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Comparative study and analysis of two medieval baths in western Algeria: Sabaghine bath in Tlemcen and El Bali bath in Nedroma

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Abstract

The abundance of water and springs has always allowed the presence of quite numerous baths in the ancient medinas. These public buildings have played a major role in the daily lives of the inhabitants, and have continued to evolve to this day. In this place the bathers carried out a hygiene of the body and the mind but also allowed themselves, meetings and discussions between the different social classes. Today, the modernization and degradation of the medinas, that of Tlemcen, Nedroma or other cities, threaten this architectural element, whose traces must be transmitted to future generations as a testimony to a civilization. Given its multifunctionality, the hammam deserves a multiple dimensional reading. In this article, we will present an inventory of two existing baths: the Nedroma one dating from the 11th century, and the one of the dyers whose dating is unknown; before moving on to a comparative study of their architectural and spatial characteristics. Indeed, their comparative study allows us to answer a set of hypotheses relating to their dating, but also to grasp the typology and architectural aspect in which they are part: more modest baths, if we compare them with the monumental baths of Turkey or the Middle East.

Keywords

Bath, Hammam, Nedroma, Tlemcen, Typology.

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1. Introduction

The bath, Moorish bath or hammam[1], is this space where all social classes, even all families, mix together and today represents a legacy of the collective baths inherited from the Romans; hence their importance in urban fabrics, in social life, but also in economic life (Benaboud, 2005). Each culture has created its own form, but the bath culture in the Maghreb is an event in which the purification of the body remains the main element. In addition, there are other secondary elements, such as wedding and religious rituals, health activities, and entertainment activities (Karatosun and Tuba, 2017). The bath is a concept that has evolved over time and in socio-cultural contexts; Resulting from the fusion of Greek, Roman and Turkish traditions, it has been established by researchers and historians that it was the Greeks and Romans who knew the first public baths of antiquity (El Habashi, 2008). In their conception of cities, the Romans gave great importance to the thermal baths and excelled in its interior and exterior decoration, using the most noble materials and the most advanced techniques (Dumreicher and Kolb, 2008).

With the arrival of the Umayyads to authority and Damascus as its capital, bathing quickly became part of the customs of the inhabitants of the Middle East, and quickly found its place among Muslims. In Al Andalus, it is the Umayyad prince *Abd al-Rahman Iér*, who contributes to the development of the bath, and thus gives it all its architectural splendour (Pauty, 1933); and on the other side of the Mediterranean, it is thanks to the contributions of Andalusian art and Marinid architecture that it has acquired its Maghreb form (Carlier, 2000). According to André Raymond, the attendance or absence of baths would constitute a significant element in the spatial distinction of the city's neighbourhoods and its importance; for him, the most beautiful and remarkable baths were located near the centre (Raymond, 1985). The bath was also found either near the mosque, and within the religious complex itself, or near important water sources (Benaboud, 2005). Each ancient medina has a large number of baths; there are 60 baths in Algiers according to D. Haëdo, 57 in Damascus, just over a hundred in the Iberian Peninsula in the 10th century (Castano Blazquez and Jimenez Castiillo, 2004). From the East to the West and Hispania, the public bath with its hygienic, entertaining and social functions was an integral part of the inhabitants' mores.

Today in Algeria, and despite the importance given to historical monuments and heritage, they remain buildings little studied by researchers and scientists. Some Algerian baths have been studied in the context of archaeological excavations or censuses during the colonial period; as is the case of Agadir bath (Bel, 1913), Sabaghine bath in Tlemcen (Marçais and al, 1903), or the Qalaa of the Beni Hammad, but there are probably still some in other cities of the country that remain unknown to researchers. On the other hand, studies on baths in Algiers during the Ottoman period were carried out by the architect and Dr. Nabila Cherif Seffadj, a study published in his magister and doctoral thesis (See *The baths of Algiers during the Ottoman period. History, topography and urban study,* Doctoral thesis, 2005).

2. General presentation of the site and the two baths

2.1. The site

The two baths studied are located in the wilaya of Tlemcen, in northwestern Algeria. The latter consists of 20 daïras, including Tlemcen in the centre, and Nedroma in the northwest of the wilaya.

The former medina of Tlemcen, to which Sabaghine bath belongs, is one of the oldest historic cities in the country, it alone contains a heritagea of inestimable value and has qualities specific to the urban structure and architecture of Muslim cities (Ghomari, 2007).

As for the old medina of Nedroma, which includes the El Bali bath, the city is located at the foot of Mount Fillaoucene, on an ancient Berber city. (Sari, 1968).

Al Bekri first gave it this name in 1068, and there were never any remains or inscriptions found that could attest to the Roman presence in the city, so

[1] *Ibn mandur in his book gives the following definition of the term, Hammam: word of Arabic origin, singular male name of hammamat, derived from the root hamim which means hot water. Hamim also means "Sweat".*

he described the city as « *at the foot of a great mountain, the Fillaoussène. To the north and west of the city lie fertile plains and cultivated fields. It is ten miles from the sea; it is a considerable city surrounded by walls and having a river bordered by gardens that produce all kinds of fruit* ». Another description of Nedroma is provided by Al-Idrissi, around 1164 (559 H): « *Nedroma, a considerable city, well populated, surrounded by walls, provided with markets and located on a hill at mid-shore.... Fields sown and watered by a river depend on it. On the eastern side of the hill, there are gardens, orchards, houses and water in abundance* » (Grandguillaume, 1976).

The city still has a site of inestimable historical and heritage value and a strategic position. It contains a set of historical and cultural values that have contributed to the creation of an identity specific to the region, it is easy to see that without being equal to the great metropolises such as Fez, Kairouan, Constantine or even Tlemcen - its neighbour and rival - Nedroma is part of the medina family (Khattabi, 2017).

2.2. The two baths

Sabaghine bath:

Located in the northeast part of the medina of Tlemcen, and with a total surface area of 572m², the Sabaghine bath owes its name to the dyers' alley where it is located. It was also nicknamed the Sidi Bel Hacen bath in memory of the pious Ahmed Bel Hacen El Ghomari who honoured the place with his frequent visits (Marçais, 1911). It is the most quoted bath in the works concerning the city of Tlemcen, probably due to its history and architecture.

In 2010, the bath was restored as part of the "Tlemcen Capital of Islamic Culture 2011" project; work began on the shoring of the floors, arches, domes and stairs, as well as the stripping of the various plasters. The work is now at a standstill.

The bath is surrounded by dwellings and is difficult to distinguish from the outside except by the treatment of its entrance.

El Bali bath:

Also known as the El Mourabitine bath (Almoravid bath), it is located in the heart of the old medina of Nedroma, in the place called Tarbi'aa and is considered as one of the oldest baths in Algeria, hence its name of old bath.

The bath, unlike Sabaghine bath, has been a national monument since 1912 and was restored in 2003. Still functional, it is frequented daily by the inhabitants of the district and the city of Nedroma.

3. Comparative study of the two baths

A comparative study of the two monuments, based on an analytical reading, is necessary to identify common and similar points, but also points that diverge spatially, conceptually and architecturally. It also allows us to highlight the typological characteristics, if any, of the baths in the region. The choice of common and divergent points was identified and developed on the basis of the methodology of architectural analysis (Boudon, 1975), as well as the work provided by Caroline Fournier on the Al Andalus baths (Fournier, 2016).

4. Historical background

First, it is important to review the chronology of the two baths. For both baths there is no official document attesting to their date of construction. Sabaghine bath, was linked to the Almoravid period according to Georges Marçais; in effect, it is difficult to date the construction of the bath, no historical document exists on this subject. However, it can be linked to the first period of the 11th century (Marçais W and al, 1903), on the basis of its architectural style and its similarity to other baths preserved in Spain or Sicily.

The El Bali bath, an annex to the Great Almoravid Mosque of Nedroma, was built to allow the faithful to practice their ablutions, hence its dating by researchers to the Almoravid period (1095-1147) (Merouane, 2005).

5. The situation

It is clear that the location of the two baths remains dictated and defined by their functions and importance, as

not only a major site and key element within cities but also as a place of social exchange, gathering and spiritual purification for the inhabitants of the districts (Raftan and Radoine, 2008). Sabaghine bath is located in the heart of the medina of Tlemcen, in the heart of the old Tagrart district founded in the 11th century by the Almoravids.

El Bali bath, is also located in the heart of the former medina of Nedroma, but unlike Sabaghine bath, it has an entrance visible from the outside, despite the lower level of its access compared to street level.

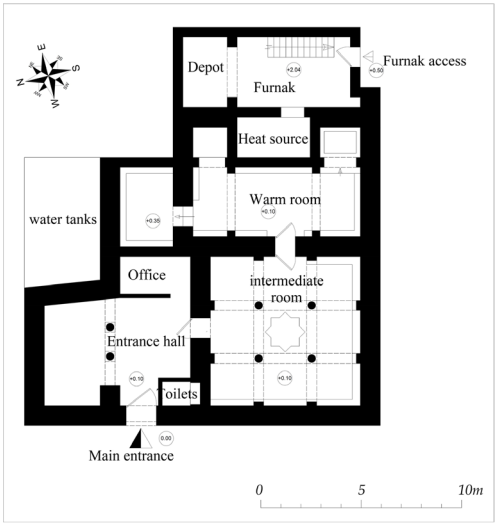

Figure 1. *Ground floor plan of El Bali bath.*

6. The architectural character

6.1. Spatial organisation

The bath has a number of rooms with a specific purpose and organization: Their arrangement ultimately consists in harnessing the heat, so that there is a gradual graduation of heat between the different spaces. Generally, the bath space is organized according to the multiple needs of the user, ranging from the purification of body and mind, to the commutative or meeting space. It is therefore divided according to these needs into three distinct parts:

-the intermediate room or *bayt al-wastani:* used to rest the swimmer during his bath, and for the various massages and treatments provided to the body.

-the hot, warm room or *bayt al-sakhun:* space used as a steam bath, equipped with cold and hot water basins.

-the cold room or *bayt al-barid*, or rest rooms.

-additional rooms are provided in addition to this basic layout, such as toilets or warehouses (Cherif Seffadj, 2009).

Architecturally and in terms of space organisation, the two baths are similar: both contain three large spaces and are arranged around a central space of quadrangular shape: in the past, it was the most important part of the bath: the intermediate or tepid space[2] (El Habashi, 2008). The latter is ordered around a central space decorated with a water jet, surmounted by a vault and surrounded by lateral galleries; the intermediate space is delimited by a series of arches and columns. At the level of the two baths the intermediate space is no longer and has been converted into a cold room and therefore the transition from the cold room to the hot room is done instantly. On the other hand, for Sabaghine bath, a small space was built between the two rooms to serve as a new tepid room.

The spatial design of the two baths remains the same, however, and reflects a unique, centralised mode of operation and articulation, and therefore does not present an in-line sequence of parts. This is what we notice in the El Bali bath, where the intermediate space (currently the cold room) is located in the centre of the bath and occupies a little more than half of the total bath area. The bath has not been modified except for the transfer of a few spaces and the addition of sanitary facilities at the entrance. Nevertheless, we notice the addition of the cold room with the changing rooms due to the reduced surface area of the bath. Also, two water basins for the bath supply are located in the north-eastern part of the building.

In the case of Sabaghine, a comparison between an old bath reading published in 1900 by Marçais, and the current form of the latter was necessary, in order to highlight the changes it has undergone. In the book on "The Arab Monuments of Tlemcen", the authors give a detailed description of the bath and already point out at that time that it had undergone transformations and additions to its spaces.

According to William Marçais' de-

[2] *In almost all the well-preserved baths, where the organisation of the spaces is centralised, it is around the intermediate room that the other spaces are articulated.*

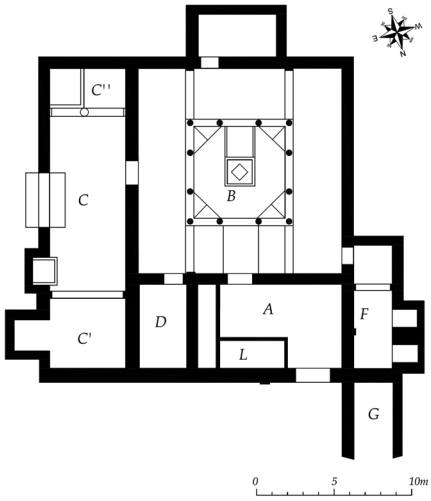

Figure 2. *Ground floor plan of Sabaghine bath established based on that of Marçais in 1900.*

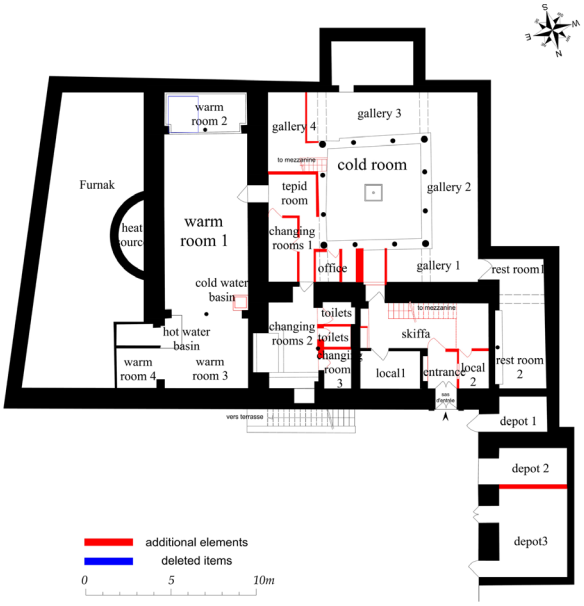

Figure 3. *Current ground floor plan of the bath.*

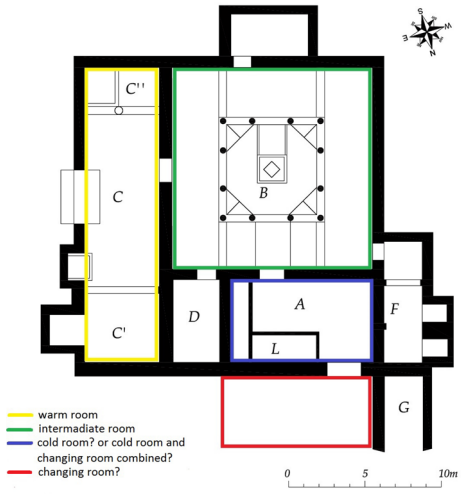

Figure 4. *Hypothetical plan of the bath previously.*

scription; from vestibule A, a vaulted room, where a part has been dedicated to the installation of latrines (L), a square space B with 5 m sides is accessed, the frigidarium. A dome resting on twelve monolithic limestone columns with a water jet in its center tops this space, surrounded by four galleries. The part surrounding the central space was raised and provided with benches for bathers to rest, at the time placed on the ground. From the galleries of this central space, access is given to ancillary rooms that are also used for bathers' rest.

A door on the left of the cold room opens directly onto the hot room, the antique caldarium, and isolates the temperature of the oven from the rest room. Oven C, divided into 3 parts of unequal dimensions; the first largest C, contains a hot water tank and distributes for this purpose the steam and humidity necessary for this space. The other two parts limited by stone columns are symmetrical; part C' has a fairly deep cabinet, and finally the third part C" is half occupied on one side of the cold water tank and on the other side of a space for massage.

The other rooms present, were used either as a rest area or as a storage area for the bath. However, Marçais points out the absence of the intermediate room or tepid room. According to him, it was probably located at the location of room D. The space G, at the entrance to the bath and adjoining room F, served as a fuel storage space for the bath [Figure 2]. Today the bath seems to have been mutilated with different arrangements from its original layout; however, it is worth noting either the addition of new parts such as the two mezzanines (in the entrance hall and gallery 4), or the separation of rooms by brick walls or wooden partitions, or the drilling of skylights in the vaults and domes. A part has also been designed to act as an intermediate room between the cold room and the hot room, a space that is missing from the plan made by Marçais. The toilets are no longer at the entrance of the bath but have been moved to another space. For the hot room, the location of the cold and hot water pool has been modified. To this end, the following figures

show all the modifications compared to the initial plan drawn up by Marçais in 1900 [Figures 3].

At the Sabaghine bath, the absence of the cold room or changing rooms is highlighted: have the spaces been merged into a single space or has the changing room area been demolished? Figure 4 shows a hypothetical plan of the bath previously [Figures 4].

For the surface area of the two baths: the total surface area of El Bali bath is 244m², almost half that of Sabaghine bath which is 572m², this difference in surface area is reflected in the relative proportions of the different rooms:

Most of the difference in surface area between the two baths is found in the cold room (ex intermediate room) as well as in the hot room; that of El Bali bath is almost half that of Sabaghine bath for both spaces [Table1].

Table 1. *Surface comparison of the spaces of the two baths (Authors).*

Espaces	El Bali bath	Sabaghine bath
Entrance vestibule	43m²	25m²
New cold room (frigidarium) + rest areas	55m²	150m²
Total cold rooms	98m²	172m²
Hot room (caldarium)	45m²	90m²
New intermediate room	0m²	20m²
Side rooms	3m²	44m²
Ground floor surface	244m²	501m²
Floor area (mezzanine)	0m²	71m²
TOTAL	244m²	572m²

6.2. Architectural components

The vertical elements:

The columns

In the dyers' bath, the former intermediate chamber or bayt al-wastani is the centre of the composition. The arches, which rest on the eight monolithic columns, form the octagon and support the dome. As for the other four corner columns, which each have two arches, they form the square of the central space and replace the octagonal plane of the dome. The bath has two other columns at the level of the warm room in a square shape with no decoration, and two others in niches. Apart from the columns of the hot room, the other 12 columns are identical in shape, size, shaft, and capital. The columns are without base, with a cylindrical barrel without fluting, and a square capital inspired by the Corinthian order [Figure 5].

El Bali bath has 4 columns at the level of the former bayt al-wastani that support the dome in the center and 2 columns in the entrance hall. All the columns of the bath are identical and have, like those of Sabaghine bath, a cylindrical barrel without fluting, but they contain a base, with a square capital and without volute or decoration. It also includes 4 other engaged pilasters in the walls at the level of the warm room in a square shape and without ornamentation [Figure 6]. The columns are made of stone in both baths, and are not only decorative elements but also represent internal supports for the structure of the building. As for the capital, it is an essential element in the column because it allows the thrust of the vaults and arches to be distributed.

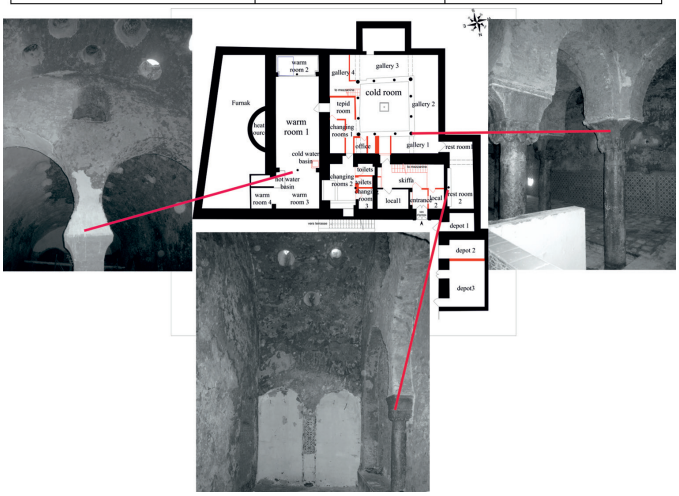

Figure 5. *Identification of the columns at the Sabaghine bath.*

Figure 6. *Identification of the columns at the El Bali bath.*

The walls

Traditionally, building materials are sought and transported close to the building site, including soil, sand or stone. In both baths, the load-bearing walls are 1m thick and have been made with rammed earth or pisé or tabiya. This technique is very common for this type of building; it is a very solid, hard, compact material that is resistant to strong thermal changes (Chennaoui, 2009).

The thickness allows to insulate the spaces and to avoid heat losses, especially in the hot room. One or two coats of lime plaster will strengthen the waterproofing of the parts. The pointing mortar is generally thick and consists of soil and lime. For the recent separations at the two baths, they were made with hollow brick, but solid brick was used at the furnak level.

The horizontal elements:

Arcs and arcades

The arches are elements that are part of the building's structure but also decorative elements; there are eight horseshoe arches protruding beyond the octagon that forms the dome of Hammam Sebaghine's cold room, and three others at the entrance vestibule of El Bali bath. On the other hand, it is the semicircular arch that dominates the spaces of El Bali bath and there are twelve of them in the cold room. The horseshoe arch made of brick is very common among Muslims, and is mainly chosen in bath galleries with large changing rooms or a large intermediate room, it is found in the majority of Al Andalus baths dating from the 10th to 11th centuries.[3]

In terms of the framing of the interior doors, the lowered semicircular arch dominates; and in terms of the exterior door, the horseshoe arch for El Bali bath and the semicircular arch for Sabaghine bath.

Roofing: Vaults and domes

The two baths are enhanced at the level of the former warm room by a dome supported by columns in the centre, and by a set of barrel vaults around it. The central space of Sabaghine bath is more masterful and larger than that of El Bali bath, and is therefore decorated with an octagonal fluted dome of sixteen arches or panels, with three lateral openings for the passage of light [Figure 7]. The dome is used to cover the alcoves and the central space of the intermediate room with a square plan. Examples of half-timbered domes have been found in Gracia Jofre's baths in Seville and in Gibraltar in the intermediate rooms.

The one of El Bali bath is a dome on trunks adorned with ten m'dhaouis[4], and undecorated [Figure 8]. The passage of natural light through the rest of the baths was done through the circular m'dhaouis at the level of the barrel vaults which covered all the remaining

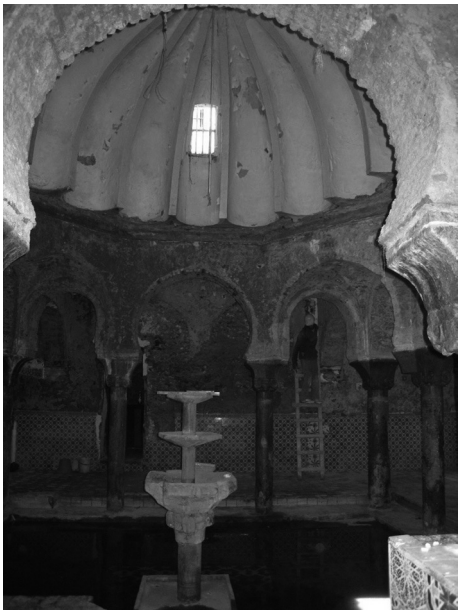

Figure 7. *View of the Sabaghine bath dome from the cold room.*

Figure 8. *View of the dome that adorns the centre of the El Bali bath.*

[3] *Examples include the 10th century Umayyad Alcazar bath in Córdoba, or the 11th century Villardompardo bath in Jaen.*

[4] *Small openings in the vaulted bath roofs for natural light to pass through.*

spaces (hot and cold room). Cradle vaults are the most commonly used in the baths of Al Andalus, as well as in the Maghreb, they are particularly adapted to the circulation of heat (Azuar ruiz, 2005). Made of brick, from the outside the domes are covered with a layer of plaster with no trace of tile roofing.

The terrace of El Bali bath consists of a dome and seven barrel vaults that can be distinguished from the outside and are topped by 3 chimneys for the evacuation of hot air. Unlike Hammam Sabaghine, which is topped by a dome and six barrel vaults, but also has three fireplaces.

The barrel vaults that adorn the Sabaghine bath are difficult to distinguish from the outside because they are buried under new illegal buildings (shops and housing). These in column-beam structure, have encroached on a large part of the roof of the bath and cover totally or partially several vaults by endangering the stability of the latter. The bath terrace was once used by dyers to dry skins, wool and fabrics using an outdoor staircase [Figure 9].

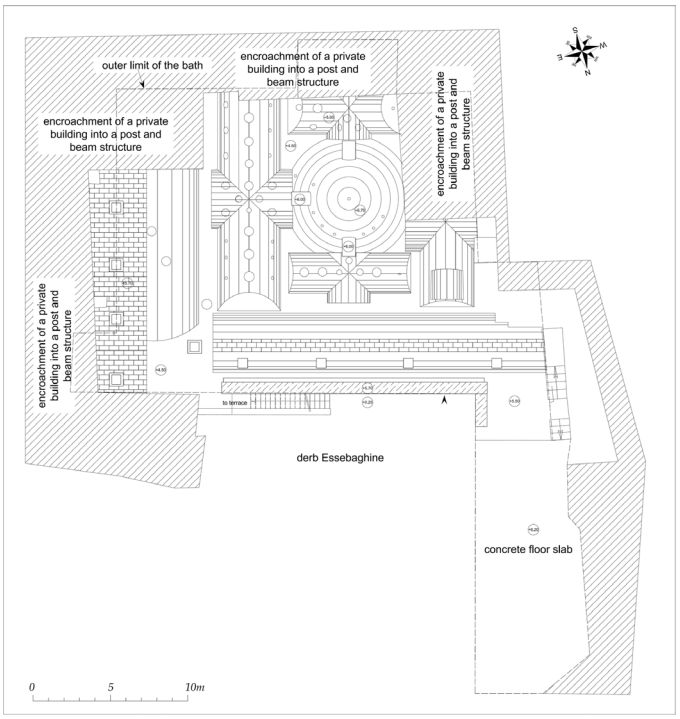

Figure 9. *Plan of the terrace of the Sabaghine bath.*

The hypocaust furnace system

The hypocaust is this underfloor heating system, used since Roman times in the thermal baths and maintained in the Arab baths. The principle of hypocaust is as follows: a powerful chimney or oven directly adjacent to the building produces hot air that circulates under the floor of the rooms to be heated raised by means of small piles or low walls. Air also circulates behind walls, as hypocaust rooms are almost always equipped with heated walls held in front of the walls by stones or, more frequently, by terracotta dowels (Bazzana, 1999). In traditional baths the oven or furnak is located behind the hot room with independent access, it allows to propel the hot air but also to heat the water of the pool at the level of the hot room; as it is the case in the Sabaghine bath.

At the El Bali bath, the oven is located under the hot room immediately, near a space for storing wood for combustion. From the viewpoint of the smoke emanating from the space, the walls are almost black. A smoke exhaust duct of square cross-section passes through the walls of the hot room to exit at the level of the terrace in the form of chimneys, a level of 2m above the level of the terrace. In addition, the space requires the most qualified workers.

The ornamentation

There is a total absence of decoration in the two baths; apart from the interest in the dome of Sabaghine bath and the capitals of the columns, the other areas of the bath are characterised by their simple design and execution.

7. Conclusion

The comparisons made in this study provide information on the richness and importance of each bath, both of which are public baths built within cities (medina). We discover that Sabaghine bath, with its surface and interior decoration reflected in its dome and capitals, was probably more imposing and important than El Bali bath. The latter, annexed to the great Almoravid mosque of Nedroma, did not enjoy the same social and economic status as Sabaghine, which was located in the heart of the former medina of Tlemcen.

The spatial design of the two baths is identical and therefore belongs to a single family where the layout of the different rooms is centralised; unlike the Merinid baths of El Eubbed

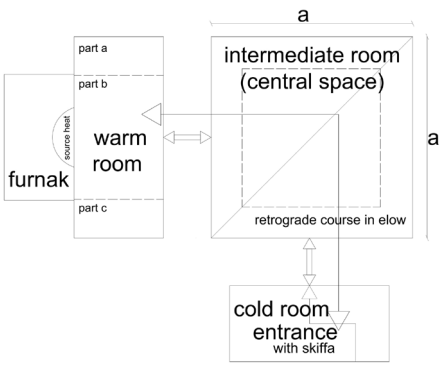

Figure 10. *Spatial organization diagram common to both baths.*

(Marçais G and al, 1903), Morocco (Terrace, 1950), or other baths in Spain dating from the 10th century, whose shape and layout of the spaces is linear or in a row (Fournier, 2016). The organization of Sabaghine bath and El Bali bath is based on the central quadrangular room, which represents almost half of the total bath area. To this end, this mode of organization reflects a single mode of operation, where the user must follow an elbow circuit and where his privacy is preserved. The rooms are not placed in a row and therefore the hot room is perpendicular to the one before the intermediate room. There is also a recessed space in the warm room for the bathers' intimate toilet in the two baths [Figure 10].

For this purpose, we can therefore link these two baths to the 11th century baths already reported in Spain[5]. And by the similarities observed, we can link the construction of Sabaghine bath to the 11th century, thus linking it to the Almoravid dynasty present at the same period in Tlemcen, and confirm Marçais'[6] hypothesis. The architectural study of the two baths provides us, in addition to information on the way in which the spaces of this type of monument function and are arranged, with a new material support; which, in addition to its historical richness and use, represents a traditional architectural unit that bears witness to the ingenuity of mankind in the past. An ingenuity that is reflected in the constructive mode, but also in the design of the hypocaust, mainly reserved for the hot room equipped with two basins.

Through this study, we want to demonstrate that the management of this type of monument is essential for the safeguarding and enhancement of our cultural capital, which will first result in a national classification of Sabaghine bath.

Further studies will allow us to develop all the baths still existing in Tlemcen, or to compare them with similar baths in Spain, in order to highlight similarities and differences.

[5] In her book on Al Andalus' baths, Caroline Fournier links this type of bath to Jaén's 11th century model. She cites Naranjo and Villardompardo as similar examples. Another bath, located in Palma de Mallorca, has only its intermediate room with a centralized layout.

[6] Return to the general presentation part of the bath.

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