde5af306116f0e

Figure 9 - Unknown author. Weber House, Hayama (1980). Yoshihiro Takishita, architect (www.shiguchido.jp/ytprof_en.html.)

Figure 10 - Unknown author. Ofuna house (2001). Yoshihiro Takishita, architect (www.shiguchido.jp/ytprof_en.html.)

Figure 11 - Unknown author (https://heritage. ky.gov/Pages/index.aspx)

ant with a surrounding atmosphere, hiding objects, and themselves, in an atmosphere that foster this discovering about existing space, place and areas in between. (Lawson, 2001, p. 207) Addressing an inventive imagery, feeding its careful upgrade.

The log cabin experience is therefore an experience to manage as a completion methodology act. Both Norwegian and Japanese examples share this dichotomy. And the American example does also the same thing, since the cabin is also a device in American culture, with a historical background and design model proved settlement, wood framing and actually re-invention, nowadays with some high-tech solutions, occupying large areas, with very confortable interior spaces, but recollecting all the imperatives for an experience that is centered in efficiently systems, being common to find big impressive contemporary buildings that are just a "wild" copy from the actual urban welfare. The Norwegian contemporary cabins, even though can also contain those systems, continue to display area containment.

Clearly, the American example is a different one, even if sharing principles, construction techniques and exterior layout. Is specially a horizontal mode, that begun as an acceptable domestic space, a reasonable option for English pioneers to settle in North America, in the late sixteenth century until the early beginnings of the 20th century. (Hoagland, 2018, p. 2) The American

cabin in the woods was a good compromise as first home, also endangering the principles for an in place to re-build, re-shape and re-configure cabin. They were built like homes; they could accommodate an escape from civilization. They were harmonious within Nature. Characters like Huckleberry Finn adventurous kid from Mark's Twain literary repository, reflect this taste for a better uncivilized life, because prior to a compromise with rules of behavior the best experience in from the wild forests crossing paths. Even though the American cabin evolved, with influences from Central (Germany, 1730-1783) and Northern Europe. (Hoagland, 2018, p. 34) The idea for a provisional shelter, with massive log expression, placed in the middle of the forest, with surfaces of stone that would appear and be included in the primary construction.

A basic round-log cabin could be built with even fewer tools: a felling axe to fell the tree and shape the notches and a hand saw or crosscut saw to cut logs to length. If hewn logs were desired, a broad axe would be required. (Hoagland, 2018, p. 20)

In a more traditional and practical approach, using wood at its almost natural shape, visible intersections (notchs) in walls, expressing a feeling of basic construction methodological approach. Something Norwegian and Japanese examples share, but with a less ruthless shapeable approach. The American case was a case for a faster settlement, topography adaptation, expressing cultural narratives in type, design, and wood treatment (shaping). With a most massive wood layout and design, heavy at sight, toned as a consistent piece of triumph, exhibiting the overcoming difficulties, with a good amount of hard work.

Most essential to a log cabin were, of course, the log walls. The type of wood depended on what was available; chestnut, white oak, cedar, poplar, pine, and fir were preferred due to their length and straightness. Builders could leave logs

Figure 12 - Unknown author. View from the outside of the Swedish Log Cabin, Darby Creek, Drexel Hill Pennsylvania (www.colonialsense.com/Architecture/ Houses/Swedish_Cabin.php)

in the round – even with the bark on for a very expedient structure, usually an outbuilding – or hew them square for a more permanent dwelling. They could also hew logs in part, which was often called "shaped": either hewing the sides for a more finished look or to enable cladding to be put on, or hewing the top and bottom, for a tighter fit. When builders hewed or sawed the logs so that they were only two to six inches wide, this was often known as plank construction. In the twentieth century, builders used circular saws to square logs. (Hoagland, 2018, p. 20)

It is not that on the other two examples the construction work wasn't hard enough, or the construction material heavy enough. The beams from the Japanese examples have non-orthogonal shapes, are in fact heavy and difficult to manage and maneuver. But the result cabin from the American case is different. Houses with less exposure to light and exterior elements, less windows, or smaller ones. Sharing, of course, a special site location approach, that both Norwegian and Japanese examples similarly reflect. Even if the Japanese has the referred originality reproduced in an ability to be dismantled and resembled elsewhere. Decompression, as an underneath treatment for inadequate urban compression, is a shared performant feature in the three examples.

The American example, however, has a historical downsize that results from slavery, that consequently framed how some of those houses were built and then used. "Slave quarters" were common, near bigger cabins, the main principal building. Mainly, as everything in USA, it can be argued, the cabin was also seen as a symbol of patriotic heritage, suitable to dispose as a unique model resulting from a re-adapted tradition by pioneers and those who adopted them as places to live.

With a long history in this country – and one that was identified with good, patriotic qualities of self-reliance and individualism – as well as an honest, unornamented appearance, the log cabin gained new proponents in the early twentieth century. It may not have been suitable for urban or suburban homes, but for Americans who took to the road in search of something a little out of the ordinary, it provided a worthy destination. (Hoagland, 2018, p. 156)

2.2. *House as settler and artefact for a sustainable lifetime span – conclusions*

On the day after humans disappear, nature takes over and immediately begins cleaning house—or houses, that is. Cleans them right off the face of the Earth. They all go. If you're a homeowner, you already knew it was only a matter of time for yours, but you've resisted admitting it, even as erosion callously at tacked, starting with your savings. Back when they told you what your house would cost, nobody mentioned what you'd also be paying so that nature wouldn't repossess it long before the bank. (Weisman, 2007, p. 15)

A cabin, even if just placed swiftly over landscape, is part of a changing and design process. Natural landscape design is then shaped, as the cabin, combining form, function and a complex network of symbols, external data and influences "surrounding" an atmosphere, and creating or shaping its absolute "vagueness". (Trigg, 2012, pp. 110-112) Space is not vague, is Architecture. But the proximity with the experience it sug-

Figure 13 - Unknown author (/www.loveproperty. com/gallerylist/92728/cosy-cabins-for-sale-you-cant-help-but-fall-for)

gests has an important role, it was argued, to dispose a specific mood, interpretation and then deploy processes of memory and belonging.

Belonging is defined as a unique and subjective experience that relates to a yearning for connection with others, the need for positive regard and the desire for interpersonal connection (Rogers, 1951). A sense of belonging does not depend on participation with, or proximity to, others or groups. Rather, belonging comes from a perception of quality, meaning and satisfaction with social connections. Belonging may also relate to a sense of belonging to a place or even an event. It is therefore a complex and dynamic process unique to each person. (Allen, 2019)

Heredity from sense of belonging, is something, can be argued, permanent. The reason is rather raw on its impressive trace. Architecture is absorbed, a unifying disposition common to all perceptions of space. "The architectural design concerns itself with 'space' as its raw material and with the articulated room as its product." (Rudolf M Schindler, 1912) Schindler summarizes those adoptive conditions for human occupation, following the accommodation of stability and structure as features, and describes the 'wide span of space-forming surfaces. This is notable because incorpo-

rates an emotional tie to nature's architecture, what produces and uses as explanatory measure, highlighted by Sigurd Hverven as an attribute: 'Nature phenomena' builds human identity. (Hverden, 2018, p. 135) But Schindler searches the common ground within time and security (Sarnitz, 1982, pp. 60-63) – a comfortable feature. Stating that space is not only raw material of architecture, still 'medium for its art', or for architects art. A stage, in the sense of availability and suggestion. Not by showing off within the medium information spread rhythm, rather by means about external elements.

If the human presence would just be suspended, the Natural world would cut through all the processes of imagination proposed by the flux of environmental changes that were produced. As it was argued, these changes, processes, in the specific case of the cabin, have an important side effect. They are managing material for one purpose, inhabit space in the Natural world (forest or other natural atmospheres), proposing a vernacular approach and subsequent use, that is cemented along craftmanship practices, it was argued, being possible to say this value has a qualified impact in these constructions, its use and dissemination. Perception about space, place and atmospheres are enhanced, it was argued, by these features. And because they remain as contemporary practices, not only for renovation, re-location and shaping new cabins, the hereditary background is due to transform the comfort feature. And this is optimal when the purpose is to relax, to be apart from urban fuss, or to just practice the walking by nature paths.

An important detail that is proposed by the Norwegian, the Japanese and the American cabins examples, considering its differences, is the use of these cultural artefacts to enhance sense of belonging. Or which identification is produced resulting from this use. As argued, the Norwegian cabin finds its purpose when suggesting a movement, or mobility transition that confronts the urban center environment experience, suggesting

a decompression in a natural atmosphere. But, in general, the three examples propose something that is related. To contextualize the argument, is relevant to say that this suggestion is among the use of the forest and consequent experience in Nature from a very early age in childhood. And that this use, in adulthood, is even deeper and often. On the other hand, the Japanese and American examples are different in identification and background, even if proposing a contact with Nature and subsequent proportional effect in the human body and mind. Being the Japanese example a delicate spatial "machine", and space product mechanism.

One interesting fact: in 2020, Norwegians spent 33,6 billion kroners buying cabins ("hytter"), a record reached because of COVID-19 pandemic. (Bjørgum, 2021) This tendency helped reach a total of 440 443 cabins registered and owned by locals. So, an eventual use was transformed in a more often one – since a great number of cabins are isolated buildings or are located in districts very afar from the city center. Caracteristic who helped manage reclusion needs, quarantines and actions related with COVID-19.

To conclude, it was proposed to study which footprint is constituted cabins value and how it influences time, space, and function among three examples. How the heritage vernacular product is an argument, how urban experience is complemented by it and even re-enforced by this completion. How the cabin is device, ancient practice, or just emblematic source, from origin, transforming itself as resource and something undeniable centered on being, in Nature. The cabin can be an artefact, a device, or a place of settlement. The principles besides its construction and adaptation for a contemporary life are relevant, usable, and even practical, if considering COVID-19 pandemic and its consequences in Norwegian cabin market. Also, that flexibility within construction methodology presented in the Japanese example, could eventually, can be argued, help solve transitional location replacement if necessary for health protection reasons.

Finally, that the cabin space produces perceptional images, grounds sense of belonging, based not only in the aesthetical value (craftsmanship), the architectural vernacular layout and the natural atmospheres values. All these reframing a symbolic value: an ecological footprint of being.

Assuming the in-transition positioning about the Norwegian cabin, related to the city-cabin-city dichotomy, and the flexibility present in the Japanese cabin ("Mikka"), associating this positioning with the Mediterranean condition, in its several alterities, among the movements, life in this region and how to address housing availability, considering architecture atmospheres and the impact this materiality has in the immateriality realm, about the idea of home, house and like celebrating this conception as also a condition, it is important to propose certain aspects about this possibility and the foreground of its manifestation in architecture and architectural practice. To use in both "margins" of the Mediterranean Sea is, across cultural barriers and borders, and assuming these as just subtle enough to ground the basis of using a space, staying in a place and being and belonging.

On that regard, this article as reflected about this condition of being in landscapes and the urban environment. And, on that matter, as suggested the need for recognizing what will be called a virtual "bridge" along the Mediterranean region, from inside to the outside, from the outside to the inside of the region. This "bridge" can be suggested to have four different "topographies" for action proposition and specification: the African region specially, in its outskirts near the margins, within a settlement that understands landscape and climate change actions needed (Angeliki Sampatakaki, 2021), to create a continuous landscape interaction and growth from the margin to the interior areas, suggesting renewable disposition for locals, and sensing this ambivalent proposal as a bridge effect from the countries in the South of Europe to the "North" of Africa; to create a line of reasoning across

the several countries from the African margins, that helps to establish a region of interest, suggesting several reformulations about urban development and connection with landscapes and Nature, considering the margins, the sea, the atmospheres and how to integrate them in the wide Mediterranean region they belong; a third, related to the "topographic", immaterial value of the "bridge" and the mixed cultural backgrounds when changing places, to create a new disposition considering these as an asset – based on the fact that they are in-transit, along their imagery, and have fewer knowledge and information about this Mediterranean condition from the Western side, or the "arrival city" (Salem, 2021); and a fourth, assuming that landscape adaptation and territorial evolvement, along geographies and topographies is something that has to happen in both (all) region, including European countries, to develop a group of public dynamic across countries to develop inhabiting solutions not only as an exclusive urgent reaction to a certain event or need (as a negative consequence), but as a wider positive perspective, about a necessity, even if with more than one chronological approaches, in the immediate or in the long term, but included in a plan that accommodates a reflection about urban integration and development, the in-transition condition about the house and the individuals, and collective memory. This kind of public dynamics, linked with a wither cultural background, centered in the housing inhabiting solution, can then inform a more reliable and less negative impacted solution among house atmospheres and architecture.

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Under the Mediterranean influence – Eastern and Western European architecture during the 19ᵗʰ century

R. Guirguinova

IFAG/IBBTE, University of Stuttgart, Germany

Abstract Mediterranean cities as complex compositions of different cultural and historical layers are the living example for the function of architecture as an expression of the collective memory of a society, capturing important historical moments for a city and its residents, and herein becoming a medium of communication inside a society and on a transcultural level. The strong ideological influence Mediterranean culture has on the development of European cities is especially visible in the architecture and urban planning practice during the 19th century. From general cultural phenomena such as the Grand Tour to the establishing of the term *Stadtbaukunst*, both Western and Eastern European societies were clearly oriented towards the principles of Mediterranean urbanity. The paper analyses the key aspects of this ideological leaning in both contexts through the comparative study of two projects – the reconstruction of Geissplatz-Viertel in Stuttgart (1905-1909) and of Kapana district in Plovdiv (1906-1924).

1. Development through exchange

Architecture plays an important role in the cultural, economic, and even political development of a city and its civil society. As an expression of the *collective memory* of its residents, a term coined by Aldo Rossi (1982), it captures important historical moments for a city while serving as a medium of communication within society and on a transcultural level. The built environment of the city, its public spaces, serve as the stage and anchor point for societal transformation and the connected development of the urban morphology. General historical research on the birth and development of the European city is based on this exact belief as a brief glance at some of the central scientific contributions on the topic indicates – reading Enrico Guidoni's *"La città europea: formazione e significato dal IV all'XI secolo"* (Milan, 1978), Leonardo Benevolo's „*La Città nella storia d'Europa*" (Rome-Bari, 1993), Charles Delfante's *"Grande historie de la ville. De la Mésopotamie aux Etats-Unis"* (Paris, 1997), Gottfried Kiesow's „*Gesamtkunstwerk – Die Stadt*" (Bonn, 1999) or Franz Heigl's *"Die Geschichte der Stadt: Von der Antike bis ins 20. Jahrhundert"* (Graz, 2008) we can find a clear link between the development of European cities and functional, economic, political factors on the one hand and cultural aspects on the other hand. The interaction of different historical urban structures and architectural layers within the city and the idea exchange with other cultural contexts have had an important impact on the continuous development of European cities.

Mediterranean cities as complex compositions of different cultural and historical layers are the living example for this observation. Their central position in every research on the origins of the European city is based on their fundamental role as the birthplace of European urbanity. Early settlements like the Ancient Greek polis, for example, followed the clear planning principles of the Hippodamean grid, in which public spaces such as the agora and private, living spaces, exemplified by the model house, were integrated. The latter model house served as a module, which could be combined to an *insula*, then to a *district* and

finally to a *polis*. Consequently, the Roman and later Byzantine empire introduced impressive infrastructural masterpieces such as the famous Roman aqueducts and different public building typologies (e.g., thermae, stadiums, theatres) to continental Europe while establishing a tradition of cultural exchange.

Mediterranean harbour cities such as Rome, Lisbon or Athens are maybe the most illustrative example for the influence of cultural exchange as a driving force for the development of cities. As visible in their dense cityscape they were often formed as a collage of different influences and historical layers, yet at the same time have an individual and very contextual sense of place. This special quality is palpable in the poetic and often idealised vision of Mediterranean urbanity and is often associated with the explorer mentality of openness for exchange and transformation. Italo Calvino's *"Le città invisibili"* (Torino, 1972) captures this ideology perfectly in Marco Polo's poetic recollection on architecture and urbanity as an expression of culture, time and memory, when posed the question why he is never telling the story of his home town Venice – *"Every time I describe a city I am saying something about Venice"* (Calvino 2009, p. 78). The overall vivid and active urban life of Mediterranean cities, their *joie de vivre* or *dolce vita* is centred around public spaces – from the small or representative square, through the streets, alleys, courtyards, cafés, restaurants, bars, and even house entrances.

2. The influence of mediterranean urbanity on european cities

While it is unsurprising that European societies have been fascinated with Mediterranean culture for centuries, the development during the 19th century allows us to examine this allure from the vantage point of the architecture and urban planning practice.

The Grand Tour phenomenon, roughly dated back to the period from the 1550s to the 1850s, is an early expression of this vivid interest for Mediterranean cities. Though often associated with the movement of British travellers towards continental Europe (Layton-Jones 2009), the Grand Tour of the 18th and 19th century included various wealthy European and even North American travellers, who typically journeyed through Europe with their main goals located in the southern parts of the continent – Rome, Pompeii, Naples and even Greece or Constantinople for the more adventurous travellers as Philip Wilkinson points out (Wilkinson 2013, p. 28).

The complexity of the Grand Tour constitutes a multidimensional historical analysis of its nature (Paquette & Wright 2021, p. 130) – from a sociological perspective it served as a social and educational rite of passage for nobility and the educated upperclass, yet in its initial concentration on urban landscapes and architecture, the Grand Tour reveals its close interaction with the development of European architecture and urban planning at the time. Furthermore, on a cultural level, it introduced an early form of cultural tourism and travel writing (Colbert & Morrison 2020, p. 3), later transformed into a larger trend thanks to the infrastructural progress of the 20th century. Ultimately, the Grand Tour established Mediterranean culture and urbanity, with representatives such as Rome and Venice, as the cultural centre of Europe and of the whole Western world at that (Wilkinson 2013, p. 28).

The fascination of European travellers for the urbanity of Mediterranean cities is fittingly described by the following observation – *"Travellers were keen to engage with the urban fabric"* (Paquette & Wright 2021, p. 130). Therefore, it is unsurprising that the culture and urban morphology of the explored Mediterranean role models had an evident influence on the general development of European cities during the 19th and early 20th century. While the Grand Tour was part of the classical education of upperclass gentlemen, it also fuelled the classicist architecture trend – the travellers wanted to incorporate the purchases from their travels,

such as new art collections, for example, into the architecture and interior of their representative private estates (Wilkinson 2013, p. 31).

The rising number of architects, who were able to travel along the route of the Grand Tour, such as Inigo Jones, for example, usually depended on a wealthy patron, scholarships, or their own labour in order to finance their study travels (Wilkinson 2013, p. 29). Nevertheless, the mobility of young professionals within Europe with Italy and Greece as the typical destination for educational travelling became an important source of cultural and idea exchange, forming the architecture and urban planning landscape of European cities in the 19th century.

The orientation towards Mediterranean role models was deeply rooted in the material culture of both Western and Eastern European societies. While in Western Europe this tendency was transported especially by contemporary professionals like the German architect Theodor Fischer, for example, whose Italian trip indisputably shaped his later planning practice, his understanding for architecture and aesthetics, as well as influenced his urban planning ideology (cf. Kerkhoff & Fischer, 1987), in Eastern Europe the wealthy upper-class was the predominantly relevant actor in the observed cultural exchange. Especially on the Balkans, in societies, which had been subjugated by Ottoman rule for centuries until the second half of the 1800s, the rich merchants were the actors, who initiated an active connection to Western and Southern Europe and were able, through their patronage, to introduce the Mediterranean influence into Eastern European societies supporting the professional education of master builders and craftsmen through educational travels abroad (Bichev 1955, p. 10). This tendency not only started to shape the material culture according to Mediterranean role models but further enabled the development of individual local architectural styles such as the Baroque architecture of the Plovdiv merchant houses (fig. 1) with South-Eastern (Is-tanbul, Thessaloniki) and Western European parallels (Vienna) as architect Milko Bichev convincingly argues in his historical analysis on the subject (Bichev 1955).

Figure 1 - House Kujumdzhiev in Plovdiv
Source: Personal archive of the author (RG)

Another aspect of the observed idea exchange stems from the interest of European societies for the urban morphology of Mediterranean cities, which strongly influenced their urban planning and architecture ideologies in the 19th century and has herein left long-lasting traces in Western and Eastern European cities visible even today. We can observe this connection very clearly in the oeuvre of well-known architects such as Theodor Fischer, a German representative of the reform architecture movement, who expressed his professional ideology in his *"Sechs Vorträge über Stadtbaukunst"* (München, 1920); and the Austrian architect and urban planner Camillo Sitte, who formulated his observations on the principles of modern urban planning in his book *"Der Städtebau: nach seinen künstlerischen Grund-sätzen"* (Vienna, 1889). Both supported the idea of *Stadtbaukunst or city planning as an art form*, focussing on Italian role models and Mediterranean urban morphology in general. Sitte, for example, analyses the planning principles, on which the creation of quality urban spaces (especially pub-

lic places) is based, and herein uses famous and lesser-known case studies from Italian cities, among other from Rome, Florence, Venice, Modena, and even historical examples such as the forum-site in Pompeii and the Acropolis in Athens, in order to analyse the characteristics of good urban spaces, which can be further utilised in the planning of European cities in general.

While it is evident that Mediterranean culture influenced both Eastern and Western European architecture and urban planning during the 19th century, the previously reviewed development poses further questions regarding the central ideological aspect in the orientation towards Mediterranean role models and the differences we can observe in its influence on the transformation of Eastern and Western European cities.

3. A comparative analysis

In order to analyse the extent of the observed ideological leaning towards Mediterranean architecture and urban morphology in Western and Eastern European societies and its influence on the built environment the paper proposes a comparative study of two projects in urban contexts with similar dimensions, indicative of the status quo and development during the 19th century – the reconstruction of Geissplatz-Viertel in Stuttgart (1905-1909) and the rebuilding of Kapana district in Plovdiv (1906-1924). The chosen pairing between Stuttgart and Plovdiv aims to represent the everyday practice of European architects and urban planners during the analysed period, presenting two urban contexts of similar size, cultural importance, and infrastructural development. Furthermore, the historical, political, and economic circumstances of the two cities are indicative of the general European situation at the time as both Stuttgart and Plovdiv were crucially transformed during the late 1800s by the rising active role of the bourgeoisie. Through industrialisation and the establishment of a new civic society new

architectural typologies such as the town house or villa emerged, yet the problem of the reconstruction of historical districts became one of the most important tasks of contemporary urban planners and architects. While there was a new and growing awareness for the typology of the old town centres, the new and higher standards for building and living demanded a transformation of the existing old structures accordingly.

3.1. Geissplatz-Viertel in Stuttgart (1905-1909)

German cities have a long history of *Old Town-Making* as Vinken points out (Vinken 2016, p. 18). The period around 1900 played a crucial role in this development. The up-and-coming *Heimatschutz* movement and the need to modernise cities posed the question of how to reform old towns according to their traditional style and morphology while securing needed sanitary and infrastructural standards for the residents. Stuttgart was no exception from these tendencies. With the fast development of the city's industry the population was growing fast and needed low cost, yet sanitary housing. This housing shortage, which was especially visible in the dense old town centre, led to the foundation of the *Verein für das Wohl der arbeitenden Klassen* in 1866 (Werner 1911, p. 20), which was determined to relieve social tensions by overcoming the housing problem.

The reconstruction of the Geissplatz-Viertel, which architect Karl Hengerer planned, was one of the central projects of the new charitable society and included some of the oldest buildings in Stuttgart dating back to the 13th century. The settlement had remained relatively compact during the Middle Ages. The needed changes in this densely built and populated district included the securing of better ventilation, a new sewerage system and the introduction of a massive construction type replacing the old mainly wooden frameworks, which bore a substantial fire risk (Langner 1994, pp. 148-149).

The ideological backbone of Hengerer's design followed Theodor Fischer's and Camillo Sitte's urban planning principles of a *Stadtbaukunst*, aiming to create a new urban ensemble around Geissplatz. While Hengerer had the central role to oversee and plan the urban reconstruction, supported by his colleagues Mehlin and Reissing, other contemporary architects were also commissioned to design singular buildings or building façades in the district. Eisenlohr and Weigle, Paul Bonatz, Bihl and Woltz, Dollinger and Martz contributed to the project as Werner points out (Werner 1911, p. 22).

A *Künstlerkomission*, an *artistic commission*, which included Pfeiffer and Fischer amongst other senior officials, had to oversee the development of the project and secure that it was being planned according to the standards of modern urban planning (Werner 1910, p. 4). The commission certainly also ensured the aesthetic uniformity of the new district as Weber and Antoni point out (Weber & Antoni 2016, p. 64).

The urban planning principles and architectural role models Hengerer envisioned for the new Geissplatz-Viertel variated between two main areas – the higher rising, more functional and minimalistic aesthetic of the part along the Eberhardstraße (Langner 1994, p.184), and the lower, denser central area surrounding Geissplatz.

Figure 2 - Postcard of Geissplatz in Stuttgart with direct view to the building in Geissstraße 12. Source: Stadtarchiv Stuttgart 9450 Postkartensammlung G 42 b/2

Hengerer's design for the building in Geissstraße 12 (fig. 2) is a prime example for the architecture principles the urban renewal followed. Positioned prominently at Geissplatz, the design has a representative function for the area. The gable façade of the four-story building is oriented towards the square and structured by a higher ground floor, panelled with sandstone on the street level. The main entrance to the tavern is accentuated by a massive staircase leading up to the renaissance portal of the entrance. On the side, a lower side wing of the building hangs over the narrow passageway connecting the street with the inner courtyard and the side entrance directly connected to the main staircase. The passageway is framed by a large segmental arch opening in the side wing. An oriel window with a half bell-shaped roof adds a vertical accent to the main façade. The gable front is mainly organised by the horizontal window rows and generally abstains from large ornamental or historicist decorations. The only decorative elements are the entrance portal, the structured windows, and small bas-reliefs in the rendered façade.

The central square of the new district, Geissplatz (fig. 2), received the most attention from Hengerer. The Hans-im-Glück-Brunnen, designed by Josef Zeitler and donated by the *Verein für das Wohl der arbeitenden Klassen* in 1909 soon became the main attraction of the new public space. Its fairy tale motif made it a fitting replacement for the old well and accentuated the inviting ambience of Geissplatz further (Werner 1911, p. 23). The master plan for the square follows Camilo Sitte's urban planning principles, adopting the original structure of the streets and building structure and designing the edifices surrounding Geissplatz in groups, creating a scenic background for the square. The accentuated ground floors of the buildings containing large storefront openings and arcades create a coherent urban space. The qualities of Geissplatz become visible in its popularity as an important public space and meeting place in Stuttgart even today.

Analysing Hengerer's design for the building in Geissstraße 12 and his ideas for the Geissplatz itself, we can observe distinctive parallels to the ideology of reform architecture. The designs are simplified, reject the eclecticism of historicism, and are oriented towards volumetric proportions and the reinterpretation of traditional elements. The urban planning principles behind the project for the old town reconstruction allow us to further observe an ideological vicinity to Camillo Sitte's and Theodor Fischer's *Stadtbaukunst* ideology, which, as previously observed, can be directly linked to the strong influence of Mediterranean role models on the urban planning principles formed in 19th century Europe.

The urban renewal of Stuttgart's old town was seen by its contemporaries not only as a regional project but also as a project, which has the potential to become a European and international example for old town planning (Werner 1910, p. 1). This attitude and Hengerer's later role as consultant for the *Grand Percée* project in Strasbourg (1908), invited by the city's urban planning commission, document the transregional impact of the Stuttgart project as a role model, deeply rooting the principles of *Stadtbaukunst* derived from Mediterranean urban morphology in European architecture and urban planning.

3.2. Kapana district in Plovdiv (1906-1924)

Plovdiv experienced comparable transformations during the observed historical period. Designed in 1891, Josef Schnitter's plan for its urban development followed contemporary European principles and aimed to transform the city's oriental structure by introducing new infrastructure and creating a modern wider street system (Zheleva-Martins & Farkov 2009, pp. 59-60; Kalinkova 2014, p. 62). Simultaneously, the first generation of Plovdiv architects after the 1878 liberation from Ottoman rule, who were mostly Western and Central European graduates,

were designing and transforming the cityscape. The buildings along the Main Street from the period, characterised by historicist and later secession architectural elements, are examples for the local architectural style development at the time, strongly influenced by Western European tendencies (Chinkov 2002, pp. 30-35).

While the years after 1878 were marked by the creation of various important architectural ensembles such as the Main Street amongst others, they also led to the consolidation of the central Kapana district as an architectural and urban planning ensemble consisting of historical buildings spanning over five centuries (Chinkov 2002, pp. 48, 53). The narrow streets of the old oriental marketplace withstood Schnitter's plans to rebuild the narrow street system according to modern sanitary and infrastructural standards. Meanwhile, the typical compact urban structure of Kapana remained and was extended by newer larger streets at the end of the 19th century (Topalova 2017).

The trading and crafts district included various built examples of Plovdiv's oriental architecture, which were later destroyed, such as Kurshum Han, Golemiat Bezisten, several mosques, a public bath and several warehouses (Chinkov 2002, p. 55). After a fire destroyed the whole district in 1906 iconic buildings such as Kurshum Han were severely damaged (Velchev 2002). The subsequent reconstruction of the district created the structure of Kapana as we can explore it today. The work on rebuilding the district started in the period 1906-1915 but the majority of the realised projects was designed and built in the 1920s and 1930s due to the interruption of World War I (Chinkov 2002, p. 57).

While most of the buildings in Kapana were commissioned by private owners and therefore designed according to current architecture style principles, including secession elements, and erected rather fast, allowing the owners to continue their craftsman or merchant activity, the question of Kurshum Han's faith spanned over three dec-

ades and became a central discussion point for Plovdiv society around 1900. Nevertheless, the reconstruction of Kapana district followed Schnitter's plan and the morphology of its historical layout, creating a new urban ensemble, characterized by its small scale and density with narrow street fronts and the typical building type of an open ground floor with big storefront windows and more private upper floors. The attention to the quality of public space, which the architects included in their designs, is visible in the integration of the streets and various small public places inside the district to a system of meeting and interaction points.

In order to exemplify the development and architecture principles behind the rebuilding of Kapana at the beginning of the 20th century we will focus on the work of one of the most famous Plovdiv architects, Stoiko Stoikov, in the district. Stoikov, alone and with his partner Boris Gradinarov, has designed various buildings in Kapana of a smaller and larger scale, yet adhering to the observed contemporary European stylistic tendencies. The architect had studied in Munich and after 1912 returned to Plovdiv to start his professional career. He was fascinated by ancient Greek and Roman culture and architecture, which his father had introduced him to in his childhood and con-

tinued this tradition through his own interpretations of historical elements. Strongly influenced by the late stages of the secession movement, Stoikov created buildings following the idea of vertically structured façades, volumetric design and the conscious use of ornamental details (Chinkov 2002, pp. 131-132).

Stoikov's early work in Kapana district can be exemplified by his project for the two-story house of Bohoriakim Eliakim, designed in 1922. The design adheres to the characteristic street view in Kapana, consisting of buildings with narrow fronts of about four meters width, which according to Chinkov make up over 40 to 45% of Kapana (Chinkov 2002, p. 56). Stoikov's façade design follows secession role models and has a very clear structure (fig. 3). The ground floor includes a wide storefront window, the first and second stories are visually connected by the vertical element of an oriel window and crowned by a triangular pediment. Two rusticated pilasters frame the façade on the sides. The only decorative elements are integrated in the triangular pediment and in the capital level of the rusticated pilasters.

Stoikov's central work in Kapana, the KK Building (fig. 4), located on one of the central squares in Plovdiv today, was designed in 1924 as a representative building for the Kutsoglu family. The five-story corner building is one of the first business buildings in the city (Petrova & Dimova 2012). The design of the façade follows the principles, already implemented by Stoikov in other projects in Kapana, yet develops them even further. The ground floor is horizontally accentuated with a frieze, large storefront windows, and a cladding with a rusticated darker stone. The upper stories are not horizontally differentiated – the façade is clearly vertically organised through pilasters in different widths, narrower in the concave façade around the corner between Knjaz Batemberg Street and Dzhumaja square. The corner is further accentuated with a round dome with metal cladding. The façade does not contain many decorative or-

Figure 3 - Plan for the house of Bohoriakim Eliakim in Plovdiv. Source: National Archive Plovdiv: Ф 29К Оп. 12 П а.е. 400 л. 1

Figure 4 - The KK building in Plovdiv
Source: Personal archive of the author (RG)

naments. Some of the elements used are a bas-relief of the letter "KK" above the corner entrance and vegetable festoons, typical for the secession-influenced Plovdiv designs.

Analysing the rebuilding of Kapana district at the beginning of the 20th century and especially Stoikov's oeuvre, we can find clear signs of the intensive idea exchange with Western and Central European architecture. While the ties with Western Europe (Germany, France, Italy) were strong, the dialogue with Central European architecture seems to have been even more intensive. The secession movement, with prominent representatives such as Otto Wagner, Joseph Maria Olbrich and Josef Hoffman, was then further transported by Wagner's students Jože Plečnik and Jan Kotěra and influenced the contemporary Slovakian and Czech architecture (Philipp 2006, p. 339). The strong cultural ties of the young Bulgarian society to this context transferred the secession ideas to Plovdiv as well. Neverthe-

less, the clear orientation towards contemporary Western urban planning principles and herein towards the *Stadtbaukunst* ideology supported by Camillo Sitte and Theodor Fischer transported the ideas of Mediterranean urban morphology into the rebuilding of Kapana and Plovdiv's urban planning in general. The characteristic density and building typologies of the district, its interpretation as an urban ensemble and the attention to the creation of quality urban spaces for interaction, work, and retail, as well as the vivid colour scheme of the narrow façades, document the inevitable Mediterranean references.

4. Conclusive remarks

The 19th and the beginning of the 20th century were undoubtedly a period of fast transformation for European architecture. As we found in the case studies from the Western and Eastern European context, despite the rising orientation based on national borders and the search for a national style the period was a time of intensive idea exchange on an international level. Both projects document the fascination with Mediterranean role models. We can read Sitte's ideological signature, based on his studies of Italian piazzas, in the design for Geissplatz and its framing as an urban entity. Simultaneously, the additions to the public place at Dzhumaja Mosque in Kapana district occur in a similar fashion, with attention to the pedestrian experience of the public space and its scale. The typical layering of different historical and cultural artefacts we can observe there further underlines the orientation towards Mediterranean examples. Though different in their functional core and scale, both projects clearly represent the active leaning of Western and Eastern European architects and urban planners towards Mediterranean role models and culture during the 19th century.

While the Mediterranean influences on European architecture and material culture

during the observed historical period are inestimable, the analysed projects indicate its further deeply rooted impacts on the development of the built environment of Western and Eastern European cities. The latter are based on two core insights – on the recognition of the importance of quality urban spaces as the backbone of urban life and civil society and on the instilled understanding for the importance of idea exchange as a driving factor in the constructive transformation of European cities. The further development and modern state of both Geissplatz-Viertel and Kapana district, which remain great urban spaces and public meeting points even today, offering small islands of Mediterranean *joie de vivre*, prove the sustainability of these concepts.

The urban morphology of Mediterranean cities and the urban culture principles they represent allow elements of cities such as Sienna, for example, to remain role models for communicative and welcoming quality urban spaces within the human scale, evident in contemporary research on the urban planning practice (Gehl 2010; Wolfrum et al. 2015). Most importantly, Mediterranean cities teach us of the importance of cultural and idea exchange and how it can positively shape the cityscape if allowed and carried out in a reflective way.

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Cultural Heritage and Citizenship: Theory and Practice in the Portuguese Context

L.O. Caetano, J.L. Crespo

CIAUD, Lisbon School of Architecture; Universidade de Lisboa, Portugal

Abstract   This piece is a reflection on citizen action in safeguarding cultural heritage, taking into account the public participation that is needed and is referenced in current strategic documents. Using the power that any citizen has to request the classification of a real estate property (enacted in law) as a starting point, it is of interest to see how civil society has behaved in this regard. To achieve this, requests for classification of real estate filed with the Directorate General of Heritage in 2020 and 2021 were consulted. The results showed that a large majority of applicants are agents of civil society. This fact reinforces the importance of associations and civil participation in safeguarding heritage as a part of community identity and a generator of territorial appropriation. However, it is important to increase awareness of citizens' power to initiate the classification procedure, and to create support mechanisms – such as digital support platforms – that make it possible to compile the information needed to follow up on the application.

1. Background and context

1.1. Definitions and Concepts

The concept of heritage as a cultural asset has been refined over time, just as the natural and constructed landscape (including buildings and the urban fabric) inherited from the past has been understood differently from one generation to the next (TOMÉ, 2018).

Historic heritage as a concept was born during the Renaissance, but the preservation of assets of historical and artistic interest under the care of the State only started after the French Revolution. That which is historical and artistic thus takes on an instrumental quality and is used to construct the representation of a nation and the term "heritage" is coined to refer to a collection of cultural assets under State management, imbued with new meaning (SOUZA, 2015). The practice of preservation is based on national legislation, whose guidelines are found in Charters, Conventions, and Recommendations written by international organizations, "representing attempts that go beyond the establishment of rules and procedures, creating and circumscribing concepts that are sometimes global and sometimes local" (CURY, 2004, p. 7).

The first international document dealing with heritage was the Athens Charter, drafted at the First International Congress of Architects and Technicians of Historic Monuments in Athens in 1931. The urban environment's cultural aspect appeared when the Declaration of Amsterdam was published in 1975. It stated that architectural heritage includes not only individual buildings of exceptional quality and their surroundings, but also all areas of towns or villages of historic or cultural interest (CURY, 2004). The Washington Charter, 1986, gave rise to the idea of specific values of traditional urban civilizations in cities or neighbourhoods, thus going beyond the condition of a mere historical document. In the 21st century, the Vienna Declaration of 2009 reinforced the idea that "history and heritage are instinctively linked to the sense of local, national, and world identity. Sharing heritage is a key component of social cohesion and the sense of community and integration". According

to Manuela Tomé, when we interfere in only one architectural object or in parts of the whole, there may be no change in the sense of loss of values, but if we modify typological aspects or the whole, we will be causing a sense of loss in the community that may be irreversible (TOMÉ, 2018).

In turn, the Davos Declaration of 2018 reinforces the need for quality planning in the field of heritage as a guarantor for improvements in quality of life, increasing collective identification with the "place". Collective identification will improve the experience of urban spaces and promote more inclusive and cohesive societies by fighting discrimination and radicalization, and the civic integration and conscience. In fact, this underlies the New Urban Agenda (which defined the sustainable development objectives) arising from the United Nations Conference on Housing and Sustainable Urban Development – HABITAT III – when it states that human settlements must "be inclusive; promote civic engagement; stimulate feelings of belonging and appropriation among all inhabitants; prioritize safe, inclusive, accessible, green, and quality public spaces that are suitable for families; strengthen social and inter-generational interactions, cultural expressions, and political participation" (HABITAT III, 2017, p. 5). Regarding the concept of Public Participation, the literature review linked with empirical research carried out as part of the doctorate research-action (CAETANO, 2021), it is considered that, as a rule, this refers to participative processes determined by law (normative) or provided by Public Institutions (MOTA, 2013, ARRUDA, 2017, and PRONSATO, 2005), while Citizenship means civic movement or impulse to participate in the public sphere and may be of an assertive or propositional nature (HOSKYNS, 2005, and PERUZZO, 2015). However, when public participation is active, encouraged by Public Institutions or demanded by citizens, then it is similar to the concept of Citizenship (CAETANO, 2021).

1.2. Heritage Defense

Associations (HDAs) The theme of Cultural Heritage and Citizenship is inextricably linked to Heritage Defense Associations (HDAs), where the defense of cultural heritage is the preservation of the history and memory of different communities.

According to Ana Matos and Maria Bernardo, these Associations fulfil three roles: they enable democratic drive; they are a force to counterbalance the State; and they compensate for inefficiencies in government action. In this regard, HDAs have been an "effective means for expressing the position and will of populations in those matters" (MATOS and BERNARDO, 2018, p. 2).

Despite the appearance of HDAs in the 19th century being more a scientific than a civic phenomenon, including actions regarding cultural tourism, they were outlawed after the military coup of 1926, until 1974. During the effervescent period between 1974 and 1978, they experienced marked growth and were given a legal framework in the Portuguese Constitution in 1976 (Article 73).

The contribution that HDAs made to conceiving the Portuguese model of cultural heritage, materialized in the first Portuguese Heritage Law (Law 13/85 of 6 July), resulted in the 1st Meeting of Heritage Defense Associations in Santarém and a subsequent National Campaign for the Defense of Cultural Heritage in 1980. Obviously, the creation of the first government body to supervise the area of Heritage, the IPPC (1980), and Portugal's accession to the European Community, including the Granada Convention of 1985, in which Member States of the Council of Europe recognize "that architectural heritage is part of Europe's cultural heritage and an asset of all Europeans" (NASCIMENTO, 2020, p. 48) also contributed to that outcome.

1.3. Identity and Identification

A community's cultural heritage represents the identity of a given society at a

particular time and in a specific geographic space. The aspect of built heritage is linked to the concept of a "city" or "historic city". Within this scope, we feel it is relevant to analyse the definition of cultural or urban identity. We attempted to find a possible definition of "urban identity" as it is more consistent in terms of context. We start with Kevin Lynch's reflection on "the image of the city", when he states that there appears to be "a public image of any city that is a superposition of the images of many individuals. Or perhaps there is a number of public images, created by a significant number of citizens. (…) Each individual has their own unique image that, in a way, is rarely or perhaps never disclosed, but is nevertheless close to the public image and, in different environments, becomes more or less determinant, more or less accepted." (LYNCH, 2011, p. 51).

From Lynch's words, it can be seen that the image of the city is the result of collective/city memory along with the city's specific identity and the identification/appropriation by individuals who make up the community.

In light of this, it seems important to linger for a moment on the two categories we have mentioned: collective memory and urban memory. According to French sociologist Maurice Halbwachs, collective memory is "a collection of memories built by society and with reference to a group that is beyond the individual (…) and simultaneously a constant stream of thought that is continually being transformed and redefined because it retains from the past only that which is still alive or can live in the group's consciousness and is of interest to it" (Apud RIBEIRO and MELO, 2012, p. 6). The memory of a city is the "experience of an urban space and implies a simultaneous condensation of past, present, and future" (SILVA, 2017, p. 32).

"Perception of identity offers the recognition of the character of a place, not so much as something constant but as something coherent with the person themselves. Individually, identity is perceived by a sense

of belonging, through a coherence between narratives and personal (individual or social) experience of the place" (BRANDÃO, 2011, p. 63). In this regard, it is important to note the mechanisms of space appropriation each individual carries out in their daily life.

In the proposed parallelism, the city's Identity would comprise the physical medium (morphogenesis), with its community, plus the city/collective memory (narratives), integrated within its developmental course (history). In these terms, identification is therefore the link of individual identities to the collective/urban identity, generating a sense of belonging and ownership between all its inhabitants. Finding the link that potentiates that identification could mean the fulfilment of the collection of ideas proposed by the New Urban Agenda of the United Nations Conference (HABITAT III, 2017).

2. Context

An analysis of public policies on cultural heritage, and the action of civil society – in particular HDAs – direct us toward some factors to bear in mind.

According to Sofia Magrinho's doctoral research, there were 18,000 recreational and cultural associations in Portugal in 2017, totalling approximately 3 million associates and being responsible for creating 30,000 direct jobs and moving around €400M per year.

Despite this, several authors point to a lack of citizen participation in public life (CAETANO, 2021), including issues related to cultural heritage (MAGRINHO, 2016); the distance between legal provisions and practices (noted by researchers and association leaders) (MATOS and BERNARDO, 2018), with empirical investigations on that theme, such as the survey carried out with municipalities in 1995 by Al-maden Magazine to determine the number of HDAs in territories (RAPOSO, 1997) and the empirical study carried out by Maria Manuel Reis in 2003, where HDAs were surveyed

to discover the real situation of the total-ity of associations (REIS, 2016). Still with regard to the fragility of the activity of as-sociations, note some of the results seen in the doctorate research-action (CAETANO, 2021) in contexts where there are no dia-logue channels open between local author-ity and civil society. It was observed that, in general, associations depend financially on Municipalities for their survival. There-fore, if the Associations should become a "discordant voice", they run the risk of be-ing extinguished due to lack of financial support or may be co-opted by the local authority.

In the case of cultural heritage, it is im-portant to highlight the pivotal role assigned to HDAs by the first law in 1985, which regulated the participation of such organiza-tions in the Consultation Council of the pub-lic body responsible for classifying cultural assets (Article 6 of Law 13/85). However, in moving to the existing Base Heritage Law (Law 107/2001 of 8 September), that privi-lege became the abstract right to enjoy "the right to participation, information and popu-lar action" and being able to "cooperate" with public institutions (Article 10 of Law 107/2001). In short, any technical competen-cies the associations had were taken away and their activity was relegated to aware-ness-raising activities and citizen education (MAGRINHO, 2016).

3. Object of the study: legal background and methodology

Some authors have discussed the ac-tivity of HDAs, but, in general, the focus is on the relationship between government and civil society in the defense of cultural heritage.

However, there is no research carried out in the operational field. In other words, with regards to the legal provision that "The initiative to launch an administrative pro-cedure of classification or inventory may come from any person or body, public or private, national or foreign" (Article 25 of Law 107/2001), thus justifying this study.

Under the terms of the Base Law for the Policy and Framework for Protecting and Valuing Cultural Heritage (Law 107/2001), "cultural heritage policy specifically aims to preserve and safeguard cultural heritage of European importance and cultural herit-age of exceptional universal value, in par-ticular when dealing with cultural assets that are part of Portuguese cultural heritage or have significant connections with it" (Ar-ticle 5(3)).

Heritage is safeguarded through classi-fication, which is understood to mean "the final action of the administrative procedure through which a certain asset is said to have priceless cultural value" (Article 18(1)). In the case of real estate assets, "these may be monuments, collections of buildings, or sites, in the terms in which such categories are defined in international law" (Article 15(1)). Real estate assets "may be classified as being of national, public, or municipal interest" (Article 15(2)). "Classification of cultural assets by municipalities will be pre-ceded by an opinion from the State's com-petent bodies and services, or of the Au-tonomous Regions if the municipality is located therein." (Article 94(2)). The deci-sion to classify assets of national and public interest is made by the central Government body that supervises cultural heritage; cur-rently, that body is the General Directorate for Cultural Heritage (Direção Geral do Património Cultural, DGPC). In view of the procedures set out in the Law, the technical services responsible for evaluating the possi-bility and level of classification of real estate property carry out one of two procedures: firstly, the issuance of opinion on proposals submitted by City Councils regarding the classification of assets of municipal interest so as to verify if the assets has attributes that make it advisable to classify it as be-ing of national or public interest; secondly, a study of the attributes of cultural assets to determine the existence of attributes that make it advisable to classify the assets as

being of national, public, or municipal inter-
est, whether by initiative of those services
or applications sent to the DGCP under the
terms of Article 25.

This research was limited to the years
2020 and 2021. The data under analysis are
the fifty-two (52) submissions for classifica-
tion of real estate cultural assets throughout
the national territory (excluding in the Porto
district, as these use a different data base)
sent to DGPC.

It should be noted that applications for
opinions on municipal intention to classify
assets as being of municipal interest and
applications for classification for national
or public interest were seen. The objective
of this research is to ascertain who are the
applicants who initiate submissions for the
classification of real estate cultural assets
as being of national and public interest. The
answer to this question will enable a reflec-
tion on the action of civil society at the
operational level of safeguarding cultural
heritage.

For systematic reasons, applicants were
divided into three categories – Government,
Academia, and Civil Society – with the fol-
lowing sub-divisions:
- Government: Central Government Bod-
  ies, such as Regional Directorates for
  Culture (Direções Regionais da Cultura,
  DRC), and Local Government Bodies,
  such as City Councils;
- Civil Society: Heritage Defense Asso-
  ciations (HDA); private individuals and
  owners.

4. Outcome of research

The research revealed that 22 submis-
sions were filed in 2020 and 30 submis-
sions were filed in 2021. Most were sent by
municipalities for the issuance of opinions
– on intentions to classify real estate prop-
erty as being of municipal interest – repre-
senting around 64% of submissions filed in
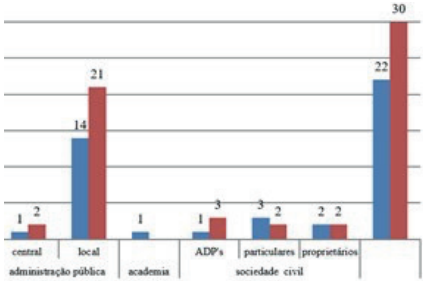2020 and 70% in 2021, as can be seen in
Figure 1.

*Figure 1 - Number of submissions for classification
by type of applicant*
* DGPC Data base

Regarding the sub-types of agents in
civil society, it can be seen that there is no
single dominating element; rather, they are
distributed fairly evenly. See Figure 2.

However, we felt it would be more
logical for Heritage Defense Associations
(HDAs) to have an unequivocal key role, as
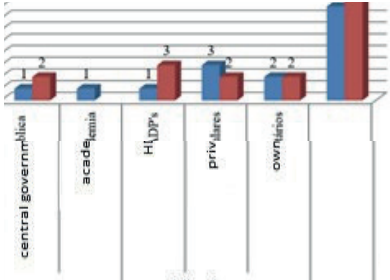they should have a more suitable technical
and logistical framework.

*Figure 2 - Number of submissions for classifica-
tion as national and public interest by type and
sub-type of applicant*

5. Conclusions

The results obtained demonstrate that
most applicants are agents of civil society, re-
inforcing the importance of associations and
civic participation in safeguarding heritage.

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However, a closer analysis reveals that, while it is true that civil society is still the driver of classification of cultural assets, Associations are deficient at the operational level.

These conclusions assume that the identity element in communities is the generator of territory appropriation. However, the jargon used in these submissions requires applicants to have underlying specialist training in order to ground their classification proposal, putting them out of reach of common citizens.

Although in a different context, more specifically, in the research on public participation in territorial submissions carried out by local authorities in medium-sized cities, social actors were asked to take part in semi-structured interviews. "The content of the interviews varied depending on the social group to which they belonged, but in general, political leaders and specialists explained the low level of participation with lack of tradition and the individualism that predominates existing societies. In turn, the more "common" layers of the social spectrum – Government technicians and members of civil society – feel this is due to a sense that a citizen's opinion is not take into account, a fear of retaliation by political leaders and specialists, the jargon that is hard to understand for non-technicians and even technicians not working in the field of urban planning; and the mistrust in political representatives, which results in citizens drawing further away and being uninterested in political issues". (CAETANO, 2021, p. 160). Drawing a parallel with the field of heritage, there are some similarities, particularly regarding the prior technical knowledge one must have to take active part in these processes.

It is also important to increase awareness that citizens may initiate the process to have an asset classified and to create support mechanisms that make it possible to compile the information needed to follow up on the application.

Without forgetting the fact that public policies on heritage and the associated legislation have pushed away HDAs from decision-making processes (MAGRINHO, 2016), it is observed at an operational level that there is a field of work that has not been properly filled in by these civil society organizations.

HDAs may become re-invigorated by become more actively involved in Academia and, at the same time, creating digital logistical support platforms that could support the preparation of submissions for safeguarding heritage.

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Acknowledgements

The challenge of link musealized objects to its primitive building

V.G. Nascimento

Universidade de Lisboa, Faculdade de Belas-Artes, Centro de Investigação e de Estudos em Belas-Artes (CIEBA), Portugal / Laboratório HERCULES, Universidade de Évora, Portugal

F.A.B. Pereira

Universidade de Lisboa, Faculdade de Belas-Artes, Centro de Investigação e de Estudos em Belas-Artes (CIEBA), Portugal

A.N. Alves

Universidade de Lisboa, Faculdade de Belas-Artes, Centro de Investigação e de Estudos em Belas-Artes (CIEBA), Portugal

A. Candeias

Laboratório HERCULES Universidade de Évora, Portugal / City University of Macau Chair in Sustainable Heritage, Universidade de Évora, Portugal

Abstract   Religious objects are deeply connected to the ceremonial space where they originally belong, being part of the building's integrated heritage. Therefore, the material and the immaterial cultural manifestations should be considered as part of the building's identity. The patrimonialization of religious artefacts, such as altarpiece paintings, often lead to their musealization and therefore the link with their primitive building has been lost. In most cases the lack of information associated with these objects hinders their interpretation and promotes the objects' individualization, resulting in the dissociation from their original context. To avoid this situation and to rescue the connection between the musealized objects and their primitive building, UP Heritage Project proposes an integrated approach as a way to valorize Évora's City patrimonial set.

1. Integrated heritage

We all have a personal opinion about what Heritage is, which is built on our individual experiences and personal interests. Each view is unique because the way we look at Heritage is influenced by several factors and can change over time, as its interpretation and re-interpretation is constant and can be updated according to the evolution of Heritage itself (Gustafsson, 2019, 21).

Therefore, the concept of Heritage is more than a legal framework: it is the result of a collective reflection on this subject and mirrors the relationship between society and its cultural manifestations. For this reason, it is a concept that is still under construction and should remain open to discussion.

1.1. The link between objects and their primitive building

It is common to consider that the connection of an object to a building is related to its materiality and depends on the architectural structure. This conception can be associated with the definition of monument presented in international charters such as the Charter of Granada, ratified by Portugal

in 1991, which includes in that definition «[…] the installations or decorative elements that are an integral part of it» (Assembleia da República, 1991).

The use of the term "integrated" as a criterion for attributing an object-building link allows this definition to be interpreted in many ways because it does not establish clearly and unequivocally the nature of that link. In other words, it does not clarify whether the link is based on the support's materiality or if it is related to the immaterial context of its creation and use.

In the past decades, the national and international guidelines are no longer based on the asset support dependence to the building's structure and have begun to consider as well the influence of the architectural setting on the cultural objects' interpretation and contextualization, as we can see in the Charter of Cracow of 2000 (2004).

Following these guidelines, the Portuguese Law No. 107/2001 defines the bases for the regime of protection and valorisation of cultural heritage and establishes that «[…] the cultural heritage includes not only the tangible and intangible assets of relevant cultural interest but also, when relevant, the respective contexts which, due to their testimonial value, have an interpretative and informative connection with them.» (Assembleia da República, 2001).

1.2. Conceptual review

Almost two decades after the publication of Património integrado ou a alma dos monumentos (Calado et al, 2003) there is still a tendency to limit the scope of the integrated heritage to its materiality in Portugal, considering only the «[…] movable assets integrated into immovable assets […]» (Ministério da Cultura, 1997).

Since 2001 the Portuguese cultural heritage legal framework recognises the intangible aspects of heritage as values that should be valorized and preserved, as the updated law includes the material and immaterial assets with historical and artistic value, that represent the cultural identity of a community and are thus identified by that community (Assembleia da República, 2001). However, this document did not establish a connection between the immaterial manifestation and the tangible heritage related to them.

Having this in mind, we believe that it is urgent to discuss the importance of setting up a clear and unequivocal link between the building and the tangible and intangible cultural manifestations related to its usage and significance, as a way to preserve its heritage identity and to effectively apply protection measures.

In this regard, we consider that a building's integrated heritage should include all assets whose purpose and existence was determined by the building itself, forming together a unit, a total work of art, whether or not these assets are currently contained within the build. This includes the installations or decorative elements incorporated in its structure, the movable assets that remain in its primitive location or that have been set in another building, as a museum, as well as the intangible cultural manifestations associated with the building's usage (Nascimento & Alves 2016).

To clarify that, the 2009 Portuguese Law states that the integrated mobile assets are composed by the objects «[…] materially or permanently linked to cultural immovable assets, as well as movable objects which are permanently assigned to the building's service or ornamentation» (Ministério da Cultura, 2009), making it clear that the link between a building and an object can be intangible, justified by its use. However, this document ignores the objects that were created to be part of the building but due to a musealization process have been placed in another place.

2. Religious heritage musealization

The musealized objects and the intangible manifestations are key aspects to consider when trying to understand a building's

identity as a whole. This becomes clear when we think about religious heritage, as both the symbolic values and the ritualization of the space that originally gave meaning to its existence (Aires de Barros, 2003). However, the patrimonialization and the musealization of religious objects as a way to ensure their safeguard causes the dilution of their connection to their architectural, functional and symbolic contexts.

Although many buildings were designed with their filling, constituting a total work of art (Gesamtkunstwerk), the discussion about the bond between the artistic object and the place for which it was made emerged in the mid-twentieth century with the idea of Site-Specific (Kaye, 2000). However, the importance of linking the object to its original place was not taken into account in the musealization process. Only recently did the original context start to be considered as essential to a correct interpretation and valorisation of musealized heritage.

Understanding the «here and now» of a cultural object, its unique existence, is essential to the sense of authenticity, according to Walter Benjamin (2010), as it is to know the symbolic and ritual context of the religious objects in order to make a correct interpretation of its values. Therefore, this information should be taken into account during the musealization process of objects that have been created for some cult purpose, as its authenticity is directly related to its symbolic and evocative role in the context of their original use.

From our point of view, the process of musealization should approach the objects with a wide perspective, less focused on the object's individuality and more on the interpretation of the set as a unity.

But how can we preserve the identity of religious buildings when part of their integrated heritage has been musealized?

The relocation of religious objects to exhibition spaces presents great challenges in communicating their symbolic and functional values because in many cases the information available in the exhibition space does not allow their correct interpretation.

Despite the effort to indicate their provenance, in the case of liturgical objects or other museological pieces that originally had a ritual or symbolic usage, the lack of information about their use limits the reading and interpretation to their material aspects.

On the other hand, in their primitive location, the absence of information about the musealized assents that were originally part of a religious building is one of the factors that mostly contributed to increasing the problem of dissociation between an object and its primitive context (material and immaterial).

The tendency to value "the current dominant conception" of heritage (Oliveira Martins, 2011), the context in which the heritage sets are currently found, directs the action to preserve and to value the historical and artistic aspects of the objects, devaluing the multiple aspects and the various references that mark the course of a heritage asset.

That is why the former object-centered approaches have evolved to the construction of strategies directed to the person-object connection, to put people in the centre of heritage actions. It is necessary to know in order to understand, to understand in order to respect and to respect in order to value, in a complex process that leads to the creation of identity and belonging bonds that are the bases for the construction of a collective heritage consciousness.

In the case of museum objects, the effectiveness in transmitting information depends on the creation and availability of contents, which also poses challenges to the choice and management of mechanisms to make that information available, in an era when "we've got the whole world in our hands".

The extension of the museums' action to the historical buildings to which the musealized objects belonged would allow the recontextualization of the heritage set through the creation of a dialogue between the exhibition space and the objects' primitive context.

3. An integrated approach to valorize évora's patrimonial set

These possibilities were explored as part of our research on the musealization of 16th-century altarpiece paintings, through the creation of communication activities aimed at recontextualizing the religious heritage in the collection of the Frei Manuel do Cenáculo National Museum, in Évora.

On a first approach to the problem of recontextualization, the activity "From the hermitage to the museum: the story of a painting" intended to solve the lack of information about the origin of the painting "Lamentation about Christ taken down from the Cross", by placing an informative table next to the painting with some data about its primitive building and its musealization process.

The same approach was used in St. Brás Chapel, where the painting was originally part of one of the side altars, indicating its current location at the Museum. In both places, the content was made available in Portuguese and English, including images and a QR code that provided the painting's technical and material study results.

The information tables were complemented with a flyer containing information about both museum and chapel opening hours and locations, to encourage museum visitors to visit the chapel and the religious community of the St. Brás Parish to visit the museum, establishing a link between the two spaces.

This activity lasted several months and ended with a museum guided tour focused on the displayed objects that belonged to St. Brás chapel, regarding their symbolic and functional values associated with religious use, and their importance as a historical document and the information that could be obtained with the technical and material study. The goal was to contextualize the objects through a reading of their material and immaterial globality and to promote the contact of the local community with the museum.

This activity was the starting point for the development of a more comprehensive proposal, that was initiated with the collection of Frei Manuel do Cenáculo National Museum and further extended to the monuments and buildings of Évora's historic centre. The suggested intervention aims to recover the connection between the musealized objects and their original buildings, as a way to enhance the heritage value of the historical set classified as World Heritage by UNESCO in 1986.

Évora is known as "the city museum" and its historical heritage has been seen as an asset for the touristic and cultural valorization of the territory. However, and from our point of view, it is urgent to apply measures that revalorize the heritage spaces outside the tourist route, raising interest for other heritage spaces. By circulating in a restricted area of the city, visitors are limiting their own mobility and consequently are conditioning their understanding of the evolution of the historical centre as a heritage set.

3.1. UP heritage – you preserve heritage project

UP heritage project has the objective of creating sustainable solutions to the following problems:
- the dissociation of information of musealized objects, recovering their connection with the original buildings;
- the access to the interior of historic buildings that are closed, using digitization and visualization tools to "open it" to the public;
- the devaluation of heritage spaces located outside the city's touristic nucleus, promoting circulation and encouraging visits to lesser-known monuments.

With the support of the HERCULES Laboratory and the City University of Macau Chair at the University of Évora, we sought to structure an appealing and easy-to-implement approach that would meet the

objectives of disseminating and valuing heritage, contributing to its preservation.

Following the trend of heritage passports, currently available in several Portuguese cities, we have created Évora's Heritage Passport, a passport that provides information about several heritage spaces in the city, establishing relationships between them, the buildings and the city's museum collections, offering an overview of the historical and artistic value of the city.

Taking the example of St. Brás Chapel, located outside the city walls and the tourist route, the Heritage Passport includes information about the building, the traditions associated with it, its level of protection and its musealized heritage, as well as information about access and opening hours.

All places of heritage interest are marked on a map, included in the passport, and users are invited to walk around the city

Figure 2 - Heritage Passport – St. Brás Chapel. Sara Szerszunowicz, City University of Macau Chair at the University of Évora, 2021

Figure 3 - Évora's Heritage Passport Map. Nuno Carriço, City University of Macau Chair at the University of Évora, 2021

and stamp their passport on each place they visit. To complement the information in the passport, we use QR Codes to give access to the UP heritage digital platform, where more content about the historical and artistic heritage is available, as well as virtual reproductions of the building's interior which allow visitors to learn more about the traditions and the building's current usage.

The use of QR codes, although is not an innovative strategy in the context of cultural mediation, is a tool that has been used by several institutions to improve the visit routes and provide informative content. Augmented

Figure 1 - Heritage Passport. Sara Szerszunowicz, City University of Macau Chair at the University of Évora, 2021

reality and 3D models are currently viable solutions to respond to limitations in access to the interior of some buildings, virtually opening these spaces to people.

In the last two years, several museological institutions have resorted to this type of solution to create virtual visits and keep their collections accessible. Today it is possible to explore our heritage by using platforms, such as Europeana project that provides access to various tools and contents to promote digital access to European cultural heritage, or Google Arts and Cultures that has revolutionized the approach to the digitization of collections, by providing free access to museum exhibition space around the world.

Today, there are several innovative projects that, driven by digital connectivity and policies that encourage digitalization, have created open platforms where content is available for free. However, the segmentation of the target audience and the availability of content without an effective mediation (Sacco, 2013) ends up, in our opinion, conditioning the access to information.

Currently under development, UP heritage digital platform intends to be a mediation tool, which aggregates various types of information from several sources and makes them available in a clear language. The challenge we currently face in developing this idea is to find the best way to ensure that everyone has access to heritage and can understand it.

However, cultural mediation strategies focused on the digitization of heritage raise other issues, such as the authorization for images collection and free availability on the Internet of 3D scans of classified heritage, since there is still no legislation on this subject.

Conclusion

It is common to consider that integrated heritage is related to the object fixed to the architectural structure of a building, such as «[…] the installations or elements that are an integral part […]» of the construction, as it is presented in the Resolution of the Assembly of the Portuguese Republic No. 5/91. However, the use of the term "integrated" as a criterion to attribute an object-building link makes this definition open to individual interpretations, as it does not clearly define the nature of the connection, whether it is based on the material connection, related to the support, or on the immaterial connection, regarding the context of their creation and original use.

In the past decades, the contextualization of the objects placed inside historical buildings have become a concern, but this did not lead to the reviewing of the previous conceptual framework. Nevertheless, the national and international guidelines are no longer based on the material support dependence and now begin to contemplate the influence of the building to a correct interpretation of the objects, as it is clearly defined in the Portuguese Law No. 107/2001: «[…] cultural heritage not only includes the set of material and intangible assets of relevant cultural interest but also, when applicable, the respective context, which, due to the value of testimony, has an interpretative and informative relationship with them».

Regarding this question, we strongly believe that a building's integrated heritage should include all assets whose purpose and existence were defined by the building itself, forming a unit, including not only the installations or decorative elements incorporated into the structure, but also the original and existing movable assets, as well as the intangible cultural manifestations associated with it. This conceptual redefinition proposal allows us to establish several building-object connection levels, from which it is possible to analyse the link between the building and its integrated heritage.

Although it is easy to reinforce this building-object link when objects are part of the architectural structure, patrimonialization of the mobile objects with relevant historic and artistic value sometimes leads to their musealization or the relocation in

museums, promoting the loss of the original material and immaterial context.

Technological developments and the on-going process of digitalization have made it possible to develop new strategies for valuing and communicating heritage, based on the new approach on access to information. To recontextualize the museum objects, recovering the connection with their original building, we created the UP heritage project, which consists in the creation of a user-friendly product that gives access to information about the building and its integrated heritage (material and immaterial, placed inside the building or in another location), providing an integrated approach to the interpretation of the patrimonial set.

The Évora Heritage Passport was designed to be Évora's historic centre guide, establishing relationships between the various heritage spaces and promoting circulation outside the traditional tourist routes. On the other hand, by reinforcing the connection between buildings and their musealized objects, we seek to offer an integrated reading of that heritage, which we hope will lead to its valorization and preservation.

Although arising in the context of academic research, and still in an embryonic phase, we believe that the future implementation of this project can contribute to the promotion of Évora's city historical and artistic heritage, complementing currently available offers, such as Évora Ticket.

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What did the Roman Temple of Évora look like in the nineteenth century?

A.N. Alves

Universidade de Lisboa, Faculdade de Belas-Artes, Centro de Investigação e de Estudos em Belas-Artes (CIEBA), Largo da Academia Nacional de Belas-Artes, 1249-058 Lisboa, Portugal

Abstract   The graphic restoration of monuments was a very common practice over time, resulting in the creation of ideal iconographic representations of buildings, which often ended up being considered as real, with different implications for the restoration of these monuments. Through an iconographic and descriptive comparison, this article intends to analyse a set of descriptions and images of the Roman Temple of Évora, dated between the end of the 18th century and the first half of the next, to understand what the real image of the temple in this period was, and the importance of the representation of James Murphy in the context of that time.

Introduction

Although the practice of rigorous architectural surveys was common in the last decades of the 18th century, often sponsored by scholars interested in these issues, the exercise of graphic restoration did not fail to appear in many surveys carried out then. The pursuit of the monuments' original form was common practice over the centuries, to study and deepen knowledge about architectural styles. Some of these images circulated throughout Europe in publications, often regarded as true testimonies through which a building could be appreciated and studied, when the means of reproduction and dissemination of information were still very limited.

In this context, while on a tour in Portugal, the Irish architect James Murphy made a drawing of the Roman Temple of Évora, which is today in the National Library of Ireland (McCarthy, 2002, Navarro, 2003, Belchior, 2010). By establishing a correspondence between what he observed and the principles of Vitruvius, Murphy made a graphic restoration of the temple, which he published in his work *Travels in Portugal; Through the Provinces of Entre Douro e Minho, Beira, Estremadura, and Alem-Tejo, In the Years 1789 and 1790* (1795). This image was later reproduced in foreign publications and considered the "real image" of the temple.

Much has been written about this Irish man and his architectural survey of the Monastery of Batalha, widely studied by several authors (Neto, 1997, 2008, Belchior, 2010, Redol, 2011, Mulvin, 2021). In the present article, we seek to carry out a visual study on his published drawing of the Roman Temple of Évora, based on the comparison between the existing images of this monument and several descriptions made over the centuries. Our goal is to understand what the monument looked like by the end of the 18th century and the beginning of the next, to understand how Murphy's representation influenced the vision of the monument at a national and international level. This should leave room for a future analysis on how these images influenced the restoration carried out in 1871, which favoured the Roman character, praising the city's antiquity as a form of national superiority.

1. Monuments' graphic restoration practice

With the beginning of the application of scientific methodologies to collecting practices and with the development of Art History, the need to make reliable monuments' representations to serve as a study base, or even as collectable elements, begins to develop, especially in the 18th century, thus giving birth to the Museum of Images, as stated by Françoise Choay (2000, 65-68). A reliable image of distant elements becomes necessary to establish typologies and comparisons.

Until then, many representations were made from descriptions, as was the case of Sérlio's drawing of the Sphinx in the 16th century (Choay, 2000, 68), which was based on Herodotus' reports, taken as real until Norden drew it on the spot during his voyage in 1737. Even so, the presence at the site was not a guarantee of reliability, as evidenced by the nose represented on the sphinx by Pococke in 1743. An ideal perfection was intended and, for this reason, although the survey could be faithful to the monument represented, the published version was sometimes subjected to improvement or adaptation to the advocated ideas, resulting in that monument's graphic restoration.

The expansion of travel routes and archaeological excavations brought new answers to this need for knowledge, which was increasingly instilled in European society at the time. Added to these factors is the movement to study and understand Gothic architecture, whose origins are well established in England. The systematic monuments' graphic survey is supported by English antiquarian societies, in the search for an understanding of the Gothic style and its origins, in which one regularly observes the practice of graphic restoration by the author, by improving details or correcting pre-existing restorations. In these drawings, the ideal beauty of the original styles is unquestionably sought, in the wake of the 19th-century's stylistic restoration practised by renowned architects such as Viollet-le-Duc, in France, or Scott, in England, when these ideas passed from drawings to buildings themselves (Jokiletho, 1999, Choay, 2000). The aesthetic component of these proposals, by valuing their author and his ability to work, made them the target of publications in collectable albums by great connoisseurs from the 18th century onwards.

2. The Roman Temple of Évora

It is in this context that the Irish architect James Murphy's first trip to Portugal takes place, in 1789, sponsored by Sir William Conyngham. During this stay, he carried out a rigorous survey of the Monastery of Batalha, published in 1795 in the form of an album (Murphy, 1795a), with drawings made on-site and later subjected to a graphic restoration in his atelier. These were seen as reliable sources, influencing future interventions carried out in the monument (Neto, 1997, 45).

Upon completion of this work, the architect made a tour across the country, visiting several locations in the Alentejo, including Beja, where he meets Frei Manuel do Cenáculo (NETO, 1997: 32), and the city of Évora. This trip resulted in a book, *Travels in Portugal; Through the Provinces of Entre Douro e Minho, Beira, Estremadura, and Alem-Tejo, In the Years 1789 and 1790* (Murphy, 1795b), followed by a French translation just two years later, and also a German one, making it a reference book for travellers of the time (Navarro, 2003). The Portuguese translation was published in 1998, only two centuries after this work's first edition.

In this publication, several monuments and popular traditions are described in a kind of travel journal that went far beyond the mere description of the places from an architectural point of view. In the National Library of Ireland, there is an album with 36 watercolours made during this trip, some of which later served as the basis for the published engravings (McCarthy, 2002, Na-

varro, 2003, Belchior, 2010). This set must have been put together by Murphy to show his boss Conyngham the trip's results. According to McCarthy (2002), the images that served as the basis for the engravings include further detail, providing more information about the depicted topics.

One of the images that can be found in both cases is an illustration of the Roman Temple of Évora, which served as a starting point for the study presented here, although we mention only the published image. (Unfortunately, the drawing of the temple was never published by any author until now, and the fact that the National Library of Ireland is under a major renovation, preventing access to its archive, makes it impossible to compare the drawing made on-site and the image that is approached here. However, this work shall be done as soon as the opportunity arises.)

3. James Murphy's description of the Temple

In the representation of the Roman Temple of Évora, published in 1795 by James Murphy (figure 1), one quickly perceives that the image does not exactly portray what its author saw in place. A figure in Roman robes is even added in the foreground. In this draw-

Figure 1. A view of the Temple of Diana at Évora (Murphy, 1795: engrav. XIX). https://purl.pt/17093

ing, Murphy largely obliterated the medieval elements added to the temple, depicting the building "with a lovingly and lyrically-described plan in delicate ink washes that presents the clarity and logic of the structure" (McCarthy, 2002, 115). As in other cases, the human figure was correctly dimensioned to serve as a scale for the drawing.

Although the published image presents us with a more or less well-preserved version of the temple, in the description that accompanies it, the author states that:

The entablature is entirely deftroyed, except part of the firft facia of the architrave; the reft of the work is in a degree of prefervation fcarcley credible for a monument of this age. For this it is indebted to the durability of the materials, which is a fpecies of granite fomewhat afperous, but exceedingly hard. The rubble-work in the front ad fides is evidently Moorifque, as may be inferred from the pinnacles with which it is crowned.
At one fide of the hexaftyle are five columns, including the angular one; at the other, I could difcover but three. From thefe and the columns of the front we may infer that it had been a Peripteral Temple […] (Murphy, 1797, 307).

After this note, Murphy relies on Vitruvius to extrapolate about the original form of this temple, which he considers to be very badly treated. As a result, he carries out its graphic restoration. Despite keeping part of the structure added later, he gives the building a new look, moving the walls into the background to enhance the columns, and burying the podium, by raising the floor level to an impossible height in relation to the surrounding buildings, including the Palace of the Inquisition, building to which the temple was connected until 1844/45, as we shall see. This refinement depicts the classical character of the building, returning to it some of the original dignity.

In point of antiquity, as well as elegance, it is the moft eftimable ftructure in Portugal, yet I am forry to add, that the ftate of neglect in which it is left redounds little to the honour of difcernment of the people of Evora. […] (Murphy, 1795, 308).

[Temple of Diana at Evora.]

Figure 2 - Temple of Diana at Evora (The Penny Magazine, 1835: 313)

The dissemination of this book, as well as of other important works by this architect, ended up giving him notoriety, and so he became identified as a reliable source. This aspect is highlighted in later representations of the temple based on the image in the book, as well as in all the published considerations by the most varied authors until our days, which assumed that the temple really looked like this at the end of the 18th century. The lack of a critical analysis of Murphy's image, with the exception of the one existing in an article about the restoration of the temple by António Carlos Silva (1994-95), justifies the urgency of the study that is now presented.

In this context, this representation is taken as true and published on June 6 of 1835, in *The Penny Magazine* (figure 2). In the illustration, now improved with more extra figures dressed in 19th-century fashion and with new architectural elements, the structure is invaded by vegetation, following a romantic vision. The masonry walls of the north façade are set back, creating a kind of narthex where there is a sales counter, probably making a connection with the pro-

saic slaughterhouse function mentioned by Murphy in his book. The layout of the surrounding buildings is changed, a tower is now added in the middle of the houses with a more updated appearance, and the corner of the Loios convent is changed to the opposite side of the temple. In the same year's edition, the French *Magazin Pittoresque* republished the engraving from the English magazine, adapting the text, but without any reference to Murphy. The same image also appears in a Spanish article entitled "Ruinas de Portugal" (Portugal ruins), in the publication *El Instrutor*, as referred by Maria Cátedra (2011), and, two years later, in the Portuguese periodical *O Archivo Popular*, accompanied by texts emphasizing Giraldo Sem Pavor's conquest of Évora, rather than the temple's architectural structure.

In an engraving located at the National Library of Portugal, there is another representation directly based on Murphy's proposal, dated 1850 by the institution, which denotes only the updating of the clothing of the passer-by, represented by the Irish architect as a roman figure, without any critical view of the represented monument (http://purl.pt/1060). There is yet another representation inspired by these sources, published by Rui Viegas Dias (2007, 211). There is also a copy of this image in a private collection, without any indication of author-

Figure 3 - Engraving of the Roman Temple of Évora. Private collection ©author of this text

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ship, provenance or date (figure 3). In this image, there is a reference to the Évora Cathedral's towers, which had been obliterated until then, but a set of houses is added in its place. The people depicted no longer admire the temple, as in the previous examples, but are engaged in trivial tasks unrelated to the symbolic meaning of the Roman building, as happened in previously mentioned published cases.

This continuity and imagistic replication show the influence of the Irish architect and how his interpretation of the temple came to be considered as the existing reality. However, this fidelity was questioned by some authors even in the 19th century, as is the case of the German Emilio Hübner, when he stated that Murphy's work "earns an undeserved value when it comes to antiquities and Roman inscriptions, and absolutely cannot discern the false from the true, the ancient from the modern" (Hübner, 1871, 6), or even by Gabriel Pereira, who describes the engraving as "imperfect", emphasizing the existence of a four or five-step staircase leading to the street pavement (PEREIRA, 1883, 36).

4. The Roman Temple of Évora's real image in the 19th century early years

Confronting this personal interpretation given by the Irish architect, we find other images and written descriptions that portray a completely different reality.

The image believed to be the oldest discovered until now was published in 1927, in the magazine *Feira da Ladra*. Dated from the 16th century, it shows a Roman Temple in ruins, without an evident connection to the Évora's temple. In 1944, Túlio Espanca publishes it again in the magazine *A Cidade de Évora*, accompanied by a critical commentary, where he clearly identifies it as the temple in question, to which he believes a significant graphic restoration would have been carried out and, to prove his analysis, he identifies the surrounding buildings from the time of the engraving (Espanca, 1944).

More reliable representations can be found in the 19th century. In these cases, the temple is attached to a building, the former Palace of the Inquisition, from which we know it was separated between 1844 and 1845, under Cunha Rivara's direction, who was then the city's librarian. To illustrate this moment, there are three images.

The first was drawn by Carlos Van Zeller (1811-1837) (figure 4), an English soldier of Portuguese ancestry, who was in Portugal in the 1830s (Valente, 1942). Originally published in the magazine A Cidade de Évora by F.C., in 1943, its current location is unknown. It shows a more faithful representation of the space, with the correct urban framing, with an accurate representation of the Cathedral's towers in the background, ignored in previous depictions.
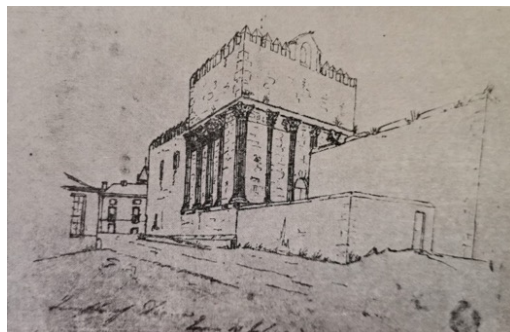

Figure 4 - The Roman Temple of Évora, Carlos Van Zeller, 183?. (FC, 1943)

There is another representation of the temple from the same period, probably a little later, which is in a private collection, and was published by Paulo Simões Rodrigues (2007, 52). There, a more rigorous survey of the surrounding urban fabric can be found, with special emphasis on the Cathedral. However, the temple has only five columns on the north facade, and the sixth is replaced by stone masonry. In front of the temple, the esplanade drawn by Carlos Van Zeller can no longer be seen, but rather a heap of fragments of columns and other decorated

stone elements, which seem to serve more as an adornment of the setting, than to reflect a rigorous survey. This image was probably made during the period of demolition of the annexed structures of the Palace of the Inquisition, between 1844 and 1845. The National Library of Portugal has a very similar image, a little less erudite, with the simplification of some elements, which seems to be a copy of the first one (figure 5).

Figure 5 - Vue d'un Temple Romain dans la ville d'Evora en Portugal. Dupont, 1850 [?] (https://purl. pt/1241)

In addition to the fact that the podium is visible in these representations, the presence of the Palace of the Inquisition's structures that abutted the temple, as well as the esplanade on its north facade, seem to correspond to a description of the temple made in 1651 during an inspection of the city's slaughterhouse, originally published by Celestino David in *A Cidade de Évora*, in 1947, which has gone unnoticed until now:

[…] outside the north door, there is a brick sidewalk that ends in the corner of the Inquisition, and next to the same door on the east side there is a staircase with twelve steps of stone. […] and the brick pavement up to the north gate, entering the portal, is thirteen and a half rods [c.14,85m] and two rods wide [c. 2,2m], up to the walls that support this pavement, and the stone staircase to the corner of the same butcher shop on

the nascent side, entering a little into the brick pavement, is five rods and four palms long [c. 6.38m] and a rod and a half wide [c.1.65m], and this northern door is a small stone arch with its wooden doors […] (David, 1947, 274-5)

Also, to confirm this description, a reference can be made to an inquisition notice in a document from the 1630s, published by Pedro Fialho de Sousa (1999, 156), which clearly shows the connexion of the temple to the aforementioned building.

From the 19th century, there is a very complete description of the temple published in the pages of O Panorama, in which it is mentioned that its west side could only be seen from the backyard of the old Inquisition building, confirming that the layout was maintained as appears in the images of Carlos Van Zeller. According to Miguel Abreu (1874, 161), despite having been published in 1844, this description was made in 1839:

The whole northern section runs at the same level of height, with the corresponding columns and five intercolumns; it seems that this side would be the top of the whole gallery; the lower entablature of this side is in great ruin, and partly crammed; at the height of the capital of the fourth column, attached to it, there is the high wall of the inquisition building, and it is a pity that it takes half of the view from this majestic side: there is also a low wall on this part at the height of the entablature, which served as a cattle enclosure, when the beautiful piece of architecture we have mentioned served as a public butchery, distorting it, as if the insults of time and the ravages of barbarians weren't enough. […]
This side [western] lies hidden from the public by being embedded in the backyard of the extinct Inquisition's house, crammed six to eight feet high, and quite ruined – It is unknown in what time, by what people, and for what purpose rough masonry walls were built over these beautiful fragments, and also the intercolumns sealed with bricks, opening in the wall erected in the south side two pointed Moorish-style shutters, made from rough and poorly carved stones. ("Evora", 1844: 408)

These images and descriptions are in direct conflict with Murphy's representation, showing the existence of an esplanade in front of the north facade of the temple, described by some as a cattle enclosure, accessed by a twelve-step staircase located on the east side, which would have disappeared in the 19th century.

Although we did not find many explanations about this discrepancy in the images in the consulted authors, we cannot fail to mention the proposal made by Vilhena Barbosa in 1865, when he describes the various previous uses of this space, dating the later elements to the Arab occupation period. According to this author, the temple was buried until a visit by King Fernando II, who ordered the lowering of the street level and the exhibition of the podium (Barbosa, 1865: 316). This information conflicts with the topography of the place since the podium is above the height of the surrounding buildings; and still lacks confirmation regarding the date on which this royal consort visited the city for the first time, considering that he only arrived in Portugal in 1836.

5. The "unquestionable" image

The topic of iconographic veracity in the representation of monuments is no longer relevant with the advent of photography. This new faithful means of reproducing reality came to be seen as a new essential tool in the development of the restoration practices of this period, leaving an unquestionable testimony of how the monuments were presented at a given moment.

In this context, several images of the temple exist. In this article, we show a photograph of the north façade that can be found in the Photographic Archive of the Municipality of Évora (figure 6), which has already been published by other authors but allows us to assess the correctness of the last-mentioned drawings.

In this photograph, the difference in the outer masonry finishing between the col-

umns is easily seen, especially in the place where the structures of the Palace of the Inquisition would be attached, proving its previous existence.
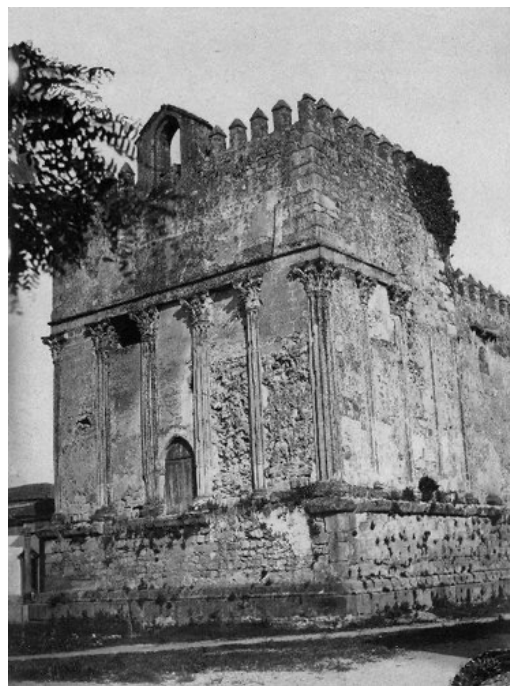
Figure 6 - North facade of Roman Temple of Évora before 1871. (Coleção Pereira & Prostres, Arquivo Fotográfico da Câmara Municipal de Évora)

The aforementioned esplanade explains the existence of the door that appears here without allowing access from the street to the temple, becoming an anachronistic element in the building. Another photograph from the same collection shows the south side, where we can find architectural elements that help us to better understand the changes that had been imposed to the temple over the centuries.

In a report on the Cenáculo Museum presented to the Municipality in 1868, Augusto Filipe Simões describes the state of the temple, used at the time as a reserve/exhibition space for the tombstone collection,

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referring to James Murphy's book (Simões, 1869). This document also highlights the existing cracks in the walls and the fact that part of the roof had already collapsed, and proposes a restoration intervention that would encourage the removal of all structures added after its use as a Roman temple, taking several prominent figures as a reference, among which the scenographer and architect Cinatti, who will direct the intervention, stands out. Thus began the process of restoration of the temple, resulting in the removal of all elements presumed, in 1871, to have been added after the Roman period. This process led to the existence of new ruin in the city, whose discussion goes beyond the limits of this article (Manuel, 1951, Silva 1994-95, Rodrigues 2000, Cátedra, 2011).

Conclusion

The graphic restoration of monuments was often perceived as their real image, eventually influencing the interventions carried out in the monuments from the 19th century onwards. It was wrongly identified as a reliable source for the reconstitution of missing elements, or the correction of obvious construction errors, following the precepts of Stylistic Restoration. Through the comparison between the image published by James Murphy and other iconographic and written descriptions of the Roman Temple of Évora, it is possible to realize that the Irish architect graphically restored the monument, making it correspond to the principles of Vitruvius, following a common practice of the time. In this way, he praised the Roman component of the building, giving it an extremely important historical value to prove the antiquity of the city of Évora, a perspective which would later be followed in the 19th-century restoration.

From the images presented, one sees that the north facade of the temple was interrupted by a wall of the old Palace of the Inquisition until 1844. On the west side, there was an esplanade, possibly made of brick, which gave access to a door located between the central columns. The 17th-century description also mentions the existence of twelve steps that would give access to this space, which are no longer represented in the 19th-century drawings and engravings.

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From tradition to modernity: teaching earth construction as a key to changing contemporary architectural thinking

Filipe González

CIAUD, Lisbon School of Architecture; Universidade de Lisboa, Portugal
gonzalez@fa.ulisboa.pt

Abstract This article aims to address the theme of teaching of earth construction in a university context. It is true that the study of sustainability applied to architecture and heritage is essential to the architect's skills, but it is also essential that ancestral techniques are suitably adapted to the current construction context, inserted in what are considered good construction practices today.

With this, it is intended to present a path in university education in Portugal with the approach to the prospective integration of construction techniques with their necessary adaptations so that they are applicable with pragmatism and constructive realism.

Building with earth assumes a very relevant position in world buildings; however, it is also particularly relevant when it comes to Mediterranean heritage and the migrations that Mediterranean people have made all over the globe.

Thus, from the migration of ancestral construction systems to the dissemination of new ways of building, schools of architecture assume a preponderant role in the change in the construction paradigm and, simultaneously, are responsible for architectural ethics that assumes environmental responsibility.

The contemporary construction sector is one of the largest contributors to global environmental degradation, responsible for nearly 40% of energy-related carbon emissions (UN Environment Programme, 2021). Accordingly, a critical re-evaluation of architectural education has become imperative to foster a new generation of ecologically responsible practitioners. This article argues for the integration of raw earth construction techniques into university curricula as a means of addressing this challenge. Moving beyond the oral transmission of ancestral knowledge, academic instruction can adapt these low-impact, cradle-to-cradle methods to contemporary standards, equipping students with both practical competencies and an ethical framework for sustainable practice. Drawing on the experience of an elective course established in 2017 at the Faculty of Architecture, University of Lisbon, this paper demonstrates how a pedagogical focus on raw earth construction cultivates critical understanding of materiality, energy efficiency, cultural heritage, and professional ethics. Ultimately, it underscores the transformative potential of integrating raw earth pedagogy as a replicable model for sustainable architectural education worldwide.

1. Introduction: The Ethical Imperative for a New Pedagogy

The global predominance of energy-intensive construction materials, particularly concrete and steel, has resulted in a built environment characterized by excessive embodied energy, large-scale waste generation, and inequitable resource extraction (Beiser, 2018; Seto et al., 2016). Embedding environmental ethics within architectural curricula is therefore no longer optional but imperative, requiring attention to intergenerational justice, distributive equity, and an ecocentric worldview (Leopold, 1949).

Within this ethical framework, raw earth construction emerges not as a nostalgic return to pre-industrial techniques, but as a forward-looking, resilient strategy. Its teaching constitutes an act of resistance against anthropocentric and globalized models of construction, advancing instead a localized, bio-positive practice (Minke, 2012).

Historically, knowledge of earth construction was transmitted through intergenerational apprenticeship, relying on imitation and empirical trial and error. With the professionalization of architecture, however, such vernacular knowledge was progressively marginalized. The current challenge is to reintroduce this wisdom into academia, transforming it through scientific inquiry, engineering rigor, and design innovation.

2. Pedagogical Rationale: From Empirical Knowledge to Informed Practice

The teaching of raw earth construction provides students with:
- Embodied Energy and Circularity: Earth, when locally sourced, is characterized by minimal embodied energy, full recyclability, and non-toxicity, thereby offering a tangible counterpoint to the linear "take-make-dispose" model (Krayenhoff, 2019).
- Systems Thinking: Earth construction demonstrates how a wall can simultaneously serve as structure, insulation, thermal mass, and finish, fostering systemic rather than symptomatic thinking (Easton, 2007).
- Site-Specificity and Humility: Working with earth compels students to analyze local soil properties and adapt designs accordingly. This engenders an ethic of collaboration with ecological conditions rather than imposition upon them.
- Critical Awareness: Younger generations, already sensitized to ecological issues from early education, are particularly receptive to approaches that align professional practice with ecological responsibility.

3. Case Study: The Elective Course Construction with Earth: Dialogues in Form and Materiality

3.1. Origins and Student Engagement

In 2017, the Faculty of Architecture at the University of Lisbon introduced a second-cycle elective course entitled Construction with Earth: Dialogues in Form and Materiality. Its aim is to transpose into the academic sphere what was once transmitted informally within families and communities, providing a speculative and experimental framework that empowers future architects to make informed choices regarding materials and techniques.

The course began in 2018 with 25 places. Demand consistently exceeded expectations, leading to expanded enrolments:
- 2018-19: 39 students;
- 2019-20: 41 students;
- 2020-21: 34 students.

3.2. Curriculum Structure

The course (42 contact hours, 3.5 ECTS) is organized into seven thematic modules:
1. The Human Ecology of Architectural Space
2. Tradition and Method
   - Vernacular architecture
   - Contribution of vernacular architecture to sustainability
   - Natural materials in architecture
3. The Earth as Building Material
   - Reversibility and irreversibility of physical phenomena
   - Soil analysis
   - Physical properties of soils
   - Stabilization of earth for construction
4. Raw Earth Construction Techniques
   - Earth by subtraction
   - Handcrafted earth
   - Earth stacked without mold
   - Earth stacked with mold
   - Geometrized earth in the form of blocks
   - Earth as finishing material

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5. The Architectural Form and the Proposed Materiality
   - Tension and compression architecture
   - Structural typification
   - Material typification
6. The Interaction between Form, Function, and Materiality
   - Conscious projectual intensity
7. Innovation in Specific Techniques
   - Development of technologies for earth as a construction material
   - Innovation in construction techniques
   - Adapting old technologies to new requirements
   - Architectural elements of earthquake resistance in raw earth construction

3.3. Teaching Methods and Evaluation

The course emphasizes practice-based inquiry informed by scientific understanding. Students are expected to:
- Represent architectural objects through drawing using appropriate codes of communication.
- Explore the relationship between form and materiality through stereomorphic conceptualization and structural efficiency.
- Engage critically with "form finding" and "form making" processes.
  Assessment is based on:
- Practical Project: Developed throughout the semester, encompassing methodological critique, technique development, and innovative ideas related to raw earth construction.
- Final Presentation: A five-minute video documenting the project, where students justify their design choices with scientific rationale.
- Continuous Evaluation: Participation in class discussions and workshops, attendance, punctuality, and demonstration of ethical and social responsibility.

4. Discussion: Cultivating the Responsible Architect

The course demonstrates the potential of raw earth pedagogy to align architectural education with ecological responsibility. Its success can be attributed to three key contributions:
1. Empowering Choice: Students gain the capacity to specify low-carbon materials, grounding their decisions in both evidence and ethics.
2. Fostering Innovation: The academic environment provides space for experimentation, extending the potential of earth as a contemporary construction material.
3. Reconnecting with Heritage: Particularly in Mediterranean contexts, the pedagogy re-engages students with vernacular traditions, ensuring continuity while enabling innovation.

5. Conclusion

Integrating raw earth construction into architectural curricula is more than a technical choice; it is an ethical imperative. By moving knowledge from the margins to the center of education, universities can prepare architects who are capable of responding to the climate emergency with responsibility, creativity, and humility. The University of Lisbon case study demonstrates how such an approach can be structured, evaluated, and received with enthusiasm, offering a replicable model for sustainable architectural pedagogy worldwide.

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Researching an ancient amphitheatre in archaeology and architecture

D. Lengyel, C. Toulouse

Chair for Architecture and Visualisation, BTU Brandenburg University of Technology Cottbus-Senftenberg, Cottbus, Germany & Lengyel Toulouse Architects, Berlin, Germany

Abstract   This paper aims to shed light on one of the most influential building typologies of the Mediterranean region, the Roman amphitheatre, on the basis of the monographic architecture of an architectural heritage of a very particular form from the point of view of archaeological and historical heritage in collaboration with the design of contemporary architectural design. This special building shows that uncertain archaeological knowledge alone is not sufficient to generate a hypothesis for an entire building that also meets architectural requirements. It is architectural design thinking that is able to tie up the many loose ends in order to establish a complete and consistent spatial hypothesis. Nevertheless, the hypothesis remains one variant among many, for a hypothetical design version must always make assumptions, even if these are scientifically based, generally supported by analogies or by means of common plausibility and probability, whose variants, possible through combination, go to infinity.

1. The revival of a monument

1.1. The amphitheater in the city

Dyrrachium was a Greek colony and became an important seaport in Roman times at the starting point of the Via Egnatia, the continuation of the legendary Via Appia, connecting Rome with Byzantium. The need for representation was correspondingly strong (Fig. 1).

And so Dyrrachium, today's Durrës in Albania, was given one of the relatively few amphitheatres on the eastern shore of the Adriatic Sea. In close chronological succession to Pula and Salona near today's Split, it

also corresponds in its dimensions to these two reference works, even if the finds are considerably more sparse and in a much poorer condition.

Nevertheless, the finds allow to deduce the dimensions of the amphitheatre as a representative of a well researched building type.

Its external appearance will have been similar to that of Pula, except that it did not have the characteristic external stair towers as in Pula. The finds allow these to be excluded here.

The research of recent decades has thus led to a comprehensive hypothesis regarding many aspects of the amphitheatre. A complete, spatial geometric consolidation and
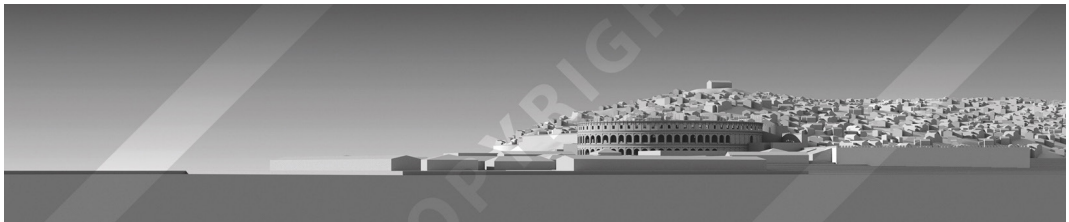
Figure 1 - Dyrrachium as it arose from the sea

thus spatial validation of the partial hypotheses is what this cooperation was intended to produce.

1.2. *The scientific mission*

The variant chosen here by archaeological and architectural-historical sciences as a composition of many partial hypotheses represents for the first time for this largely destroyed amphitheatre the current state of science, which is supposed to serve as a basis for further research. It is therefore not intended to represent the final conclusion of research, but rather the starting point for further research. The assumptions made here are intended to form the basis for scientific discourse.

From an archaeological point of view, there is therefore in no way any claim to a finalised research. The aim of this project is merely to coordinate the present scientific findings in such a way that they result in a completely consistent hypothesis in order to present it to the scientific community for further discussion.

2. The Specificity of Durrës

What is special about this amphitheatre is its topographical embedding in the terrain. Unlike in most other cases, where the topography was used by the Romans to build an at least single-symmetrical complex, which is achieved by aligning the amphitheatre with its axes on a slope or even on a valley basin, here the orientation is twisted in relation to the terrain (Fig. 2).

And even though it most likely ended up being an amphitheatre that redeems its twofold symmetry from the outside, so that the visitor does not notice the special orientation at first, the entire construction is asymmetrical. While the cavea and those axes of the outer façade that protrude beyond the site would have been regular, the development, i.e. the access to the individual sections for visitors, was most likely hetero-
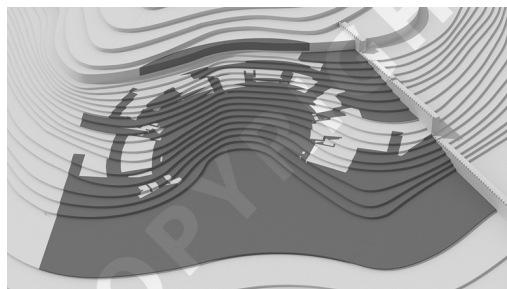
Figure 2 - Excavated terrain
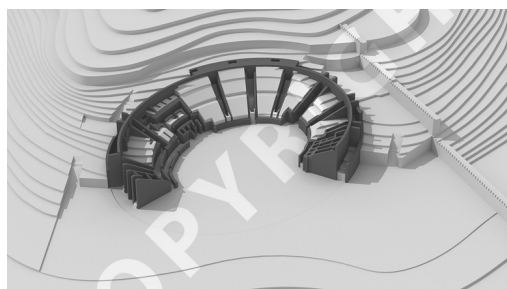
*Figure 3 - Substructures for terrain fillings*

geneous throughout. No two walkways were alike, only a few entrances resembled those of other amphitheatres, while the asymmetrical arrangement probably necessitated an extraordinarily large number of individual solutions (Fig. 3).

This is the clear result of the few finds already present. Fortunately, there are just enough finds from the ground level to determine the almost continuous variation in construction around the arena. The ground level was protected, among other things, by the fact that the amphitheatre was only rediscovered in the 20th century.

3. From Findings to Geometrical Hypotheses

Nevertheless, the findings were only sufficient to indicate precisely this exceptional circumstance, but not to disclose the reasons for
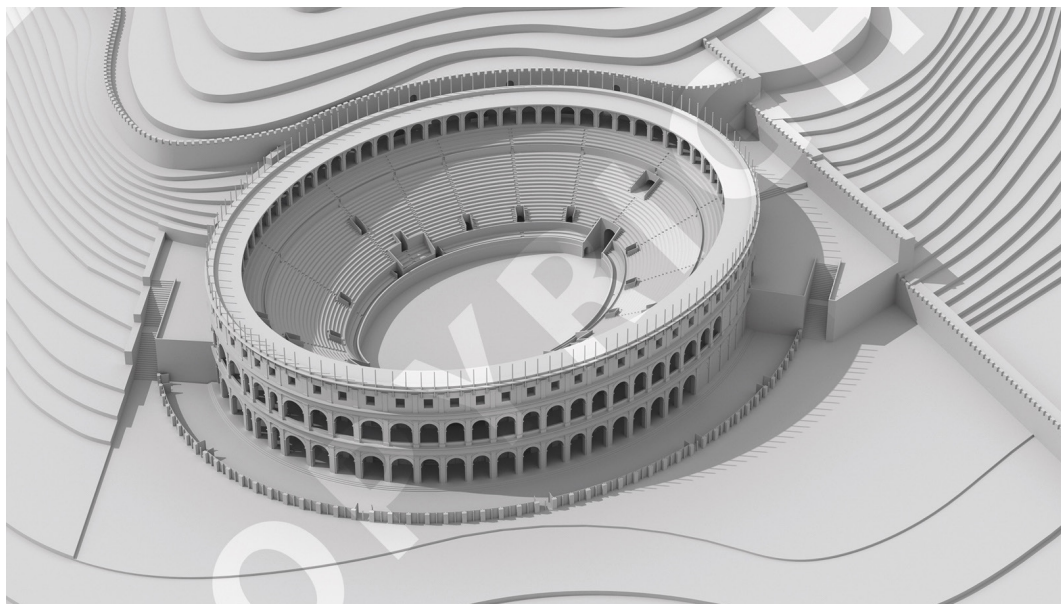
Figure 4 - Idealised representation of the amphitheatre

it. Nevertheless, the hypothetical architectural design variant offers a proposed solution that is able to unite all open questions and remarkable findings in a plausible overall model.

And that was precisely the ambition that required considerably more assumptions than just those necessary to interpret the findings. It is the integration of the individual assumptions into a comprehensive hypothesis that made it necessary to lead all the missing links, at least in a hypothetical way, to a possible solution being plausible.

The missing sections, by no means, were expressly ignored areas, but only those parts of the architecture that were situated so far away from the actual finds that their description was not required so far. The verbal statement that it is an amphitheatre with a documented size of arena and overall construction in a dimension similar to Pula is not only verbally conclusive, but also sufficient for a picture in the imagination of the recipient. But this turns out to be completely individual. As soon as the description of the embedding of the individual finds is brought to a completion, the person reading the ma-

terial is left to their own interpretation and imagination. The completion of the interpretation of the finds into a complete framework, by contrast, allows the reader to judge it as a whole and thus also to re-evaluate the single statements.

4. The Historical Rational

And even with this proposal, a proposed solution is only available for the amphitheatre itself; the reasons for this unusual solution still remain in the dark, although it can be assumed that it was a case of fitting into a pre-existing street grid, i.e. the turn from an optimal topographical position was made in favour of axial access from the surrounding streets.

The street grid itself has not been conclusively clarified, although there is much to suggest that it was aligned in the direction of the major axis of the oval of the amphitheatre. Above all, the tunnel for access to the arena from the north, well protected and thus well preserved, is an indication of access directly from a street course.

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Ultimately, some further excavations would have to be carried out to support the hypothesis. But even if it may never be possible to assert with certainty what the reason was for the rotation of the structure in relation to the topographical settings, the present work provides a demonstration of how it could have been intended and how it could have functioned.
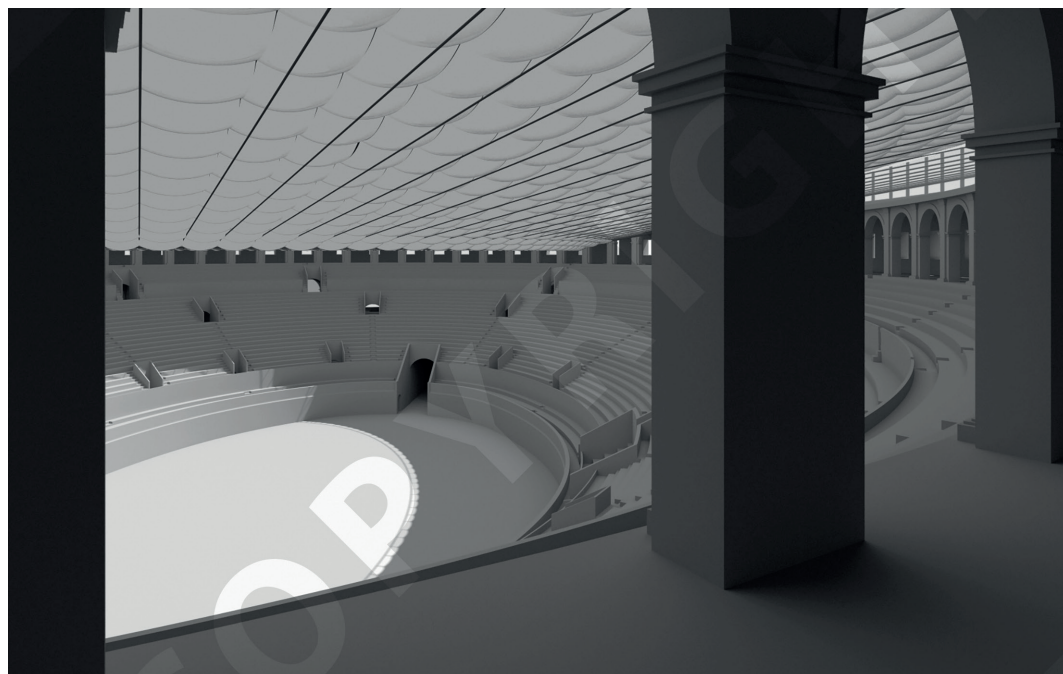
5. Visualisation of a Design Idea

Last but not least, it should be noted that the visualisation reflecting the hypothesis displays the open hypothetical character as such. The representation is thus in no way to be confused with the simulation of architecture, nor does it show how the amphitheatre might actually have looked. Rather, it shows the design idea (Fig. 4), complete in its structure but at the same time as abstract as necessary to avoid being mistaken for sure certainty as a photorealistic simulation.

In order to be used as an archaeological research tool, it is still nescessary to read and study the archaeological reasoning and justifications. It is not the intention of these visualisations of the archaeological hypothesis to allow the archaeological argumentation to be understood via the visualisation alone. On the contrary, the visualisation intends to illustrate the archaeological hypothesis itself, but with two claims.

The first is to show the hypothesis as extensively as possible, with all the assumptions that were necessary to reach the level of detail achieved being variously justified, from actual finds to obvious additions such as rhythmic repetitions to assumptions derived merely from analogies, as regards the entire upper floor.

Here, the hypothesis touches in a special way on the second claim, i.e. the claim of the architectural hypothesis, since its aim was to design, on the basis of archaeologically established references, a completion of the building that would appear as plausible as if it were as well preserved as, for example, the façade of the reference amphitheatre in Pula.

Figure 5 - Perspective from a historical visitor's point of view

6. Acknowledgements

7. Reference Projects

The authors have developed the visualisation method on the basis of earlier projects from different eras and with varying degrees of certainty, all of which were carried out in close cooperation with scientists from the disciplines of archaeology, historical building research, and also art history.

The project that covered the largest time frame was the construction phases of the Cologne Cathedral and its predecessor buildings, which, starting with a simple ornamental basin in an assumed Roman private garden, spanned two millennia via at least four predecessor buildings, of which only the last has been handed down in a contemporary historical illustration. The demand for consistent pictorial representation, especially in the intriguing phase of the juxtaposition of the last Romanesque predecessor building and the Gothic choir, laid the foundations for the balance between adherence to scientifical statement and the need for completion in favour of a consistent architectural vision that requires just enough concreteness to create a spatial image in the viewer's imagination, based as far as possible on scientific hypothesis alone (Lengyel et al. 2011, Lengyel & Toulouse 2013a, b).

Other projects include the imperial palaces on the Palatine in Rome and the Gardens of the Caliphate city of Medina Azahara for the German Archaeological Institute, the ancient royal city of Naga in today's Sudan for the Egyptian Museums in Berlin and Munich (Lengyel & Toulouse 2011), the first century of the Bern Minster for the Bern Minster Foundation (Lengyel & Toulouse 2019), and the Ideal Church of the Würzburg Prince-Bishop Julius Echter von Mespelbrunn for the Martin von Wagner Museum in the Würzburg Residence (Lengyel & Toulouse 2017).

It is constantly the architectural expertise to create spatial constellations in such a way that the scientific statement remains in the foreground. Geometric projection plays the central role here, i.e. the visual representation of the virtual three-dimensional model. Modelled plastically according to the traditional rules of the architectural model, the model is translated into images according to the equally traditional rules of architectural documentation as virtual photography (Fig. 5).

8. Conclusion

It remains completely open whether the amphitheatre actually looked as presented here, and there are in principle an infinite number of other possibilities. Essentially, due to the poor condition of the amphitheatre and the small number of finds, it will probably never be possible to confirm with

any degree of certainty what the amphitheatre may have looked like. As a result, any assumption will always retain the character of a hypothesis, and there will probably be as many proposed architectural solutions as there are archaeologists.

But nevertheless, the summary and completion of the current state of research, which is for the first time completed here, facilitates an overview of the current state of research and allows to see it in an overall context as well as to interpret it in a new way. Considering that the archaeological interpretation of even the fewest finds always relates to the familiarity with better preserved references, in the end it is the architecture, the architectural expression, that is, the expressive impact of the architectural design, that forms the starting point for any interpretation.

And it is only in a complete presentation that the certain insights can also be interpreted architecturally. Only when there is an appearance that, even if only hypothetically, brings together all the findings and insights in a single architectural design, can these be compared with other buildings of the same type and then interpreted architecturally. The risk of over-interpretation, especially the assumption that the building might actually have looked as it does in in the present visualisations, is countered by the abstraction created by not adding anything that is not part of the archaeological hypotheses.

The abstraction contrasts so clearly with the popular photorealism of many so-called reconstructions that even the casual observer is likely to suspect it to be a hypothesis.

The present work therefore in no way replaces the archaeological description of the amphitheatre and the derivation of the argumentation, but it supplements it with visuality, which offers the potential, from the point of view of archaeology, to retrace the consistency of the entire hypothesis and, from the point of view of architecture, to interpret the amphitheatre in the context of better preserved buildings, also from the point of view of design.

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The historical landscape in Liguria: architecture heritage in Ventimiglia

A. Panicco

Politecnico di Torino, Italy

Abstract   The peculiarity of the coastal landscape of the Ligurian Riviera of Ponente has been the settle of urban centers and the development of productive activities. During late Middle Age the foundation of new settlements promoted the development of the coasts and the rise of a local architectural heritage.

The coastal landscape has visibly transformed over time, in particular during the post-war economic boom. This meant a deep change and the consequent loss of some elements that characterized it. Since the last decades of the 20th century, there has been the intention to recover local assets, both from the architectural and landscape point of view, through specific actions of recovery, conservation and promotion of the vernacular heritage. These dynamics will be analyzed through the town and territory of Ventimiglia. Over this, the environmental components and the ecological degradation, due to the anthropic impact and the mismanaged tourist pressure, will be examined.

1. The Ligurian Riviera of Ponente

1.1. The coastal landscape of Liguria

The western part of Liguria is characterised by a close link between the sea to the south and the mountain ranges, that stretch along its entire length, to the north. It has always been the protagonist of the settlement of urban centres and the development of productive activities, thanks to the favourable climate (given by the mitigation of the sea and the presence of the mountains that allow to stop the perturbations coming from the north), the presence of important sea ports useful for the commercial exchange and the passes that allow the connection with the Po Valley.

In the territory there are valuable archaeological remains and testimonies dating back to prehistoric times. In this context, the case of the town of Ventimiglia is emblematic. Through the analysis of its landscape and architectural heritage (which has received to us through building elements, archaeology, documents, iconographic and cartographic sources), it is possible to reconstruct the evolution of the settlement, starting from its foundation in the Roman age up to the current and possible future transformations.

2. The urban development: from roman times to the post-war

2.1. The territorial context

The landscape around Ventimiglia is very varied, since it has undergone considerable changes: within a few kilometres there are typical Mediterranean features followed by Alpine ones. This relationship has determined the development of human activities over time, which still contribute to defining the current appearance of the territory.

The area lies between the Roja and Nervia valleys, which are perpendicular to the coast and give rise to a large flat area overlooking the sea. Both of them have a

fluvial origin and differ in their environmental characteristics. The former presents a geographical configuration with steep and deep valleys and is known above all for the considerable number of rock engravings scattered over an area of several kilometres, recognised as valuable evidence since the Middle Ages (BERNARDINI 1979). The Nervia valley has different morphological characteristics, with softer hill profiles uniformly covered by rich vegetation (PAGLIERI 1987: 155), in which there are important villages of Medieval origin with highly valuable historical and landscape characteristics, such as Apricale, Dolceacqua, Isolabona, Pigna, Perinaldo, Rocchetta Nervina and Castelvittorio. The valley floor is characterised by the presence of cultivated areas and the boundary of the mouth of the Nervia was marked since the Middle Ages by the church of San Rocco, located along the ancient Roman road, to indicate the estates of the town of Ventimiglia; it was later moved as far as Capo Sant'Ampelio, including marshy areas that were subject to land reclamation in the early 19th century, in order to acquire building land to meet the growing demand for construction.

The coast also has different characteristics. To the east of Ventimiglia, given the alluvial nature and the deposits accumulated at the mouth of the Roja and Nervia water basins, there is a large flat area along the low and linear coastline on which the lower town is developed, expanded since the construction of the railway network in the second half of the 19th century at the expense of the large cultivated areas. To the west, the coastline is high and indented. The limestone, marly calcariferous rock and the lack of erosion phenomena due to the absence of water basins are indications of fewer changes over time than in the east coast. The notoriety of the site is given by the presence of imposing cliffs facing the sea at Balzi Rossi, which constitute an important prehistoric deposit (BERNARDINI 1981: 56-67). Finally, near the Calandre area, the rocks have a composition of sandstone layers characterised by a high degree of landsliding. The instability of the soil affects the upper town of Ventimiglia, with its medieval layout; landslides sometimes cause problems of instability of the buildings, making it difficult to make them safe, so that, in the past, it was necessary to resort to the demolition of large buildings, but above all to set up reinforcement works on the hillside, which had an impact from an aesthetic and ecological-environmental point of view (CILIENTO, PAZZINI PAGLIERI 1991: 7).

2.2. Settlement nuclei (3rd century BC - 14th century)

Since prehistoric times the area around Ventimiglia has been chosen for the settlement of communities. Documentary and archaeological evidence of the presence of one of the most important economic centres in Liguria dates back to around 300 B.C. (LAMBOGLIA, PALLARÉS 1985: 3), where the existence of an *oppidum* is mentioned in the vicinity of the plain between the Roja and Nervia valleys, with the name of *Albitium Intemelium*. Archaeological excavations conducted in the first half of the 20th century brought to light three circular enclosure wall structures that probably encircled the urban centre (LAMBOGLIA 1950: 82-83; PALLARÉS 1987: 10). These findings have led to the supposition of an organised and fortified type of settlement, which reveals a political and economic position characterised by contrasts with neighbouring populations and which needed to be protected given its location on the transalpine road of the Roja valley, which allowed the control of trade and commerce with the Po Valley.

Albitium Intemelium was founded near the Nervia torrent and numerous testimonies of this first settlement nucleus have been preserved, the remains of which, occluded from view as early as the Middle Ages due to the substantial layers of debris and aeolian sands (LAMBOGLIA 1964: 31-55), are today only partially visible due to the

phenomena of intense concreting that occult this heritage. In fact, the first discoveries were made at the end of the 19th century when, in order to make the railway network run, urbanisation works were started on the flat area beyond the upper town, in the plain between the Roja and the Nervia. Excavations have identified a primitive *castrum* and the cobbled structures of the *cardi* and *decumani* that determined the extension of the settlement through an organised centuriation. Urban planning began in 89 B.C. with the recognition of Latin law and the election of the *Municipium cum suffragio*, favouring the contraction of the name of the town to *Albintimilium*, which expanded its boundaries in a southerly direction (DURANTE, DE APOLLONIA 1988: 3-34).

Since the last decades of the 19th century, infrastructures and the huge growth of residential and service buildings have limited the excavation of the subsoil, thus suffocating the archaeological areas that today appear fragmented, poorly visible and difficult to reach, running the risk of mismanagement. The Roman city (with an area of approximately 600 × 400 m) and its orthogonal urban layout, legible through the zenithal plans drafted during the constant and numerous studies related to the archaeological excavations, becomes scarcely perceptible to the eyes of those passing through the town (LAMBOGLIA, PALLARÉS 1985: 25).

Some striking examples of this are the republican baths, whose floor mosaic known as *Arione* is located below the ASL-polyclinic building (and can therefore only be seen in a small part). The remarkable Roman theatre, built between the end of the 2nd and the beginning of the 3rd century A.D. (LAMBOGLIA 1962: 3). The valuable Roman theatre, built between the end of the 2nd and the beginning of the 3rd century A.D. (LAMBOGLIA 1962: 3-23), of which the remains have received to us in elevation, appears to be located between the network of railway tracks and the flyover of the Strada Statale 1 - Via Aurelia (built on the ancient Roman military communication route that connected Piacenza with Gaul and Spain).
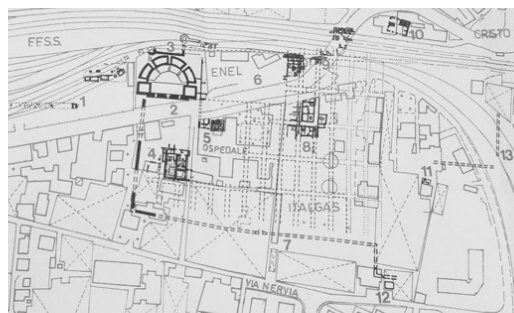

Figure 1 - Ventimiglia, archaeological area (from Lamboglia, Pallarés 1985). 1 - Necropolis; 2 - Roman theatre; 3 - Pro-venza gate; 4 - Republican walls and buildings; 5 - Baths with Arione mosaic; 6 - Probable forum area; 7 - Sea gate; 8 - Insulae I-III, VI and VII; 9 - Flyover excavations; 10 - Libanore and Rossi excavations; 11 - Garzo excavation; 12 - Mosaic of the seasons and villa Fazio; 13 - Probable remains of the republican walls

Figure 2 - Ventimiglia, remains of the Roman theatre (photograph by the author, 21.01.2022)

Hypotheses concerning the area on which the upper town is developed today, claim that private villas could have been located there, but it is impossible to confirm these assumptions by supporting them with archaeological excavations because of the presence of medieval buildings (LAMBOGLIA 1949: 114).

With the crisis caused by the fall of the Roman Empire and the invasions of Italian soil, the urban landscape of *Albintimilium* began to take on a new configuration. The

first settlement centre from the Roman period was replaced by a second centre on the top of the hill at the mouth of the Roja stream, which led to the abandonment of private residences. Given the historical unstable context in fact, the population sought to settle in a place that could guarantee a better defence thanks to its elevated and strategic position. The axis of the town therefore moved from the flat area between the Nervia and the Roja to a more elevated site, on which the *castrum of Vintimilium* was established (ALLAVENA 1947: 33-34). From the 9th century the urban centre was included in the *Marca Arduinica* and became a feudal possession of the Counts of Ventimiglia. The fortified settlement born around the cathedral (already existing and dating from pre-Roman times) and the castle (ROSSI 1886: 28-30), and then expanded to the foothills, as can be seen from the construction of the church of San Michele around 1041 at the behest of Count Guido. Situated outside the walls, it was granted to Benedictine monks from the nearby monastery of Lérins (LAMBOGLIA 1954: 73-91). The territory of the town began to exert a strong influence on the coastal area and the hinterland, in an area between Monaco and Taggia. Numerous small settlements were founded at different altitudes along the valleys adjacent to the town and still today constitute a rich architectural and landscape heritage. However, it is fascinating to observe how the cartographic *Tipo cartografico di Ventimiglia (IM) e territorio*, kept at the Archivio di Stato di Torino and dated to the 17th century, shows a schematic representation of the town focusing mainly on the built-up area, the access gates, the castle and the church belonging to the Augustinians located on the other bank of the Roja river, today close to the current railway station. Attention in this document, which includes both elements of the fortified and religious heritage, is drawn to the fact that neither the complex of San Michele nor the cathedral and baptistery are mentioned, buildings that were fundamental to the development of the settlement and its social and town functions.
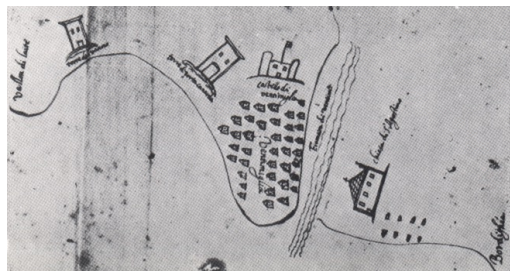
Figure 3 - Tipo cartografico di Ventimiglia (IM) e territorio, Archivio di Stato di Torino, XVII secolo circa

In the 11th century and through the establishment of the free communes, the power of the counts began to fragment. The town was finally conquered and subjected to the rule of the Genoese *podestà* from 1251 (until the end of the 18th century), it was once again enlarged and provided with defensive walls (ROSSI 1886: 50-102). From the time of the Genoese conquest the town suffered a violent decline as its municipal territory (which until then had extended from Menton to Coldirodi and inland to Breil-sur-Roya) was reduced. The urban layout acquired a definitive conformation between the 13th and 14th centuries, being reshaped starting from the pre-existing buildings and through the constitution of the Oliveto quarter, built on the olive groves owned by the Benedictines of San Michele and the only spaces still usable for building expansion within the perimeter walls (CILIENTO, PAZZINI PAGLIERI 1991: 36-40). The built fabric therefore appears to be very dense, with a prevalently residential function and with buildings of power (both secular, in the case of the *loggia del parlamento*, and religious, with the cathedral and baptistery) arranged along the lines of height differences and with longitudinal development.

Figure 4 - Ventimiglia, upper town (photo by the author, 21.01.2022)

2.3. Territorial expansion

The municipal territory of Ventimiglia therefore extended over hundreds of square kilometres. The different environmental context made it possible the extensive farming activities on large areas of land, concentrated mainly along the coast, as can still be seen from the iconographic sources. Thanks to the nearby catchment basins, water could be directed through canalisation works.

In Ventimiglia we observe the presence of cultivated fields in the whole area surrounding the nucleus of the Roman town.

Figure 5 - Matteo Vinzoni, Tipo Geometrico per l'amicabile adequamento de' limiti fra la Seborca e San Remo e fra la Seborca e Vallebona, detail, Archivio di Stato di Genova, Raccolta cartografica, 1759

It can be assumed that a further agricultural typology was provided by the vegetable gardens, useful for a more punctual and localised production in small areas on the eastern side of the settlement centre of the Medieval town.
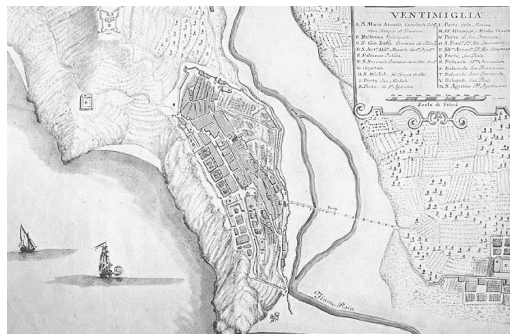
Figure 6 - Matteo Vinzoni, Pianta della città di Ventimiglia, Archivio di Stato di Genova, Fondo cartografico, 1773

Through the attestation of the formation of the *Campus* quarter mentioned for the first time in a deed dated 11 October 1334 kept at the Archivio di Stato di Genova, Notai Antichi, no. 278/II, c.34v (*Actum Ventimilii in quarterio Campi, in domo heredum*), we can see how the name of the area, located between the Borgo, Lago and Oliveto quarters (whose toponym we note), seems to refer to the close link with agricultural activity.

We can also note the presence of numerous plots with tall trees with a regular planting pattern and therefore assume the cultivation of fruit species. If we look inland, we can recognise cultivations developed along the mountain slopes, mostly following the lines of the slope, along which, through terracing, olive groves and vineyards were grown, taking advantage of the exposure to the sun.

The landscape was therefore characterised by these almost isolated settlements in the territory (the Roman and Medieval nuclei of Ventimiglia themselves are at a certain distance), located along the coast or along the communication routes that crossed the Alpine valleys in the direction of the

Po Valley and immersed in a mainly agricultural context. A territory therefore, since ancient times, highly anthropized and useful for productive activities, whose strongly geometric subdivisions of agricultural land and of equal areal size per plot seem to indicate a subdivision of productive land probably made on paper.

In relation to this, through the elaboration of cadastral data collected in the 16th century concerning the diffusion of land ownership, it becomes possible to understand the relationship that was established on the territory between built-up areas and agricultural parcels.

cazale or *dirupte*. Their presence might suggest a relative depopulation of the countryside surrounding the town, not so much in terms of abandonment of dwellings, but more as evidence of a previous period of demographic prosperity (AMALBERTI 1985). Thus there is a social phenomenon whereby the countryside undergoes a progressive abandonment of its inhabitants in favour of the town, the population within the countryside surpasses the point that, instead of there being a return to the countryside, there is an urge to found new settlements.

Table 1 - Agricultural parcel of Ventimiglia (1545) (Graphic revision by the author from Amalberti, Ascheri, Brizio, Palmero, Rossi, Villa 1996)

City	Owners	Property	Parcel
Airole	24	181	8
Bordighera	112	723	6
Camporosso	144	2223	15
Soldano	53	848	16
Vallebona	169	2012	12
Vallecrosia	70	945	13
Ventimiglia	661	3624	6

Table 2 - Urban settlement (1545) (Graphic revision by the author from Amalberti, Ascheri, Brizio, Palmero, Rossi, Villa 1996)

City	N. Buildings
Airole	22
Bordighera	85
Camporosso	117
Soldano	48
Vallebona	150
Vallecrosia	53
Ventimiglia	471

It is fascinating to observe the number of owners in Ventimiglia which is about six times higher than in the neighbouring towns, with the highest number of owned properties (however higher in percentage) and the lowest number of plots per inhabitant. Indicatively, therefore, ownership appears to be more diffuse and micro-parcelled (suggesting perhaps mixed farming) where owners have fewer parcels and vice versa, it is more concentrated for owners with more parcels.

Moreover, it becomes possible to identify the presence of buildings located in the upper town, but also close to the cultivated fields and identified by the terms

Following the entry for *case di residenza* in the land register of 1545 (Archivio di Stato di Imperia sezione di Ventimiglia, faldone 30, registro n. 76) it becomes possible to understand the extension of the settlement in the towns of the far western part of Liguria.

Here we observe the prestige of Ventimiglia underlined by the size of the built-up area, four times larger than the larger neighbouring towns. The town therefore asserts itself by its size given by its prestige in an undisputed manner over the entire surrounding territory (AMALBERTI, ASCHERI, BRIZIO, PALMERO, ROSSI, VILLA 1996: 149-167).

2.4. Railway infrastructure, tourism and the post-war period

The most impactful event that constituted a profound change in the Ligurian territory was the advent of the railway in the mid-19th century.

Through the descriptions of some writers, we are given glimpses and suggestions of the appearance and characteristics of the coastline, before the construction of the railway network changed its configuration. «Maritime Liguria, although in contact with the Apennines, differs from them in its landscape, climate, products and also in the way of life of its inhabitants. They are two regions that must be described separately» (VIVIANI 1807: 43).

Some French authors observe the variety of botanical species along the succession of landscapes crossed and the changing relationship between the sea and the mountains characteristic of Liguria. «As soon as the traveller has reached the top of the great chain, he is struck by a very different spectacle: he is surrounded by precipices and, whichever way he looks at it, deep gorges and fearful precipices present themselves to him with their threatening appearance; further on, the narrow gorge of the torrent, into whose depths the eye plunges with fear; further away, the sea; but on its shores, more serene panoramas are to be found: olive groves, vineyards, orange and lemon gardens cover the whole coast with a green mantle and offer, in a limited space, an enchanting view and a delightful stay» (GIARDELLI 2004: 340).

The building of the infrastructure was made to run as close as possible to the coast in order to exploit the flatter areas, given the uneven morphology of the territory and for economic reasons. In fact, in order to save funds for expropriations, it was preferred, where possible, to lay the railway track on state land near the coast. The pinewoods, previously planted to curb coastal erosion, were thus sacrificed in favour of the road system (PANZINI 2020: 17-18; AGNOLETTI 2018). The direct consequence was a distortion of the landscape qualities that had characterised the Ligurian coast until then. Photographs and postcards from the period illustrate how the construction of the tracks was sometimes almost next to the sea. This entailed the construction of retaining walls, ancillary buildings for the stations and tunnels which modified the natural layout of the territory and the urban settlements built near the water, causing the loss of the relationship of close continuity. In the space of a few decades, therefore, there was a profound change in the landscape.

The railway, initially created to make it easier to reach Liguria, led to the development of national and foreign tourism from the end of the 19th century onwards (GARNERO MORENA 2003: 46). In order to respond to the needs related to tourist flows, it became necessary to build large accommodation facilities and urban centres began to expand. The growth took place above all along the longitudinal extension of the railway line for economic reasons and ease of access, while the wealthiest families also sought accommodation in places situated more along the coast or inland, favouring the expansion of the cities towards the interior (SALIZZONI 2020: 89).

Figure 7 - Ventimiglia, vintage postcard (late 19th century)

From the 1930s the policy of the Fascist Party in favour of internal tourism and

the development of an educational system based on outdoor sports activities, identified Liguria as a planning area for the propaganda structures of the regime: the colonies (GORI 2004: 141-168; BERRINO 2011: 201-207). The Ligurian landscape, so wild and varied, gradually began to change, integrating itself into an increasingly anthropic context marked by the impact of the tourism industry.

This phenomenon of the expansion of urban centres continued throughout the first half of the 20th century. However it took on an exponential trend in the second season of tourist development in Liguria with the intense cementing phenomena that took place after the war, expanding in a linear manner along the railway network and therefore facing the sea. This caused the break-up of panoramas and the change of Mediterranean landscapes (ZANINI 2012: 41-64).

Cities expanded in an increasingly uncontrolled manner, especially along the railway line, the coast and in the flat areas. The infrastructural network was therefore expanded: old roads were expanded and new ones built, such as the highway from the early 1960s with its viaducts, bridges and tunnels (SAJEVA 1968: 183-191). The ever-increasing demand for housing in seaside resorts, especially in summer, also led to the development of bathing establishments. Thanks to the presence of these establishments, with increasingly limited positioning intervals between them, many piers were located in an attempt to increase the size of the beaches, or create new ones where they were lacking, in order to be able to gather more users and provide easier access to the sea. New port areas were enlarged and built to increase trade and to facilitate the movement of tourists.

All this led to a radical transformation of the Mediterranean landscape in favour of the ever-increasing anthropisation of the territory, with the consequent loss of natural environments or connections between ecologically connected areas.

3. Towards protection policies

3.1. Landscape enhancement actions

In 1985 an initial attempt was made to curb the phenomenon of unregulated growth of towns by issuing protection restrictions on landscape and environmental assets.

This led to the reverse phenomenon, characterised at first by a slowdown in building growth and then by the economic crisis at the beginning of the 21st century. The consequence of the decline in market demand at the expense of large construction and entrepreneurial activities. led to the abandonment of buildings and some infrastructure. Even today, observing the coast, it is possible to see the crumbling and degraded remains of buildings close to the sea or erected on the mid-coast, which represent a serious deterrent to the Ligurian landscape (MANIGLIO CALCAGNO 2002: 8-11).

However many actions have been taken to counteract the problems linked to the abandonment of the buildings and the rail infrastructure network by mitigating the impact of the structure at urban and landscape level. In fact a project was developed to move the railway inland, mainly by building the route and stations in tunnels. In this way it becomes possible to guarantee a revaluation of the buildings facing the sea, to recover the dilapidated architectural heritage and above all to try to improve the urban margins, the restoration of the relationship between the town and the water, the development of actions aimed at safeguarding the panoramas and views of the Ligurian landscape (TOSCO 2007: 125-128). Redevelopment measures have been planned on the old track bed, such as the design of new waterfronts which, as in the case of Ponente Ligure, extend for tens of kilometres. The aim is to try to reconnect and mend the relationship between sea-town-hinterland, favouring at the same time, where possible, ecological-environmental connections (CINÀ 2010: 41-52; BERTELLO, INTORCIA 2011).

Particular attention has also been paid to the production of quality local products such as vineyards and olive groves, with the restoration of the terracing system where abandoned. In particular in the area of Ventimiglia the Rossese di Dolceacqua, whose vine cultivation was already attested in the 19th century thanks to the work of Giorgio Gallesio (ANGELINI, BASADONNE 2004: 147), has started to be cultivated on large and numerous plots for export, especially with neighbouring France.

Particular attention is therefore being paid to the restoration of historic centres, to less impactful mobility, to the promotion of local products and to the enhancement and recognition of landscape assets.

3.2. Urban and vernacular architectural heritage

Ventimiglia thus possesses a great wealth of valuable heritage relating to its settlements throughout history. This heritage, as we have already mentioned, is not always the object of a correct enhancement, but on the contrary it is often not very usable and the protagonist of a bad management. The tourist boost the town has received since the last decades of the 20th century and the important help given through archaeological excavations, restoration work and the desire to place greater

Figure 8 - Dolceacqua (photograph by the author, 27.03.2016)

emphasis on the architectural heritage of the town, has led to greater attention being paid to the latter, which are however suffocated by building density.

The vernacular heritage of the small villages along the valleys, particularly in the Nervia valley with Apricale, Dolceacqua, Isolabona, Pigna, Perinaldo, Rocchetta Nervina and Castelvittorio, has been more successful. These small settlements of Medieval origin (around 11th-13th centuries) are now popular tourist destinations, not only in Italy, but also abroad. They are also enhanced by their inclusion in an environmental context that has in turn undergone measures to promote them, as in the case of Dolceacqua and the local production of Rossese. Thanks also to the tourism drive, restoration and promotion work has been applied in the villages through social and cultural events, such as the temporary setting up of important exhibitions in prestigious architectural buildings (in the castle of the Doria family in Dolceacqua there is an exhibition on Monet, who depicted the town in his paintings), wine and food events and cycle-pedestrian routes organised in the surrounding area. The landscape context adjacent to the villages, some of which are part of the Regional Natural Park of the Ligurian Alps, has allowed the development of actions to protect and safeguard the villages themselves.

In fact, as in the case of Rocchetta Nervina and Dolceacqua for example, they are known not only through their architectural heritage, but also through their landscape value, given the nearby Monte Abellio, which has been declared a Site of Community Importance since 2005 and is therefore subject to protection by the European Commission Habitats Directive (92/43/EEC).

Moreover the site of Rocchetta Nervina is mainly known thanks to the small water basins that form from the course of the Barbaira stream, which constitute a valuable naturalistic landscape and a bathing place during the summer (MERIANA 1991).

Figure 9 - Laghetti di Rocchetta Nervina ((photograph by the author, 13.08.2021)

Finally, as of summer 2021, the newly built port of Ventimiglia has been acquired by the Principality of Monaco, which will set up a direct sea communication system between Monte Carlo and the border town. At present, there are already luxury boats in the port area under completion. The connection is likely to make the town better known across the border, thus promoting international tourism and the economy, enabling the redevelopment of buildings and the enhancement of the cultural heritage of the town.

Figure 10 - Ventimiglia, harbour construction site (photo by the author, 21.01.2022)

4. Conclusions

There is a growing awareness of how landscape plays a fundamental role in life of everyone and involves environmental, cultural, scientific and economic interests. In addition the greater attention of the population to the quality of life is stimulating new policies aimed at transforming the territory and protecting it, focusing on issues concerning the redevelopment of degraded and abandoned areas, the enhancement of ecological-environmental connotations (geological, floristic and water), the recovery of the cultural identity of places, the restoration of ecosystems and the correct insertion of new works and infrastructures in the territorial context. In the light of the analysis of these components, it becomes significant to think of safeguarding actions as planning the future evolution of a site, reflecting on its development.

The intention is therefore to try to promote a functional balance between anthropic activities and the naturalistic context, a balance that will also have repercussions on the economic and real estate market, which in turn will lead to the enhancement of the Ligurian Riviera.

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Water caption systems in Mediterranean terraced landscapes facing climate change

A. Ghersi

Architecture and Design Department-dAD, Polytechnic School; University of Genoa, Genoa, Italy

Abstract   There is a fundamental relation between Mediterranean landscape and the human capability to manage water. Most of the Mediterranean cultivations (olive-trees, vineyards) are dry crops, but an increa- singly longer and more frequent arid hot period can create critical conditions. Traditional Mediterranean landscapes still keep signs of strategic system of water capture, conservation and drainage. Terraced systems assure water to rural villages and to cultivations, for irrigation. The maintenance of people is the only possible strategy to protect these places. Resident communities have changed their everyday-life style, changing their way to exploit landscape resources. Sometimes they have abandoned the terraced areas, and the economic activities to sustain their families. Today most of their incomes derive from tourism. Nevermore the experience in the landscape can be the main theme to offer, to more and more attentive visitors, who like to become affectively involved in the particular character of these places.

1. Double need about water

In rural terraced landscapes, water is a necessary element for the life of the cultivations. In the past, humans have always looked for different ways to collect, accumulate and move water (Ambroise, Frapa & Giorgis, 1993). The intriguing metaphoric lithography by Escher (fig. 1) about the illusion of a continuous waterfall/mill is placed in an Italian terraced landscape, to underline the necessity of water in that kind of rural environment. But water can become a destructive element when, in intense raining events, it provokes erosion and degradation of drystone walls. Water systems have a double aspect: to offer water, captu-ring the existing resources, and to drain efficiently, to prevent erosion and other dangerous effects on the stability of the versant. The presence of dry stone walls determines a particular microclimate that allows to overcome the harshest periods of drought: the stone collects the humidity of the air and gradually releases it to the ground (Barbera, 2017). Furthermore, along the dry stone
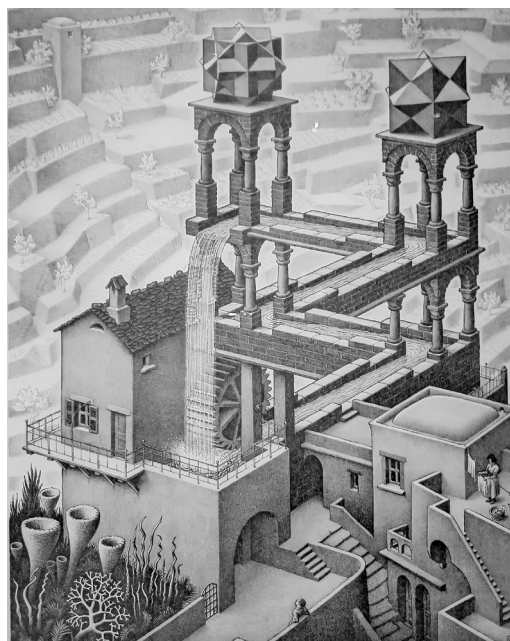

Figure 1 - M.C. Escher, Wasserfall, lithography (1961)

walls, rainwater slows down and flows away in the cracks between the stones, and is then collected in the channels. It is for this rea-

son that these artifacts play a vital role in defending the soil and preventing landslides: their maintenance need defines a key-role of farmers as landscape guardians (Ghersi & Ghiglione, 2012).

The complex and fragile terraced rural systems of the Mediterranean landscape are subjected to increasing neglect and to the effects of climate change (Pievano & Varotto, 2021).

In many Italian regions (Galli, et al., 2008, Vene-ziani Scaraccia, et al., 2012), these diverse landscapes, with a high agricultural vocation, are subjected on one hand to the pressure of urban growth, on the other hand they are stressed by prolonged droughts and increasingly accentuated conditions of aridity. These are contrasted by intense rain events, which cause erosion and degradation phenomena, especially where the action of continuous maintenance by man ceases. The most typical characters of these landscapes are then at risk due to the need of continuous maintenance (Murtas, 2015). Agriculture remains the element capable of balancing sustainable productive use and landscape conservation in rural areas, characterized by specific local adaptation of the same system, otherwise subject to a progressive degradation (Brancucci, et al., 2017), which determines the loss of economic, historical and cultural values and constitutes a risk of instability of the slope (Alberti, et al., 2018).

2. Vocation for sustainable agriculture

The terracing systems have a particular vocation for sustainable cultivation, given the difficulties of accessibility and spaces for mechanical processing. In these landscapes of "heroic agriculture", every job must be done with the minimum expenditure of energy, optimizing the use of existing resources and the recovery of materials. In fact, in many terraced areas, recycling, sustainability and organic cultivation are practically dictated by morphological conditions. To reverse the trend of abandonment and to recover these historical landscapes, it is important to highlight the opportunities for new rural communities, able to organize adaptive strategies also through innovative technologies, starting from the existing values.

In Mediterranean rural terraced areas, visitors and/or migrants can become new temporary or permanent engaged guests of the remnant communities, becoming an important part in the conservation of historical landscapes. In this process of transformation of the communities, exploiting the local resources and practicing multi-functional agriculture, water is a crucial element and the continuity with the traditional methods, to find, preserve, spare, absorb or remove it, is necessary, in a sustainable future.

3. Ligurian examples

In many Ligurian study-cases we can observe interesting examples, from draining wells to underground cisterns: some of them can be readapted to solve contemporary problems tied to climate change, offering positive living environments to inhabitants and possible tourists.

We can find still working systems in the rural areas, like in the citrus cultivation in Vallebona (IM), in the Western Riviera. The caption from a source and a system of channels, both on the surface and underground, are connected with a traditional pool, immediately below the main buildings, and with a deep draining well, conducing irrigation to the terraced bands.

In Diano Castello (IM), a village built on the ridge of a promontory, a system of hypogean ci-sterns, called "lone", are under the houses, assuring water to the residents.

In the Promontory of the Mesco in Levanto (SP), near the Cinqueterre, an intervention by the FAI (Italian Environment Found) gave new life to an abandoned farm, with particular sensibility to the procurement of drinkable water, in a particular situation of being inside a National Park, with no driveway accessibility.

4. Learning from tradition

In the western Riviera, thanks to the mild climate, citrus groves have been cultivated since ancient times (Gallesio, 1811; Lo Basso & Carassale, 2008). In the Imperia area, in the valleys behind Bordighera, which, starting from the sea, rise towards the mountains, the slopes of the hills are terraced in dry stone. Until few decades ago, these terraces were planted with orange groves – in particular bitter orange trees – and aromatic herbs (lavender, thyme, rosemary, but also roses…). France and the village of Grasse are not far from Vallebona and here, as in other villages near the border, the tradition of distilling perfumed waters (used in confectionery)

Figure 2 - Vallebona (IM), Castellan locality, cultivation of orange groves

and essential oils for cosmetics was established.

Figure 3 - Vallebona (IM), fish pond/cistern, with the panorama of the valley and the sea

The bitter orange found a particularly favorable climate in Vallebona, as well as in other areas of Provence and Italy, thanks to the excellent exposure: the valley is sunny and well sheltered from the cold.

The economy of the valley was based precisely on the cultivation and harvesting of orange blossoms to be distilled. Until the second postwar period, in Vallebona many plants of bitter orange were cultivated, which in spring fed the numerous distilleries in the area. During the harvesting period, which lasted about twenty days in May, the collectors also arrived from the nearby valleys and from the coast and began early in the morning by collecting the freshly opened, more humid flowers, which they placed on cloth sheets to dry them delicately and carried then to distill before it got too hot. A patient work that was carried out mostly by women and girls who did not have to follow the work in the fields and who, having small hands, were able to do this delicate work in the best possible way.

All this up to the 1950s: then the harvest of flowers was no longer profitable and the tradition was gradually lost, as well as the art of distillation which was increasingly challenged by the chemical industry, capable of obtaining artificial aromas and essences at very low prices.

Figure 4 - Vallebona (IM), channel and water collection tank.

Figure 5 - Vallebona (IM), outlet of the main channel, at the base of the dry stone wall, from the cistern, running below the vineyard

The distilleries closed and the oranges, no longer cared for, were gradually decimated by frosts.

Only a few years ago a young farmer revived this particular crop, with the aim of involving other local growers and thus renewing the tradition of growing bitter orange trees. Together with the cultivation activity, it was necessary to restore and reorganize the water collection system with modern technologies.

With commitment, the walls were rebuilt and the traditional irrigation systems restored, to plant the citruses, cultivated with biological criteria, which today have reached about 500 plants.

The distillery's current production of oil is very few liters, in great demand by perfumeries around the world. Orange blossom water is produced in greater quantities and is destined to the confectionery and catering sector, also recording an important demand from the international market. In 2012, orange blossom water became a Slow food presidium. The work and enthusiasm of the young producer/entrepreneur, keeping his family's tradition alive, is today a driving force for the economy of the whole village.

From the nucleus of houses, which also includes the distillery, there are canalizations which, collecting rainwater and from the river upstream, feed some tanks and a large fish

pond/cistern, surrounded by a pergola on two sides, from which there is a very remarkable panoramic view of the valley till the sea.

From this large water reserve, a water distribution network leads to the terraces below, which have channels at the foot of the walls.

A deep draining bore integrates the water collection system.

5. An hypogean system to collect rain water

The early medieval village of Diano castello ("Castrum Diani") is located on a promontory, between the Varcavello and San Pietro rivers, overlooking the Gulf of Diano. Due to the distance from the waterways and the lack of natural springs, the inhabitants have created a system for conveying rainwater, digging in the clayey soil, below the houses, a series of underground caves/cisterns, called "*lone*", up to 10 meters deep, and connected

Figure 6 - The village of Diano castello (IM), surrounded by terraced cultivations

Figure 7 - Diano castello (IM), one "lona", digged underground

by a network of tunnels. This system guaranteed the community the necessary drinking water and irrigation of crops during periods of drought, danger, siege, during the raids of the Saracens and Lombards.

The sedimentary rock of the hill on which the town stands is soft but waterproof. Rainwater is conveyed into these large underground chambers directly from the roofs and is kept clean and fresh. To increase hygiene, the walls of some "*lone*" are covered with harder stone cladding. Over the centuries, almost all the "lone" are expanded and modified, becoming more and more functional. In the historic center, each house has its own private "*lona*", even dug se-veral meters deep and then developed horizontally. Going down to the cellar, it was enough to lower a bucket and draw water.

The "*lone*" are still present and can be partially visi-ted: it is an ingenious example of water collection, a significant testimony of the link between man and water, with historical, social and highly sustainable value. This surprising labyrinth of artificial caves represents an important resource. Its restoration and re-use can become strategic, especially when, during some summers, in the crowded tourist area of the Diano area, the scarcity of water becomes a concrete emergency.

6. Observing butterflies to search for water

On the promontory of Punta Mesco, inside the Protected Area of the Cinque Terre National Park, a clifftop farm has been recovered by the FAI (Italian Environment Fund). The 2009 donation has allowed the FAI, with the support of the Zegna Foundation, to implement a project that respects the principles of the park, while reinstating the area's historical function as farmland, with 60% of the energy coming from renewable sources. The first phase of the salvage operation involved the overhaul of the buil-dings and terraces, with cultivation of

olives, grapes, fruits and vegetables, facing the open sea. After many years of abandonment, Mediterranean shrubs invaded the cultivated lands, covering the cultivated terraces: the re-opening of the rural spaces meant an enrichment of biodiversity, with the building of the rural habitat, with bees in 18 beehives, and many different plants, attracting different animals.

Today the visitors, coming from Levanto or Monterosso, following a pedestrian path, will discover the innovative environmental and economic sustainabi-lity project built around Case Lovara, a "pilot" site that will serve as a model for the proper management of human work in areas that are subject to historical and landscape constraints. Case Lovara Farm re-presents a laboratory for experimenting techniques and technologies capable of making the territory resilient to climate change through sustainable technologies, aimed at the use of renewable energy sources in favor of energy saving and for the purification of collected rainwater and for the subsequent treatment of waste water, in a delicate landscape context.

The absence of connection to the public water network and the scarcity of water resources have led to the study of an efficient water collection, purification and recirculation system, which allows maximum water savings and the least possible waste of the precious resource. After a careful study of the existing resources, identifying all possible sources of water also by observing the places visited by butterflies, a new water supply system was created.

The water comes from two primary sources: part of the surface water of the Rio Gatta and rainwater collected from the roofs, to which a system for collecting drainage water from the ground for irrigation purposes is added.

One existing draining water well, characterized by some stairs built along the internal curved surface, is located in one of the lower terraces, to drain from the upper cultivated soil, held by dry stone walls. The well has been connected to the new water collection channels. Work has been carried out for the arrangement of the banks of the streams and for new bridles that form the collection basins, from which the water is conveyed to the sedimentation tubs.

Particular attention was paid to respecting the exi-sting "aquatic" environment. During the river bed recovery intervention, the new bridles were built to add potential reproductive habitats for the amphibious species present in the park, including the alpine newt. From here the water is conveyed by gravity through the network of pipes that innervates the entire agricultural area and is collected in underground tanks in the terraced bands for a total capacity of 80,000 liters. From the tanks, the water is conveyed in two different directions: on the one hand it feeds the irrigation network, on the other hand it is pumped into the sophisticated purification system for drinking water.

Figure 8 - The the promontory of Mesco (SP), between Levanto and Monterosso, in the Cinque Terre National Park

Since the characteristics of these surface waters vary considerably according to the seasons, various purification systems have been installed to guarantee the quality of the water even in the most unfavorable conditions. The used water is not dispersed but is recovered again: gray water is reused for

Figure 9 - The recovered cultivated terraces around Case Lovara, on the promontory of Mesco (SP)

toilet drains while black water is sent to the wastewater treatment system. The MBR microfiltration system – Membrane Biological Reactor – with modular ceramic panels allows to obtain residual water that can be used for irrigation purposes. The use of water and electricity resources are subject to time limitations, with the introduction of timers for users, limited use of household appliances and attention to raw materials.

7. Conclusion

The recovery of traditional water collection systems in Ligurian landscapes becomes an opportunity to restore the functionality of abandoned rural areas, thanks to the initiative of intelligent operators who bring back to life products of great excellence and rare productions. The multi-functionality of new agriculture must be integrated with a new rural tourism, proposing experiences and narration of the peculiarities of the diverse productive terraced landscapes.

As in the Vallebona example, the contribution of farmers/artisans to the conservation of the envi- ronment, the preservation of traditions and the development of a new experiential tourism becomes increasingly evident: people aware of the importance of the relationship with the environment and the territory, custodians of millenary traditions, but open to innovation and with many stories to tell.

The "lone" system in Diano Castello represents an example of how in the past

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Figure 10 - Vallebona (IM): the little channel at the base of a drystone wall, occupied by the new pipes to water the citrus groves

Figure 11 - Diano castello (IM): from the historic village towards the surrounding terraced landscape, following a long pergola in a vineyard

Figure 12 - Arrangement of the banks of the stream near Case Lovara, on the promontory of Mesco (SP)

it was possible to exploit the collection of rainwater: a system used by an entire community that could be enhanced and reused, suggesting similar strategies for other places.

Among the possible applications, the numerous cisterns for the irrigation in western Liguria are interesting: now fed by the aqueduct, they could instead recover, at least in part, the rainwater.

The example of the project carried out by FAI at Mesco represents a reference model, where the recovery and recycling of water, in a context of

extraordinary beauty, but of great sensitivity: the limitations imposed by the characteristics of the site become an opportunity for environmental education of visitors.

These landscapes have a richness of resources that can represent a new opportunity to protect the territory, to develop social, cultural and economic growth: they can become generative matrix for new environmental challenges (Scavone, 2021), starting from their analysis and conservation, towards an integration with innovative technologies.

After the pandemic, the rediscovery of the quality of some agricultural landscapes will lead to the search for a better quality of food, of excellent productions and of experiential tourism for the people who wish to understand local values.

Meeting local protagonists (experts, historians, farmers, touristic operators, …) can be a plus-value to enrich the proposal with the story-telling about the local peculiarities.

A new community based on the re-activation of abandoned rural landscapes with a contemporary interpretation of multi-functional farming can welcome young people and visitors, following biologic and sustainable approaches, such as respect of the traditional systems, recycling and sparing resources (Vigotti, 2021).

Water is an attractive element, from which we can learn and convey to the guests the deep soul of Mediterranean landscapes.

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Mediterranean heritage in the 19th century house of Madeira and the Canary Islands

Rui Campos Matos

CIAUD, Lisbon School of Architecture; Universidade de Lisboa, Portugal

Abstract   In the 19th century, most of Madeira Island upper class houses were compact outward-facing two-story buildings. They were open to the street or to the back garden when located in an urban environment, or to the surrounding garden when located in the outskirts of the city, as isolated free-standing buildings. In the Canary Islands, most of the houses were structured around a central courtyard, although they had openings – or even balconies – facing the street or the landscape when isolated in rural settings. Based on comparative research on the 19th century architectural history of Madeira and the Canary Islands, this paper will address these two types of houses, both with a Mediterranean matrix, focusing on the way they were viewed and inhabited by the first "health tourists" and the different fate that befell them.

1. Introduction

Transcending regional, historical, and cultural boundaries, the courtyard house is one of the most enduring architectural typologies. Its origins date from more than 9000 years ago, and span a large part of the globe, from China to the Mediterranean Basin, where it gave shape to the Greek, Roman and Islamic urban house (Rapoport 2007, Schoenauer 2000). In the Iberian Peninsula, its progressive replacement by the compact house – the outward-facing house which, in an urban context, tends to occupy narrower lots with an open facade over the street – began with the retreat of the Islamic occupation and the progressive Christianization of the territory. On the western façade of the Peninsula, – the space that is today the borders of Portugal – this retreat left no significant traces. From the Islamic urban morphology, whose constitutive cell was the courtyard house, nothing remained, at least on the surface (Trindade 2009).

The same did not happen in Spain, where the Islamic matrix was prominent in cities such as Córdoba, Seville or Jérez de la Frontera, and the courtyard house is, until today, an important element of urban morphology.

This was due, among other factors, to the significant size and importance of these cities when compared to those of the Gharb al-Andalus – Lisbon, Coimbra or Santarém – and to the slow process of Christian repopulation that lasted until the end of the 15th century with the conquest of Granada (Trindade 2009). These disparities gave birth to two different urban cultures which already characterized the kingdoms of Portugal and Castile at the beginning of the maritime expansion. The fact would have significant repercussions on the morphology and typology of insular houses and towns of Madeira and the Canary Islands – the first territories occupied by the two Iberian communities of Portuguese and Spanish settlers-farmers. From the second quarter of the 15th century, they transferred to the islands the millenary Mediterranean knowledge on how to build, adapting it to a new environment.

2. Madeira house versus the Canary House

In terms of their fundamental architectural structure, Portuguese rural houses are divided into two types: two-story houses and one-story houses (Oliveira & Galhano

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2003). The former would denote pre-Roman origins – the isolation of the mountains – and the latter the influence of Roman and Arab cultures. Although schematic and simplistic, this classification can help understand what, in essence, distinguishes the Madeira house from the Canary Islands house. In fact, what can be found in Madeira is the first type, the compact house, the one in which all the functions – housing, livestock, storage rooms – are located under the same roof (Fig. 1), as opposed to the courtyard house type, which prevailed in the Canary Islands, where each of these uses is organized around a courtyard – its main structuring axis (Quintana 2008).
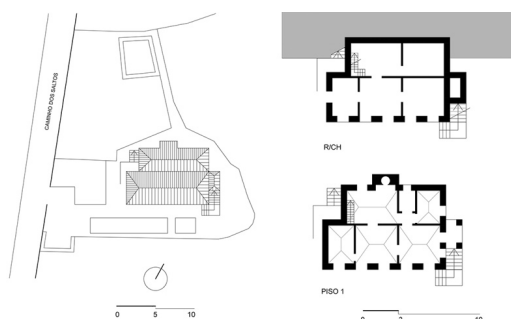
Fig. 1 - Typical 18th century two-story compact Madeira house (survey and photograph by the author)

The two-story Canary Island houses – the houses of wealthy people – have, as a common feature, the distribution around a courtyard surrounded by wooden galleries,

from which a staircase connects to the upper floor (Fig. 2-3). The courtyard is surrounded by the compartments of the ground and upper floors and works as the catalyst for all the activities of the dwelling. The original organization of this type of house can be found all over Castile, in mainland Spain. Usually, the ground floor is for working areas and the upper floor for the owner's residence. The model has little to do with the Mudejar house, in which the "zaguan", connecting the courtyard to the street, is never at the axis, and there are only two galleries and
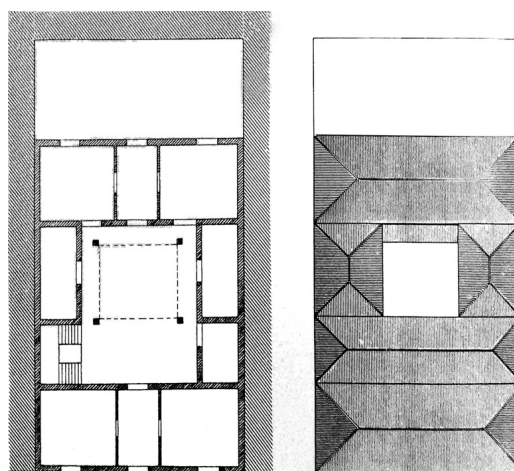
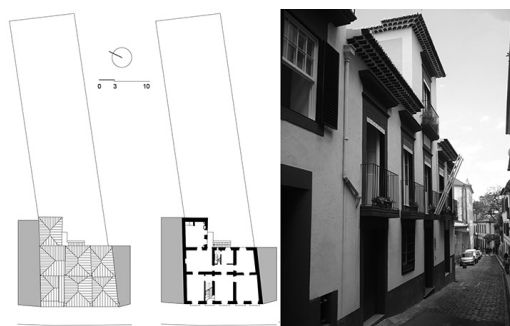*Fig. 2 - Typical Canary Islands courtyard house (in Gasparini, 1995)*

Fig. 3 - Canary Island courtyard (in Hernández 1995)

a staircase of little importance – features that are absent in the Canary Island house. The origin of the Castilian courtyard lies in the Roman peristyle – squared and surrounded by columns – inspired by its Greek predecessor (Rodríguez 1978).

Interestingly, the Canary Islands urban courtyard house seems to have resulted from an evolutionary process in which the plot, where initially there was only a compact volume with a rectangular plan and a street facade, was progressively occupied around an empty open space (Gasparini 1995, Alemán 2008). Gasparini (1995) refers to an interesting study carried out on the typological formation process of the urban house in Garachico which, in the author's opinion, repeats itself on the other Canary Islands cities – an evolutionary dimension of the courtyard house that is also mentioned by Alemán (2008) regarding the city of Las Palmas.

From a typological point of view, that is, in everything that refers to the spatial and functional organization of the house, the courtyard house is therefore distinct from the Madeira compact house. This applies both to the houses located in rural and urban areas.

One of the characteristics of Funchal – the capital of the Portuguese archipelago – which is common to many Portuguese cities, is the existence of deep urban lots with backyards (Fig. 4) where there is room for cultivation and even livestock, generating vast unbuilt spaces within the blocks.

Fig. 4 - Typical 18th century Madeira urban house (survey and photograph by the author)

This peculiarity, which fascinated most of the 19th century travelers, is absent in the Canary Islands cities where the courtyard house prevails, densely occupying the blocks, which tend to have a more quadrangular layout.

It was this asymmetry between the architecture of the two archipelagos that Torriani accounted for in 1590 when he referred to an exception that proved the rule: the houses on the Spanish island of La Palma which he described as being "white, built in the Portuguese style, narrow on the inside, and generally without wells or courtyards" (Torriani 1999).

3. The health tourist's choice

In the Atlantic island's context, until the last quarter of the 19th century, the rental of urban or rural houses to people seeking a cure by "taking the airs" – especially the British – was a specificity of Madeira. In the Canary Islands this demand appeared later and had a more limited expression. Several factors – cultural, social, and economic – contributed to it. Among them, the persistent aversion to the courtyard house type, openly manifested by foreign travelers and health tourists, cannot be excluded.

Authors such as Hernández (2009) give us a vivid testimony of the bad acceptance that the traditional courtyard house in the Canary Islands had among the British, whether as a temporary or permanent residence. Indeed, the picturesque architecture of the place, despite being much appreciated, became the target of severe criticism when the internal organization of the house did not meet the demands of comfort and hygiene that the codes of Victorian mentality required. The bathroom was missing, the main staircase and the service stairs – which segregated the circuits of employers and employees – were missing too and there was no outside garden enveloping and giving intimacy to the house. Hernández (2009) cites a Foreign Office document that explicitly warned the British community residing in the islands

not to hire local architects, "since they know nothing about plumbing and ventilation and are used to the courtyard method in which it is impossible for them to have a ladder".

No similar warning was necessary for the British community residing in Madeira, not only because there were no local architects throughout the 19th century, but also because, in the domestic architecture of the Portuguese archipelago, the tradition of the courtyard house did not exist. What predominated, as mentioned before, was the compact house: a free-standing house in the urban garden plot, with two or more floors, covered by a hipped roof, with a square or rectangular plan and two interior stairs – the main one, usually centralized, and the secondary for service purposes. This type,

the most common in Madeira rental houses, was the result of a slow process of miscegenation, in which the compact insular house slowly adapted to the demands of the British. Inside the austere and frugal enclosure, its functional structure and its finishes complied with the sophisticated standards of comfort of the Victorian clientele (Fig. 5).

In the Canary Islands, traditional houses rarely entered the rental market. This was due to two factors: the reluctance of their owners to rent them to "invalids" – those who suffered from tuberculosis – and the fact that the latter, when they settled in, found them uncomfortable and unhealthy. The residences rented by "health tourists" in the Spanish archipelago were, for the most part, built at the end of the 19th and beginning of the 20th century, distinguishing themselves from the traditional Canary Islands houses for having abolished the courtyard. Its owners could be either locals or British residents – to whom the Foreign Office recommended self-construction whenever the rent exceeded a certain value.

In this case, the British resorted to the services of an architect of their nationality residing on the island, or to the famous pattern books, where it was possible to choose from a catalogue the cottage that best adapted to their needs. The local owners, in turn, when they built their house, thanks to a process of acculturation to which Canarian historiography devoted exhaustive studies, ended up adhering to the formal typologies and repertoires of English-inspired architecture – import features that can be included in the context of Arts & Crafts and the eclecticism of the late 19th century.

In fact, Hernández (2009) expresses his total disagreement with the idea of those who saw the Canary Islands 19th century Eclecticism as a phenomenon of pure "facadism", stating that this movement gave birth to profound changes in the typology of the archipelago's traditional house, that is, in the conversion of the courtyard type into the outward-facing

Fig. 5 - Typical free-standing Madeira house in an urban garden plot (survey by the author; photographs in Matos 2013)

compact model, surrounded by exuberant gardens where, invariably, there were a dragon tree, a palm tree and an araucaria. In this way, a curious set of cottages, still visible today in the Orotava Valley, Tenerife, was born (Fig. 6).


Fig. 6 - A cottage in the Orotava Valley, Tenerife, Canary Islands (photograph by the author)

Another characteristic of these gardens – which the British used as a place for healing, socializing, and enjoying nature – was its symbolic character, with which they affirmed their cultural identity. In the Canary Islands – when compared to Madeira – this symbolic dimension seems more ostensible.

The courtyard garden of the inward-looking house had an intimacy which was the opposite of the eclectic exuberance of the British cottage garden, enveloped by a variety of exotic species, lawns, playing fields and other events.

Like the first family hotels and boarding-houses in Madeira, the first Canary Islands hotels were also installed in urban buildings from the 18th or early 19th centuries, originally intended for housing and located in the old inner walled city. From a typological point of view, the same difference between the two types of houses persisted: while in Madeira the urban house was compact, organized around the stairwell and with the characteristic garden backyard, in the Canaries, the house was organized around a courtyard. Here too, this difference largely explains the preference of the British for Madeira boarding houses and hotels.

Interestingly, the typology of the courtyard house was not a difficulty for the installation of the hotel – on the contrary, its spatial organization made it easily convertible into a hotel program: the main floor was reserved for rooms and the ground floor for services and the owners and employees housing.
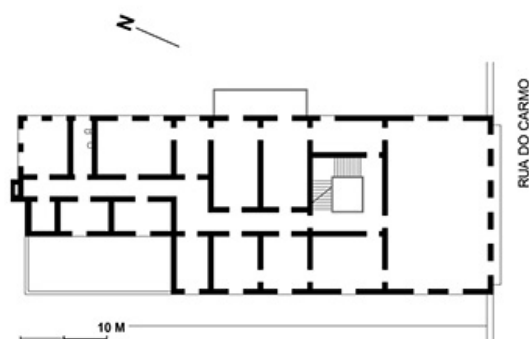
Fig. 7 - 19th century Madeira urban house with central interior staircase (in Matos 2010)

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However, as it happened with the rental houses, the strong dislike the British felt for this spatial and functional organization persisted. They saw in it a lugubrious inward-looking atmosphere that did not fit their demands of intimacy, comfort, hygiene, and relation with the exterior. On the contrary, with the houses of Funchal the empathy was immediate, as evidenced in the vivid testimony of Isabella de França (Fig. 7).

To understand the contrast between the courtyard typology and the compact house of Funchal, one might compare the testimony of Lady Burton (1897) with that of Isabella de França (1970), two English aristocrats who visited the islands in the mid 19th century, writing down detailed descriptions of the houses they stayed in or visited. Lady Burton settled in *fonda* Gobea located on Calle de San Francisco, the original backbone of the historic center of Orotava, on the island of Tenerife. She described it as "an ancient relic of Spanish-Moorish grandeur – the palace of a defunct Marchesa – a large building, […] built in a square, the interior forming the patio, or courtyard. Verandaed balconies run all around it inside, in tiers of dark carved wood"(Burton 1897). Her adaptation to the building was problematic, as she was forced to adapt the great hall on the main floor to her needs, dividing it with a screen to create space for a makeshift kitchen and bathroom (Fig. 8).

Fig. 8 - Fonda Gobea, Orotava Valley, Tenerife, Canary Islands (photograph by the author)

Lady Isabella de França describes her arrival at the 18th century manor house where she stayed in the center of Funchal: "A very large, heavy door stood open, leading into the patio, a sort of entrance hall, level with and paved like the street. Nearly all the best houses have this patio, into which people on horseback, or in palanquims, ride at once, and dismount under cover, at the foot of the stairs. We alighted at the door, and went up a flight of stone steps, at the top of which our Hostess appeared, and led us to our apartments" (França 1970). What she calls a "patio" is here not an open-air "patio", as was the case in traditional Canary houses, but a generous stairwell, whose pump was illuminated at the top by a skylight. As for the interior staircase giving access to the main floor – to which was given a major role – it was a common feature in large urban houses from the mid-18th century. Further on, Isabella compared them to the homes of Belgravia, one of the elite neighborhoods of 19th century London.

From these two testimonies, on two examples of significant urban houses of the two archipelagos – the Canary house, organized around the courtyard and the compact house in Funchal, organized around the stairwell – emerges the contrast that, from a typological point of view, distanced them, and also the affinities that the British felt towards the latter.

4. Conclusion

Private life – and the notion of intimacy associated with it – emerged in the 19th century as an essentially bourgeois phenomenon, giving rise to a new organization of domestic space and the emergence, on a large scale, of a suburban house type, compact and surrounded by a garden, where the family took refuge from the tumultuous and polluted life of the center of the city. In the arrangement of its interior compartments, this house was also the reflection of a new mentality – "the moral house" of the Victo-

rian era, which Girouard (1984) describes in his history of the English country house. To a certain extent, the ideal of the Victorian bourgeois house was a hygienic and anti-urban ideal, unrealizable in the dense fabric of the traditional city. Designed just for family life, this house found in the garden not only a space for leisure and protection of the privacy of its inhabitants, but also a guarantee of its health.

The prevalence of this new mentality, which the United Kingdom – the ruling industrial power of the 19th century – spread across the globe, associated with the ideas of city hygiene promoted by the medicine of climatotherapy – the dispersed and well-ventilated city – contributed to the decadence of the courtyard house. From then on, its role as a constitutive cell of any healthy neighborhood became problematic. The aversion and distrust with which health tourists from Northern Europe looked at it is therefore, not surprising. The knowledge some of them had of its deep roots in classical antiquity and Islamic culture, nor its climatic adaptation to the harsher temperatures of the Spanish archipelago, were enough to dissuade them: the Madeira compact house, set among gardens on the outskirts of the city, agreed with the dominant health paradigm that fitted their cultural beliefs. A paradigm that in the 20th century would give birth to the Modern Movement town planning and the Athens Charter based on health promotion, clean air, sunlight, and the planning of the city according with its four functions: housing, work, recreation and circulation.

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Conservation of historical port architecture

D. Pittaluga, G. Calvi

DAD, Dipartmento Architettura e Design; Università degli Studi di Genova

Abstract   Is it possible to preserve historic buildings, pass on their memory, make their history understood and at the same time give them new functions? How much can the new demands of life and work be reconciled with the maintenance of historical structures? These are some of the main questions that we tried to answer with a research project focused on some historic buildings in the port area of Genoa. The project is part of a broader research plan already started some years ago. In this essay we want in particular to address the issue of warehouses serving the port; medieval warehouses, transformed several times in different eras. In particular, the methodology applied for the Salt Warehouse in the Molo District will be illustrated. In this case a detailed historical analysis was carried out in various city archives. This first part of the research was accompanied by a complex archaeological high level analysis.

1. Introduction

In the Mediterranean region there are many elements that the different nations have in common: ancient history, migrations, economical and cultural exchanges, the rich material and intangible heritage, the need to preserve this heritage and the real economical problems and their management. Sometimes in some contexts the influence of a Mediterranean culture is felt more deeply; often, however, these areas are most at risk of change due to the greater exposure to contacts and exchanges between the different populations of the Mediterranean aerea (Naser Eslami 2019). It is therefore more important than ever that every Mediterranean culture preserves this richness, preserving its own original cultural matrix and also preserving this rich heritage of exchanges which in the past laid the common foundations for a history of this great Mediterranean area. Preserving and showing what is autochthonous in a specific area while preserving and showing what derives from the contacts that took place in the past among the shores of the Mediterranean sea can be a first step for an increasingly widespread acquisition of a common conscience and an equally shared fate.

Undoubtedly, one of the most significant areas in many territorial contexts, even if different, is the port area (Pittaluga & Fratini 2019). For this reason, the area of the ancient Port of Genoa was chosen as the case study to be presented in this article. (P.D.)

1.1. Questions

Is it possible to preserve historic buildings, pass on their memory, make their history understood and at the same time give them new functions? How much can the new demands of life and work be reconciled with the maintenance of historical structures? How much in carrying out conservation projects can we count on political will, on popular participation? How can we intervene to help a change of mentality: from transformation and destruction to conservation and respect? These are some of the main questions that we tried to answer with a research project focused on some historical buildings in the port area of Genoa. The project is part of a broader research plan already started some years ago; this research plan includes several PRAs (University Research Projects), of which the scientific director for all is prof. Daniela Pit-

taluga in some cases in cooperation with professors of other foreign universities. In particular, on the issues of conservation and enhancement of port structures, we worked with the 2016 PRA with a project on "The archeology of architecture in the restoration site" (with prof. J.A. Quiros Castillo) of the Universidad del Pais Vasco- Facultad de Letras, Departamento de Geografia, Prehistoria y Arquelogia, PRA 2018 with a project on "Conservation and restoration: methods of analysis and monitoring strategies" (with arch. C. Kopreining Guzzi) of CISAPSI-Inter-municipal coordination of studies and analysis of the historical heritage of Switzerland Italy, PRA 2019 with a project on "Conservation and restoration: methods of analysis and maintenance strategies of material and restoration:strategies for a quality project" (P.D.)

2. The trade district in genoa: a "warehouse district" serving the port

2.1. The sea route: a possibility of exchanges and trade

The Ligurian capital – at least limited to its first historical phase – is not at the center of the main maritime trade routes, and based on the findings it is believed that the span of the maritime routes extended from Marseille to the Tyrrhenian coasts but already in pre-Roman times it is known that Genoa was the emporium of the Ligures who settled in the region, where goods such as honey, livestock, tunics and timber were traded by land. In the 5th century BC Genoa is a prosperous and lively port center that regularly receives food and handicrafts that are directly used or marketed in southern Piedmont and in other Ligurian coastal sites. The first news of the salt trade date back to the 3Th century BC. At that time salt was considered a very precious commodity. In Roman times, despite the wars that occurred during the period directly involving the Ligurian capital, we

have certain news of the beginning of the export trade. Despite the war events, Genoa maintained its role within the Italian trade network at least until 640 AD. During the years of piracy, Arab sources, which refer to around the year 1000, describe Genoa as a rich city, an exporter of fine fabrics that are traded on the Mediterranean routes, and consequently the target of looting (which occurred around to 950 AD), which reduce the city to a state of devastation. Unfortunately, the news on the commercial role assumed by Genoa in the early Middle Ages is scarce and incomplete. To find the presence of Genoese trade on the North African coasts – in particular on the Egyptian one – it is necessary to wait until 1103 AD, when many Genoese traders are arrested in El Cairo. And it is between the eleventh and twelfth centuries that the political and economic rise of Genoa begins, and that the urban scenario begins to connect with the port one; the reasons that led to this expansion of trade are not fully defined. Some sources speak of a silver trade with North Africa which yields huge profits, much more than salt or other precious commodities; however, this hypothesis does not seem to be sufficient to justify the increase in port traffic, also due to the fact that Genoa does not own silver in its lands and must go to Sardinia to get it – a region Genoa contends with Pisa until 1125.

Certainly the political-ecclesiastical structure of the city in the early 1200s and the far-sightedness in the economical organization of goods and the port have meant that the port income has grown more and more over time. In fact, the port structure of this century is already complete with a dedicated judiciary – the "*Salvatori del Porto e del Molo*" – and already in 1134 we have news of taxes on anchoring in the port, of houses in the "Ripa" and in the neighborhood of the Pier; in 1150, the Pier in front of the church of San Marco is described as a regular landing and disembarkation point. There are also reports of duties on the salt trade that ships from Sardinia must pay in quantities corresponding to a salt mine,

while the duty is reduced to a single quart of salt from boats coming from Provence. In 1496 Genoa, which had not placed particular interest in overseas conquests, obtained a monopoly on the salt trade. If in the sixteenth century with Andrea Doria the Republic lived the period of its maximum splendor, starting from the seventeenth century the navy began to feel heavily the effects of the years of war conflicts (Varaldo Grottin 1996).

In 1623 the port of Genoa was declared a "Free Port" for all goods; this provision has the first concrete effect that vessels can benefit from discounts on customs duties. This operation – which serves primarily to strengthen trade with Holland and the countries of Northern Europe, where Genoa exports silks and fine wools and imports cod and cereals – continued until the end of the Republic, significantly increasing the profits of Genoese traders and of the city as a whole. Between the end of the seventeenth and the middle of the eighteenth century Genoa was subjected to numerous attacks which followed one another by the fleets of the main European powers: initially with the famous bombing of 1684 by the French, to which it ceded Corsica in 1767 and less than a century later, in 1748 the English attacked and blocked the port. Following the French Revolution of 1789, the situation does not seem to have changed, and despite the city maintaining the pace of its trade unaltered, with the advent of the Industrial Revolution the value of exported goods – silks, velvet, rice, jams, lemons, oil – drops dramatically. At the dawn of the nineteenth century, the face of the Old Port changed radically: the first factories were built, the first grain silos were also built, and the type of goods traded also completely changed. Coal, wood and cotton become the most imported products, the engine of the industry of the nineteenth century; the warehouses present in the port structure, including those at the pier, are thus adapted to accommodate the new goods. On December 19, 1898, the construction of the Cotton Warehouses

was started at the Old Molo; it ended in 1901. In 1903, following the creation of the Autonomous Consortium of the Port, it is possible to ascertain to what extent over the course of the century, and in concomitance with the two World Wars, the entire production and trade are transferred to other areas of the city, leaving the Old Port in a state of progressive disuse and abandonment, a condition that lasted until the 1970s. Starting from the end of the 1980s, the municipal administration put in place a plan for the redevelopment of the old port area: in this context, the ancient industrial artifacts of the Molo are the subject of recovery interventions that have included a new intended use. The warehouses of the Abundance in via del Molo are partially converted to periodically host the Science Festival and as a branch of the Faculty of Languages. Similarly, the Salt warehouses in via Bottai are destined for new residences. The conversion of the former Cotton Warehouses by architect Renzo Piano takes on great importance in this sense. The recovery intervention was completed in 1992 on the occasion of the Colombian celebrations with an exclusively exhibition purpose. Despite the numerous urban restoration interventions completed in recent decades in this part of the ancient
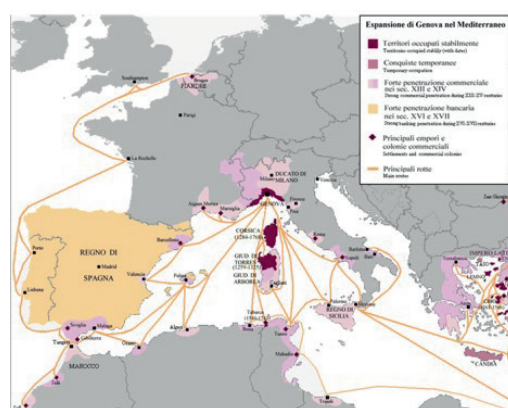

Figure 1 - The Genoese expansion from the twelfth to the seventeenth century AD
Source: Laure 1940, p. 95

fabric of the city, other significant architectural emergencies – which – former grain warehouses, salt warehouse in vico Malatti – need to be returned to new sustainable functions at the service of the community (P.D., G.C.)

2.2. *The district of the Molo, a district of Warehouses*

1125 is the year in which the first urbanization of the Molo district begins, it is the year in which the city within the Carolingian walls reaches a critical point in its development. This state of necessity therefore requires the city government to expand the urban defensive organization outside the old walls, now also including the stretch of water between the peninsula of the Pier and the Port. This sudden interest in the Molo peninsula is also due to the nearby new construction of the Ripa arcades (1133-1334), conceived as a privileged place for the sale of goods. This leads to the need of establishing a political-territorial-administrative organization of the Molo district, which takes place according to the dynamics of the time (targeted division into building plots of the district and construction of a religious building, the church of San Marco). Since then, the municipal consuls have understood the vocation of this strip of land as an ideal place to host all those types of workers who dealt with the construction, maintenance, and launching of boats, and more generally with maritime trade and shipping. The planned intervention is aimed at giving a precise urban identity to the neighborhood in 1281 a special magistracy was established called "Salvatores portus et modules" for the safeguarding and management of the port and the pier, whose office, the "Palacietum", has been located since the 12th century in front of the church of San Marco. And it is precisely at the end of the 13th and the beginning of the 14th century that, again thanks to the intervention of the "Magistratura del Porto e del Molo" (port and molo

magistracy), they also began to organise the various unloading points of the warehouses to protect and store goods. In 1418 the Municipality decided to grant the administration of the wharf to the "Banco di San Giorgio", with rights on the redemption of the land which could be used for a very long time. And it is precisely in an administrative document of the Banco di San Giorgio, dated 1444, we find the first representation in plan of the Molo district, now available for us in the version drawn up and updated a century later, i.e. in 1544. This document is part of the "Cabella embolorum sive terraticorum", an administrative list of leases of houses, warehouses and businesses ordered by owner or family name, and represented in plan and elevation with the metrature indicated on the side. It is at the end of the 15th century that the Molo begins to "specialize" according to functional areas – sailmakers, remakers, coopers. If on the one hand in the seventeenth century we find on overcrowding building extended to the whole district (that will end at the end of the following century), on the other hand we record a significant development of a new specialized commercial structure that we will find permanently throughout the 1700s. and beyond, namely the Warehouse. Already in 1544 in the Mandraccio there were seven warehouses in total, before becoming eight with the Magazzino dell'Abbondanza a few years later in 1556. The "Magazzini del sale" reached 30 units in 1660 (fig. 5), to which others will be added 4 largest during the 18th century. (Poleggi Grossi Bianchi, 1979, pp. 302-303). Another type of "overcrowding" recorded at the turn of the seventeenth and eighteenth centuries, is the one related to the boats and landings that saturate the entire area of the Mandraccio; this leads to work on the Molo on several occasions, which is further enlarged in 1638. At the end of the century it will no longer be necessary to pay all this attention, except for modest repairs to the Old Molo, the work of the Molo Nuovo will be finished, where the "Lanterna" currently stands. This work frees the harbor from the

incessant storm surges of the libeccio and allows the port to regain the prestige it had enjoyed for a long time; proof of this is the constant increase in the number of warehouses throughout the eighteenth century, intended to accommodate the most varied goods: coffee, sugar, salt, spices, cocoa.

The historical research work began by proceeding backwards, on the basis of the only certain source of the presence of the Magazzino del Sale of Vico Malatti (currently identified with the number 13r), the "Fondo Tipi", preserved in the Archive of the State of Genoa. This is a figured register in plan and raised with the attached sizes of the 27 Warehouses present at the Molo in 1660; each representation has a note at the top of the page which gives us summary information about the owner of each warehouse (fig. 2) and the arrangement and use of the same.
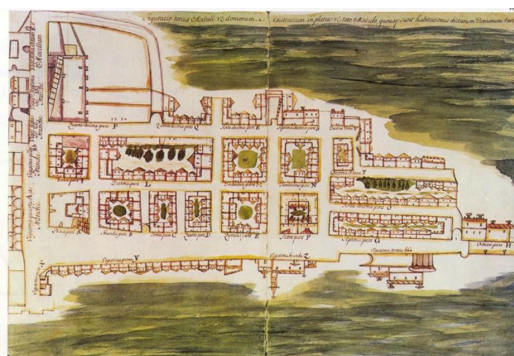

Figure 3 - 3D reconstruction through photo-graphic recomposition of the plan of the Molo district in XII, XIV, XVIIth century, with the addition of a detailed plan of the Molo (Poleggi, Grossi Bianchi, 1979, p. 201; Barbieri 1938)

Source: Calvi 2021

3. The Vico Malatti salt warehouse

Figure 2 - Plan view of the district of the Molo, 1540

Source: Gabella Terraticorum sive Embolorum, code Figuratis – Archivio di Stato di Genova, Fondo San Giorgio, collocazione E 65

A complex 3D reconstruction was carried out of the whole district of the pier by comparing the different data available (unpublished written sources, published written sources and material sources) (Calvi 2021) (see fig. 3): this part of the study is It was important to have a good understanding of how many and which warehouses have been preserved up to now in this particular area. (P.D., G.C.)
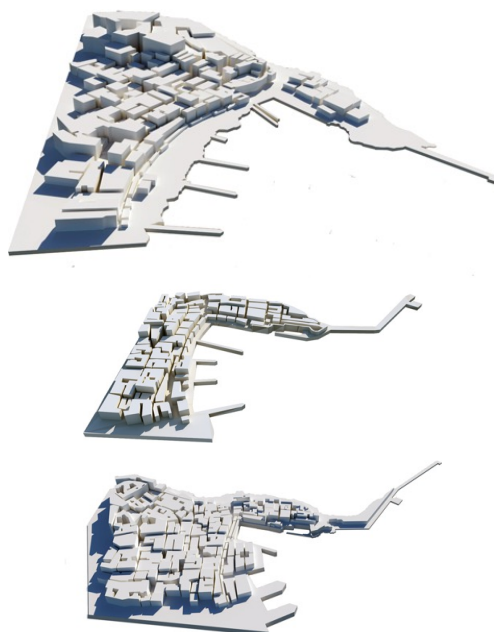

Figure 4 - Detail, highlighted in red, the Vico Malatti salt warehouse

Source: Gabella Terraticorum sive Embolorum, code Figuratis – Archivio di Stato di Genova, Fondo San Giorgio, collocazione E 65

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Figure 5 - Comparison (at different scales of representation) between the reconstruction of Poleggi del code Figuratis (left – Poleggi, Grossi Bianchi, 1979, p. 201) and a recent cadastral map of the Molo district (on the right, marked with sheet 66, cadastral map 82). The salt warehouse is highlighted in red
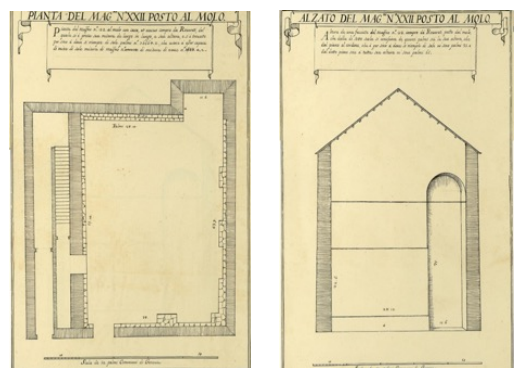

Figure 6 - Plan and section of Salt Warehouse n. 23, Molo (today vico Malatti n. 13)

Source: Fondo Tipi cit. in Calvi 2021, p. 60

3.1. The warehouse analyzed through the indirect sources

The historical research work began by proceeding backwards, on the basis of the only certain source of the presence of the Vico Malatti Salt Warehouse (currently identified with the number 13r), the Fondo Tipi (the collection of documents), kept at the State Archives of Genoa. Through the investigation of the warehouse under stuy, numbered according to the Fund as the twenty-second, it was possible to trace the surname of the owner of the building, that is Rovereto, literally quoted as "[..] *warehouses I buy from Rovereti*". From this single documentary trace, the first existing documents on the Molo district were subsequently analyzed, namely the "cabel-la embulorum "and the register "embulorum figuratis", the latter dated 1 March 1544. Since it could be seen inside, we found out it contains information dating back to a century earlier (1444). This precious document contains the painted list of all the houses and shops on the pier, accompanied by their measures. Following the verification carried out on the building located in plan at the tenth-eighth angle (fig. 14), the correspondence was found, albeit with the relative approximations due to the non-rigorous representation, with the current location of the Magazzino del Sale in Vico Malatti 13r. The archaeological reports made by the Soprintendenza Archeologia, Belle Arti e Paesaggio di Genova and other scholars during the last century help us to clear up all sorts of doubts and confirm that the building still retains the original foundations of the 16th-17th centuries. (in particular reference is made to the excavations of Piera Melli in 2007 and 2014). In the footnote at the top of the page in the map of the Tipi Fondi, it appears that the warehouse inside also had a house and a "vacuo", that is an empty space, from which the salt was introduced at that time; a very precise indication is also given of how many salt mines it could contain (also based on the type of boat that transported it). The document also refers to a preexisting building (identified as a ruin), but unfortunately the unit of measurement given is not sufficiently precise to indentify another pre-existing warehouse at east. The warehouse di vico Malatti is represented in plan with a rectangular shape and an area of about 150 square meters; in it, we can clearly see a recess at the corner of the short side to the east, which, in the elevation, is recognized as a primitive silo dug out of the masonry where the salt from the aforementioned vacuum was presumably thrown. On the long side, to the north, there is a staircase that in plan would seem to be included between the walls of the warehouse even if outside the actual compartment – this is because it served as a service

staircase to reach a second floor from which the salt was unloaded- the traces of which are still visible today on the walls. In the elevation, which we cannot define as either a section or elevation as the author gives it a misleading tridimensionality in order to embellish the representation, there is no trace of the staircase which we can therefore think was completely external to the perimeter as it is still today. The house inside the Warehouse seems to have been built on a third floor connected internally by a wooden staircase, as was the custom at the time; we have no evidence of this pre-existence except in the elevation mentioned above, where a continuous floor is drawn over the entire width of the building. Unfortunately there is no more certain information about the Magazzino until 1798, in the middle of the Napoleonic period, when it was registered within the Cadastre of the Ligurian democratic republic; the property no longer belongs to the Rovereto family but is attributed to two brothers, Capurro Bartolomeo and Capurro Nicolò (see: S.a., Cadastre of the Ligurian Democratic Republic 1798, vol. 1168, p. 137, sub. 1, p. https://mappe.comune.genova.it/MapStore2/#/viewer/openlayers/1000000789).

At the end of the eighteenth century, the Warehouse houses inside a house of 4 mezzanines and a land fund, usually used for the storage of goods. It is only from the following century that the Magazzino del Sale of Vico Malatti is again cited in an official document, a census of the inhabitants of the Molo referring to the years 1865-1871, which can be consulted in the Historical Archives of the Municipality of Genoa (Municipal Administration Fund). The only information that is provided to us by this source is that the names of those occupying the property are not listed under Vico Malatti 13r, as in the other pages of the census, but there is only the wording "Warehouse", together with the given that it was owned by the former Port Finance Office. In this document there is no information either relating to what type of goods it contained, or whether this building was already made up of a single room without floors as it is today, or if it still had at least one floor. Probably at the end of the nineteenth century the Magazzino del Sale and the entire Man-draccio district were already beginning to suffer from the displacement of the port infrastructures to the west, and it is perhaps for this reason that on 24 September 1904 the property passed ownership to Consorzio Autonomo del Porto, which in turn officially sold it in 1925 to the Society of Caliphates and Carpenters of the Port: following the last transfer of ownership, the former Salt Warehouse is no longer used exclusively to contain salt, but all types of goods that required a place for storage (Sa, Warehouse of Vico Malatti (Archive of the Port Authority of Genoa, envelope E1 / 167.3, p. 7). Following the progressive abandonment of Porto Antico, in 1937 the former Salt Warehouse was reconsigned to the State Property, which in 1955 drew up a new survey of the plan (currently kept at the Soprintendenza Archeologia, Belle Arti e Paesaggio di Genova). Subsequently, the property is leased to SOBOLT srl, a bolting company founded in 1985, which uses it for the storage of goods until 2009. In this same year, SOBOLT acquires the Warehouse from the State Property through the stipulation of a deed of sale. 2009 is also the year in which the Soprintendenza affixes, on 8 July, the monumental bond to the former Salt Warehouse declaring the asset of "particularly important Historical, Artistic and Archaeological interest", protecting its architectural integrity and its conservation. To date, what remains of the original structure are the load-bearing masonry, composed of stones and bricks (exposed, on the internal walls, plastered, on the outside), and the wooden roof with trusses that support the main beams, the secondary joists and the plank on which the typical Genoese slate slab roofing is placed. It is also possible to access the internal courtyard shared with civic 3 of Vico Malatti where you can see the external staircase belonging to the Warehouse. (P.D., G. C.)

3.2. The warehouse analyzed through the direct source

In the course of this research, we have tried to trace a precise historical reconstruction of the former Magazzino del Sale and its development in the urban context in which it is inserted, and of all its elements and construction phases and to trace a pre-diagnosis on the conservation conditions. The survey of the structure was carried out, the only one present to date so detailed, paying particular attention to the masonry compartment and the elements of the wooden roof. The analyzes and studies on the wooden roof, despite the constraints due to a partial visibility due to the work activity that has never been interrupted in this building, have shown how these direct analysis tools, once compared with indirect historical sources, allow to build solid starting points for a correct archaeological reading of the building. Clearly, the reconstructions that emerged following the discovery of the documents in the various archives (see prg-ph.3.1), needed confirmation, and this was possible thanks to the comparison with the direct analyzes carried out on the structure. A scrupulous visual pre-analysis of the roof,

compared with the manuals and other contemporary buildings, and the mensiochronological analysis carried out on the masonry sector, allowed us to confirm the theories and expand our knowledge of the structure. We now know, with good certainty, how both the roof and the masonry compartment have undergone several construction phases, the main ones of which have been identified in this research.

The trestle roof with "pseudotruss" dates back to the seventeenth century and was probably built with the use of the building as a warehouse. It has undergone some limited reinforcement additions identified (some struts, wooden chains of the trusses, and iron chains subsequently placed in the seventeenth-century masonry, as seen in the mensiochronological analysis) (Pittaluga 2009 a, Pittaluga 2009 b, Mannoni *et al.*, 1991). In a certain way, these roof reinforcements also affected the masonry, as evidenced by the external buttress, in correspondence with the central "pseudotruss" (B), visible from the shaft on the east wall. Even the masonry itself could be divided, macroscopically, on the basis of the studies carried out, into 3 main phases: the medieval / sixteenth-century structure of the ruin, partially survived and still visible today in the three stone pillars. dear marly on which the three arches on the west wall and in the pillar on the north wall currently rest, the main seventeenth-century brick structure, and the various infill or repairs that took place between the nineteenth and the first half of the twentieth century.

Furthermore, the visual pre-classification of the wooden elements, the thermographic investigation, the pre-analysis of the degradation of the roof covering, the thermogravimetric and calcimentric investigation, also allowed us to draw a first picture of the general condition in which the building currently is. If for the main beam no critical situations of deterioration were found, it has been seen that for the planking and for the secondary beams there are some portions that need further study. (P. D., G. C.)
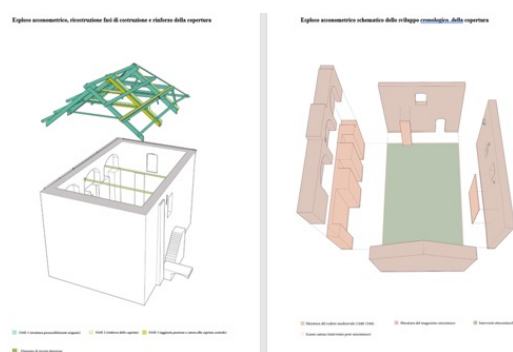

Figure 7 - Axonometric section of the Magazzino del Sale in vico Malatti. On the left stratifications on the roof, on the right phases of transformation of the masonry
Source: Calvi 2021, p. 264

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3.3. Preserving memory, preserving material traces and giving them new uses

As anticipated, the former Warehouse of Salt is currently home to a company that uses the property as a warehouse. It can therefore be said that the function for which it was built, has not actually changed much over time: only the material deposited there has changed, first the salt, today the bolts. This fact probably helped in the conservation of the building itself. The walls, as we have seen, keep traces of the first building (16th century) on one side, while on the other they retain the major changes of the 17th century. The wooden roof, apart from minor interventions (Pittaluga, Calvi 2022), is that relating to the roof of the Magazzino del Sale (17th century): it is a typical Genoese structure of the 16th-17th century, it is a trestle structure. One of the few still preserved. And here, in part, is the answer to the first question posed in the initial part of this essay. As we have seen (see chap.…) the district of Mandraccio and of the Molo in particular, was a district of warehouses. Some have the system left, others nothing; the Warehouse of Salt in vico Malatti is almost entirely preserved. The reasons can be found in the persistence of the same function and in the very few changes of ownership that this last warehouse has undergone over the centuries (see chapter…).

How can it be possible to combine the new needs and at the same time hand down history?

This step could be a little more difficult. Specifically, this case-study was chosen because it is particularly emblematic. The area in which it is located, the old pier, and the building itself are very representative of Genoa commercial vocation in the Mediterranean. (see chapter…). And like so many areas bordering the Mediterranean, both in the north and south shores, these areas were in the past the most open to trade and also the most sensitive to receiving contamination even from one country to another. They are the richest in history. However,

as mentioned in the introduction, they are also the most exposed to cancellation. Even this Genoese area is no exception: currently it is adjacent to a strongly tourist area, the Porto Antico area which hosted the Universal Exposition in 1992 and which has seen a change in the area in partly attentive to the pre-existing, in partly destructive (see in this regard Mannoni 1994). The strong attraction of the area could in the near future be even more problematic than the historical heritage. How to act, then? Part of the answer comes precisely from this story. The study of this building started from a specific will of the owner who, in agreement with the Soprintendenza Archeologia, Belle Arti e Paesaggio di Genova, wanted to consult the university: the aim was to have a good knowledge of the building and a conservation proposal of the same, of enhancement and at the same time of maintenance of the current function.

For this purpose, the research was included in a PRA. The survey and knowledge phase of the entire building and its roofing began in 2019 and some guidelines were subsequently drawn up and discussed directly with the property and the Soprintendenza. During this second phase, an attempt was made to better understand the meaning of this building and from here a complex investigation began on the direct sources and on the direct sources that had been previously considered: this investigation showed that this is an ex Magazzino del Sale in a district that in ancient times was almost entirely made up of warehouses serving the Port (see paragraph…). From this awareness, all the work carried out in close agreement between the University, Soprintendenza and Property started to preserve and enhance this plant in compliance with both work and community service needs. As mentioned previously, guidelines have been drawn up that have made it possible to maintain the use of a Warehouse on the ground floor and to provide for the separately new accessible attic floor the possibility for the public of being able to view part of

the wall structures and the complex wooden structure of coverage. This second phase is in progress and the work is still long but the results are encouraging. (P.D.)

4. Conclusions

So how can you answer the questions posed at the beginning of the article?

As has been said, this research is part of a broader research plan that started with the University Research Projects (2016-2018) with the research and continued in the following years.

The novelty of this intervention is that, unlike the previous examples which had involved the university, the institutions responsible for control and public bodies, this time the privileged interlocutor is a private property. This represents a novelty of no small importance. In fact, there are multiple constraints related to use and sometimes different aspirations. In the case in question, the property has shown to be attentive and collaborative. In this case we had to deal with a property aware of the importance of the building in order to understand a part of the history of the city. Awareness that, in part, was present from the beginning but that was consolidated during this research up to the precise intention of making this building complex partially visible to the territory. And from this understanding a whole other series of study and research possibilities arose.

This is not always the case. The reflection that we want to bring here is on how necessary it is to induce this awareness also in the private citizens. Only in this way will they be available for a real collaboration with the institutions responsible for research and protection. And this not only for encumbered assets but also for unencumbered assets which constitute an extensive, widespread and sometimes little-known but very characteristic asset of most of the sites that overlook the Mediterranean. This could be the turning point for their survival. (Pittaluga 2017) (PD)

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In origine le montagne avevano grandi ali

M. Abbo

Geologist, Self-employed, Sanremo (IM), Italia

Francesca L. Buccafurri

Architect, Self-employed, Ospedaletti (IM), Italia

Angela C. de Hugo Silva

Architect, Self-employed, Botucatu (SP), Brasile

Frida Occelli

Archaeologist, Self-employed, Torino (TO), Italia

Abstract   The contribution, in addition to reconstructing the transformation of the environmental and landscape context of reference, aims to compare the characteristics and evolution of the material constituting the Ventimiglia cliff in its «natural» and «man-made» state as a building material that from it derives: on the one hand through a historical-cartographic investigation that allows the study of the «natural» transformations of the morphology of the territory, on the other through the analysis of the masonry techniques characterizing the numerous defensive architectures still present in the area, aimed at determining the resistance to aging of the same "puddinga", artificially modeled and integrated into the buildings.

The almost absolute interchangeability between the natural "puddinga" and a cement conglomerate, artificially constituted using rough and rounded calcarenite aggregate, suggests interesting constructive symbiosis, even more necessary in a highly valued, but fragile and changeable landscape.

1. Introduction

On the border between Italy and France, in the Municipality of Ventimiglia, there is the cliff of Punta della Rocca, a suggestive place characterized by pliocene branches overlooking the sea, attributable to sedimentation conditions such as torrential delta, in where the clay-sandy deposits appear interstratified with conglomerates.

Here, more than elsewhere, it is evident how geology has determined the morphology of places, defining their conformation, vegetation cover, anthropization, the availability of natural building materials and therefore, the landscape and the context landscape and architectural in its broadest meaning.

The area, characterized by a high geological fragility, has a vertiginous morphological evolution and on several occasions during the twentieth century required major consolidation interventions. Since 2017 it has been the target of in-depth geotechnical instrumental monitoring activities which will soon be accompanied by rigorous archaeological studies: the size and typology of the elements already collected have allowed to perform a partial reconstruction of the ancient landscape where the frequency is verified in remote times, in a general framework of settlement dynamics that historically seemed to be in mutation and decisively influenced by the morphology of the territory.

There is in fact a close connection between the geological outcrop line character-

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ized by soft "clayey" rocks and the one in "puddinga" conglomeratic – mechanically more resistant – with the development of the town of Ventimiglia Alta and, in particular, of its defensive architectures built on ashlars of wall obtained from the same lithotype that Cliff is composed.

And again: the thin sandy horizons present within the pliocene conglomerates allow the development of high-altitude spring aquifers, an integral part of the strategic position, guaranteeing a safe water supply even during periods of siege.

2. Geology

2.1. Stratigraphy and parameters

The Pliocene strips of Punta della Rocca can be attributed to delta-type sedimentation conditions, where clayey-sandy deposits appear inter-stratified with the conglomerates, with heteropic passages to the latter. The deposition current highlights an alternating sedimentation mechanism, typical of fluvial-marine environments, subjected to "rapid" and sensitive variations in the mean sea level, which reach more than a hundred meters.
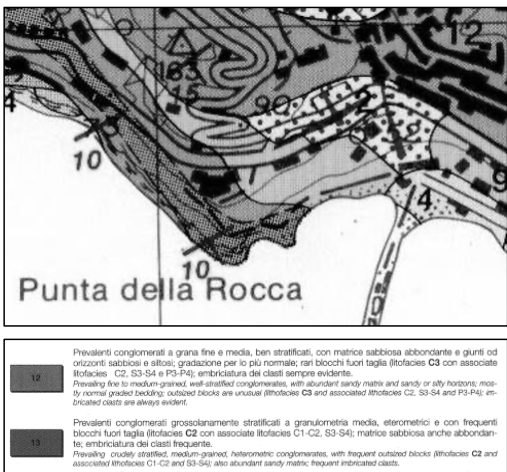

Figure 1 - Geological map of the Ligurian Pliocene, Marini 2002

Lithologically, the conglomerates of Punta della Rocca (subunit U3b in Marini 2001) are generally poorly stratified and with a good degree of cementation at sea level. Towards the top, they pass to more heterogeneous sediments (conglomerates of the Fort of S. Paolo subunit U3c in Marini 2002), with alternating small and slow pebbles mainly consisting of medium-sized elements; in general, compared to the lower portion, the clasts are less rounded and often dispersed in a sandy-clayey matrix.

As a concrete conglomerate cast on site with coarse aggregate, nature has compacted the "available" stone aggregates with calcareous concrete, making it difficult to distinguish the "natural conglomerate" that emerges on site from the man-made "artificial conglomerate".
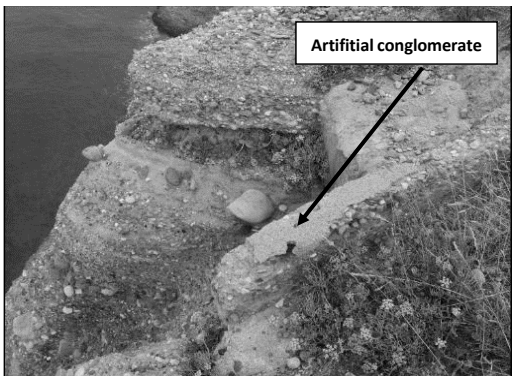
Figure 2 - Comparison between "natural" and "artificial" conglomerate

The "fine" grained conglomerate emerging at Punta della Rocca, precisely because it has a good "natural" cementation and a homogeneous aggregate, has long been used as a natural "stone" for construction on site.

The following table shows the uniaxial and triaxial compression strength values obtained in the laboratory tests carried out on conglomerate samples. From these values it is possible to obtain the average values of the Hoek and Brown resistance parameters of

the rock material, σci = 22.6 Mpa, mi = 8.6 and s = 1.

Figure 3 - Monoaxial and triaxial compressive strength of the Punta della Rocca

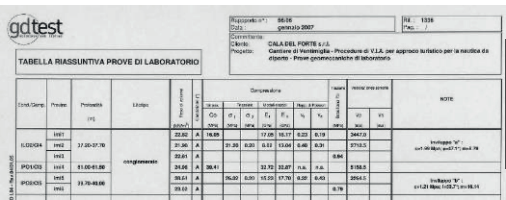The value of the compressive strength is exactly comparable to the values of Rck (compressive strength of the cubic sample) and Rcyl (compressive strength of the cylindrical sample) which are usually used to precisely define the resistance class of the concrete of EN206.

Where the strengths of the conglomerates are measured on cylindrical samples, they belong to class C20/25, it means medium-low strength concretes.

With reference to the following table, the resistance class of the pliocene conglomerate places the formation between the "weak" rocks and the "medium-resistant" rocks.

For the sake of easy understanding, therefore, it is a "weak" rock with low resistance like many of the "younger" sedimentary rocks.

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2.2. Morphological evolution of the Cliff

The Calanco is the place where the extreme speed of the evolutionary process of the "clays" present on the side of the Punta della Rocca cliff is most easily to see, capable of causing the retreat towards the mountain of the +45 m altitude line on the l mm of a variable quantity between 2-8 m, as visible from the superimposition of the topographic survey of the Civil Engineer of the 1960s and the 1:1000 scale photogrammetric cartography of the Liguria Region of 2014.

Table 1: Field estimates of uniaxial compressive strength of intact rock.

Grade*	Term	Uniaxial Comp. Strength (MPa)	Point Load Index (MPa)	Field estimate of strength	Examples
R6	Extremely Strong	> 250	>10	Specimen can only be chipped with a geological hammer	Fresh basalt, chert, diabase, gneiss, granite, quartzite
R5	Very strong	100 - 250	4 - 10	Specimen requires many blows of a geological hammer to fracture it	Amphibolite, sandstone, basalt, gabbro, gneiss, granodiorite, peridotite , rhyolite, tuff
R4	Strong	50 - 100	2 - 4	Specimen requires more than one blow of a geological hammer to fracture it	Limestone, marble, sandstone, schist
R3	Medium strong	25 - 50	1 - 2	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow from a geological hammer	Concrete, phyllite, schist, siltstone
R2	Weak	5 - 25	**	Can be peeled with a pocket knife with difficulty, shallow indentation made by firm blow with point of a geological hammer	Chalk, claystone, potash, marl, siltstone, shale, rocksalt,
R1	Very weak	1 - 5	**	Crumbles under firm blows with point of a geological hammer, can be peeled by a pocket knife	Highly weathered or altered rock, shale
R0	Extremely weak	0.25 - 1	**	Indented by thumbnail	Stiff fault gouge

* Grade according to Brown (1981).
** Point load tests on rocks with a uniaxial compressive strength below 25 MPa are likely to yield highly ambiguous results.

Figure 4 - Rock resistance classes with respect to the uniaxial compression parameter, Hoeck e Marinos (2001)

Figure 5 - Retraction of the +45m altitude from the 1960s to 2014

The retreat of the summit edge corresponds an advance towards the valley of the lower altitudes, confirming the impression of a general decrease in the average slopes of the Calanco found in the following photographic comparisons.
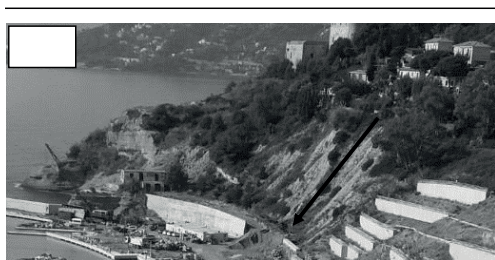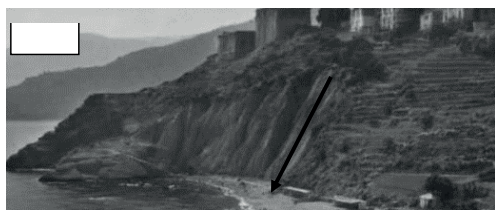
Figure 6 - Between about 1960 and the year 2019, the Calanco totally changes its appearance

The rate of retreat of Calanco is equal to about 10-12 cm/year, resulting from the cartography of the general plan of Ventimiglia of 1826, in which the Calanco appears much more extensive and located about 23.9 m further to the sea than the current position.

igure 7. The upper edge of the Calanco in 1826 is in dashed
Figure 7. The upper edge of the Calanco in 1826 is in dashed dark gray, the current edge in black

The main morphogenetic agents that determine the evolution of the cliff, in addition to the more evident direct action of the wave motion that acts on the foot and easily erodes the clayey portions, are the karst action and the action of the marine aerosol.

On the one hand, as is well known, the sandy horizons intertwined in the conglomerates, often uncemented and perhaps centimeter thick, give rise to spring phenomena: at Punta della Rocca there are two caves below the mid-sea level, characterized by the terminal presence of karst feeding infundibulum.

On the other hand, the humidity of the air, charged by electrically active saline ions due to the proximity of the sea, favors the dissolutive action on the carbonate cements: the dissolution of the carbonates that bind the clasts of the conglomerate, occurs in a widespread way on the cliff, with production of a very slippery "carpet" of loose pebbles. This thin cover is cyclically eroded and mobilized by the stream waters which are diffused in their passage during the rains.

Furthermore, for a principle similar to that which precedes the formation of Sardinian "conchi" or "tafoni", the presence of small niches favors the accumulation of nocturnal humidity with rooting of mosses, increasing the alterative and erosive action.

Finally, the alterative action, which allows the "jutting out" of stretches of the cliff together with the action of the sea, governs the occasional detachment due to the collapse of much more important rock masses than the continuous detachment of the pebbles. Continuous actions of thermal stress (due to differences in day / night temperatures), stresses due to surface detensioning, rock protrusion due to basal and selective erosion, lead to the formation of thin surface fractures of the rock. In these fractures, following the minimal accumulations of rainwater, the root systems of the trees that force the rock to tensile stress, that is, in a very different "way" from the compression already analyzed previously, insinuate themselves. When stressed by "extension" stresses, the rock has much lower resistance values and therefore the fracture undergoes a progressive widening, extending in the rock matrix. Where the strength of the re-

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sidual rock bridges is no longer sufficient to support the weight of the rocky prism, it detaches and collapses, often assisted by the hydrostatic thrust of the water inside the crack, in case of rain.

3. Anthropic settlement

3.1. Historical development of the Upper Town

Geomorphology has always influenced the development of the town of Ventimiglia Alta. The addition of soft rocks and geomorphologically more resistant material to the action of water has led to a slow and progressive transformation of the landscape. Marine erosion, together with the other morphogenetic agents, has acted over the millennia by removing the soils that sloped steeply towards the sea, producing the contrast between the sandy shore at the foot of the gullies and the emergence of large rocks and rocky prominences, shaping the current seat of the Upper Town over the centuries.

In fact, if the pre-Roman and Roman settlements are located near the Nervia stream, at the extreme east of the study area, with the Gothic invasion we witness the shift of the urban center and the development of the Upper Town, immediately to east of the cliff of Punta della Rocca.

During the Middle and Final Bronze Age, with the conclusion of the post-glacial ascent of the sea level, a landscape characterized by lagoons, swamps and rear-dune lakes was structured, endowed with strong biological productivity and wide sandy coasts excellent for hauling boats. The coastal and rear-coastal settlements must have been innumerable, while on the high ground the dislocation of the sites was concentrated at intermediate altitudes, in sites with good visibility on the sea and the possibility of control over the pass routes towards Piedmont. In the hinterland generally are forms of strategic control of the territory with arched sites ("castellari") to control the

mountain passes and high pastures (Castel D'Appio, S. Lorenzo D'Appio).

The period from the advanced Iron Age to the Romanization of the Ligurian territory is considered decisive in the development dynamics of the sedentary grouped settlement in Liguria, with the consolidation of stable *oppida* to control the territory and the coast. The excavations carried out in the Nervia plain conducted starting from the second half of the nineteenth century have shown that at least from the fifth-fourth century BC, there was an *oppidum* on the sea in the stretch of coast at the foot of the Colle Sgarba escarpment.

On the eve of the Romanization *Albintimilium* represented, thanks to its strategic position, an important crossroads of trade between the hinterland and the coast. In the beginning, the Romans erected a *castrum* as a *presidium* of the area on the edge of the Colle Sgarba hill.

The Roman settlement, at the beginning of second century BC, leaned against and partly overlapped, on the southern slopes of the oldest *oppidum*.

Around 89 BC following the *lex Pompeia*, the Intemeli Ligurians obtained Latin law and were constituted in *municipium*. *Albintimilium*, together with *Albingaunum* (current Albenga) and *Lucus Bormani* (today's centers of San Bartolomeo al Mare and Diano Marina) became one of the cornerstones of the Romanization of extreme Western Liguria.

But the growing insecurity, which culminated with the Gothic invasion, led to the decline of the city favoring the relocation of the residential nucleus on the hill at the end of the Roia River mouth which, as we have seen, constituted a strategic location thanks to the particular geomorphological context came to be created over the millennia.

In the 5th/6th century, with the progressive abandonment of the center in the plain of Nervia, the upper city developed around the Byzantine castrum, settled on the pro-pages of the "Scoglio Alto", near the Cavo.

Under the Goths, Ventimiglia enters the *Provincia Maritima Italorum* and becomes the seat of a diocese while maintaining a large rural area around it, well connected with Piedmont. In the 7th century, under the Longo-Bards, a Lombard-Byzantine fortress was built on the summit of the Cavo.

Under Charlemagne, Liguria Marittima was included in the Marca della Tuscia and the ancient Ventimiglia *Municipium* had the dignity of a committee, being erected as a County, with jurisdiction over the entire Roia Basin. The canal port, which in the early Middle Ages had come to establish itself with respect to that of Nervia, became a very important landing point for the supply of the timber necessary to build a powerful fleet capable of countering Arab ships, a constant threat of the Mediterranean.

Around the thirteenth century the town grew and developed around the three poles of the Cavo, the *podium* Oliveti and the *burgus*, on the right bank of the Roia stream. All the spaces are occupied with the birth of the walled village and the replacement of the Byzantine *castrum* with the buildings of the new secular and ecclesiastical authorities at the ridge of the Cavo as evidenced by the archaeological finds that took place at the beginning of the twentieth century.

At the end of the twelfth century, tensions with Genoa led to bitter clashes that would cause the inexorable decline of Ventimiglia. The war phases between Genoa and Ventimiglia are concentrated between 1219 and 1222, with a definitive enslavement of the Ponentine city in 1251. Thanks to the deeds drawn up by Giovanni di Amandolesio, notary of Rapallo serving in Ventimiglia, a rich documentation related to the fortifications of the coastal city and its political and social order from 1256 to 1264. Following the Genoese capture of Ventimiglia, the city was reorganized with the extension of the city body in the direction of the Oliveto. The image of Ventimiglia began to take on the current shape of an irregular quadrilateral, developed between the ridge of the hill and along the waters of the Roia up to the height of the religious complex of San Michele inserted in the city walls.

Ancient cartography and sources show that, starting from the sixteenth century, the center of Ventimiglia, by now little involved in the socio-economic processes of the time, remained almost unchanged, maintaining active at least until the eighteenth century the landing at the mouth of the Roia albeit in a reduced form.

3.2. The lithotypes and Ligurian masonry techniques

But geology has not only determined the urban development of the Upper Town; it has also materially substantiated the architecture built using sedimentary rocks of local origin.

In particular, the examination of the numerous defensive structures still presents in the area highlighted the massive use of "puddinga" conglomerate, the same lithotype of which the *Punta della Rocca* cliff is made, a sort of open-air quarry.

Figure 8 - Detail of a "puddinga" wall above an outcrop of the same lithotype

In every era the cost of transport, in terms of human effort and time, was among the highest of all construction site operations.

This also explains why in Liguria, a region very rich in lithological varieties but

also without carriage roads, the ancient quarries of building stone were not very many; the important quarries were therefore close to the sea, reachable by "*lizze*" (inclined planes), so that the blocks were loaded directly onto large boats or ships.

Exchanges with the hinterland, very scarce and reduced to objects of limited size, took place by oxen-drawn sledges; the smaller centers, far from the large quarries, especially if there were large slopes to overcome, had to obtain supplies on site: if they could not open small quarries near the inhabited area, they mainly exploited the "troubadours" of healthy rocks, brought to light by nearby streams, as well as collecting materials from the plowing of cultivated fields or the demolition of abandoned buildings.

In particular, the visual examination of the walls of the various defensive architectures allowed to identify both coherent clastic sedimentary rocks, originating from the accumulation of fragments coming from the disintegration of other older rocks into lithified sediments, and sedimentary rocks of chemistry, formed by direct precipitation from saturated solutions derived from the alteration of primary rocks: the first type includes sandstones (or arenites), consisting of clasts ranging in size from 2 millimeters to 63 microns, derived from lithification of sands, and conglomerates, derived from the lithification of rounded pebbles; limestone and marl belong to the second type, formed by decreasing percentages of calcium carbonate, in the second case combined with a more or less accentuated clay component.

Furthermore, even if to a very limited extent, metamorphic rocks with a schisty appearance are identifiable, i.e. characterized by an isorientation of the minerals from which derives the presence of parallel planes that determine a considerable cleavage: these are clay-shales, with a very fine grain, originating from low metamorphism of clayey rocks.

It is interesting to note how the masonry techniques adopted strongly relate to the characteristics of the materials: if the sandstones and limestones, in fact, are used to create the sketches of the "small appearance" work, exploiting their regular stratification, the less resistant and hard clayey schists are used exclusively as flakes.

The type of masonry used depended in the first place, for each single period, on the socio-economic environment that produced it as it determined choices: execution in self-sufficiency or through more or less specialized masters, use of local or of quarried materials, production of lime for mortar or use of clayey earth, et cetera; but after this the type of texture of the wall depended partly on the executive capacity of the builders, whether they were in accordance with a tradition or imported or even original schemes, and partly on the technical characteristics of the materials chosen. Obviously, all these components could interact but while the one could also be diffused according to cultural models, the others always remained linked to the invariable geolithological nature of the region.

But any masonry, to withstand the tests of time, had to be built by a skilled workforce; that is, those who built had practically learned, based on experiences accumulated over a long time and passed on with the apprenticeship.

The only techniques that survived in Liguria after the fall of the Western Empire were the thin courses made with rocks in small layers, only split; the polygonal technique of small dimensions; the "herringbone" technique. They involved the art of the stonemason, on which those of the molder, the ornatist and the sculptor were based. (Mannoni, 1993)

In particular, the first, called "small appearance", was made with small rectangular blocks of constant size, obtained by splitting from rocks with regular stratification (such as limestone and quartzite), which, due to their reduced thickness, involved the installation of a wall filled with "sack" with mortar and stone chips.

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Figure 9 - Detail of a masonry with a cantonal corner in puddinga

This explains why, when in the 12th century they wanted to resume the visible use of worked and fashion-born stone, they resorted to the Antelami Masters, coming from the Lombard Prealps, rich in quarries who had continued to supply precious materials and masters of stone.

In the second half of the fourteenth century a progressive simplification of the preparation of the ashlars begins and an ever-greater irregularity in the courses, which led to the new masonry techniques of the sixteenth century, during which colored or painted plaster coating was adopted in the new urban constructions; Lombard stonecutters continued to work precious stones only as signs of power or as components of the architectural form (rusticated baseboards, cantonal stones, outlines of openings, et cetera).

In the "modern" masonry technique, once the complete work of the mason, only the static strength was taken care of abolition of the courses, but transversal homogeneity and areas called "pillars", with large square stones with large points in the corners and in the attacks of the thorn walls.

It is important to keep in mind that the abolition of continuous segmented facing was also accompanied by the elimination of sack fillings, with the consequence that the segments ended up forming a homogeneous three-dimensional network, in the empty spaces of which they were compacted with wedges ("flakes") or smaller materials, often also made up of broken bricks. The ashlars were always made with the healthiest benches, sometimes squared and even flattened with a point ("piqued stones"), but being no longer visible, they were often only split with the peak following "hairs" more or less perpendicular to the planes natural stratification that constituted the support surfaces ("scapoli"). In large buildings, in order to further reinforce the main structures, not only the cantilevers were built entirely with the larger ashlars, but also the isolated pillars and those embedded in the same external wall between two axes of openings, in correspondence with the walls of plug. When the ashlars of the pillars were rough, their joints were finally forced with hammer-driven "flakes".

Figure 10 - Detail of the interior of the walls of Castel d'Appio

It can be concluded that this technique required good quarrymen, some stonemasons but above all good masons; it had the advantage of consuming all the healthy material produced by the quarry, large and small, also of recovering materials still good from demolition, obtaining statically homogeneous walls and particularly resistant in the most loaded or gripping points. It is no coincidence that this type of work, developed in the sixteenth century, lasted in richer or cheaper editions until the last century, in a good state of conservation even if without plaster.

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Figure 11 - Detail of the interior of Castel d'Appio walls

A significant example: preventive archeology interventions in Castel d'Appio

The Castle d'Appio, mentioned for the first time in 1221 in the Genoese Annals, until its last occupation in the course of the XVIII century was the subject of numerous constructive interventions, some of which were identified and read during the excavation campaigns carried out on the occasion of its restructuring in 2008-2009.

Today the fort develops according to an elongated morphology in the N-S direction, which follows the course of the ridge. The walls are preserved, which rests on the rock, and which has access to the west; two imposing towers (one in the NW part and one in the S) and, to the NE, a large square cistern in masonry (Fig. 12).

Figure 12 - Aerial photo of the Castel d'Appio site

Due to the characteristics of the masonry technique, the towers seem to be attributable to the thirteenth-century layout, while the multi-layered walls seem to date back mostly to the post-medieval age.

Between 2009 and 2010, archaeological assistance was provided to the excavation operations aimed at consolidating the unsafe structures and the partial removal of modern and contemporary deposits, in view of the restoration project. It was therefore a preliminary intervention which did not complete the stratification in place, but which allowed the identification of some evidence that can be related both to the phase of the first occupation and to earlier phases.

In particular, partially englobed by the structures of the current walls, tears of heavily shaved walls have been identified which seem to reveal the presence of a tower. They are made of medium-sized rough blocks in limestone or conglomerate, arranged in pseudo regular courses. It is not yet possible to observe the structure in its entirety or any life plans related to it, since the investigation was interrupted at levels that still partially obliterate the shaving and document a subsequent phase of attendance. Therefore, no materials are found that allow us to give evidence but the type of equipment, the choice and processing of the materials totally different from those of the 13th century artifacts, as well as the stratigraphic relationships, suggest a dating prior to them.

Not far away the shaving of a structure directly founded on the base rock emerged, of which only a short section between some cuts of later age can be documented. The lithic elements that compose it, calcareous and split-worked, are bonded with very abundant mortar and are not distributed according to a regular arrangement, a fact that could indicate that the structure is preserved only at the foundation level or that it corresponds to the core of a masonry. At the cistern, on the other hand, the shaving crest of a structure with a curvilinear profile was identified, which is intercepted to the south by the cistern itself and to the north by the

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boundary: it must develop further to the east, still covered by levels of rubble perhaps related to its demolition.

A last structure perhaps prior to the thirteenth century could be read in a fragment located in the northern part of the northern tower and partially covered by the perimeter of the latter. It consists of limestone pebbles and split "puddinga" elements, of medium-large size, which do not seem to have a regular arrangement and are linked by very abundant mortar. It also determines part of a paleo-walking surface. The flooring relating to a phase of the tower's life is laid on mortar, on a yellowish clayey layer or directly on the base rock and made of compacted pebbles, distributed within the contours determined by three parallel rows and regular spacing of pebbles elongated arranged in NS orientation; the result is a design characterized by four N-S strips parallel to each other and with equal dimensions (Fig. 13).

Figure 13 - Flooring of the Northern tower

This flooring has been the subject of numerous restorations that have allowed it to be used for a long time until the eighteenth century. In the points where it was missing, it was possible to observe a clayey deposit, with evidence of fires and holes on the upper interface, which seem to be linked to a floor, already removed in antiquity, relating to the life of the tower in its oldest stage.

Inside the southern tower, no pavements have been preserved but only a compact clayey layer that gives back ceramic material from the 13th century and which has been interpreted as a regularization of the soil functional to the laying of a system that can no longer be documented (Fig. 14).

Figure 14 - Clayey layer of the Southern tower

The construction phase of the eighteenth century is evidenced by the construction of an imposing ballast tanked in part of the eastern wall, with the probable purpose of strengthening it in its most vulnerable section, where it would not have endured attacks conducted with the new ballistic instruments.

To the XVIII century, but perhaps also to posterior age, seems to be attributable the system of dry stone structures made with materials of recovery from the collapses, that define, leaning to the city walls, an environment perhaps created to realize a military post from which to operate towards the outside of the castle remaining protected by a sort of embankment between the dry stone walls and the city walls itself, here characterized by numerous failures (Fig. 15).

Finally, to the phase of occupation by the French troops of the fortified complex, are attributable some evidence found in the pavement of the northern tower: these are small pole pits probably functional to support of a light canopy placed as a temporary

Figure 15 - Dry structure made with recycled materials

cover inside the tower. The dating of this last phase of tower's use is shaped by the discovery of ceramic fragments in *taches noires*.

4. Conclusions

"The mountains originally had large wings. They flew through the sky and stopped on the earth, following their pleasure. Then the earth shook and wavered. Indra cut off the wings of the mountains. He fixed the mountains to the earth to make it stable. The wings became clouds. Since then the clouds have gathered around the peaks" *(*R. Calasso – *La rovina di Kasch*, Adelphi, 1983 Milano).

This was the order established according to Vedic beliefs. Since then much of that original order has been forgotten or even subverted. The mountain reliefs and the cliff, far from stable and immutable, return to move. These are slow movements, barely perceptible in a lifetime, but sufficient to undermine the sense of permanence and stability that man has always longed for.

Against chaos, "the unmentionable present" (R. Calasso – *L'innominabile attuale*, Adelphi, 2017 Milano), the age of inconsistency, we can only oppose the memory, the testimony, an material architecture that blend with the very substance of the earth. The memory of when it was still possible to feel part of a world, a landscape, firmly anchored to a stable land.

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Fortress of yesterday, heritage of today, lesson of tomorrow: The Kasbah of the caïd of Tamnougualt

Hracherrass, Loubna

Abstract   Local building materials, available everywhere and free of charge, have been the basis of all buildings constructed by man since the dawn of time. These materials, which come from nature, perfectly reflect the links between people and their environment. Known for their respect of the environment and their energy performance, we notice a renewed interest towards them more and more these last years. Architects, scientists, and other actors are now going back in time to further unravel all the mysteries of these materials and construction techniques of yesteryear while conducting parallel reflections as to their updating in the face of current challenges. Morocco, a Mediterranean country but also an African one, still shelters an important urban but especially rural architectural heritage built in local materials and according to ancestral techniques as diverse as similar through the different regions of the country.

This paper will focus on a kasbah[1] of southern Morocco, called kasbah of Caid Ali of Tamnougualt. The choice of this building illustrates one of the key elements of Moroccan rural architectural heritage, the one of the Kasbahs, a word designating a citadel or fortress housing several ksars, in reference to the houses located within its walls. The particular architectural layout of the kasbah, its history, its role and the ancestral building techniques in local materials will be evoques in order to highlight its specificities.

Keywords: kasbah, ksar, heritage, architecture, local material.

1. Introduction

The kasbah of Caid Ali,was built in 1924 and was one of the command centers of the Mezguita tribe of southern Morocco. It is located in Tamnougualt, a large oasis in the Darâa Valley in the Moroccan Atlas Mountains, 75 km from the city of Ouarzazate in the southeast of the country. First built with local materials, mainly earth, it illustrates well the model of defensive architecture of the time.

This kasbah has undergone partial restoration work in 2014, but still houses a large part in ruins. The aim here is to present some of the work carried out in situ during a study trip in the site, by a group of student architects that I co-supervised with another professor supervising students in geology. The architectural surveys, the restitutions, the restoration and construction techniques of the walls and earthen structures will be evoked in this paper. The main objective is the enhancement of this heritage and the reinvestment of ancestral construction techniques in order to valorize them and eventually re-use them as a sustainable construction model.

2. The studyarea: a village in the Darâa Valley

Located at the edge of the Moroccan Sahara, in the Darâa Valley, an old caravan road connecting North Africa to Central Africa through Marrakech, this valley is one of the richest Moroccan regions in culture and history. It constitutes, in addition to the geographical units of the "Dir" of the Anti-

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[1] Citadel or fortress in Moroccan Amzigh language.

Atlas, the valley of Oued Ziz and Tafilalet, the region of Darâa-Tafilalet extending over 115.592 km[2] for a population estimated at 1 627.269 inhabitants in 2014. Since the administrative division of 2015, This region contain 5 provinces including that of Errachidia (chief town) and 109 municipalities.

Built at 75 km from Ouarzazate, the village of Tamnouguelt is part of the localities formerly built on the upperslopes of the middle Drâa river in the direction of the city of Zagora in the southeast of the country. Surrounded by the jbel kissane in the north and bordered by the Atlas mountains in the west, this village was the former capital of the Mezguita[2] region and the residence of the famous caïds of the time.

3. History and process of urban development of the ksar of tamnougualt

The date of foundation of tamnougalt is unknown with precision, however its history is strongly linked to the whole of the other ksours of the distrcit of «Mezguita» former political capital of the region formerly. Some historians refer to it as a former military garrison of the Saadians, who ruled the Darâa Valley from 1511. However, its real political and economic influence was recorded two centuries later, under the reign of the Alaouite[3] sultan Moulay Ismail who appointed Taleb El Hassan as the caïd in charge of its governance.

The management of the «ksar»was then handed to the descendants of this caïd until independence. These leaders were able to extend their powers over the whole of the Mezguita (from the Darâa gorges to the surroundings of the «Ksar» Aït Hammou Ou

Saïd) there foreformed one of the strongest and most redoubtable family lineages of leaders known in the history of Morocco, with that of the «glaoua»[4] leaders of the «telouat»[5] in the atlas, with which several episodes of tension have been reported through historical accounts, including mainly that of 1924, when the nephew of the caïd thami lglaoui at the head at the time of the glaouas, had attacked the ksar of Tamnougalt without managing to cross it after 17 days of battles and since which the Glaoua and the Mezguita became allies until the independence.

4. Village informations

- An ethnological and anthropological eclecticism:
  The "ksar" includes a diverse population reflecting its history, because in addition to the descendants of the caïd Taleb El Hassan who once governed the district of Imzguitn, it is home to amazigh speaking Drawa and Mrabtins Sadoqiyines, descendants of the zaouïa of Sidi Saleh of Lektaoua and some descendants of Mhamed Bennacer of the zaouïa of Tamgrout.
  In the past, a Jewish community lived in the ksar before its final departure, a mellah (Jewish quarter) whose remains survive until today, testifies to this presence.

- A socio-cultural mixing:
  The coexistence of people of different origins and referentials, has given Tamnouguelt a particular character witnessing a remarkable cultural wealth. In this village, the inhabitants are bilingual,

[2] It is a Moroccan rural commune of the province of Zagora, in the region of Drâa-Tafilalet in the south east of Morocco.

[3] In reference to the Alaouite dynasty, having reigned in Morocco since the second half of the XVII century.

[4] The inhabitants of a tribe of the Grand Atlas region north of Tizi-n-Glaoui, between Marrakech and Oued Idermi in Morocco.

[5] Amazigh village, of the province of ouarzazate, in the region of daraa tafilalt in morocco.

they speak (Arabic and Amazigh), perpetuate regional craft activities (ahwach dance, aqlal, etc..) and still practice traditions drawn from the past. In addition to the presence of businesses reflecting the regional dynamism of the past, the distribution of space and activities between the different human groups of the ksar testifies to a certain harmony and a cultural complementarity between the different social groups that cohabited there: the Draoua (Amazigh-speaking), the Amazighs, the Jews, and the Mrabtins (S. Mouline, 1991).

- Socio-political organization:
  In the Mezguita district to which tamnouguait belongs, the socio-political frame work is made up of lineages and fractions. There, the command was always local without ever asking for foreign protection. Thefamily of Oulad Taleb El Hassan ruled under strict rules, the Mezguita for a long time, the descendants who, at a given time, detached them selves from the mother house to form a new home and live separately, could not be designated to command (S. Mouline, 1991).

The caïd once in power, designated a khalifat to succeed him after his death, the latter was appointed by a judge,«ulamas»[6] and the «sheikh»[7] of the «zaouia»[8] of sidi saleh who met in tamnouguait for this purpose. All the ksours of Mezguita came under the authority of the caid of tamnouguait but they were administered locally by notables appointed by the wealthiest families of the region.

Morphologically, the ksar of Tamnouguait extends over 5.59 hectares and is articulated around four distinct entities: Aslim Haut, Aslim bas, Zaouiat Sidi miloud and the kasbah of the caid. It is built according to the models of typical oasis «ksars» of the region of south-eastern Morocco. This «Ksar» is built on top of a hill and is surrounded by mountains on both sides, on the ground plan, its shape is similar to an ocean liner that spreads out in length.

However this ksar has the particularity of not containing a wall surrounding the enclosure of its components, according to writings it has never had, but on the site, we can perceive parts of this wall badly preserved, but which has existed since the beginnings of this village for security reasons.

Another particularity characterizes this ksar, it is indeed about its accesses, in number of four, unlike the majority of the oasis ksars of the Moroccan south-east, in addition to an access giving on the big public place «assarag», there is an other access since the palm grove, then another one in the North East leading to the servants houses, to the slaves lodgings, to the soldiers shelters, to the Jewishfamilies houses, and finally an access giving on the public place next to the marabout[9] of the saint Aid Sidi Abdellah Ben Ali.
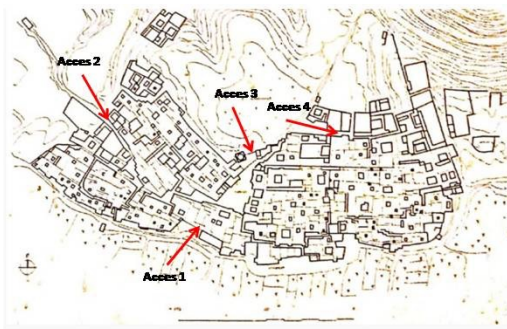

Figure 1 - The acces of the kasbah, author, 2022

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[6] In Islam, the ulama are the guardians, transmitters, and interpreters of religious knowledge.

[7] In morroco, it's commonly designates a chief of a tribe.

[8] It is a Muslim religious edifice that constitutes the center around, which a Sufi brotherhood is structured.

[9] Tomb of a saint.

The ksar includes besides two big kasbahs of which that of tamnougualt, a marabout, a mosque, a synagogue, a «mdersa»[10] and houses.

5. The Kasbah of the Caid Ali

The Kasbah of the CaidAli, is one of the main architectural buildings of the ksar, built by a caid whose name it bears, probably in 1924, it was his residence, and the center of command of all the Mezguita.

This kasbah is built in earth according to the models of the architecture of the houses of the notables of the Moroccan South East region, of a significant size, it is built around patios, has several rooms and rises in height. After rehabilitation work this kasbah, dressed a new skin, becoming a guest house for tourists.

It's building materials and design make it a bioclimatically sustainable building, given the thermal comforts felt inside. Indeed, this kasbah is totally introverted, so that all of its rooms have windows overlooking only the central patio witch is providing light and ventilation to this building. Its architecture reflects the genius of ancestral know-how in terms of energy-efficient construction, using adapted local materials and architectural arrangements adequate to the climate of the region marked by a cold winter and a very hot summer.

5.1. Flagship architectural elemnts of the kasbah

• The patio
A key element of the architecture of this kasbah, it provides natural light and airflow. In its original conception, it was entirely uncovered, but after the restorationwork, it wascovered with a roof composed of reeds, protected by plastic sealant films. However

this cover is removable at will, especially in summer when it is very hot, because the infiltration of air from the roof refreshes the galleries surrounding the patio thus conditioning the air. The patio of the kasbah, is marked by a succession of arcades of Arab-Moorish inspiration, translating a great crafts manship, given the complexity of their construction in earth.

Figure 2 - The patio, author, 2021

Figure 3 - The roof of the patio, author, 2021

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[10] Muslim religious education institution.

Upstairs, and always in the same principle of the houses with Arab- Mooris patios, we find a wooden guardrail with an ornamentation simply made of a repetition of the same octagonal motif.

- **TheRooms**

In this kasbah, the rooms are designed in a traditional way, they are longer than wide for structural reasons (because the length of the joistsserving as beams carrying the roofs does not allow large spans). The thickness of the wallsisaround 50 cm for the interiorwalls and can reach 1m for the exteriorwalls.

Most of the rooms in this kasbah are multi-purpose, they serve as living spaceduring the day and as sleeping space at night.

Figure 5 - Niches in plaster,in the room of the favorite, author 2021

Figure 4 - The patio, author, 2021

In addition to the rooms mentioned above, this kasbah contains a room called the favorit's room, it is dedicated to the main wife of the caid, it is distinguished by its larger size, its location in the kasbah, its architectural elements, particularly well maintained compared to otherrooms, such as decorative wall niches in plaster, arches and by a wall claddind in traditional earthenware tiles.

Figure 6 - Arches,in the room of the favorite, author 2022

- **The Rest space**

It's a space located near the main door, exclusively reserved for men (the the upper Floor is indeed the only place invested by women), this space is articulated around a small patio, and distribution galleries, it is used in par-

Figure 7 - The rest space, author 2021

ticular in summer, to prevent during the day against the excessive heat. The thickness of the earthenwall can reach 1 m wide.

• **The Caid Room «BIT LKAID»**

This is the most important space of the kasbah, it is located on the ground floor near the main entrance. It acts as a workspace for the caid, in which he exercises his functions according to his prerogatives. This room, was polyvalent,of share the variousfunctions that took place there: perception when the tradesmen, the landowners, the farmers came there to paytheir taxes, court, when hearings, took place there in the presence of judge «cadi», meeting room to receive the personalities, or the ulama to discuss and legislate on religious issues and finally a place for storage, a sort of safewhere money, gold and important papers werekept.

Spacially, this room is different from the others ones of the kasbah, with an entrance door of small height, made of solid wood studded and decorated with arches.Its height

is indeed thought in such a way as to oblige the people entering it to bend their heads in a way of respect, for the caid.

The lock of this door is also considered among its elements of distinction, infact, given the importance of this room, its lock was ingeniously thought according to a device, certainly artisanal, but which remains rather complicated, It's made of wood cut with the hand and only the caid proceeded it.

Figure 8 - Height of the door in relation to the human size, author 2021

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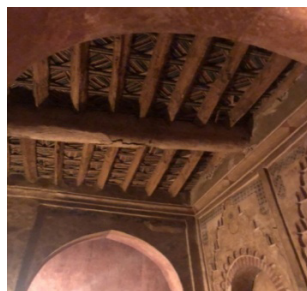*Figure 9 - The wooden door lock, author 2021*

Figure 11 - The tataoui, in the caid roorm, author 2021

Inside, we find arcades of Arab-Moorish inspiration which are better worked than those of the central patio of the house, marking more, the importance of the room compared to the other spaces of the kasbah. The roof of this room is considerably also, well worked, it is made of «tataoui[1119]», a kind of wattle and daub of vegetable fibers in occurrence the pinklaurel, imported from the regions of the Moroccan high Atlas, dyed in yellow or in ochre with natural pigments of mineral or vegetable origins, supported by joists in trunk of palm tree coming from the palm grove of the ksar, cut in two or in four according to the supported load.

Besides the aesthetic dimension referring to the material ease, the tataoui is presumed to becarrying the luck «baraka» in the popular conscience of the inhabitants of the Moroccan southeast to the owner of the house in which it is used.

- **THE KITCHEN «Kochina»**

Among the architectural particularities of this kasbah, we note the existence of a kitchen on the floor. Indeed, in the majority of rural houses in Morocco, the preparation of food and the baking of bread is done outside. In this kasbah, there is a space inside, 3.5 meters high, containing two ovens traditionally built in clay for cooking, whose smoke is released through a zenithal opening also providing natural lighting to this this window-free space.

Figure 10 - Niches and arches in the caid roorm, author, 2021

Figure 12 - A cooking oven in the kitchen, author, 2001

[11] The origin of the wordrefers to the region of Tata, located in southern Morocco, it is there that this type of ceiling made of mosaic of vegetable fibers in laurel, reeds and palm is the most common. It is a decorative ceiling of Amazigh inspiration with strong ethnological symbolism.

5.2. *Constructive tehniques*

The kasbah of the caïd is built entirely with local materials, its walls are made of raw earth and its stone bases, like the other houses of the ksar of tamnougualt.

Its construction was made according to the traditional techniques widespread in the region of the Moroccan southeast. This type of artisanal construction is characterized by its low cost, its ease of implementation and its energy efficiency.

Here, we find two techniques of construction in raw earth, the pisé and the adobes of raw earth. In what follows we will present these two traditional techniques, which architecture students had the opportunity to approach during a workshop organized on site.

5.2.1. Construction of the walls in pisé

The construction of an adobe wall passes by two stages: the installation of the bedrockand the construction of the wall in itself thereafter, this operation is done by a team usually composed of 5 to 6 people, resulting from the same «douar»[12], according to a precise distribution of spots.

A. Installation of the formwork

Before starting the construction of the wall, we first proceed to the installation of the forms. On the ground, we start by laying a kind of wooden sticks called «chkoula» in Amazigh, spaced about 1m to each other and openwork at the ends, on these «chkoula» we put boards in parallel (the distance between the two boards corresponds to the width of the desired wall), The maintenance of these boards is done by wooden rods of a rounded shape and pointed on one side, called «tigousin» in Amazigh, fixed perpendicularly on the «chkoulas», these rods are connected by strings or «chrit» in local dialect, on both sides of the boards to keep

them straight. We then obtain a kind of parallelepipedic wooden mold called «louh» or «amdday» in Amazigh, approximately 80 to 90 cm high, its width and length depend on the size of the wall to build.

Figure 13 - A sample of a formwork, author, 2021

Once the formwork is ready, we proceed to the installation of the foundations of the wall.

B. The foundations

The foundations are made of large stones called «trhati» in Amazigh, usually collected locally, they are laid at the bottom of the formwork molds on a height of about 20 to 40 cm, they allow to support the earth of the walls but also serve as a barrier against rising water capillaries. When laying the« trhati» the «maalem» must be careful to remove easily the «chkoulas» during the dismantling.

C. The wall building

The pisé is poured directly over the bedrock stones, it is made of soil recovered on site, mixed with straw or small branches and small stones collected on the spot. During the preparation of the pisé the maalems ensure to respect a certain proportioning, so as to balance the different constituents of the pisé (often argillaceous soil must be in majority in the composition, the vegetable

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[12] It is a rural village in Moroccan dialectal Arabic.

branches and the stones must not be too large in order to ensure a good grip and resistance of the material).

The pouring of the pisé is done in stages: maalem pour a first layer, the dammers called «achbat» in Amazigh dament it up to the desired height. The «azduz» or the «mkirz» in Amazigh is a heavy wooden tool of about 1.2 m high, it is used to compact the different layers of the poured pisé.

Once the height of the wall is reached, the wall is allowed to dry in the open air (the drying time depends on the season) during our workshop in November, the complete drying of the wall built by the students on the spot required one day.

After checking the complete drying of the wall, we proceed to the stripping, it is an easy but delicate operation requiring a a special ability on the part of the masson not to affect the built wall. Once the boards are detached, the beater or «achbbat» checks the wall, before coating it with a very thin layer of earth.

Figure 14 - Students preparing the pisé on the spot. author 2021

Figure 15 - Students using azduz during the Construction of the wall, author 2021

Figure 16 - Maâlem, sripping the wall, author 2021

Tools used in the construction of an adobe wall

Louh or ammday	
Tabout	
Azduz or L'mkirez	
chkal	

Figure 17 - Traditionnal tools used in the construction of an adobe wall, author, 2021

5.2.2. Raw earth bricks

After the pisé it is the second technique of earth construction used in this part of the country. The maalem of the region make their own bricks, which are distinguished in two types: the bricks or adobes of raw earth of small size, and «lahbil» bricks of raw earth also but of larger size. The main material of these two bricks comes from the surroundings of the building site.

5.2.2.1 Raw earth Bricks

The maalem mix the earth previously sifted with straw or vegetable fibers and add water to form a soft enough paste, that they then put in wooden molds moistened with water and sanded, to avoid adhesion of the mixture to the walls. They pack the corners, and level the surface of the bricks with sticks to get similar bricks. they let them dry in the open air before unmolding them, avoiding exposing them to the sunlight so as not to crumble them, the drying time requires 4 to 5 days on average, in the case of our workshop 4 days were enough for a complete drying.

Figure 18 - Student preparing adob row earth, author 2021

5.2.2.2. Raw earth Bricks called lahbil

These are also raw earth bricks, made almost like the previous ones, the difference lies in their larger size and their coarser composition, indeed to make these bricks one does not proceed to the sifting of the earth, and little care is given to the composition of the other elements of the adobe as the nature of the elements themselves (it may contain pieces of glass, plastic, etc.) or the size of the vegetable fibers or the straw entering its structure. The moulds used to make «lahbil» are often larger and individual, on our site the maalems worked with prefabricated artisanal moulds in taule.


Figure 19 - Student preparing lahbil, author 2021

5.2.4. Traditional roof techniques

Once the construction of the four walls is completed, we move on to their roofing. The maalems begin by laying beams perpendicular to the walls, spacing them out from about 1 to 1.4 m, one in relation to the other. Their number depends on the length

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of the space to be covered. A second cover transverse to the beams is added, formed by beams of a length of 2 to 3 meters maximum, these are spaced approximately 30 to 40 cm apart. These beams and girders are fixed to the walls with a clay mortar. Then, the craftsmen come to weave on top of it, a cover made of reed racks reinforced with tree branches that they cover with a plastic film to ensure its waterproofness, before covering the whole with an earthen slab that they coat with a mixture of clay and straw. These traditional roofs are used as cover and floors supporting the floors, the wood of the beams and joists serving as structure comes from the branches of trees, and the trunks of palm trees split in 2 or 3 according to the scope of the pieces.

Figure 20 - Roof on tataoui, author 2021
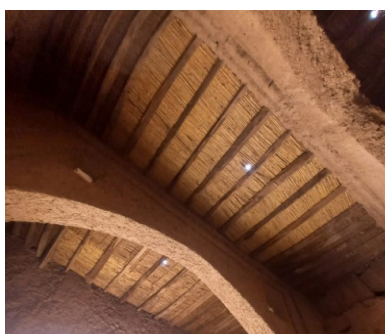
Figure 21 - Traditionnal roof, author 2021

5.2.5. The Wall coatings

In this kasbah, we found several types of wall coatings, earthenware, plaster and straw, lime, «tamelast» and «tadelakt». This last one, considered indeed as one of the noble coatings through the history of Morocco, requires a particular knowledge, that only the local craftsmen hold.

a) «**Taddelakt**»

Among the objectives of the workshop that I led in the kasbah, there was the initiation of architecture students to the techniques of preparation and implementation of this coating whose name in Amazigh «taddelakt» comes from the verb «dalaka» in Arabic, which means massage. Indeed, in the implementation of this coating the craftsman makes movements that are similar to a massage on the surface of the walls. The trainees were able to make with the help of a specialist craftsman the traditional taddelakt, whose main component is the local natural fermented lime, mixed with lime water and natural pigments at the base (eggs, saffron, indigo powder, etc.), Once the mixture is obtained, it is applied to the walls, ideally with a patina of pebbles, or

Figure 22 - Student student applying taddelakt, author 2021

with traditional wooden trowels to smooth its surface while creating decorative undulations. The «tadelakt» is appreciated for its good sealing, its decorative variants and its fungicidal properties, however it is considered among the most expensive traditional coatings used for a long time in Morocco.

b) Tamelast

It is the traditional coating most found in the kasbah, its name comes from the Arabic verb «malasa», which means smooth, because it is used to smooth the surface of the walls in earth, it is composed of very fine earth, water and straw. This technique is applied through a tool called «tatebalt» in Amazigh.

The kasbah of the caid, illustrates well the example of a traditional vernacular architecture, made with local materials, according to the old techniques, it presents some pathologies due to the nature of the earth material, the main component of its architecture and to the endurance

6. The Pathologies of the Kasbah

The Kasbah of Caid Ali, presents several pathologies, despite the restoration operations that it has known. In order to detect them, and because of my training as a heritage architect, I carried out a diagnostic work, initiating the students to its different techniques in order to draw up a picture of the different pathologies of the kasbah, in order to provide for the appropriate actions for its safeguarding.

This work took place in three phases:

1. The phase of pre-diagnosis: the primary stage of knowledge of the building: it is based on a first global approach of the building based on the recognition of its constructive system and the determination of the state of conservation of the elements and materials which compose it, this phase is essentially based on visual observation.

2. The information collection phase: it corresponds to a collection of all the information necessary for the establishment of the complete sanitary diagnosis of the building. (information resulting from documentary, historical and archaeological studies, etc.). This phase also allows: an investigation of the constructive system and the physical-constructive recognition of all the elements which constitute it, the identification of the various building materials used in this kasbah and the statement of the possible degradations and the various attacks (microbial, fungal, etc.).

3. Diagnosis phase: this phase allowed: to analyze, in depth all the information, to draw conclusions on the sanitary assessment of the building and finally to formulate the recommendations relating to the actions to be carried out in order to treat the identified pathological problems (this aspect will not be presented in this article).

The results of this diagnostic work allowed us to classify the different pathologies encountered in the kasbah as follows:

a) Superficial degradations: Disbonding of plaster, paint, earthenware;

Figure 23 - Surface detachment of the earthen mortar

Figure 24 - Surface detachment of the earthen mortar, author 2001 and craks, author 2021

Figure 25 - Detachment of retaining boards of stairs

Figure 26 - Degradation of the base of acolum, author 2001

b) Structural degradations: Degradation of the base of certain columns of the central patio, detachment of retaining boards of some stairs, cracking of beams.

c) Cracks: That we classified in 4 categories

Micro-cracks: Filiform cracks smaller than 0,2 mm, corresponding to fine cracks on the surface of the paint or coating of a wall, a ceiling or any other support.	 Figure 27 - Author, November 2021
Faïençage: Cracking in the form of fine networks of micro-cracks of less than 0.2 mm in width. The faïençage is an aesthetic problem.	 Figure 28 - Author, November 2021

Cracks: Visible linear crack with a more or less regular layout, with a width between 0,2 and 2 mm.	*Figure 29 - Author, November 2021*
Lizarding: Cracks of more than 2 mm of width which crosses the thickness of the masonry of a construction according to a frank, long and zigzagged course.	*Figure 30 - Author, November 2021*

The various degradations and pathologies noted are due to a whole of factors:
- Internal factors: the nature of the ground (instability of the ground), the nature of the materials and the construction system (earth).
- External factors: restoration works and repairs of the building, imbalance of the thermal regime of temperature and actions due to humidity, stormwater, etc.

Conclusion

Our elders, generated in Tamnougualt constructions adapted to the context, perfectly in agreement with their environment, they provided a maximum of comfort to their original inhabitants while meeting other needs including security,that marked marking the country's former wartime periods. There, the local knowledge and the constructive genius joined together to serve the users. An architecture certainly vernacular, but sustainable and self-sufficient, so sought after nowadays. True living laboratories, these places must be reinvested in order to learn from them. Long forgotten, they risk disappearing forever, carrying mysteries, and erasing a large part of a rich human history.

In Morocco, a resurgence of interest is recorded in favour of the heritage in recent years, but it remains essentially focused on the rather urban heritage, whereas the country abounds in architectural treasures in our campaigns.

However, reinvesting, this rural heritage, should not be limited to actions of its simple restoration, although essential to ensure its sustainability, but the return to heritage should also be in a learning purpose, because as Frank Liyod Wright (1988) said building is like «the creative process based on experience» and is not restricted to a technical act. The earth, this efficient organic material, like all the other local materials (very popular) nowadays, holds many secrets still to be discovered in order to benefit from it in our contemporary architectural productions.

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Analysis of the evolution of typologies
in the Malagueira neighborhood

C. Petronila

PhD student, School of the Arts, Archicture Department; Évora University, Portugal.

S. Salema

PhD; School of the Arts, Archicture Department; Évora University, Portugal.

J. Matos

PhD; School of the Arts, Archicture Department; Évora University, Portugal.

P. Guilherme

PhD; School of the Arts, Archicture Department; Évora University, Portugal.

Abstract   This research was aimed to understand the evolution of Malagueira's typologies and their variations. The urban plan for Malagueira was initiated in 1977 by the architect Álvaro Siza Vieira, for an area of 27ha and the construction of 1200 dwellings.

The houses in the Malagueira neighborhood are considered an example of ingenious design. In fact, on a fixed plot of 8m×12m, very well adapted to the natural topography of the site, Álvaro Siza considered not only the possibility of a courtyard house (with outdoor space within the plot), but also the predefined expansion of the house that considers the growing needs of a family and its development. Álvaro Siza designed two basic evolutionary types, from 1 (T1) to 5 (T5) bedrooms, with a maximum of two floors and variations in the location of the uncovered patio: typology "A" with a front patio and typology "B" with a rear patio. However, in 1988, other possible variations of the predefined types were designed, through the reconfiguration and repositioning of the interior staircase. In this study we will analyze some of these variations and their evolution, as well as the feasibility of this development. Despite the basic principle of areas, the concept became quite interesting due to the adaptation to the different familial composition of the inhabitants, as well as to the volumetric variation that cancels the potential simplicity in the repetition of the different typologies.

From the study carried out, we concluded that some typologies require more adaptation work (namely, changing the location of the kitchen), which could make their development more difficult or impossible. This induces some impediment at maximum densities that induces diversity.

1. Introduction

1.1. Malagueira neighbourhood

The urban plan for Malagueira was initiated in 1977 by the architect Álvaro Siza Vieira, for an area of 27ha and the construction of 1200 dwellings (GOMES, 2016).

The houses of the Malagueira neighborhood are characterized by their evolutionary layout, with highly rationalized areas, supported by a functional organization, based on the concept of house-patio. The architect Álvaro Siza Vieira, has thought of 8mX12m, thought of houses for a plot of houses, the typology "A" with a front patio and the typology" with a rear patio, with an L-shaped layout, in both types. Each of the typologies can be evolutionary, from 1 (T1) to 5 (T5) bedrooms, with a maxi-

mum of two floors, so they can adapt to the needs of the residents and the evolution of the family.

Both typology "A" and typology "B" are arranged between walls that can vary in height. The houses have the peculiarity that the water supply, electricity, telephone, etc., are made of elevated channels, which are also a hallmark of the neighborhood of Malagueira (VIEIRA, 2012).

This project, designed by architect Álvaro Siza Vieira, stands out clearly from others, because on a plot of 8m×12m there is a house-patio, with a wide variety of typologies based on the position of the outdoor patio and the position of the stair, which in a way distinguishes this project of Malagueira from other neighborhoods.

The houses of the Malagueira neighborhood were also intended to be evolutionary. Therefore, in 1977, the architect Álvaro Siza Vieira designed two basic initial typologies (A and B) from were different possible variations emerged.
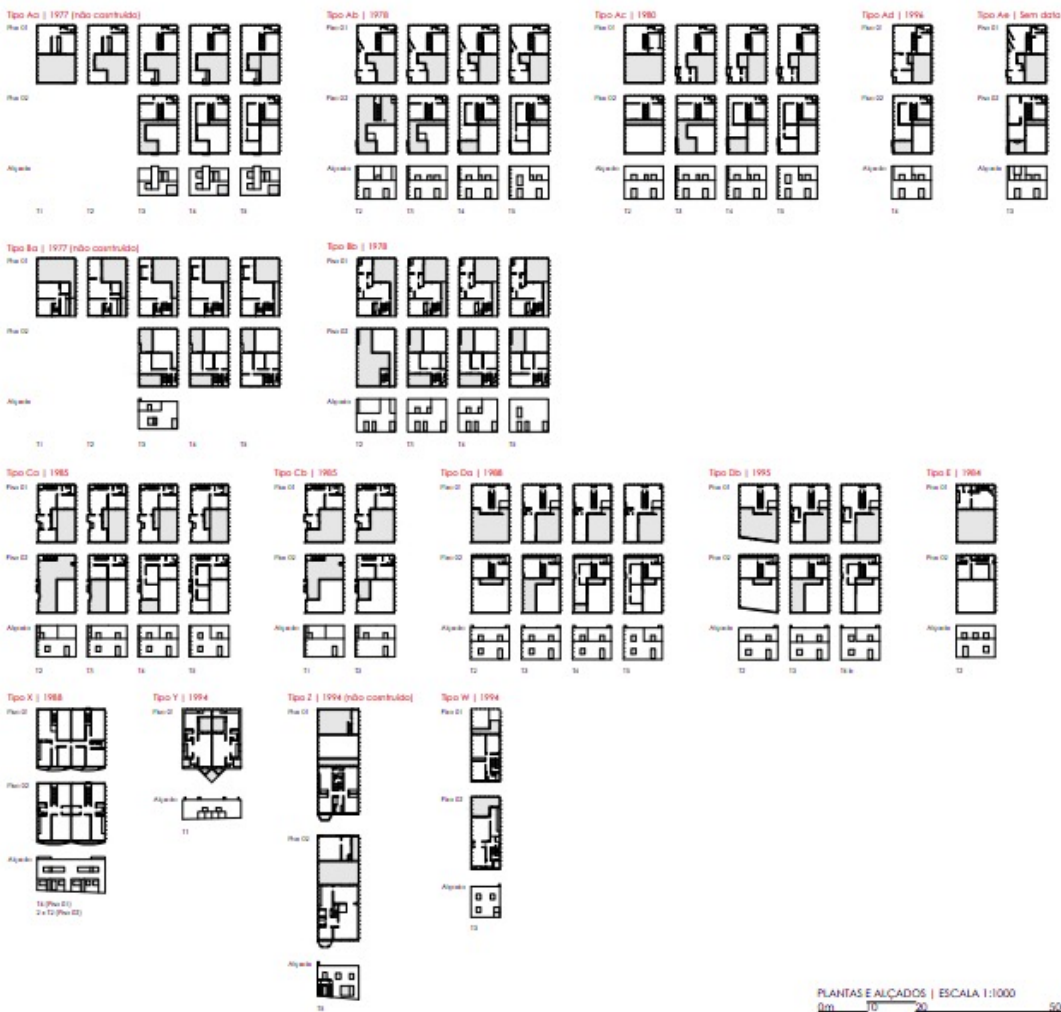

Figure 1 - Floor plans of the different types of housing
Source: Sousa, 2017

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According to José Pinto Duarte (2007) 5 main housing typologies were developed: A, W, X, Y, Z (figure 1). Type A was the most built and served as a basis for the other types. Types W, X, Y and Z, were signed off later and are considered special cases because they were designed for specific situations and contexts. Type Z, and the first versions of the type A (Aa) and B (Ba) plants from 1977, were not built. Just a few type B were built.

This research focused on 7 variations of the typology and their evolution problems.

The main problem in the (re)development of a house is essentially the location of the kitchens and sanitary facilities, which, in case of a change / alteration of the location, entail the need to change the water and sewage connections, which can affect the development of a house.

There are numerous versions to the types of houses, which emerged after 1977, as we can see in Table 1. These variations were developed to answer dwellers particular needs and requests in participatory events.

Table 1 - Color reference to identify in the general plan, Figure 2, which type of house

Types	Year	T1	T2	T3	T4	T5	Total
Ab	1978		25	334	29	30	418
Ac	1980		88	80	29	27	224
Ad*	1996				1		1
Ae*	n /d			1			1
Bd	1978			5	2	2	9
Ca	1985		1	149	32	8	190
Cb	1985			1	9	1	11
Da	1988		15	134	9	1	159
Db*	1995				7		7
E	1984		1				1
F*	n / d	6					6
P1**	n / d			7			7
P2	n / d			28	6		34
X **	1992			10	5		15
Y ***	1997			20			20
TOTAL		6	130	769	129	69	1103

* unidentified location.
** 7×12m, non-patio
*** 6×15m, non-patio

Source: Duarte, Léger & Gisela Matos, 2004

The first variation of Type A appeared in 1978 with Type Ab, followed by Type Ac in 1980. The first variation of Type B also appeared in 1978 with Type Bb, in which the kitchen is located at the back of the patio and not on the main façade, as in the T1 and T2 typologies of Variant B.

Later, in 1985 and 1988, other versions were added, based on the Type A house, in which the patio is located at the front of the property. In 1985 appeared the type Ca and in 1988 the type Da, the two versions where the development of different typologies is most possible.

Figure 2 - General plan with the location of the different housing types
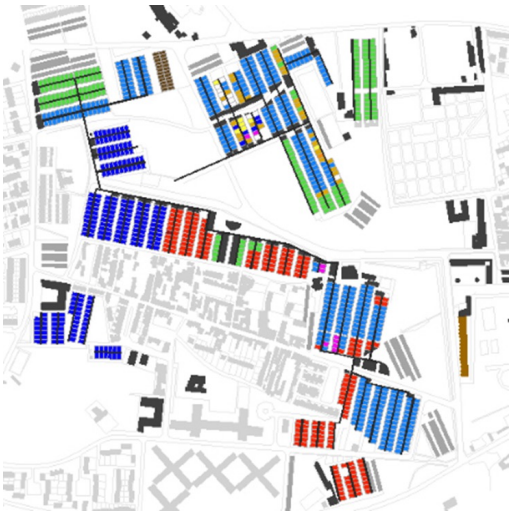
Source: José P. Duarte

2. Reproduction of the plans

This research was based in the analysis of the redesign possibilities of the 7 variations of the typology and their evolution problems, taking into consideration the initial drawings – plans, elevations and sections (2 and 3D) – of the different types and typologies. Each typology variation

was analysed and evaluated in terms of the changes each bedroom enlargement (T1, T2, T3, T4 and T5) introduced and the changes needed to cope with that evolution in size. We addressed the difficulties associated with the development of the construction, especially the change of kitchen and sanitary facilities that require changes in the infrastructure (water and sewer connections) that can (pre)determine the development of a house.

Although the first versions of the type A (Aa) and B (Ba) from 1977 were not built it is considered useful to analyse them, since they were the first versions of the plans drawn by the architect and served as the basis for subsequent versions.

Note: The plans of the different versions of the houses and typologies were reproduced based on the original drawings of the architect.

2.1. Type Aa Malagueira house - 1977

The plan of type Aa from 1977 is characterized by the fact that the patio is located in front of the property, that is, facing the street. From the analysis of all the typologies of type Aa, it can be concluded that the evolution from a T1 (one bedroom) to a T2 (two bedrooms) is simple. The T2 develops into an outdoor patio, but the development from a T2 to a T3 (three bedrooms) is more complicated, because in the T2 there is a major change in the kitchen area (Figure 3, shown in red), and in the T3 this space is abandoned to make room for the access stairs to the second floor. That is, there is a major change of the kitchen positioning from a T2 to a T3, which is seen as a major difficulty in the development. However, to change from a T3 to a T4 (four bedrooms) or a T5 (five bedrooms) is rather easy (Figure 3) since there is no change in the kitchen positioning.

Figure 3 - Plan with all typologies, version A, of the year 1977. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. circulation, 7. storeroom

2.2. Type Ba Malagueira house - 1977

The type Ba plan from 1977 is characterized by the fact that the patio is located at the rear of the property. From the analysis of all the typologies of type Ba houses, we can conclude that the evolution from a T1 to a T2 is simple, as in type A. However, to evolve from a T2 onward, there is a need to change the position of the kitchen, by building within the back courtyard, which is more complicated. The T1/T2 kitchen is located (Figure 4, shown in red) in the front, whereas in the T3/T4/T5 that space becomes the access staircase to the second floor, inducing to a relocation of the kitchen are, just as in the type A house. So, in Type Ba we have the same difficulties as in A to change between T2 and T3. The transition from the T3 typology to the T4 and T5 typologies is as simple as in the type A.

2.3. Type Ab Malagueira house - 1978

The type Ab of 1978 is one of the variants designed by Siza Vieira, based on the house type A (Table 1), in the different typologies: 25 houses - T2, 334 - T3, 29 - T4 and 30 houses - T5.

In the analysis of the house of type Ab there were no T1 built (Figure 5 and Table 1), so we analyzed the T2 (2 bedrooms) and its evolution to the typology T3 (3 bedrooms). The kitchen in the T3 changes slightly and goes past the circulation changing both its location and size next to the main facade (shown in red in Figure 5). Changes from T3 to T4/T5 continue to be simpler.

2.4. Type Bb Malagueira house - 1978

Type Bb, built in 1978, is one of the variants designed by architect Siza Vieira based on the Type B house. This type of house was built 9 times (Table 1) in different ty-

Figure 4 - Plan with all typologies version Ba, of the year 1977. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. laundry, 7. circulation

pologies: 5 houses - T3, 2 houses - T4 and 2 houses - T5.

In our analysis no T1 or type T2 of Type Bb were actally built. However, there continue to exist some positioning changes from the T2 to T3/T4/T5 (Figure 6, shown in red).

Figure 5 - Plan with all typologies version Ab, of the year 1978. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. circulation, 7. laundry

Figure 6 - Plan with all typologies version Bb, of the year 1978. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. laundry, 7. circulation

2.5 Type Ac Malagueira house - 1980

The type Ac from 1980 is one of the variants of the house type A. This house type occurs in 224 houses built in the district of Malagueira (Table 1), in the different typologies: 88 houses - T2, 80 - T3, 29 - T4 and 27 houses - T5.

In the analysis of the house type Ac, according to Table 1, again there is no T1 typology. Comparing the T2 typology with the T3 typology, there is also a change in the location of the kitchen, Figure 7. As in the previous analysis (type Aa, Ba, Ab, Bb), there is a major change in the positioning of the kitchen, that is kept unchanged at T3/T4/T5 typology, as can be seen in the plants.

2.6. Type Ca Malagueira house - 1985

The house, type Ca, designed in 1985, is one of the variants based on type A, because it has a courtyard facing the street, with an L-shaped plan. According to Table 1, 190 houses were built. In the Malagueira neighborhood, 190 houses of type Ca were built, in different variants: 1 house of type T2, 149 houses of type T3, 32 houses of type T4 and 8 houses of type T5, T1 is not recorded in this variant.

In the analysis of the house of type Ca (Figure 8) the kitchen is always in the same position (shown in red in the drawings), independently of the number of bedrooms. Thus, a continuous evolution in the number of bedrooms from T2 up to T5 is possible with no major change in infrastructures.

2.7. Type Da Malagueira House - 1988

The Da house type, designed in 1988, like the previous Ca example, is one of the variants based on the A house type. According to Table 1, 159 houses were built, in different variants: 15 - T2, 134 - T3, 9 - T4 and 1 house - T5, also in this version there is no record of built type T1.

House type Da (Figure 9) also has a fixed positioning for the kitchen (shown in red), in all bedroom evolutions.
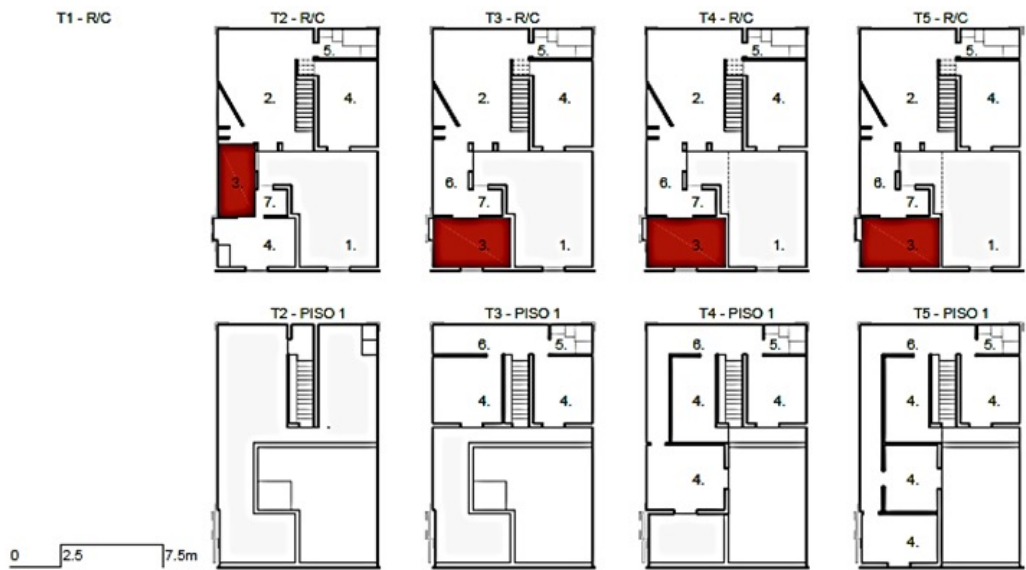

Figure 7 - Plan with all typologies version Ac, of the year 1980. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. circulation, 7. laundry

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Figure 8 - Plan with all typologies version Ca, of the year 1985. 1. Patio, 2. living room, 3. kitchen, 4. bedroom, 5. sanitary installation, 6. circulation, 7. laundry
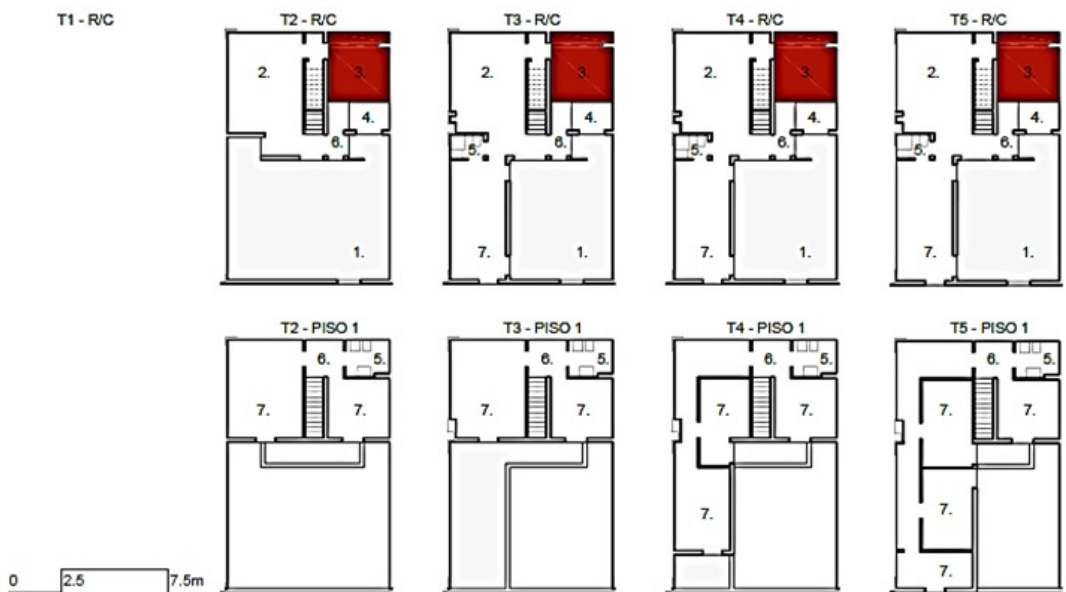

Figure 9 - Plan with all typologies version Da, of the year 1988. 1. Patio, 2. living room, 3. kitchen, 4. laundry, 5. sanitary installation, 6. circulation, 7. bedroom

3. Discussion and conclusions

We analysed 7 versions of the house types and concluded that only Ca (1985) and Da (1988) house types allow a simple evolution from a T1/T2 (up to 2 bedrooms) to the T3/T4/T5 (from 3 to 5 bedrooms) without major internal infrastructural changes. All other typologies impose a major change in the Kitchen to upgrade from a T1/T2 to a T3/T4/T5.

Table 2 - House types in terms of its ease of evolve and change

	T1/T2	T3/T4/T5	Not easy changes	Easy changes
Ab	25	393	25	393
Ac	88	136	88	136
Ad	0	1	0	1
Ae	1	0	1	0
Bd	0	9	0	9
Ca	1	189	0	190
Cb	0	11	0	11
Da	15	144	0	159
Db	0	7	0	7
Total	130	890	114	906
%	13%	87%	11%	89%

Critical changes occur when there is a need to change the positioning of the kitchen. We observe an unseen bottleneck that refrains T1/T2 house typologies Aa, Ba, Ab, Bb, Ac and Ca to evolve further without major intervention.

The maximum volume (with the maximum number of bedrooms) is only easily achieved at house types Ca and Da, or on other typologies if originally, they were already built with at least 3 bedrooms.

We believe this constraint induces some impediment (11%) in arriving to the maximum overall built density (easy for 89% of houses), contributing to an unseen or unstated volume and façade diversity.

It is unclear if this was initial thought by Álvaro Siza to maintain Malagueira's architectural and urban diversity.

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The imprint of the ideal city on the ancient city of Guelma, Algeria

Fatma-Zohra Haridi, Ali Boulemaredj, Amira Ouled-Diaf

Université 8 mai 1945 Algérie

Sara Khalil

Université de Biskra Algérie

Abstract   The starting point of this research is the evaluation of the impact of the imprint of the Platonic city on the architecture of the cities of the southern shore of the Mediterranean, and particularly the ancient city of Guelma (a city in northeastern Algeria). In this respect, approaching the imprint of Plato's Ideal City (384-377 B.C.) as a constituent of scientific research immoderately requires a qualitative methodology. To know if the ancient city of Guelma is a Platonic filiation. The epistemological statement of the central postulate of this research based on the enciphering of the extrapolation of the formal and constructive principle of Plato's ideal city and the examination of the proper value of the model of the ancient city of Guelma physically and structurally concerning constructive knowledge, spatial organization, shaping and use of materials. According to this scientific approach, how can we evaluate the imprint of the Platonic city on the architectural form of the ancient city of Guelma? For the authentic transmission of a knowledge of the past, the postulate of arrival of the analytical point of view rests on references and determinations of the ancient architectural form of Guelma inspired by the platonic inscription.

1. Introduction

The Roman foundation of Kalama, the ancient city of Guelma, is a model developed from the autarky of Plato's ideal city, which was recognized by all ancient thinkers and historians as a city whose civic virtue carries the absolute essence of the paradigm of a just and humane city. Among them are Strabo, Polybius, Vitruvius, or Hippocrates in his "Treatise on the Airs, Waters and Places".

Much later, other scientists such as Dureau de la Malle, Ravoisié, Delamare, Suchet, Grellois, Gsell and Hase recognized in the first place that ancient Kalama had all the constituent elements that could classify it among the Roman cities of eastern Algeria whose foundation was due to the inspiration of the Platonic ideal city. The aim of recognizing this paternity is to show in a coherent manner that Kalama possesses all the constituent elements of the Platonic ideal city.

To this extent, if so, should we admit that Kalama implicitly influenced by the autarkic paradigm of the Platonic ideal city? To understand or represent this fact by recourse to the influences that occurred in the issues attached to maintaining the institutional performance and development of the political and military role of the Roman city as Pradeau (2010, p. 170) asserts. In the first place, it is to make this reflexive probability objective.

In other words, the hypothesis of the presence of duplication seems particularly acceptable insofar as this recognition based only on the reflexive probability that seeks to establish paternity thanks to the potentialities of the ideal City. However, the question of the paternity of the Roman city has given rise to two major problems, that of inconsistencies in the interpretations of ex-

perts and that of historical errors due to omissions of moral meaning.

The Roman cities adopted Plato's representation of the Just City in which good and evil advocated as the basis of the living environment as advocated by Thein (2001). Hence, the reference to all the probable findings deduced puts the question of determining the choice of a necessary comparative approach back on the table. Whether the hypothesis made is one of analytically recognized duplication.

2. Method and discussion

The analytical method employed is a comparative method that it is appropriate to note before asserting that there is a real duplication of Kalama resulting from the Platonic ideal city. First, we need to study Plato's arguments about the ideal city in reality. Moreover, the analysis of the motives invoked of the epistemological, formal and representational meaning reconstructed as a considerable information carrier. The comparative method envisaged aims at highlighting the effect of the imprint of the Ideal City on the ancient Kalama, in particular by means of the concordances that underpin comparability. In this way, two combined levels of similarities between the two cases studied are distinguished. We are therefore dealing with a typology based on a double analysis. Finally, this comparative analysis sheds light on the renewed interest in comparison that leads us to the similarity of the criteria of comparability and on the implications of the criteria examined. It thus shows that the perennial duplication of the model of the Platonic Atlantad ideal city of myth and utopia inherited from Plato and Aristotle's Kallipolis. For Plato, it represents the foundation of any city than the City of Virtue. Aristotle defines the Kallipolis as governed by a justice that deploys several forms of law (Tzitzis, 2021). He states that when one moves from the real city to the ideal city, one placed before all the Roman cities of the entire Mediterranean basin.

3. The Platonic ideal city

It is for this reason that on the epistemological, representational level and formal, as Aristotle reminds us again in Politics III, (book IV). the plan and form shows the ideality perceived also in the laws that govern the city with an urban code that organizes the layout of the dwellings, the amenities for various activities (fig. 1). This code ensures the distribution of the blocks according to the rank of the inhabitants. Each part of the city corresponds to a function assigned according to the orthogonal division and the regular layout. This checkerboard plan makes the ideal city faithful to its founding place and to the permanence of right-angle geometry.
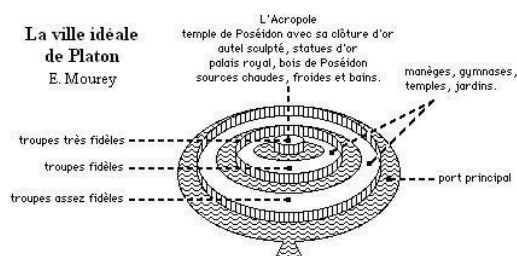

Figure 1 - La ville idéale
Source: Haridi F-Z. 2016. Headings

4. The conceptual implications of the ideal city

On the epistemological level, the Platonic ideal city, which according to Gros (2011) embodied in "purity, ornamentation, regularity, order and friendship". For Aristotle the image of the completed city, which in its form as well as in its content testifies to a universe in which civil society forms the participation of every citizen in the same society and participation of each citizen in the same collective imaginary that "unifies power through societal federation" (Van Der Meeren, 2002). The ideal city [urbs civitas] is the fulfilment of the heavenly city that

Kant (1724-1804) calls the "city of ends' and that Plato defines as a world "made of measure and beauty".

On the formal level, Plato's ideal city, as Grimal (1954) shows, is resolutely an entirely "enclosed city, surrounded by walls symbolized by the corner towers". The centralized autarkic conception offers it the possibility of being self-sufficient. In addition, it dominated by cosmic alternations that can be recognized by the variations of the formal declination in each place of the city, in relation to the position of the sun. According to TzitZis (2021) "In Plato, sacredness not only marks his conception of laws (nomoi), but is also rooted in the idea of right (dikaion) […] Thus piety is an integral part of the justice that must reign in the City".

Representationally, the Platonic city encompasses two superimposed and interlocking truths. The first truth is concerned with showing that the Platonic ideal city is "the fruit of human art which exists by nature and grows away from representation. That is, "a representation prior to the individuals, who are born within it" (Aristotle, c. 384-322 B.C., Politics I and II). In this respect, the ideal city gives shape to a "virtuous and just city where all functions and communities are associated in an autarkic form" (Plato, The Republic VII). Relatively speaking, this is the only possible way according to Thein (op. cit.) to create "the best City both human and natural".

The second truth deliberately shows that the Platonic ideal City "is a moral association which has as its basis not only community of origin, but also identity of laws, similarity of morals and ways of thinking" (Martin, 1951). The recognition of these two truths makes the Platonic ideality, a human city, responsible for building itself according to the idiom "the like loves its like" (Plato, 1861). Hence, the definition of Platonic ideality in the perception attentive to the "fundamental principles of the law of the City" (Gros, 2017) is the ideal place in which the Roman man is no longer fulfilled by himself but as a being subject to the demands of the community. Since according to Plato the City is paradoxically, dominated by a military class. This brings us closer to the Spartan ideality of the true state.

This type of ideal state remains attached to the deductive time of domicile erected as a right to the city. All the inhabitants of Roman cities take the time to live in the city despite its autarky as the only truly polite form of life. The state, however, only appears to them as a municipal aggregate. The Romans in general and the rich in particular, believe that to be a full citizen and entitled to all the rights of social life, it is good to domiciled in the city.

According to Aristotle, "It follows that there are those who are excluded from the ideal city, the laborers, the workers and the merchants; only those who make up the military class and the class from which the deliberative assembly and the judges are recruited will have the status of citizens" (Book III, 5).

5. Evidence of authorship

By virtue of this argument, it can see that the authorship of the representation of ancient Guelma conforms to the model of the Platonic ideal city, since it still bears the imprint of the autarkic paradigm. This quest for authorship must consequently appear according to even a brief presentation of its evolution during this period.

5.1. Ancient Kalama and the Platonic autarkic paradigm

Like the Platonic city, Ancient Kalama is truly marking by the imprint of the myth of its foundation and the choice of the appropriate place of settlement. This correlation participates in the spirit of the place with the right measure of the founding imaginary of the Platonic ideal city.

In this respect, it is admitted that the foundation of all the ancient cities of eastern

Algeria, and in particular the foundation of Kalama, was the result of an attachment to which we grant the fact of evolving reflection from the position of Kalama in relation to the effects of socialization. The connection of Kalama to the "celestial" universe, as precisely shown by Plato in the conclusion of Book VI, Republic (427 to 348 BC), the enclosed place, embellished with monuments decorated by remarkable steles and statues.

Kalama is a walled city with a spatial rationalization attributed to Hippodamos de Millet (Devoisins, 1840, pp. 118-119). The rampart of Kalama pierced and contained 13 square towers. In this, going from satisfying from the needs of defense to the socio-urban organization, this wall, present in Plato's Ideal City (Laws, 740), is the most important element of Kalama. The road layout has two perpendicular axes running from east to west (decumanus) and from north to south (cardo).

5.2. The settlement site of Kalama

The Archaeological Atlas (Gsell, 1965), mentions that Kalama is located near a large cemetery next to which, the archaeologists Mercier (1888), Poulle (1826-1877), Cherbonneau (1889), Schmidt (1892), Pflaum (1888) discovered an epitaph that contained very valuable details on the history of Kalama. This valley was in fact a strategic point of exchange at the center of imposing cities such as Rusicada, Tuniza, Hippo and Theveste. The dynamism of this exchange has favored distinctive living conditions such as participation in political, economic and cultural life.

As a crossroads, the Guelma valley occupies a strategic geographical position in north-eastern Algeria. It connects the Wilayas of Annaba, EI Tarf and Skikda, Constantine, Oum EI Bouaghi and Souk Ahras.

The Guelma valley is located in the heart of a large agricultural region, fertilized thanks in particular to the Seybouse[1]. This valley is framing by mountains covered in snow every winter. The valley on the south-western side descends to the foot of the Mahouna between the mountains (Djebel Mahouna[2] and Debagh[3]). It advances towards the north between "the Houara mountains which are slightly apart to allow the Fedjoudj pass to be seen" (Poujoulat, 1834).

Indeed, beyond the Djebel Houara, "a majestic green plain unfolds, made up of thick meadows, graceful fields of wheat and streams lined with oleanders. […] All the vegetation, the grandeur of the plain, the extent of the silence" (Suchet, 1840). This location gives the Guelma valley a landscape that facilitates escape and brings the fantastic back into reality. The climate of the Guelma valley is humid and sub-humid with a tasty air that offers only serenity and tranquility.

5.3. Clean time of the installation of the ancient Guelma

Ancient Guelma is mentioned for the first time by the Roman historians Justin (c. 2nd century BC; Book XIX, I) and Titus Live (c. 109 BC; Book XXX, 12) who say that Guelma was the scene of fierce battles between the Romans and the Numidians. The latter, turning their weapons against each other, often abandoned their lands to the ferocious beasts. During the truces, while the Roman colonists peacefully cultivated their conquered lands, the Numidians wandered incessantly in search of new pastures (Bouillet, 1854, p. 527).

Figure 2 - Guelma, 1832. Citadel and theatre. Delamare 1850

It was after this that Leglay (1959, p. 182) mentions that Kalama became a Roman possession from the 1st century. It was erecting as a municipal after the Roman settlement in the whole of eastern Algeria. This took more than two centuries. Appian (v. 26, AD; book VX, 10) adds on this subject "that after these wars, the Numidians endured hunger. They ate herbs instead of wheat. For drink, they never use anything but water. Their horses do not even know the taste of barley; they eat only herbs and drink little.

Figure 3 - Guelma Valley, 1832. Delamare 1850

The accounts of the historians Strabo (v. 21-25, AD, n. era), Pliny the Elder, (v., 23-79, AD, n. era) or Pliny the Younger (v., 62-114, AD, n. era) cannot omitted, but none of them mentions Guelma or Kalama. Similarly, Guelma not mentioned in road maps such as the Table théodosienne and the Table de Peutinger (Grellois, 1852, p. 5). Its location is missing in all the ancient routes such as the Itinerary of Antoninus and the Anonymous of Ravenna.

List of elements of identification of the authorship of ancient Guelma.

The identification process used to determine the functional specificities of the similarities and their role in the organization of the city. In this respect, the citadel, the Hippodamien plan, the dwellings, the recreational buildings, the stelae and the public utility facilities (see Plate III, p. 41), pragmatic witnesses of the autarky that validate the paternity of Ancient Guelma, will be examined.

The Hippodamien plan of Kalama is a creation based on the autarkic paradigm of the Ideal City (fig. 4). It represents the geometric rationality strongly underlined by the checkerboard pattern.

Figure 4 - Guelma, 1868, Hippodamien plan. Haridi 2016

The urban layout is not subject to the formalism of official surveyors. This checkerboard plan made up of regular blocks into which narrow streets 5 meters wide are integrated, "crossed at right angles giving the shape of an almost regular quadrilateral. These streets lined with houses that elevated only slightly. The plan of Kalama is similar to all the plans of the cities of the Roman colonies" (Grellois, Op. Cit., p. 32).

The citadel or castellum is located to the southeast of the city, represented in a long quadrilateral than wide. It is composed of two parallel walls and defended by thirteen square towers (see Plate I, p.40). It is 278 m long and 219 m wide (Souville, 1976, pp. 184-185). These walls, destroyed by the Vandals, were rebuilding by the Byzantines, under the command of Belisarius (500-565)4 during the reign of Emperor Justinian (482-527). As indicated by an inscription5 discovered by Captain Hackett in the year (1837). Suchet (Op. Cit., pp. 222-227) says that this rampart attests that ancient Guelma was an important military fortification (fig. 5).
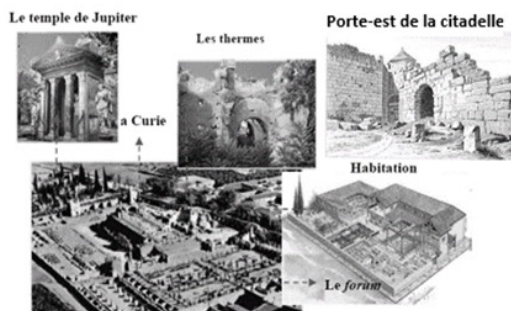
Figure 5 - Guelma, 1868, General view. Haridi 2016

The houses of the ancient city of Guelma occupied considerable space, especially during the reigns of Trajan (98-117) and Hadrian (117-138)[6]. "They lined the roads at a great distance from the center of the city" (Grellois, 1852, Op. Cit). Their facades are decorated with beautiful mosaics and interesting murals. In general, "these dwellings are large and luxurious" (Gsell, 1904, p. 20-48). The core of these houses consists of a large courtyard, surrounded by elegant buildings with large rooms. It backed by a group of buildings used as farm buildings.

Beyond this are buildings arranged around a second courtyard with a park with well-trimmed trees, fountains and a game enclosure. There are also baths with the same facilities as the public baths and luxurious stables for racehorses. In these dwellings, people lived with all the comforts of the houses of Rome. Privileged people such as duumvirs, Decurion's or flamines in charge of the administration of the estates, real estate owners and large landowners all had a house in the city and a second house in the countryside. This urban domicile was necessary for them to be able to sit on the town council.

Ancient Guelma has important buildings for recreational activities such as the baths to the east, the theatre to the north-west, the circus (where chariot races were held) to the north, the hippodrome (north-east), the amphitheater, the hunting grounds and the triumphal arches. Suchet (Op. Cit., pp. 222-227) mentions that "about one kilometer from the theatre, going towards the Seybouse, near the Roman swimming pool, there are the ruins of a temple of Aesculapius", as attested by an inscription found on the ruined site of the amphitheater.

Playful buildings.

Suchet also mentions the existence of highly decorated and majestic temples erected in all parts of the city. These temples were dedicated to multiple deities as noted by M. Hase (1868, p. 719)[7]. According to the inscriptions he collected, there was in the southern part of the city, the temple dedicated to Hercules and the one dedicated to Minerva.

Grellois (Op. Cit.) underlines at this level that these sanctuaries accompanied by a series of constructions that probably correspond to basilicas juxtaposed to markets for the retail sale of products intended for daily life. The wholesale markets were located inside the basilicas. The buildings for recreational activities surround the public square. They all "erect their colonnades, their pediments, showing to the surrounding regions the powerful influence and the fertile cultural activity of ancient Guelma. But the essential elements are the public square and the forum" (Grellois, Op. Cit).

The public square is paved. It is not accessible to carriages. It contains a considerable number of honorary monuments, statues of emperors, patrons of the city and even statutes to glorify grateful citizens. This is the case of Lucius Annius Ælius, who rendered considerable services to the city, and of his daughter Annia Ælia Restituta flaminic of two emperors and perpetual of the imperial cult (Ladjimi Sebaï, 1999, pp. 17-36). To thank her for these good deeds, the city council ordered five statues to be erecting to her. These statues adorned the squares and gardens of Guelma for a long time.

The forum alone symbolizes the existence of a civic culture in which it is important to participate. It designed according to

the organization of the republican forum of the urbs (Rome). It was the place where the curia of the nobles locating, a room intended for the meetings of the municipal council constituted by the duumvirs (consuls placed at the head of the curia).

The 2,000-seat theatre bears witness to the cultural influence and artistic splendor of ancient Guelma, especially at the beginning of the 3rd century. It is leaning against a hill where the terraces deeding.

The construction is made of blocking covered with stones. This important monument, entirely fitted out, consists of an amphitheater of 64 meters in diameter, the circumference of which occupied by the orchestra is paved with marble and behind the stage are two rectangular halls with facades made up of porticoes formed by columns (Souville, op. cit., pp. 184-185).

The orchestra is paved with marble and behind the stage are two rectangular halls with facades made up of porticoes formed of columns (Souville, Op. Cit., pp. 184-185). On either side of the stage wall are two colossal white marble statues of Aesculapius and Neptune[8].

The construction of the theatre was the work of Annia Ælia Restituta, a generous woman who represented the powerful aristocracy of ancient Guelma with dignity. She gave an amount of 400,000 sesterces for the construction of this theatre (Briand-Ponsart, 1999, p. 217-234). The thermal baths are the privileged place of the inhabitants of ancient Guelma. It is the opportune place to spend a good part of the free time far from the forum and the business. The thermal baths take the place of a café and a circle. One goes there to amuse oneself, to discuss, to play, to make physical exercises and to bathe.

The baths built in blocking with stone and mud brick linings. They were included in the fortifications of the citadel around the 2nd century AD. Their importance spatially and morally inscribed in the way of life of the inhabitants of ancient Guelma.

Also, the veneration of spring waters is a great tradition in ancient Guelma, as some inscriptions testify. In particular, those discovered at Announa by Doctor Peysonnel (1724-1725) during his trip to the region. These inscriptions are all dedicated to the protective goddesses of the freshwater springs, Fontana and Feronia (Grellois, op. cit.). The circus is located to the north of the city. It backed by a rock, but laid out on a horizontal plane to leave the arena on the outside., with the entrance to the arena on the south side of the circus. The shape of the circus is elliptical.

6. Conclusion

Paradoxically, attempting to interpret the epistemological meaning of the identity paternity of the representation of ancient Guelma in accordance with Platonic ideality is a new way of looking at it and valuing it. Thus, the rhetoric of similarities supports the recognition of the formation of ancient Guelma on the perfection of the geometric order of the Platonic city with its ideality and autarky.

An architectural representation respects the spirit of the place, which was strongly inscribing in the immanence of the imagination of the inhabitants of Guelma. Therefore, taking the effect of the paradigm of autarky as a factor of intentional representation in the creation of ancient Guelma, it was from the beginning a cultural humanism embedded in the needs and customs of the inhabitants of ancient Kalama.

Aristotle (c. 384-322 B.C., Politics III, livre III) "We see that every city is a kind of community, and that every community is constituted for a certain good which all men always perform their acts; it clearly follows that all communities aim at a certain good. The one that is the highest of all and encompasses all the others also aims, more than the others do, at a good that is highest of all. This community calleding the city, it is the political community.

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[1] The Seybouse is a wadi in north-eastern Algeria, formed near Guelma by the Cheref wadi and the Zenati wadi. Its basin is the largest in Algeria. It flows into the Mediterranean near Annaba. Its length is 225 km with an average flow of $11.5 m^3/s$ and an irrigation basin area of 6,471 km^2.

[2] Djebel Mahouna, Mountain that dominates the valley (basin) of Guelma. It is located in the northeast of Algeria. Its altitude is 1411m and its latitude 36° 22' 03'' North, 7° 23' 30'' East of the Atlas tellien massif. It limits Guelma in its southern part and is located in the commune of Ben Djerah.

[3] The Djebel Debagh frames the valley of Guelma in the west, its altitude measures 1292 meters. It is located in the commune of Hammam Debagh.

[4] Belisarius (500-565), Byzantine general under the Justinian regime. He was the architect of the reconquest of the Vandals in Africa in the year 533.

[5] Inscription giving the minutes of the foundation of the rampart of Guelma, discovered by Captain Hackett in 1836. This inscription was publishing by M. Hase, in the Journal des Savants, in December 1847, p. 719.

[6] According to Flavius Josephus (late 1st century AD, n.d.) all sources agree that the period of the reign of Emperor Trajan between 98-117, and the reign of Emperor Hadrian (117-138).

[7] Hase, M., is a member of the Royal Academy of Inscriptions and Belles-Lettres. In 1868 he published an inscription on which is written 'Beatisinis tempribus dominorum nostrorum [Valentiani] et [Theodosii]'. For him, this inscription proves in an indisputable way that Guelma represents the ancient Kalama.

[8] The statutes come from Khemissa (ancient Thubursicu Numidarum), a town 50 kilometers from Guelma. Since in the year 104, the inhabitants of Guelma erected a monument to the glory of Trajan (98-117), the victor of Decebalus. Quoted in Le Journal des Savants, 1868, p. 718.

La réhabilitation des habitations menaçant ruine du quartier Mellah de Rabat : avancées et limites

Hicham Mouloudi

Architecte, urbaniste
Professeur à l'Ecole nationale d'architecture de Rabat/Maroc

Introduction

Au Maroc, un « bâtiment menaçant ruine » désigne « *toute construction ou installation de quelque type qu'elle soit, dont l'effondrement total ou partiel peut porter atteinte à la sécurité de ses occupants, de ses exploitants, à celle des passants ou des bâtiments avoisinants même non contigus* (et*) toute construction ou installation ne remplissant plus les garanties de solidité nécessaires en raison du délabrement d'une de ses composantes principales intérieures ou extérieures ou du fait de son édification sur un terrain exposé aux risques* »[1].

Si cette définition date de 2016, le terme « bâtiment menaçant ruine », quant à lui, est apparu en 1985 après l'effondrement, dans la médina de Fès, d'une demeure mitoyenne à une autre en ruine. Toutefois, la question de ce type de bâti ne s'est réellement posée que dans les années 1990 lorsque les effondrements se sont multipliés dans cette médina at aux *Jnanates*, un quartier d'habitat non-réglementaire des années 1970 développé en périphérie proche de la ville ancienne. De nature ponctuelle à l'origine, le phénomène s'est généralisé par la suite pour devenir un fait national qui touche tous les tissus existants : urbains et ruraux, anciens et récents, réglementaire et non-réglementaire[2].

« L'enquête logement » réalisé en 2000 par le Ministère de l'Habitat et de l'Urbanisme avait recensé 89.591 logements menaçant ruine dont 17.786 situés dans les médinas[3]. Le rythme de dégradation des maisons traditionnelles s'est accéléré. En 2016, ce même ministère a recensé 22.000 bâtisses menaçant ruine situées dans les médinas, soit environ 48% des constructions menaçant ruine situées en milieu urbain (pour l'ensemble du Maroc)[4].

Pour pallier ce phénomène, ledit ministère a mis en place en partenariat avec les acteurs concernés des approches et interventions directes (confortement des constructions, relogement des ménages concernés, …) et des interventions dites indirectes (rénovation des infrastructures, le pavage des rues, la réalisation d'ouvrages de protection contre les glissements de terrains), etc.

Le programme de réhabilitation de l'habitat menaçant ruine du quartier Mellah de l'ancienne médina de Rabat est l'une de ces interventions directes engagées dans la capitale marocaine. A cet effet, une convention relative au financement et à la réalisation de ce programme a été signée le 23 mai 2018.

Malgré l'énorme effort consenti par l'Etat, ce programme a été confronté, surtout à ses débuts, aux réticences de cer-

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[1] Article 2 de la loi n°94-12 relative aux bâtiments menaçant ruine et à l'organisation de l'organisation des opérations de rénovation urbaine. Cf. BO n°6466 du 12 chaabane 1437 (19 mai 2016).

[2] Idrissi Janati M'hammed, 2020, De « l'habitat menaçant ruine » à « l'habitat social » : le cas de la Médina de Fès (Maroc), Naqd n°38/39, pp. 307-332, p. 318.

[3] Bennani Imane, 2016, *L'habitat menaçant ruine (HMR) au Maroc. Les procédures administratives à l'épreuve des effondrements*, Paris, L'Harmattan, p. 19.

[4] Idrissi Janati M'hammed, 2020, op. cit.

tains habitants qui ne se sont pas empêchés d'exprimer publiquement leur mécontentement surtout après l'effondrement d'une habitation en cours de réhabilitation. Ces habitants se sont ensuite mobilisés contre les modalités de mise en œuvre de ce programme, dans le cadre d'un collectif d'associations qui a pris en charge la défense de leurs intérêts.

Dans le présent article, nous tenterons de répondre à trois questions : Comment se manifeste la problématique de l'habitat menaçant ruine à l'échelle nationale ? Quelles sont les avancées du programme de réhabilitation de l'habitat menaçant ruine relatif au quartier Mellah de Rabat ? Quelles sont les particularités de la mobilisation habitante ?

Notre hypothèse principale est la suivante : grâce à des registres d'action diversifié, la mobilisation des habitants du Mellah aurait permis d'améliorer le processus de réhabilitation du quartier.

Sur le plan méthodologique, nous allons analyser le contexte qui a prévalu à ce programme tout en mettant en relief les stratégies des acteurs concernés à travers deux principales sources d'informations :

L'ouvrage de Imane Bennani[5] intitulé : *L'habitat menaçant ruine (HMR) au Maroc. Les procédures administratives à l'épreuve des effondrements* et l'étude relative à « L'élaboration de la stratégie d'intervention de l'Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine »[6] réalisée par le FIDESPACE, nous ont permis montrer la complexité de la problématique de l'Habitat Menaçant Ruine à l'échelle nationale.

Pour dévoiler les stratégies des acteurs concernés, nous avons effectué plusieurs entretiens (et visites sur le terrain) aussi

bien avec l'un des architectes chargés du projet de réhabilitation du Mellah qu'avec des habitants dont les membres du collectif qui a pris en charge la mobilisation contre les modalités de mise en œuvre du projet.

A cet égard, nous procéderons au traitement des revendications de ces acteurs sous les angles de la dénonciation publique. Pour ce faire, nous nous appuyons sur les travaux de Luc Boltanski et Laurent Thévenot. Concernant la dénonciation publique, Luc Boltanski (1990) prend pour exemple un ensemble de lettres de protestation envoyées au journal Le Monde pour étudier la dénonciation publique d'une injustice[7]. L'auteur met ainsi en évidence le système de relations entre les personnes intervenant dans la dénonciation, qu'il nomme des actants. Ces actants qui peuvent être, selon lui, individuels ou collectifs, se répartissent en quatre types: « le dénonciateur (celui qui dénonce), la victime (celui en faveur de qui la dénonciation est accomplie), le persécuteur (celui au détriment de qui elle s'exerce), le juge (celui auprès de qui elle est opérée) » (p. 267). Appliquée à notre cas d'espèce, le dénonciateur est un collectif créé ex nihilo pour la cause et dénommé : « *Comité de coordination de la population cible du projet royal au quartier Mellah* ». Les victimes sont certes la population cible, les persécuteurs sont les maîtres d'ouvrage délégués du programme de réhabilitation du Mellah à savoir : la société Rabat Région Aménagement et l'Agence pour l'Agence pour l'Aménagement de la Vallée du Bou Regreg et, enfin, le juge est l'autorité locale (Wali de la région de Rabat Salé Kénitra).

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[5] Imane Bennani est architecte du patrimoine et docteur en géographie urbaine. Elle est actuellement Directrice de l'Ecole d'Architecture de l'Université Internationale de Rabat.

[6] Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine, 2017, Elaboration de la stratégie d'intervention de l'Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine à l'horizon 2030, Phase 1 Etat des lieux et diagnostic général.

[7] Boltanski Luc, 1990, « L'exigence de dé-singularisation », in Boltanski L., *L'amour et la justice comme compétence. Trois essais de sociologie de l'action*, Paris, Métaillé, pp. 253-365, 382 p. 256.

I. L'habitat menaçant ruine : limites sérieuses mais avancées certaines

Au Maroc, la réhabilitation de l'Habitat menaçant ruine souffre de plusieurs limites inhérentes à la complexité du phénomène. Néanmoins, les dispositifs mis en place récemment témoignent d'avancées certaines en la matière.

II. L'habitat menaçant ruine au Maroc: une problématique complexe

La problématique de l'habitat menaçant ruine est complexe et présente de multiples facettes : sociale, technique, juridique et institutionnelle, etc.

I.1 La difficulté de quantifier ce phénomène

Le manque de profils spécialisés (BET, techniciens, entreprises, etc.) fait que les données des recensements officiels sont d'autant moins fiables qu'aucune base commune de critères scientifiques clairs et précis ne permet d'identifier sans ambiguïté les bâtiments qui représentent un danger réel et imminent d'effondrement. La vraie situation de l'état de l'habitat menaçant ruine au Maroc n'est malheureusement pas encore connue[8].

I.2 Une quasi-absence de références juridiques jusqu'à 2016

Avant la promulgation de la loi 94-12 et son décret d'application, les textes de loi existants traitent globalement la question de l'habitat menaçant ruine. Mais aucun d'eux n'a cité les droits et obligations des proprié-

taires, ni les modes d'intervention des autorités et services concernés[9].

I.3 Insuffisance des moyens financiers :

Il s'agit notamment de : l'absence d'études financières préalables au conventionnement ; l'absence de contribution de propriétaires malgré leur implication dans les conventions compte tenu de leurs conditions socio-économiques ; la faible implication du secteur privé et des investisseurs[10].

I.4 La complexité de situation foncière :

Cette complexité réside dans la rareté des réserves foncières pour le relogement et le recasement des ménages ; la multiplicité des statuts fonciers dans les médinas (Melk, Habous, Domaine, etc.) ; complexité des statuts d'occupation (location, hypothèque, etc.) ; le manque d'immatriculation foncière dans les tissus anciens et la multiplicité des héritiers (propriété indivise, etc.)[11].

I.5 Multitude d'acteurs concernés

Plusieurs acteurs institutionnels sont concernés par l'habitat menaçant ruine (HMR) que ce soit au niveau central ou au niveau local.
Au niveau central, on trouve :
• Le ministère de l'Aménagement du Territoire Nationale, de l'urbanisme, de l'Habitat et de la Politique de la Ville : Selon Imane Bennani, « *il apparaît que la problématique de l'HMR ne constitue pas une priorité du Ministère. L'intérêt porté dépend des circonstances, dans la*

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[8] Bennani Imane, 2016, op. cit., p. 132.

[9] Etude stra P36.

[10] Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine, 2017, op. cit., p. 38.

[11] Ibid, p. 37.

majorité des cas, suite à des effondrements »[12].

Au sein de ce ministère, deux directions sont concernées par ce phénomène, à savoir :

- La Direction de l'habitat sociale (DHS): elle centralise les données relatives à l'HMR au niveau du ministère, mais ne dispose pas encore d'informations précises et exhaustives sur l'ampleur du phénomène en termes de localisation et de nombre de ménages menacés, car il s'agit d'un phénomène évolutif, nécessitant l'actualisation permanente des données requises[13].
- La Direction de l'architecture (DA): En traitant la problématique des tissus anciens, la DA touche de manière indirecte celle de l'HMR. A travers les études (architecturales et les plans de sauvegarde) qu'elle lance (en partenariat avec les agences urbaines), elle vise à constituer un inventaire de l'ensemble des tissus traditionnels dont les médinas, les ksours et les kasbahs, recenser l'état des constructions, notamment en péril (notamment HMR avec une hiérarchisation par degré de vétusté) et leur valeur architecturale, dégager des propositions s'inscrivant dans une vision globale de développement à caractère opérationnel pour ensuite proposer des plans de sauvegarde comme document de référence pour toutes les interventions futures.

- **Le ministère de l'Intérieur :** La principale mission de ce ministère réside dans le recensement des constructions menaçant ruine à l'échelle nationale.

Au niveau local, on trouve les entités suivantes :

- **Holding Al Omrane :** Il s'agit de l'unique opérateur du ministère de l'Habitat qui a pris en charge cette question dans quelques villes marocaine, notamment à Fès.
- **La Wilaya :** Le wali de la région qui est la première autorité de la ville, coordonne les actions des différents départements et directions régionales se trouvant sur son territoire, notamment celle de l'agence urbaine, Al Omrane et la direction régionale de l'habitat, concernant les domaines de l'habitat et de l'urbanisme. Il est le principal acteur qui permet d'assurer la réussite de toute intervention sur l'HMR, puisque à lui incombe la mission du suivi de l'exécution des travaux de confortement ou de démolition préconisés par les arrêtés d'évacuation[14].
- **La Direction Régionale de l'Habitat (DRH) :** Elle constitue l'interface du ministère de l'habitat au niveau local et pour laquelle sont assignées les missions de suivi et de coordination de la stratégie du ministère quant aux problèmes de l'habitat, principalement du programme « villes sans bidonvilles ». Toutefois, une DRH ne dispose pas automatiquement d'un inventaire de l'HMR à l'échelle de sa région et dans la majorité des cas, n'est même pas au courant des autres informations et données concernant le nombre ou lieux où sont répertoriés l'HMR par les autorités locales[15].
- **L'Agence de Dédensification et de réhabilitation de la médina de Fès :** L'Agence de dédensification et de réhabilitation de la médina de Fès (ADER-Fès) est un organisme semi-public créé en 1989 dans le but de dédensifier la médina de Fès et de sauvegarder ses monuments. Les principales actions de l'ADER sont la réhabilitation du bâti, la mise en place de l'infrastructure et l'équipement nécessaires, le dévelop-

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[12] Bennani Imane, 2016, op. cit., p. 52.
[13] Ibid, p. 53.
[14] Ibidem, p. 65 et 91.
[15] Ibidem, p. 65.

pement culturel et touristique et l'aménagement du paysage urbain. En 2002, l'ADER-Fès change de nom et devient : « Agence de Développement et de Réhabilitation de la Médina de Fès ». Il s'agit d'une nouvelle approche qui rompt avec celle qui prédominait auparavant et qui associe la sauvegarde au développement dans sa double dimension, sociale et territoriale[16]».

En l'absence d'une stratégie d'intervention nationale et régionale qui peut amener à une intervention de mise à niveau, l'intervention se fait d'une manière ponctuelle, sans qu'elle soit planifiée en amont, *elle se fait au coup par coup. On attend l'urgence pour intervenir.* Par conséquent, il n'existe pas et serait difficile d'avoir une réelle coordination entre les différents acteurs au niveau du traitement de ce type d'habitat. C'est la raison pour laquelle une structure ad hoc a été créée à partir de 2016 sous le nom de : « Agence Nationale pour la rénovation urbaine et la réhabilitation des bâtiments menaçant ruine ».

L'Agence Nationale pour la rénovation urbaine et la réhabilitation des bâtiments menaçant ruine

L'Agence Nationale pour la rénovation urbaine et la réhabilitation des bâtiments menaçant ruine (ANRUR) est un établissement public doté de la personnalité morale et de l'autonomie financière créé en 2016 par la loi 12-94 précitée pour répondre au manque de règles juridiques spécifiques, particulièrement en matière de traitement de l'habitat menaçant ruine.

L'ANRUR est chargée des missions d'élaboration, d'étude des stratégies, programmes urbains et projets relatifs à la ré-

novation urbaine et à la réhabilitation des tissus et des bâtiments menaçant ruine et de l'élaboration et la supervision de la mise en œuvre des schémas et plans nécessaires à cet effet, ainsi que des opérations visant à valoriser les différents domaines urbains que ce soit par les opérations de démolition, de reconstruction ou de rénovation ou à travers le développement des infrastructures, la desserte en équipements de base, de l'édification de logements ou la réalisation des opérations d'aménagement foncier[17].

Selon Zhra Sahi, Directrice de L'ANRUR, « cette agence a vu le jour le 30 janvier 2019 suite à la tenue de la première session de son conseil d'administration depuis sa création, l'effort a été consacré à la finalisation de la stratégie d'intervention de l'Agence et de l'étude concernant l'organisation fonctionnelle et administrative avec la mise en place de la structure. Priorité bmr et la mise en place d'un système d'information géographique qui permettra de cartographier les risques[18]».

I.6 Des problèmes administratifs entravant l'intervention sur le terrain

Difficulté d'identification des propriétaires par l'autorité locale pour pouvoir bénéficier des programmes ; litiges entre propriétaires et locataires ; litiges entre les héritiers et/ou absence de l'un des membres[19] ;

I.7 Des difficultés sur le plan technique

Manque de sociétés spécialisées dans le confortement et démolition ; non-respect des fiches mentionnées dans les rapports des

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[16] Idrissi Janati M'hammed, 2020, op. cit., p. 315.

[17] Loi n°12-94 relative aux bâtiments menaçant ruine et à l'organisation des opérations de rénovation urbaine, op. cit.

[18] Source reportage 2M : Maisons menaçant ruine: "J'ai peur sous mon toit" 03/04/2021 (site consulté le 20 janvier 2022).

[19] Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine, 2017, op. cit., p. 38.

bureaux d'études et des laboratoires chargés de l'expertise ; manque de normes pour le traitement des bâtiments patrimoniaux (restauration, réhabilitation, confortement, etc.) par l'usage de matériaux et procédés traditionnels d'intervention ; difficultés d'intervention sur les tissus traditionnels suite au manque de profils spécialisés et disparition progressive du savoir-faire des artisans[20].

I.8 La prégnance de la dimension sociale

Refus et réticences des ménages au mode d'intervention compte tenu des émotions ressenties (sensation de frustration, de déracinement, d'injustice et parfois de colère ; manque d'implication des ménages concernés au début des opérations ; location ou vente des bâtiments menaçant ruine après classification par le BET ; cohabitation des ménages et forte densité ; paupérisation des ménages notamment les locataires et ceux résidant à titre de « Rhan » (hypothèque) ; recours des bénéficiaires de l'aide frontale à l'habitat insalubre dans certains cas (notamment les locataires) ; manque d'accompagnement social pour les ménages concernés et risque de fragilisation[21].

L'importance cruciale de ces deux derniers aspects dans le traitement du phénomène de l'habitat menaçant ruine nous incite à les approfondir davantage dans les volets suivants à travers l'analyse de modalités de sa mise en œuvre sur le terrain.

I.2 La réhabilitation de l'habitat menaçant ruine du quartier Mellah de la médina de Rabat : un chantier prometteur

Située au nord de la capitale marocaine, la médina de Rabat représente une grande valeur patrimoniale (fondouks, hammams, grandes demeures traditionnelles, …). Toutefois, existence de points noirs qui peuvent altérer son image et mettre en péril une partie de son héritage précieux : détérioration de l'espace public et du cadre bâti notamment l'existence de plusieurs habitations abandonnées ou en ruine constituant ce qu'on peut qualifier comme cmr. Cette situation est aggravée par une forte densité et une surexploitation des logements, Des lieux tels que les fondouks se sont ainsi transformés en îlots d'habitats insalubres. Un certain nombre d'habitants de la médina vit dans des conditions socio-économiques difficiles, plusieurs familles partagent parfois le même logement ; la surexploitation et le phénomène d'abandon des familles riches délaissant leurs constructions ont engendré une vétusté et une dégradation pouvant déclencher parfois un effondrement partiel ou total représentant un danger pour les passants et pour les occupants de l'habitation, mais aussi pour celles voisines puisqu'il s'agit d'un tissu compact.

Afin de remédier à cette situation, une convention de partenariat et de financement relative au programme de mise en valeur de la médina de Rabat a été signée le 14 mai 2018.

Le quartier juif du Mellah fait partie de la médina de Rabat. Il est de création relativement récente, puisque ce n'est qu'en 1808, sous le règne du sultan Moulay Slimane que les juifs furent contraints d'habiter ce quartier qui leur était réservé, au-dessus des falaises donnant sur le Bou Regreg. Auparavant, ils étaient plutôt établis au quartier El Beheira, dans le haut de la rue des Consuls, là où se situait l'activité économique du négoce. A cette époque, il y avait environ 6000 juifs à Rabat, très influents dans le commerce et l'administration du port. Les exodes des juifs de Rabat furent nombreux au cours des siècles.

[20] Agence Nationale pour la Rénovation Urbaine et la Réhabilitation des bâtiments menaçant ruine, 2017, op. cit., p. 37.
[21] Ibid.

Figure 1 - Principales caractéristiques spatiales de la médina de Rabat

Source : Ministère de l'Aménagement du Territoire National, de l'Urbanisme, de l'Habitat et de la Politique de la ville, Direction de l'Architecture, 2017, Atlas des médinas du Maroc.

II.3 La réhabilitation de l'habitat menaçant ruine du Mellah : des avancées certaines

En 2008, le quartier Mellah a fait l'objet d'un programme de réhabilitation dans le cadre du programme de mise en valeur de la médina de Rabat précité. A cet effet, une convention de financement et d'exécution a été signée, le 23 mai 2018, par le ministre de l'Habitat, le Wali de la région de Rabat-Salé-Kénitra, le président du Conseil de la région, celui du Conseil de la ville de Rabat, le Directeur Général de l'Agence pour l'Aménagement de la vallée de Bou Regreg et le Directeur Général de la Société Rabat Région Aménagement.

Le coût global de ce projet est estimé à 130 millions de dirhams (environ 11 mil-
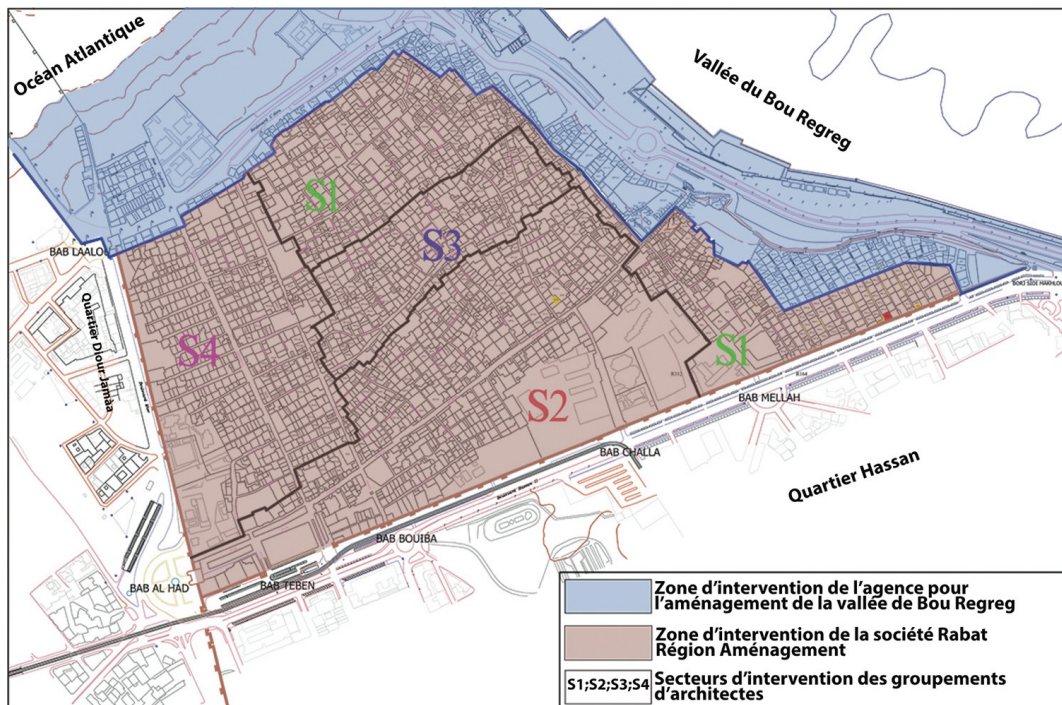
Figure 2 - Répartition géographique des interventions dans le cadre du programme de réhabilitation de la médina de Rabat

lions d'euros) avec une contribution du ministère de l'Habitat de 50 millions de dirhams. Celles du conseil régional, du conseil de la ville de Rabat et de l'Agence pour l'Aménagement de la Vallée du Bouregreg s'élèvent respectivement à 30 millions, 20 millions et 30 millions de dirhams[22].

Le maître d'ouvrage de ce projet est la commune urbaine de Rabat tandis que la maîtrise d'ouvrage délégué a été confiée à la Société Rabat Région Aménagement (40 constructions) et à l'Agence pour l'Aménagement de la Vallée du Bou Regreg (30 constructions) tel qu'il est présenté dans la figure 2 ci-dessous.

Les entretiens effectués avec Jamal Ourfi[23], l'un des architectes du groupement chargé de la réhabilitation des constructions menaçant ruine du Mellah, nous ont permis de de restituer le processus mis en place à cet effet ; alors que les visites sur le terrain nous ont permis de visualiser de près l'avancement des travaux.

En ce qui concerne le processus mis en place, la première phase de ce projet a consisté à évaluer précisément le niveau de

[22] Cf. Médias 24, Ancienne médina de Rabat : signature d'une convention pour le traitement de l'habitat menaçant ruine, 20-04-2018. Source : www.rra.ma/actualites/ancienne-medina-de-rabat/ (Site consulté le 05 septembre 2020).

[23] Les entretiens ont été effectués au mois de janvier 2022. Nous tenons à remercier vivement l'architecte Jamal Ourfi pour sa disponibilité et sa collaboration précieuse à l'élaboration de ce volet.

dégradation des constructions. Cette évaluation technique a été effectuée à partir de l'observation et du sondage au cours de deux étapes :

La première étape a connu l'intervention du Laboratoire Public d'Essais et d'Etudes (LPEE). Ce laboratoire a répertorié tous les bâtiments menaçant ruine sises dans la médina de Rabat y compris le Mellah. Ces bâtiments ont été classés en 3 catégories :

- Des constructions à démolir et à reconstruire ;
- Des constructions présentant des dégradations graves nécessitant un confortement ;
- Des constructions présentant des dégradations légères sans risque d'effondrement (fissures, …) où il faudrait faire des interventions légères par l'Etat (extérieur) ou par les ménages concernés (intérieur).

Quant à la seconde étape, elle a connu l'intervention du Bureau d'Etudes et Ingénieurs conseils en génie civile dénommé : NOVEC en tant qu'assistant à maîtrise d'ouvrage dont la mission a consisté à valider le travail du LPEE.

Ces évaluations techniques ont été à l'origine de plusieurs types de projets qui ont été, par la suite, inscrits dans le cadre du programme de consolidation du bâti menaçant ruine à la médina de Rabat. Ce programme a été réparti en 4 secteurs dont chacun est confié à un groupement d'architectes (Figure 2).

Le quartier Mellah fait partie du secteur S1 attribué au groupement d'architectes : Mohamed Nahal, Mohamed Amrani Abourouh et jamal Ourfi. A cet effet, ce groupement d'architectes a signé, fin 2018, avec la société Rabat Région Aménagement, un contrat intitulé : « Etude architecturale et suivi des travaux de confortement des bâtisses menaçant ruine à la médina de Rabat – S1 ». L'article 2 de ce contrat précise que l'objet de cette intervention est « *le confortement des constructions menaçant ruine situées dans la médina de Rabat à travers : des travaux de démolition et dépose ; des travaux de consolidation tout en respectant* *la valeur patrimoniale selon le cas ; des travaux d'étanchéité et de menuiserie* ».

Sur le plan technique, nous avons visité quelques chantiers et collecter auprès de l'architecte Ourfi des informations illustrant et expliquant la nature des travaux réalisés. Nous exposons ci-dessous deux exemples de projets dont les travaux sont achevés, sachant que d'autres chantiers sont toujours en cours de réalisation (situation en janvier 2022).

Exemple 1 : Bâtisse N°1-3 Zenket Sakaia

La bâtisse N°1-3 est située à Derb Mellah Zankat Sekaya. Il s'agit d'un bâtiment traditionnel en R+1 qui a subi plusieurs transformations au niveau de ses structures horizontales et verticales et a connu l'utilisation de matériaux modernes tel que le BA et les profilés IPN au niveau de certains planchers. Il a été classé dans la catégorie des bâtisses menaçant ruine 1er degré en raison de l'état de dégradation de ses structures. Cette bâtisse est située sur une rue commerçante. Elle est très dégradée et présente un danger pour les passantes (balcon très dégradé). Le bâti environnent est du même état.

- Après expertise effectuée par les laboratoires précités, les dégradations relevées sont (Figure 3):
- Le plancher de la galerie supporté par une structure métallique rouillé et déformée. Dégradation des escaliers,
- Les planchers traditionnels des chambres des RDC et de l'étage sont dégradés et présentent des flèches.
- Les murs de refend à droite et à gauche de l'accès au patio présentent plusieurs dégradations (fissures).
- Présence de traces d'humidité au niveau de la partie inférieure de l'ensemble des murs du RDC.
- Dégradation des balcons.
- Le réseau d'assainissement est vétuste.
- Problème de fuite d'eau des canalisations existante.

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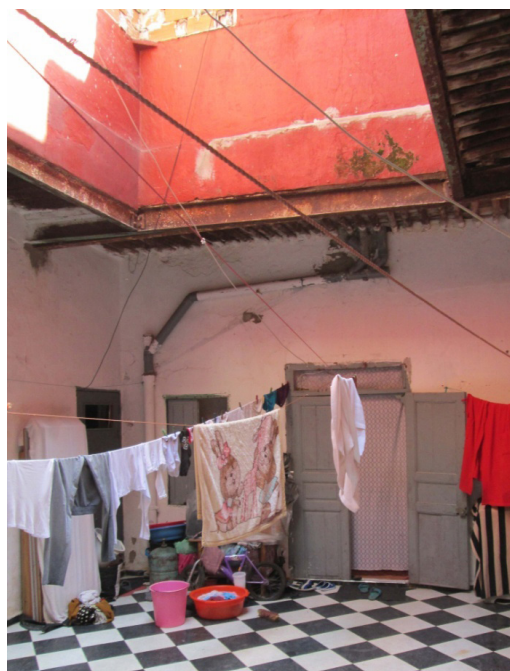
Figure 3 : Photos montrant l'état de dégradation de la bâtisse n°1-3 zankat sakaya avant intervention
Source : Jamal Ourfi architecte

Figure 4 : Photos montrant l'état de la bâtisse n°1-3 zenket sakaia après intervention
Source : Jamal Ourfi architecte

Exemple 2 : Bâtisse n°4 Rue Al Assouli

La Bâtisse n°4 est située dans une impasse baptisée rue Al Assouli. Elle est composée d'un rez-de-chaussée, d'un 1er étage et d'une terrasse accessible avec une construction partielle. Ce bâtiment est à usage d'habitation. La construction est mitoyenne à trois bâtiments à usage d'habitation de R+1 dans un état de dégradation avancé.

Après expertise effectuée par les laboratoires précités, les dégradations relevées sont (Figure 3):
- Risque d'effondrement des dalles et des acrotères.
- Risque de basculement partiel du mur de la façade.
- Risque d'effondrement de la cage d'escaliers.
- Bâtisse très dégradé menaçant ruine.
- Pourrissement et dégradation des planchers en bois.
- Fléchissement d'un profilé métallique du couloir au RDC.
- Altération et fissures des murs porteurs en moellons.
- Mur en moellons de très mauvaise qualité.
- Plancher traditionnel en rondin de mauvaise qualité.
- Effondrement partiel des planchers en bois à l'étage.
- Étanchéité dégradée avec stagnation des eaux pluviales au niveau des terrasses.

Figure 5 - *Photos montrant l'état de la bâtisse* n°4 Rue Al Assouli avant intervention

Source : Jamal Ourfi architecte

Figure 6 - Photos montrant l'état de la bâtisse n°4 Rue Al Assouli après l'achèvement des travaux
Source : Jamal Ourfi architecte

II. Une mobilisation de la population débouchant sur des résultats probants[24]

Afin d'accélérer l'opération de réhabilitation des habitations menaçant ruine du Mellah, le Wali de la région Rabat Salé Kénitra a organisé, juste après la signature de la convention y afférente (mai 2018), une réunion à laquelle ont assisté plusieurs agents d'autorité, responsables administratifs et techniques, élus et représentants de la société civile. Il s'agit notamment du Pacha[25], de deux Caïds[26], du maire de la ville de Rabat, du président du conseil préfectoral de la ville, du commandant de la protection civile, du président du 1er arrondissement de police, des cadres techniques de l'Agence pour l'Aménagement de la Vallée du Bou Regreg et de la société Rabat, Région Aménagement ainsi que les présidents de 7 associations œuvrant dans le quartier Mellah.

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[24] Il y a lieu de souligner que toutes les informations citées dans ce volet nous ont été confiées par les habitants du Mellah, membres du comité de coordination au cours de plusieurs entretiens effectués aux mois de septembre 2020 et d'octobre 2021. A cet égard, nous tenons à les remercier vivement pour leur collaboration précieuse.

[25] Le Pacha est un agent d'autorité en milieur urbain qui a un rôle de conseil, de contrôle, d'animation, d'incitation et de maintien de l'ordre. Dans les municipalités chef-lieu de province, comme c'est le cas de Rabat, le Pacha est le 1er adjoint du gouverneur. Cf. Basri Driss, 1990, L'administration territoriale. L'expérience marocaine, Bordas, Paris, p. 275-277.

[26] Le Caïd est le représentant de l'administration générale au niveau locale. Sa principale mission est le maintien de l'ordre public. Cf. Basri Driss, 1990, op. cit., p. 284.

A cette occasion, le Wali a annoncé qu'un montant de 1400 DH (environ 127 euros) par mois sera attribué à chaque ménage en tant qu'indemnité d'aide au relogement pendant la phase des travaux. Il a aussi demandé aux militants associatifs de participer à l'accompagnement social de l'opération. Les événements qui se sont succédés montrent que les choses ne seont pas passées comme on s'y attendait.

II.1 L'effondrement d'une habitation en cours de réhabilitation : l'événement déclencheur de la mobilisation des habitants

Le 10 octobre 2019, après le départ des ouvriers qui effectuaient les travaux de réhabilitation, une habitation sise dans la rue Assouli, derb Jamaa, s'est écroulée après 6 mois de travaux. Bénéficiant d'une large couverture médiatique[27], cet effondrement a suscité un vif mécontentement de la population locale qui s'est rendue massivement sur les lieux[28] pour « *déplorer le drame et surtout demander aux représentants de l'autorité locale (Pacha et Caïd) présents sur place l'ouverture d'une enquête puisque la maison mitoyenne qui remonte à plus d'un siècle ne s'est pas endommagée* ».

Parmi les habitants qui se sont rapidement rendus sur les lieux, trois locataires de l'habitation qui s'est effondrée. Ces habitants sont des personnes à mobilité réduite adhérant à une association baptisée : « l'Association El Falah[29] des personnes à mobilité réduite ». Ils étaient accompagnés du président de leur association qui a joué à fond son statut de porte-parole et de défenseur des intérêts de ses adhérents en dénonçant publiquement l'effondrement tout en incitant tous les habitants concernés par le projet de réhabilitation du Mellah à se mobiliser pour que cette situation ne se reproduise plus.

Cette réaction dudit président qui s'étend à l'ensemble des habitants du quartier du Mellah concernés par le projet de réhabilitation (au lieu des personnes à mobilité réduite adhérant à l'association) s'explique par la place qu'il occupe auprès de la population locale.

En effet, âgé de 56 ans, bachelier en sciences expérimentales, marié et père de deux enfants, le président du comité dénommé Mohamed Serhane est une personne à mobilité réduite (boiteux) habitant le Mellah de Rabat depuis 1972. Locataire d'une maison et d'un bureau[30] sis dans le quartier, Mohamed Serhane est connu par les habitants du Mellah en tant que militant associatif très actif et formateur sportif reconnu à l'échelle nationale. Il est, depuis 2013, président de « l'Association El Falah des personnes à mobilité réduite ». Grâce au soutien de plus de 150 adhérents et surtout du « Forum Ensemble pour le Développement Partenarial », cette association vise l'intégration de cette catégorie de la population dans la vie sociale[31].

En dehors de cette association, Mohamed Serhane est aussi président de « l'Alliance des associations du Mellah », membre de la Commission locale de l'Initiative Nationale pour le Développement Humain rela-

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[27] Il s'agit particulièrement des journaux électroniques « Hespress » et « Hibapress» largement consultés par les internautes.

[28] Environ 80 personnes se sont rendues sur les lieux selon les membres du Comité de coordination.

[29] Le mot « El Falah » désigne en français « la réussite ».

[30] Il s'agit d'une pièce dédiée au bureau de l'association El Falah des personnes à mobilité réduite en co-location dans une maison.

[31] Les principales activités de l'associaion sont : le diagnostic et le suivi des différents types d'handicap ainsi que l'organisation d'activités variées destinées non seulement aux PMR, mais aussi aux populations vulnérables (veuves, femmes divorcées, personnes âgées, …) telles que les soins oculaires, les circoncisions, la distribution de paniers pendant le mois du Ramadan, l'organisation de « Ftours » (le repas servi pour la rupture du jeûne pendant le mois du Ramadan) collectifs et l'organisation de soirées musicales en invitant des chanteurs et acteurs de renommée nationale.

tive à l'arrondissement Hassan et co-fondateur ou membre de plusieurs associations du quartier.

Dans le domaine sportif, et en dépit de son handicap, Mohamed Serhane a assuré, entre 1982 et 2006, l'entrainement de plusieurs équipes du football à Rabat, Salé, Skhirat et Casablanca. Entre 2006 et 2016, il a entrainé plus de 200 joueurs affiliés à la Fédération Royale Marocaine de Football en qualité de président de « l'Association Union Annasr Sportif de Rabat ».

Visiblement, cet ancrage territorial et ces différentes responsabilités ont conféré à Mohamed Serhane une légitimité territoriale et sociale qui lui ont permis d'être éligible au rôle de leader incontestable de la mobilisation contre le projet de réhabilitation du Mellah de Rabat.

II.2 Une mobilisation marquée par un répertoire d'action diversifié

Les habitants du Mellah de Rabat ont mobilisé un répertoire d'action diversifié à travers plusieurs moyens d'expression et de revendication.

- **Signature de la pétition**
La crainte d'avoir des victimes après la fin des travaux et le souci d'avoir une couverture « juridique » pour pouvoir parler au nom de tous les habitants a poussé Mohamed Serhane, soutenu par d'autres militants associatifs, à faire rapidement signer une pétition par les habitants concernés par le projet de réhabilitation du Mellah.

Dans un délai très court (48 heures), Mohamed Serhane et ses collaborateurs auraient réussi à recueillir 546 signatures[32] que les habitants du Mellah ont apposées en mention-

nant leurs noms, les numéros de leurs cartes d'identité nationales et leurs adresses. Dans cette pétition, les signataires « *dénoncent tous les dysfonctionnements juridiques et techniques entachant le projet de réhabilitation du Mellah et soulèvent l'absence de concertation avec les initiateurs du projet* ».

Le nombre des signataires de la pétition et la courte durée de sa collecte ainsi que leur répartition géographique peuvent être considérés comme un exploit de la part des organisateurs compte tenu du nombre des habitations concernées par le projet de réhabilitation (70 unités). En plus de la légitimité territoriale et sociale des organisateurs évoquée plus haut, cet exploit s'explique par la forte solidarité des habitants du quartier Mellah et leur soutien intransigeant de leurs voisins même les plus éloignés. Donc, ici, le rapport de voisinage dépasse les habitations limitrophes pour s'étendre à l'ensemble du quartier Mellah.

En outre, plus du tiers des signataires de la pétition (192) sont de sexe féminin ; ce qui représente 35%. Cette forte participation féminine exprime un rôle effectif de la femme dans la prise de décision relative à l'avenir de leur famille en général et de leur maison en particulier.

Par ailleurs, le texte de la pétition signés par les habitants comprend une dénonciation et une justification. La dénonciation de « *tous les dysfonctionnements juridiques et techniques entachant le projet de réhabilitation du Mellah* » est, aux yeux des habitants, une dénonciation d'une injustice, un parti pris contre le processus de réalisation du projet de réhabilitation. Ici, le « persécuteur » n'est pas désigné nommément comme le stipule Luc Boltanski[33] parce que, rappelons-le, le projet est réalisé dans le cadre d'un partenariat entre plusieurs institutions, à savoir : le

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[32] Nous avons pu avoir une copie de la liste des signataires. Toutefois, certains habitants ont tenu à signer la pétition deux fois !

[33] Pour Luc Boltanski, la dénonciation de l'injustice « suppose en effet la désignation d'un coupable ou d'un responsable qui peut […] être représenté par une synecdoque d'abstraction (par exemple « le capitalisme », dans un énoncé syndical destiné à protester contre les licenciements) ou être identifié et désigné nommément ». (Boltanski L., 1990, op. cit., p. 256).

ministère l'Aménagement du Territoire, de l'Urbanisme, l'Habitat et de la Politique de la Ville, la Willaya de la région de Rabat-Salé-Kénitra, le Conseil de la région, le Conseil de la ville de Rabat, l'Agence pour l'Aménagement de la vallée de Bou Regreg et la Société Rabat Région Aménagement.

Quant à la justification, elle réside dans « *l'absence de concertation avec les initiateurs du projet* ». Ce rattachement des problèmes personnels à une cause collective perçue comme valable, voire à un thème ressenti comme mobilisateur, renvoie à ce que Boltanski nomme la «*dé-singularisation des disputes* »[34].

• **Création du comité de coordination**

Après la signature de la pétition, Mohamed Serhane et ses collaborateurs ont procédé, le même mois de l'effondrement de l'habitation (octobre 2019), à la création d'un collectif d'association qu'ils ont appelé : « *Comité de coordination*[35] *de la population cible du projet royal au quartier Mellah* ». Ce Comité est constitué de 6 militants associatifs habitant tous le Mellah de Rabat et, de surcroît, concernés par le projet de réhabilitation. Il s'agit d'un président (président), d'une secrétaire (la femme du président), d'un porte-parole et trois conseillers dont un juridique.

Malgré l'insuffisance de ses moyens financiers[36], le Comité a pris en charge la défense des intérêts des habitants du Mellah de Rabat contre les menaces susceptibles d'être causées par le projet de réhabilitation du quartier. A cet effet, il a déployé des stratégies diversifiées.

• **Le recours à de multiples vecteurs d'expression et de revendication**

Les membres du « Comité de coordination de la population cible du projet royal au quartier Mellah » ont défini avec soin les modalités d'action (réunion de sensibilisation de la population, publication des actions engagées, distribution de dépliant, envoi de lettres de protestation, rencontres avec les responsables, etc.) qu'ils voulaient privilégier. Leur but est d'opérer une pression sur les maîtres d'ouvrage du projet de réhabilitation du Mellah, pour les inciter à revoir leur mode opératoire. Pour ce faire, ils jouent simultanément sur deux registres, perçus comme complémentaires, à savoir: le registre technique et le registre du débat public.

• *Réunion d'information et de sensibilisation de la population*

Les habitants du Mellah concernés par le programme de réhabilitation ont organisé deux rencontres de sensibilisation de la population du quartier. Tenue le 25 octobre 2019 dans une maison sise au quartier Mellah[37], la première rencontre, à laquelle ont assisté une quarantaine de personnes, avait pour objectif d'arrêter, d'un commun accord, les mesures à prendre pour faire face à cette situation. A cet effet, les participants ont décidé de créer un Comité de coordination en tant que porte-parole des habitants concernés. Afin de légitimer ce statut de porte-parole, lesdits participants ont insisté sur la nécessité de collecter les signatures des habitants.

Quant à la seconde rencontre, elle a été organisée 8 jours plus tard (le 2 novembre 2019) au même endroit avec la participation d'une trentaine de personnes. Le but, cette fois-ci, est d'informer les habitants sur le nombre des signataires de la pétition et sur la stratégie à adopter, notamment l'identification des acteurs institutionnels à contacter.

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[34] Ibid, p. 280.

[35] Le Comité de coordination est la traduction du mot arabe « tanssikia ».

[36] Le Comité a commencé son travail avec un compte de 100 DH (moins de 10 euros) et une cotisation de 20 DH pour ses adhérents. La plupart de ses activités sont financées par des Marocains Résidants à l'Etranger originaires du quartier Mellah de Rabat.

[37] Cette maison est la propriété d'un habitant qui sera par la suite membre du Comité de coordination.

- *Publication des actions engagées*

Comme le nombre des participants aux réunions de sensibilisation de la population était en dessous des attentes du Comité de coordination, celui-ci a décidé d'assurer une plus large diffusion de ses actions en créant une page Facebook intitulée : « *Echo nabd du quartier mellah* ».

- *Distribution d'un dépliant*

Au même mois de novembre 2019, le Comité de coordination a fait le tirage de 500 exemplaires en couleur d'un dépliant (brochure pliée à quatre faces) qu'il a distribué aux résidants à l'intérieur et à l'extérieur du Mellah.

Sur la première face du dépliant, figurent l'intitulé complet du « Comité de coordination de la population cible du projet royal au quartier Mellah » (sur l'entête), l'objet du document : « Rénovation urbaine des constructions menaçant ruine » (en bas de l'entête) et, au centre, une grande photo de Sa Majesté le Roi Mohamed VI prise lors d'un discours officiel surplombant un extrait de la Lettre Royale adressée aux participants au Forum national inaugural de préparation du Code de l'Urbanisme. La photo du Roi et le contenu de son discours ornant cette face principale montrent que le Comité tient, d'emblée, à transmettre au moins deux messages : son « allégeance » au Roi et son plaidoyer pour les valeurs et concepts prônés par le souverain dans ledit discours tels que « *le nouveau concept d'autorité, la politique de proximité et la production d'un logement décent en tant que caractéristique de la citoyenneté complète* ».

Sur la deuxième face du dépliant, le Comité précise clairement son objectif (présenté en gros caractères en rouge) qui consiste à « *contribuer à la réussite du projet royal au quartier Mellah de Rabat* », procède à un cadrage global du projet de réhabilitation du Mellah « *qui s'inscrit dans le cadre des projets de réhabilitation des anciennes médinas à l'échelle nationale en exécution de la volonté royale et en application des dispositions de la loi 12-94 et son décret d'application* » avant de soulever deux observations principales : la lenteur dans l'avancement du projet et 12 dysfonctionnements, dépassements et manquements[38].

Pour les membres du Comité de coordination, ces observations sont le résultat de la consultation de plusieurs experts juridiques (docteur en droit public) et techniques (maàlems, ouvriers, électriciens, etc.). Afin d'étayer leurs propos, ils ont pris de nombreuses photos montrant les problèmes techniques non encore résolus sur le terrain dont 6 figurent sur le dépliant.

Enfin, sous le titre : « Lois relatives à l'urbanisme et à la rénovation urbaine », la quatrième face du dépliant liste les principales références juridiques invoquées par le Comité telles que la loi n°12-90 relative à l'urbanisme et son décret d'application (1992), la loi n°12.66 relative au contrôle et à la répression des infractions dans le domaine de l'urbanisme et de la construction au Maroc (2016), la loi n°12-94 relative aux bâtiments menaçant ruine et à l'organisation des opérations de rénovation urbaine (2016) et son décret d'application (2017), etc.

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[38] Ces dysfonctionnements sont détaillés dans le dépliant comme suit: Absence de communication et de participation de la population ; Indisponibilité des compétences techniques en mesure de réhabiliter des constructions traditionnelles et patrimoniales telles celles du Mellah ; Absence de contrôle régulier des opérations de réhabilitation ; Fermeture des ouvertures (fenêtres) dans les constructions réhabilitées, ce qui les prive de l'aération ; Non prolongement des canalisations d'assainissement ; Faiblesse de l'indemnité d'aide au relogement et non-respect des délais fixés à cet effet ; Faiblesse de l'indemnité de relogement, ce qui s'est répercuté sur le pouvoir d'achat de la population cible ; Inadéquation des entreprises engagées avec la nature d'une réhabilitation d'un tissu patrimonial ; Incohérence entre l'opération de réhabilitation et l'état initial des constructions ; Les portes des boutiques ne sont pas sécurisées ; les auvents ne sont pas en harmonie avec le tissu patrimonial ; Dysfonctionnements clairs dans la gestion du réseau d'électricité et sa redistribution ; Obligation de la population de reprendre leurs constructions malgré l'inachèvement des travaux en les privant de l'indemnité de relogement.

Il est clair que les experts juridiques et techniques consultés par le comité de coordination ont joué un rôle crucial dans la conception de ce dépliant.

• **L'envoi de lettres de protestation**

Parallèlement à la distribution du dépliant, les membres du Comité ont pris l'initiative d'adresser, le 4 novembre 2019, des lettres de protestation à plusieurs acteurs institutionnels[39] susceptibles d'être concernés par le programme de réhabilitation du Mellah.

Dans ces lettres, les responsables du Comité s'insurgent contre les dysfonctionnements constatés sur le terrain et demandent des interventions urgentes pour remédier à cette situation.

A l'issue de ces envois, le Comité de coordination a reçu plusieurs réponses qui le renvoient à d'autres institutions ! Ceci l'a conduit à demander, le 29 novembre 2009, le soutien d'une association marocaine très connue en matière de défense des droits et libertés fondamentales prévues dans la Constitution marocaine et la déclaration universelle des droits de l'homme, à savoir : l'Association Marocaine des Droits de l'Homme.

II.3 Les effets de la mobilisation habitante

La mobilisation des habitants du Mellah a eu des effets très importants sur l'évolution du processus de réhabilitation du quartier. Cette mobilisation n'a, cependant, pas réussi à se poursuivre en raison des restrictions sanitaires et des divergences politiques.

• **La rencontre avec les nouveaux acteurs institutionnels**

Pour écouter le point de vue des représentants des habitants sur l'avancement du programme de réhabilitation des habitations menaçant ruine à l'ancienne médina de Rabat, le Comité de Coordination a été invité à participer à deux réunions avec les nouveaux acteurs institutionnels concernés[40]. La première réunion a été organisée au mois de décembre 2019 au siège de l'arrondissement de Rabat-Hassan avec le nouveau Caïd. Au cours de cette réunion, les représentants des habitants du Mellah ont présenté les membres et les objectifs de leur Comité, soulevé les inquiétudes des habitants quant aux dysfonctionnements qui entachent le déroulement de l'opération de réhabilitation du quartier et surtout insisté sur le fait qu'ils sont là pour aider les autorités locales. A l'issue de cette réunion qui peut être considérée comme une séance de prise de contact, le Caïd s'est montré compréhensif à l'égard des doléances des membres du Comité qui ont été appelés à constituer un dossier justificatif à l'appui de leurs accusations.

Quant à la seconde réunion, elle a été organisée la même semaine au même siège de l'arrondissement de Rabat-Hassan avec deux agents de l'autorité locale (Pacha et Caïd) accompagnés de deux Moqadems[41] qui ont, cette fois-ci, invité deux cadres techniques chargés du suivi de l'opération de réhabilitation du Mellah.

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[39] Il s'agit des acteurs suivants : Le Ministre de l'Intérieur ; La Ministre de l'Aménagement du Territoire, de l'Urbanisme, de l'Habitat et de la Politique de la Ville ; Le Wali de la région de Rabat-Salé-Kénitra ; L'Inspectrice Générale de l'Administration Territoriale ; L'Institution du Médiateur du Royaume ; Le Président du Conseil régional de Rabat-Salé-Kénitra ; Le Président du Conseil de la ville de Rabat ; La Présidente du Conseil de l'Arrondissement de Rabat-Hassan ; Le Directeur de l'Agence pour l'Aménagement de la Vallée du Bou Regreg ; Le Directeur de la Société Rabat Région Aménagement ; La Directrice de L'Agence Nationale de Rénovation Urbaine et de Réhabilitation des Bâtiments Menaçant Ruine.

[40] Au mois de février 2019, un nouveau Wali a été nommé à la tête de la région de Rabat Salé Kénitra au même titre que plusieurs Caid dont celui de l'arrondissement de Rabat Hassan qui chapeaute le quartier du Mellah.

[41] Les Moqadems sont des auxiliaires de l'autorité locale.

Au cours de cette réunion, les membres du Comité ont commencé d'abord par afficher leur « légitimité » en montrant aux participants la version originale de la pétition signée par les 546 habitants du Mellah. Ensuite, ils ont distribué des exemplaires du dépliant comme s'il s'agissait d'une « carte-visite » reflétant leur posture tant politique que sociale. Enfin, et en réponse à la demande du Caid formulée lors de la réunion précédente, les membres du Comité ont présenté 11 dossiers (montages photos avec commentaire séance tenante) relatant des dysfonctionnements techniques enregistrés dans certaines habitations réhabilitées. Outre cette présentation des problèmes techniques qui aurait eu un fort impact auprès des participants, les membres du Comité ont tenu à dénoncer l'absence de communication avec les habitants ou leurs représentants en dépit de leurs compétences aussi bien sur le plan technique que juridique. Si les dysfonctionnements techniques figurent dans les 11 dossiers présentés, ceux juridiques ont été formulés séance tenante[42].

Aux termes de cette réunion, le Pacha a demandé aux membres du Comité d'aider les autorités locales à convaincre les réticents quant à l'intérêt du projet.

Visiblement, les membres du Comité de coordination ne se sont pas contentés d'exposer des faits, mais ils ont aussi tenté d'apporter des preuves tangibles à l'appui de leurs accusations en recourant à des ressources aussi bien rhétoriques[43] (montage photos de problèmes techniques) que documentaires (références juridiques). A cet effet, ils ont pleinement joué le rôle du « dénonciateur »[44] qui tente, parfois, de dépasser la situation particulière des habitants (« victimes ») et de se construire une légitimité que seule cette scène inédite peut lui conférer. Cela rejoint certaines conclusions des recherches sur le débat public menées par divers auteurs en France, lesquels considèrent que ce débat constitue un levier majeur de reconnaissance pour les acteurs qui y participent[45].

• **La visite du terrain par le nouveau Wali : l'amorce du changement**

Le dimanche 26 janvier 2020, les habitants du Mellah ont été agréablement surpris par la visite du Wali de Rabat Salé Kénitra. Accompagné exclusivement par les agents de l'autorité locale (Pacha et Caïd) et deux Moqadems, le Wali s'est rendu au Mellah afin de voir de près l'avancement des travaux du projet de réhabilitation du quartier. Présents sur place, les membres du Comité

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[42] Les dysfonctionnements juridiques avancées par le Comité sont : L'arrêté municipal de réhabilitation est collectif au lieu d'être individuel ; Le décret d'application de la loi n°12-94 relative aux bâtiments menaçant ruine et à l'organisation des opérations de rénovation urbaine évoque le droit au relogement au profit des habitants dont les constructions feront l'objet de réhabilitation alors que sur le terrain ces habitants ont reçu une indemnité de 1400 DH au lieu du relogement; Les procès-verbaux de sortie et d'entrée aux construction objet de réhabilitation n'ont pas été dressés conformément aux dispositions du décret susmentionné ; Les habitants dont les constructions feront l'objet de réhabilitation ne disposent d'aucune garantie quant à la nature et au délai de réhabilitation de leurs demeures.

[43] La rhétorique est ici entendue comme la discipline qui étudie « la façon dont on amène les gens à croire et à infléchir leur comportement, et qui enseigne l'art de la persuasion ». Définition citée par Véronique Catherin (Cf. CATHERIN V., 2000, La contestation des grands projets publics. Analyse microsociologique de la mobilisation des citoyens, Paris, L'Harmattan, p. 175).

[44] Selon Luc Boltanski, le dénonciateur « doit convaincre d'autres personnes, les associer à sa protestation, les mobiliser et pour cela, non seulement leur assurer qu'il dit vrai, mais aussi que cette vérité est bonne à dire et que l'accusation, qui désigne un être (individuel ou collectif) à la vindicte publique, est à la mesure de l'injustice dénoncée ». Cf. Boltanski L. (1990, op. cit., p. 256).

[45] Rollant R., 2007, « De la légitimation des acteurs à la légitimité du débat public », in REVEL M, BLATRIX C., BLONDIAU L., FOURNIAU J.-M., DUBREUIL HERIARD B. et LEFEBVRE REMY (dir.), Le débat public: une expérience française de démocratie participative, Paris, La Découverte, pp. 178-188, p. 182.

ont saisi l'occasion pour se présenter au nouveau Wali et surtout lui montrer certaines habitations réhabilitées ou en cours de réhabilitation – dont la maison qui s'est effondrée – qui posent problème. Cette visite inopinée a été fortement appréciée par les habitants dans la mesure où ils ont eu l'occasion de voir le Wali donner ses instructions pour résoudre les problèmes soulevés. Pour le Comité de coordination, elle est la consécration de quatre mois de mobilisation puisqu'elle a permis de changer le cours des choses à travers des améliorations notoires enregistrées, depuis lors, dans les travaux entrepris.

- **Pandémie et politique : des freins à la poursuite des activités du Comité**

Le confinement instauré au Maroc suite à la pandémie du Covid 19 a sérieusement entravé l'activité du Comité qui a été contraint à cesser toutes ses activités. Après un arrêt d'environ 2 ans, ledit Comité a éprouvé de grandes difficultés à les reprendre pour des raisons, cette fois-ci, politiques. En effet, les élections marocaines (législatives et communales) de septembre 2021 ont eu un impact négatif sur l'activité du Comité de coordination qui n'est pas parvenu à réunir ses membres en raison de divergences politiques. Ces membres ont, en effet, soutenu des candidats différents lors des élections ! Pour le président du Comité, « *certains chantiers sont arrêtés et plusieurs constructions ne sont pas encore réhabilitées à cause, semble-t-il, de problèmes financiers. Une intervention royale s'avère la seule solution pour débloquer la situation* ».

Conclusion

La complexité de l'habitat menaçant ruine, qui dure depuis des décennies, a conduit le législateur marocain à promulguer, en 2016, une nouvelle loi (n°12-94) précisant les missions des acteurs concernés par ce phénomène tout en créant une structure *ad hoc*, à savoir : l'Agence nationale pour la rénovation urbaine et la réhabilitation des bâtiments menaçant ruine (AN-RUR) en vue d'assurer le suivi et la coordination nécessaires.

En ce qui concerne le quartier Mellah de Rabat, et bien que cette agence n'ait pas été encore opérationnelle à l'époque, des efforts considérables ont été consentis, à partir de 2018, tant sur le plan institutionnel, financier et technique en vue de réhabiliter les constructions menaçant ruine répertoriées.

Toutefois, quelques dysfonctionnements constatés sur le terrain, notamment au début de l'opération, ont été à l'origine de la mobilisation des habitants concernés. Les répertoires d'action mobilisés par ces opposants renvoient au modèle classique des mouvements sociaux, c'est-à-dire celui de la pression des groupes organisés sur les décideurs. Cette combinaison lutte-pression reste la seule ressource qu'ont les citoyens qui sont déçus par la qualité de certains travaux ainsi que leur mise à l'écart dans le processus de réhabitation. Sur le plan opérationnel, elle traduit la contribution des « citadins ordinaires » à la construction et à la gestion des problèmes publics.

Compte tenu des nettes améliorations enregistrées dans l'opération de réhabilitation du Mellah, particulièrement après l'intervention directe du premier responsable de l'autorité locale (Wali en l'occurrence), et bien que le modèle de la pression oblige les citoyens à un éprouvant processus organisationnel, ce modèle semble efficace à intégrer les objectifs des opposants dans les politiques publiques. Le conflit entre décideurs et citoyens a, en effet, été évité, les opposants ont eu la possibilité de faire entendre leur voix et surtout le résultat intègre leurs points de vue, du moins pour les constructions réhabilitées jusqu'à présent.

Malgré ces résultats probants, la lutte s'avère une voie nécessaire quand la participation institutionnalisée est inexistante. Mais elle ne doit pas être nécessairement la solution alternative à la participation.

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The travertine in the Tuscan Architecture (Italy)

F. Fratini, S. Rescic, O.A. Cuzman, B. Sacchi

CNR-ISPC, National Research Council, Institute of Heritage Science,
Sesto Fiorentino (Florence)Italy

Abstract   This contribution examines the use of travertine in the architecture of Tuscany from the Middle Ages to the con-temporary age. The frequent use of this material depends on the diffused presence of hydrothermal springs that gave rise to the formation of this carbonate rock. In addition, the conservation problems of this material are ex-amined, which is very resistant to decay, but which may present a chromatic alteration that tends to give the sur-faces a greyish appearance.

1. Introduction

Travertine is a rock resulting from the precipitation of carbonate dissolved in the waters of hot springs (travertines) or cold (limestone tuffs), under the influence of physico-chemical and/or biological process-es. As reported by Pliny the Elder and Stra-bo, the name derives from *Lapis tiburtinum*, that is the stone of Tibur, the Latin name of Tivoli, a city located near Rome, from which this stone has been extracted from the Roman time until today. Travertine is a hard material, easy to polish, resistant to atmospheric agents, with a beautiful whit-ish colour. Thanks to these characteristics, over the centuries, it has been used in archi-tecture with both structural and decorative functions, particularly in the northern-cen-tral Italian peninsula where many outcrops of this rock are present. The Etruscans used travertine for the city walls, stones and fu-nerary urns. In ancient Rome, travertine was the stone of monumental buildings (bridges, triumphal arches, theatres and amphithea-tres, arcades, tombs façades) and flooring, but it was also used in private buildings. In the Middle Ages it was the monumental building material of Ascoli Piceno, Perugia, Ancona, Rieti, in relation to a local extrac-tion. Travertine then becomes the stone of the Roman Baroque and rationalist architec-ture, significant examples of which are the

University City of Piacentini and the EUR complex (Universal Exposition of 1942).

This contribution examines the use of travertine from the Middle Ages to the con-temporary age in the architecture of Tuscany, a region rich in hydrothermal springs that gave rise to the formation of this carbonate rock. In addition, the conservation problems of this material will be examined, which is very resistant to decay, but which may pre-sent a chromatic alteration that tends to give the surfaces a greyish appearance.

2. Genesis of travertine

Travertines are "continental carbonate rocks" which are formed in relation to the presence of springs fed by supersaturated cal-cium carbonate waters coming from a deep hydrothermal circuit. The presence of nor-mal faults that allow the rise of deep fluids heated both by the geothermal gradient and by the possible presence of magmatic bodies, as it is the case in southern Tuscany, favours this circulation. Rainwater rich in carbonic acid (HCO_3^-) of meteoric origin (due to the presence of dissolved CO_2) and pedogenet-ic, circulating in deep circuits (geothermal) through carbonate or sulphate rocks, bring in solution calcium ions in the form of calcium bicarbonate ($Ca^{2+} + 2HCO_3^-$). These waters flow to the surface as supersaturated solu-

tions. The decrease in pressure, which occurs at the source, determines the release of CO_2, which in turn causes the decomposition of the bicarbonate with precipitation of calcium carbonate. The environmental conditions of the thermal springs (evaporation speed, degassing, cooling) are reflected on the structure of the travertine with deposition rates that can reach 80mm/year (Pentcost 2005). Crystalline crusts formed in the areas close to the source's outflow are formed by fans of radiated crystals (Folk et al. 1985) or in the shape of a feather. In the distal areas and in the areas of water stagnation, crystalline laminae associated with bacterial/cyanobacterial laminae are observed.

Large vacuoles due to gas bubbles, encrusted with microcrystalline calcite, are distributed along surfaces. Overall, these travertine deposits are compact, well stratified and, if forming in active hydrothermal systems, have a whitish colour that indicates the absence of life in the immediate vicinity of the source (Capezzuoli & Gandin 2005).

Carbonate deposits derived from "fresh" waters rich in calcium carbonates are also part of the "continental carbonate rocks". Calcium carbonate is acquired during circulation through limestone rocks in a shallow karst circuit that flow at a lower temperature than ambient. Calcareous tufa is the name of these deposits (Pedley 2009; Golubić et al. 2008). These are very porous, poorly stratified deposits, containing abundant traces of macrophytes and invertebrates. The precipitation of calcium carbonate, generally slow and with low growth rates, occurs in the points where, due to an obstacle or a jump, the water assumes a turbulent motion and the vaporization and evaporation of the water favours the loss of CO_2. In this way, micro and macro crystalline encrustations are formed around the stems of aquatic plants until the bushes of rushes or the cushions of moss or cyanobacteria filaments are totally encrusted and petrified, giving rise to massive phytothermal or stromatolite structures. Fragments of encrusted stems can accumulate due to flood flows, forming small dams that delimit tanks in which a sedimentation of phytoclastic mud and sands develops.

2.1. Travertines and thermal sites in Tuscany

In the Italian territory, Tuscany is the region richest in hydrothermal manifestations and travertine deposits, some of which are still in formation. This is because Tuscany has been affected by important extensional tectonics that gave rise to the formation of intermountain basins delimited by normal fault systems that favoured the upwelling of magmas, significantly increasing the geothermal gradient.

The Etruscans and later the Romans already took advantage of this natural heritage of the region. Famous are the *Fontes Clusinae* (today's Terme di Chianciano), the thermal baths of Saturnia, Roselle, the *Aquae Volaterrae* and the *Aquae Populaniae*, represented in the "*Tabula Peutingeriana*", a medieval copy of a military road map of the imperial Roman age and sited near Sasso Pisano, the baths of San Giuliano, those of San Casciano dei Bagni.

Regarding the most important outcrop areas of travertine and calcareous tufa, the following sites are worth mentioning (Figure 1):
- Rapolano Terme-Asciano (travertine s.s. – Siena province) still subject to excavation;
- Colle Val d'Elsa (calcareous tufa – Siena province);
- Chiusdino-Frosini (calcareous tufa – Siena province);
- Sarteano (calcareous tufa – Siena province);
- Bagno Vignoni (travertine s.s. – Siena province), quarried until the first half of the 1900[s];
- Sant'Albino (calcareous tufa – Siena province);
- Bagni San Filippo (travertine s.s. – Siena province);
- Castelnuovo dell'Abate (travertine s.s. – Siena province);

- Massa Marittima (calcareous tufa – Grosseto province);
- Saturnia-Montemerano (travertine s.s. – Grosseto province) still being extracted;
- Monsummano-Montecatini (calcareous tufa – Pistoia province);
- Casciana Terme (calcareous tufa – Pisa province);
- Pignano (travertine s.s. – Pisa province).

Figure 2 - The figure shows an image of Tuscany, in central Italy, obtained from Google Earth. The image shows the cities where travertine has been used in architecture (after Google Earth, modified)
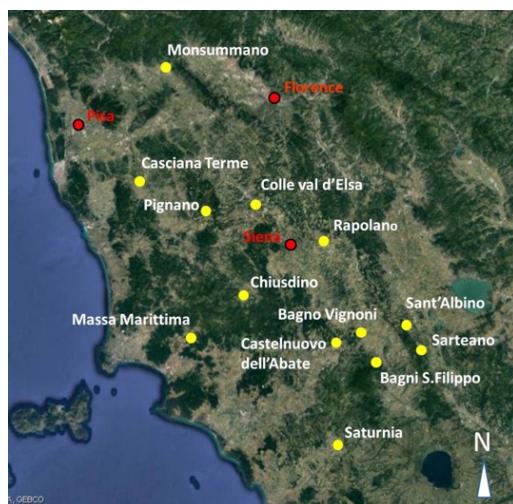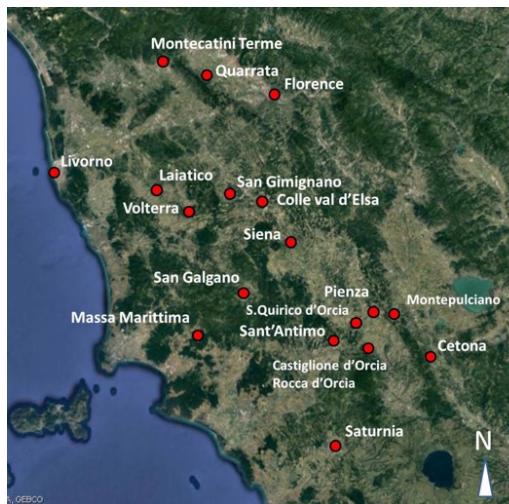

Figure 1 - The figure shows an image of Tuscany, in central Italy, obtained from Google Earth. The image shows the locations of the most important travertine and calcareous tufa outcrops in the region (after Google Earth, modified)

3. Use of travertine in the Tuscan Architecture

In Tuscany (Figure 2), the most ancient use of travertine in architecture is that present in the Porta dell 'Arco in Volterra (Figure 3), one of the main cities of ancient Tuscany (Etruria) with the name of Veláthri, seat in the Middle Ages of an important bishopric. The gate, which is part of the city walls, dates back to the Etruscan period (4th and 3rd century BC). The piers of the door are made in the local Pietra Panchina (Sartori 2004). The arch is made of perfectly squared travertine ashlars in excellent

Figure 3 - The figure shows Porta dell'Arco, the main entrance gate on the southern side of the Etruscan walls of Volterra. This gate features a round arch made of well-squared blocks of travertine. At the keystone and the two imposts, there are three heads carved in a volcanic rock from Montecatini Val di Cecina, hardly legible due to severe deterioration (credits Fabio Fratini)

conservation conditions coming from Pignano which also provided the material for the seats of the Roman Theatre.

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Siena is another ancient town where travertine was widely used. It is included by UNESCO in the World Heritage List for the substantial stylistic unity of the medieval architectural heritage linked to a very rich artistic heritage, to a still intact surrounding rural landscape and to the tradition of the Palio (horse race bareback) and its 17 districts (contrade), the true soul of the city. The travertine, coming from the Rapolano area, was used, together with the Cavernous Limestone (of Triassic age) and bricks, since the 13th century, with particular frequency from the 15th century to the present as cladding of façades and as architectural decoration (thresholds, string courses, windowsills, columns) (Giamello et al. 1992). Among the most important buildings, it can be found in the rustic ashlar of Palazzo delle Papesse, in the cladding and architectural decorations of the façades of Santa Maria di Provenzano (Figure 4), San Giorgio and San Martino, as architectural decorations in the brick façade of San Vigilio, as cladding of the façade of Santa Maria delle Nevi, in the crowning of the tower of Palazzo Pubblico.

Figure 4 - The figure shows the travertine cladding of the façade of the church of Santa Maria di Provenzano in Siena (17th century). The façade is divided into three parts by pilasters, divided into two levels by a cornice and culminating in a tympanum. In the centre, the portal is surmounted by an arched tympanum and a rectangular window, while on either side there are four niches with statues of Saints Ansano, Vittore, Caterina and Bernardino (credits Fabio Fratini)

San Gimignano is also part of the UNESCO World Heritage Sites being substantially intact in its 13th-14th century appearance, evidence of the urban organization of the municipal age. The travertine comes from the outcrops of the Colle Val d'Elsa area that extend for over 50 km². It was used since the 12th century together with the Cavernous Limestone and lacustrine limestones of Quaternary age. It is present as building material in dressed stones, sometimes finely hewn, in numerous buildings and tower houses and often as cornerstones. It is found also as architectural decorations and for the crowning of wells and cisterns.

Pienza, a Renaissance village founded by Pope Pio II Piccolomini in the 15th century, is built with the local cemented Pliocene sands but travertine from Bagno Vignoni was used for paving the streets and for the cladding of the Cathedral façade and of the bell tower. Palazzo Piccolomini, built by Bernardo Rossellino, shows a façade in finely hewn Pliocene sandstones but the window frames and columns of the internal courtyard are in travertine, allowing to lighten the slightly dark tone of the masonry (Figure 5) (Rodolico 1964).

San Quirico d'Orcia, a walled village on the ridge that separates the Orcia and Asso valleys, owes its development to its strategic position, along the Via Francigena (the medieval route that pilgrims walked from France to Rome), at the connection with the route to Valdichiana. Travertine, from the nearby Bagno Vignoni outcrop, was used in many constructions as the only building material in finely hewn ashlars, as it can be observed in the Church of Santi Quirico and Giuditta (12th-13th century) with three finely decorated portals (Figure 6) and in the small Romanesque church of Santa Maria Assunta (11th century). In the baroque Palazzo Chigi Zandodari, travertine was used as a decoration to define the different elements of the façade.

Figure 5 - The figure shows the façade of Palazzo Piccolomini in Pienza (15th century) with its façade in finely hewn Pliocene sandstone of ochre colour and window frames in whitish travertine. On the left is part of the Cathedral façade, with its whitish travertine cladding (credits Barbara Sacchi)

Figure 6 - The figure shows the south side of the Church of Saints Quirico and Giuditta (12th-13th century) in San Quirico d'Orcia (province of Siena) clad in finely hewn whitish travertine ashlars. There is a Lombard-style portal (13th century) supported by two caryatids resting on two lions, all in Pliocene sand-stone (credits Barbara Sacchi)

Castiglione d'Orcia and Rocca d'Orcia, perched a short distance away on a high hill overlooking the Val d'Orcia, were a strategic control centres on the Via Francigena. The materials used in the construction of the two villages are limestone of the Cretaceous-Eocene age and bricks, but

travertine was used in Rocca d'Orcia for the construction of a cistern, a true jewel of the small village, delimited by a circular wall that delimits a floor where the parapet of the opening is located. Likewise, in Castiglione d'Orcia, there is a wonderful travertine well dating back to 1618, located in a suggestive triangular sloping square paved with cobble stones dedicated to the painter and sculptor Lorenzo di Pietro known as Il Vecchietta, born in the village (Figure 7).

Isolated in the countryside south of Montalcino, the abbey of Sant'Antimo stands out among the olive trees for the whiteness of its travertine, a great example of Romanesque-Lombard architecture. The travertine, both as finely hewn ashlars of the masonry and in the decorative architectural elements, comes from the outcrop of Castelnuovo dell'Abate.

Figure 7 - The figure shows a travertine well dating back to 1618 in Castiglione d'Orcia (province of Siena). The well is located in Piazza Vecchietta, a triangular-shaped square on a slope paved with cobblestones enclosed in squares formed by rows of bricks laid on edge that converge towards the well (credits Fabio Fratini)

Montepulciano, located on a high hill between Valdichiana and Val d'Orcia, has extensively used travertine from the nearby quarries of Sant'Albino. It is present in the

pointed arches of the Palazzo del Capitano del Popolo (14th century) and in the Palazzo Comunale which recalls the Palazzo della Signoria in Florence with the tower in the centre of the façade. In the 16th century great architects worked in the town such as Sangallo, Vignola, Peruzzi dello Scalza with the realization of elegant architectures, sometimes entirely clad in travertine or simply decorated. Travertine is also the material of minor works such as wells and columns. Just outside the historical centre, in an isolated position, stands the church of San Biagio. Masterpiece of Antonio da Sangallo the elder, with a Greek cross plant it is entirely clad in travertine and represents a fine example of 16th century Renaissance architecture (Figure 8).

Figure 8 - The figure depicts the church of San Biagio in Montepulciano, a fine example of 16th century Renaissance architecture, entirely clad in travertine. The Greek cross plan with a central dome set on a terrace and a classical drum is visible (credits Fabio Fratini)

The village of Massa Marittima dominates the hilly wooden landscape which slopes down towards the Gulf of Follonica. The ancient *Massa Metallorum* developed thanks to the intense mining activity linked to the deposits of pyrite, iron, mixed sulphides, known since ancient times and particularly exploited in the 12th-14th century. The first European mining code, the *lex mineraria*, was drawn up here. The city bears a great urbanistic as well as monumental interest. In fact, next to the primitive nucleus (Massa Vecchia), seat of the bishopric and municipal powers, in 1228, with the affirmation of the new entrepreneurial class linked to mining, an urban expansion was planned on the plateau above. An urban layout with streets crossing at right angles, a unique feature in the medieval centres of the peninsula, characterizes this expansion. Both nuclei rest on a large travertine bench, which was the only building material (Fratini & Rescic 2013). Travertine was used as a building stone in carefully squared ashlars for religious and public buildings, in the frames of the openings, in the decorations, in the columns and pillars. An admirable example of the use of travertine is the Cathedral of San Cerbone, an outstanding expression of Romanesque-Gothic architecture of the 12th-13th century (Figure 9).

Figure 9 - The figure shows the central portal of the Cathedral of San Cerbone in Massa Marittima (12th-13th century) with a richly carved marble lintel depicting the life of the patron saint, flanked by two lion protomes, also in marble, while the travertine cladding is visible at the sides (credits Fabio Fratini)

Also, in Saturnia, which stands on a travertine plateau, on the left bank of the Albenga river, in the hilly hinterland of Maremma, travertine is the main material used in architecture. Built by the Romans during the 2nd century BC. along the Via Clodia, which connected Rome to the inner

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Etruria, it preserves the remains of the ancient Roman city walls, with only one gate left (Porta Romana) of the four originally present and the imposing ruins of the Rocca Senese. In the small village there is also a section of the Via Clodia with irregular travertine paving stones and vertical containment margins and the remains of a large travertine basin, the Bagno Secco.

From the villages and towns of ancient foundation we pass to Montecatini Terme, a renowned spa town born in the second half of the 18th century on the initiative of the Grand Duke Pietro Leopoldo to enhance the springs used already in the Middle Ages. The affirmation of Montecatini as an international tourist centre was accompanied, at the beginning of the 20th century, by the construction in eclectic forms, of large hotels and leisure facilities (casino, café-concert, theatres) which were followed by villas and hotels in Art Nouveau style. The most representative thermal building is the Tettuccio, built in neoclassical forms in 1779-81 and completely renovated in 1918-28, based on the concept of the Roman baths with grandstands, exedras, and imposing travertine colonnades from the nearby Monsummano (Figure 10).

Figure 10 - The figure shows an image of the travertine colonnade of the Tettuccio thermal baths in Montecatini (first half of the 20th century) (credits Fabio Fratini)

The railway station, built in 1937 according to the spirit of rationalist architecture, represents the last phase of the development of the spa town. The project was by Angiolo Mazzoni, one of the major designers of public buildings, railway stations and postal buildings of the first half of the 20th century. In the building, with the characteristic clock tower, Monsummano travertine was widely used as rustic ashlars cladding, in association, for decorative purposes, with stone materials such as granite and porphyry from Trentino.

The rationalist architecture in Italy had great development during the fascist regime, which, giving great impulse to the realization of public works, testified to the incisive and concrete presence in the country. This architectural current, with the reduction of forms to an essentiality which corresponds to maximum functionality (elimination of decorations, simplification of shapes to pure volumes, the use of fundamental colours including above all white), extensively used travertine as a cladding and definition of the architectural elements.

In Tuscany Livorno is one of the cities that bears important evidence of this architecture. It is the main port of Tuscany, on the Tyrrhenian Sea. It owes its birth to a project of an "ideal city", wanted by the Florentine Medici dynasty in the mid-16th century entrusted to the architect Bernardo Buontalenti who thought of the construction of a pentagonal "fortress-city" surrounded by water. The advent of the Fascist regime led to the creation and conception of massive plans for the gutting of the city. Thus, in parallel with the construction of a new hospital (the Spedali Riuniti) and the municipal stadium, ancient buildings were demolished in the historic centre to make way for the palaces of the regime, such as the Government Palace based on the project of Alberto Legnani and Armando Sabatini. The architectural complex is of a dazzling white being completely covered with travertine and enriched by two bas-reliefs, also in travertine,

one by the sculptor Vico Consorti depicting Italy in peace and in war, the other, by Tommaso Peccini, representing the history of Livorno (Figure 11). The palace has been the location of numerous movies.

Figure 11 - The figure shows the rationalist façade of the Government Palace in Livorno, clad in travertine (credits Fabio Fratini)

In Livorno the Second World War caused extensive damage. In addition to the targets of strategic interest, much of the historic town and sites of artistic and historical interest were destroyed, such as the Duomo, the Synagogue, the San Marco Theatre and many other churches and historic buildings. In the area adjacent to the Government Palace, devastated by pre-war demolitions and war damage, between 1953 and 1957, under the impulse of the Port Workers Company, the Casa del Portuale was built (also known as Palazzo del Portuale) in rationalist style according to the project of Giovanni Salghetti Drioli, that with its brick facing and the slightly inclined walls recalls the Old Fortress sited nearby. The travertine, in contrast with the red of the bricks, was used to frame both the volume of the building (corners, base, upper frame) and the frames of the openings. This building has also been the location of numerous movies.

In Florence, travertine finds its most significant use in the Manifattura Tabacchi (tobacco manufacture building), a distinguished example of rationalist architecture together with the railway station of Giovanni Michelucci, the stadium of Pier Luigi Nervi and Gioacchino Luigi Mellucci, the Institute of Aeronautical Sciences of Raffaello Fagnoni. The project is by Giovanni Bartoli and Pier Luigi Nervi and the construction was completed in 1940. The courtyard of the clock is bold and modern, just behind the curvilinear head building and the socialization spaces (later transformed into a cinema-theatre) with the glazed tower reminiscent of the Marathon Tower of the Florence Stadium. Regarding the first half of the 20th century, another interesting example of the use of travertine is found in Piombino, a city located in front of Elba Island, where this material was used in the balustrade with benches of the scenic pedestrian terrace located on the tip of the homonymous promontory (Figure 12). In the 1960s, travertine continued to be used in civil buildings both for cladding the entire building and as baseboard, frames for openings, thresholds. Subsequently, there has been a rapid decline, with, in recent years, a resumption of use as an object of architectural design and interior design.

Figure 12 - The figure shows the balustrade with travertine benches on the scenic pedestrian terrace overlooking the sea in Piombino, built in the 1920s (credits Fabio Fratini)

At the end of this excursus regarding the use of travertine in Tuscany, it must be remembered that this noble material was imitated in the so-called artificial stones between the end of the 19th and the beginning of the 20th century. In this period, the advent of new hydraulic binders made it possible to create elements of considerable hardness and durability.

The creation of artificial stone products made it possible to respond to the strong demand of materials for architectural ornamentation thanks to the ease of production of the artefacts and to the simplification of installation together with the cheapness of raw materials. These artificial stones were made of a mixture of binder and aggregate with the addition of stone powder and pigments and realized in moulds or on site with a purely decorative and/or coating function, never structural. To imitate travertine, white cement was used, and streaks of coarse salt were added to the bottom of the mould, which after dissolution left the characteristic cavities of this stone on the surface. In Florence, an example of the use of "fake" travertine is in the Casa-Galleria Vichi, an Art Nouveau building built on a project by the

Figure 13 - The figure shows an image of the Casa-Galleria Vichi in Florence, an Art Nouveau building covered in artificial travertine (credits Fabio Fratini)

architect Giovanni Michelazzi, completed in 1911. It is the most representative of the few Liberty buildings in the city. The very narrow façade is characterized by a marked verticality, with a fascinating mix of artificial stone, steel, and glass (Figure 13).

4. Travertine, a regional identity material in contemporary Tuscany architecture

In architecture, in urban furnishing, do the stone materials still represent an identifying character of the place? In the case of travertine, as for many other stone materials, the relationship with the production areas is partly being lost in favour of an extra-territorial diffusion. Certainly, in the interior design and urban furnishing, travertine is having considerable success. This is due to several factors: this material, compared to the more noble Apuan marble, has always had a lower cost, a high resistance to decay, a pleasant aesthetic appearance, noble in a certain sense. In addition, in the last few decades, the processing of travertine has changed from an artisanal to an industrial character and the advent of computerized processing techniques, both in terms of shape and surface texture, made it possible to obtain surfaces with aesthetic effects, requested by architects who deal with design. In the quarry, it is possible to extract with the least loss of material, with a reduction in costs and greater environmental sustainability. Furthermore, thanks to the new surface treatments, this material can be used for many purposes (coating, flooring, masonry, ornaments) including those for which it was not previously considered suitable (bathrooms and kitchens). Nevertheless, in Tuscany travertine is still an identity stone of the territory as evidenced by its use in public and private buildings.

As an example of contemporary urban furnishing, we recall the new Monte dei Paschi bank business centre in Siena built between the years 1993-1998 by Arch. Au-

gusto Mazzini (Mazzini 1998). The architectural complex fills an urban "void" where the main station of the Leopoldina railway was sited (1848), demolished around 1930 when the new station was built not far from it. The memory of the place is reflected both by the preservation of the old rails and the 19th century façade of the locomotive depot and by the used materials that remains attentive and respectful of the context.

In Cetona, a medieval village in the province of Siena, recognized as one of the "most beautiful in Italy", the renovation of the main square, Piazza Garibaldi, in the years 2003-2004 (curated by architects David Benedetti and Stefano Borsi) involved a few and targeted interventions aimed at giving the square a connotation of a social and collective place. In this vision, the local travertine of Sarteano was used, in the light and dark colour.

In Laiatico (Pisa) the Casciana Terme travertine was used as a delimiting element for the Teatro del Silenzio (designed by Arch. Alberto Bartalini in 2006) (AAVV 2014). It is a theatre that can be defined as "temporary" as the elements necessary for the performances are removed at the end of the event. The theatre is in a natural depression among the hills near the village of Laiatico. It consists of a small lake in the centre of which stands a monumental sculpture by a contemporary artist, different for each year, and whose backdrop is made of travertine blocks which in the visual and constructive perception recall an ancient place of worship or a megalith of the Neolithic.

In Castelnuovo dell'Abate (Montalcino, Siena), not far from the abbey of Sant'Antimo, the Tabor reception centre fits perfectly into the nature of the Starcia Valley. The centre was built on the Jubilee of 2000 by the architect Stefano Lambardi as a place of welcome, a guesthouse dedicated to pilgrims passing through the Via Francigena (Fabbrizzi 2008; AAVV 2011). The peculiarity of this realization is its immersion in nature obtained through an underground structure and "green" roofs, the cladding of the walls being made of walnut travertine from the nearby quarries.

5. Durability and conservation methods

Travertine shows an excellent durability. This is because this rock was formed in sub-aerial conditions, therefore it is already in thermodynamic equilibrium with the conditions after installation. As it was said before, during the 1900s and in the present time, the choice of travertine for architecture was mainly dictated by its texture and whitish colour, nevertheless the stone surface tends to darken in time. This fact generates chromatic alterations with considerable aesthetic damage to the artefacts. The travertine is often covered by weathering black crusts in urban environment, made of gypsum accumulations with a laminar or framboidal morphology (Affanni et al. 1991; Benocci 1991; Ruggieri et al. 1991; Cosentino et al. 1991; Török 2008), especially on the surfaces with no direct contact with water. The greyish colour is instead the most common alteration colour of the travertine, being quite uniformly spread on large surfaces of the exposed stone because of the biological colonization (Figure 14). The bio-receptivity of the travertine is highly depending on its porosity, exposition to the solar radiation or cutting direction (Caneva et al. 2004). The cyanobacteria and black fungi are the main responsible for the darkening phenomena (AAVV 2010; AAVV 2016b; Elten 1991; Bellinzoni et al. 2003; Isola et al. 2016) on the architectural travertine, however, other organisms belonging to microflora and macro flora can occur (Figure 15) (AAVV 2010; Benocci 1991; Pentecost 2005).

The biological presence, along with other abiotic factors, contributes with different levels of decay to the pedogenic processes that may arise on this kind of stone (Caneva et al., 2004). For this reason, the most frequent intervention in documented cases of conservation of travertine is cleaning, carried out with mechanical methods as

Figure 14 - The figure shows a dark grey biological colonization in a travertine baseboard (credits Oana Adriana Cuzman)

Figure 15 - The figure shows a growth of yellowish lichens on the travertine architectural decorations of the Church of San Biagio in Montepulciano (credits Oana Adriana Cuzman)

regards the higher plants and guano deposits (AAVV 2010, Ruggieri et al. 1991). On carbonate encrustations and black crusts, low pressure water is used (AAVV 2010; AAVV 2016a; Affanni et al. 1991; Benocci 1991), sometimes preceded by chemical cleaning by means of ammonium carbonate compresses (AAVV 2016b; Affanni et al. 1991; Benocci 1991, Ruggieri et al. 1991). A treatment with a biocide product is often necessary for a complete elimination of biological attacks (AAVV 2016b; Benocci 1991).

As regards the consolidation interventions, in cases where the travertine has cracks or fractures, applications of ethyl silicate can be carried out (AAVV 2010; AAVV 2016a; AAVV 2016b; Ruggieri et al. 1991), and if necessary, injections of acrylic or acryl-silicone resins (Cosentino et al. 1991). Interventions to replace compromised parts are also frequent together with the grouting of macroscopic lesions and fractures with specially prepared mortars, containing travertine dust among the components.

Protective treatments are rarely applied on travertine (silanes and/or siloxanes as reported in AAVV 2010 and Affanni & De Falco. 1991). Indeed, considering its low tendency to absorb water, the treatment with hydrophobic products (that would easily alter the natural colour of the surface) is usually avoided.

6. Conclusions

Travertine is a hard material, easy to polish, resistant to atmospheric agents that has been used in architecture with both structural and decorative functions, particularly in the northern-central Italian peninsula where many outcrops of this rock are present. Namely this contribution examines the use of travertine from the Middle Ages to the contemporary age in the architecture of Tuscany, a region rich in hydrothermal springs that gave rise to the formation of this carbonate rock. Unlike many other stone materials used historically, in Tuscany travertine is still an identity stone of the territory as evidenced by its use in public and private buildings both in the interior design and urban furnishing. This is due to several factors: this material, compared to Apuan marble, has always had a lower cost, a high resistance to decay, a pleasant aesthetic appearance. In addition, in the last few decades, the processing of travertine has changed from an artisanal to an industrial character and the advent of computerized processing techniques has made

it possible to obtain surfaces with aesthetic effects, requested by architects who deal with design. Furthermore, thanks to the new surface treatments, this material can be used for many purposes (coating, flooring, masonry, ornaments) with a high guarantee of durability. Concerning the conservation, the main problem is the formation of black crusts in urban environment and chromatic alteration with formation of grey patinas due to biological growth. For these problems the intervention involves cleaning with mechanical methods, low pressure water, sometimes preceded by chemical cleaning by means of ammonium carbonate compresses and final biocide treatment for a complete elimination of biological attacks.

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The principle is simple: to organize very low-cost meetings, avoiding unnecessary expenses, while granting full freedom to the host institution to decide on the structure of its event and to add new members to the *steering committee*.

RIPAM meetings are held every two years, lasting three days, with the possibility of an intermediate one-day meeting focused on more specific themes.

RIPAM has a website, hosted at ripam.org, which is periodically updated with contributions from participating members.

The ninth meeting was dedicated to *cultural migrations*, bringing together 99 participants with presentations. This publication gathers the articles that were selected and whose authors consented to their publication.

The areas of discussion range from architecture to urban planning, rehabilitation, heritage studies, geology, geography, chemistry, physics, art history, fine arts, and engineering – in short, all fields that, in one way or another, contribute to the knowledge and understanding of Mediterranean heritage.

RIPAM itself is also a form of cultural migration.