

Stratigraphic Study of Hernando de Zafra Arab Baths in Granada, Spain

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ARAB BATHS & ROMAN THERMAE

The tradition of Arab baths is not exclusive to Islamic culture but has its roots in Roman *thermae*, buildings of variable dimensions, ranging from small to monumental, common in all settlements during the time of the Roman Empire. This custom became deeply rooted in all the territory conquered by the Romans and was adopted by the Islamic culture that came afterwards.

The working of the *hammam* or Arab baths is very similar to that of the Roman *thermae*, with the space divided into several rooms: the dressing-room or *al-bayt al-maslaj* (the *apoditerium* in the Roman baths); the cold room or *al-bayt al-barid* (the *frigidarium*); the warm room or *al-bayt al-wastani* (the *tepidarium*); the hot room or *al-bayt al-sajun* (the *caldarium*). Heat was produced in a service room adjacent to the latter, which housed the boiler or *al-burma*, and a place for storing fuel.

This system of alternating heat and cold opened up and cleaned the pores and was one of the greatest pleasures in Islamic daily culture, as we can see from the words of the poet Abu Ya'far Harira (Rubiera 1988, p. 102):

How beautiful our baths are!
Their clear beauty seems magical.
They are a place where fire and water meet
As the human heart mixes joy and sadness.

However, there are certain differences between Arab and Roman baths, which we can sum up as follows: Arab baths are usually smaller and laid out in parallel to form a square or a rectangle; they have no niches but alcoves separated by arches and, of course, they reflect Islamic tastes and preferences in their architectural style and building methods.

Arab baths had religious significance, since they were usually built adjacent to or as part of a mosque, as the Koran says that ablutions should precede prayer and other religious rites (Maillo 1996, p. 99). Besides, the proceeds from the baths were usually used to help finance the adjacent mosques (Vilchez 2001, p. 16). In any case, Arab baths, like *thermae*, were not only places destined for bodily hygiene, but also in time became places for people to gather, talk and hold meetings, fulfilling an important social function difficult to imagine today.

HERNANDO DE ZAFRA BATHS. HISTORICAL DATA.

Hernando de Zafra baths, locally known as La Casa de las Tumbas (House of Tombs), located in what used to be the main thoroughfare of the old Medina of Granada, now calle de Puerta Elvira, are one of the few examples of Arab baths conserved in the city. They used to be in the Bab Ilbira quarter, situated on the southern edge of the Medina.



Figure 1. *Frigidarium* of the Bañuelo in Granada



Figure 2. *Tepidarium* of the Baño de Hernando de Zafra

Unfortunately, there is no historical documentation concerning these baths. The only thing we know about them are the technical details discovered by scholars in the past, which give us a few clues as to their evolution. The first historical references date back to the conquest of Granada by the Catholic Monarchs in 1492, when these baths were described in the property registry as belonging to Hernando de Zafra, who was at the time the faithful secretary of the monarchs (Sorroche 2001).

They were built outside a mosque later transformed into what is now San Andrés church. In Christian times, as the baths were considered a potential hazard as a point where Moriscos could gather to prepare uprisings, they fell into disuse and were gradually absorbed by the development of the area and eventually turned into popular dwellings. From the 17th century onwards, the nickname House of Tombs was commonly used because from the outside the vaults looked like the remains of ancient burial places.

From the 19th century, the romantic interest in the Granada's Arab past gave rise to the first reports and detailed descriptions, such as the one written by José Giménez Serrano in 1846 (Sorroche 2001).

It was given this name, the House of Tombs, at the beginning of last century, but groundlessly, because even the most ignorant people must have known that it used to be public baths in Arab times. Now the building is very badly damaged and the only things that remain standing are the strong mortar walls and the vaults, which are part of two houses and have been divided up to suit the inhabitants. Although full of rubble, the rest room and the pool room can be visited. The latter is now a timber store, measures six *varas* each side and is covered by an elegant sail dome shaped in that difficult design the experts call *rincón de clausura* and held up by twelve arches resting on twelve columns of Máchale marble, with ancient capitals in imitation Corinthian style. In the middle you can see the traces of the cold water tank, and a covered gallery with cylindrical vaults and little cupolas in the corners runs all around it. All these extremely solid brick vaults are symmetrically pierced by little star-shaped skylights set at different angles that served to illuminate the interior, bereft of windows and with narrow doorways. In the gallery or corridor in the north is a room that was used by believers to undress and in the east another one that was the hot water tank or sweat-room. To the south, according to tradition, lay a delightful garden full of scented flowers with ponds and marble fountains, some remains of which can still be seen buried in the stockyards of the houses.

The description written in the late 19th century by the scholar Gómez Moreno (1982, pp. 328-329) is more detailed and describes the exact state of repair of the building at that time:

This is the name given to Arab baths, conserved at number 3 of the nearby calle de los Naranjos; the present entrance seems to be the original one and is in a little lane, at the end of which are two pointed arches that give on to a stockyard. Before going out, a little

segmental arch leads into a small lobby with another arch opposite, giving on to a long room. Most of the sail vault in this room has collapsed; to the right there is an opening with a horseshoe arch and another very wide arch opposite, leading into a small room with tiny cubicles on each side, with sail vaults like all the other rooms in the baths, with star-shaped and octagonal skylights. The pool in this room is modern. A segmental arch doorway led into the main room of the baths, the equivalent of the Latin *tepidarium*; there are galleries around three sides and a large square space in the centre, also with a sail vault, leading into the rooms through nine slightly pointed horseshoe arches resting on columns. Old refurbishment works, perhaps to raise the floor, can be detected, because the spring of the arches were removed and the columns replaced, two of which and the capital of another date from the 14th century, as the capitals are cubic in shape and the shafts have rings at the top, according to the custom at that time. The others are made of puddingstone and too large for their capitals, which probably came from Gothic buildings from the Caliphate period. Other horseshoe and segmental arches are at the corners of the galleries; on the right-hand side stands a little room in ruins and in front of it was the entrance into the steam baths, with access from calle de Elvira number 143. This room is rectangular and has alcoves at the ends, each separated by a horseshoe arch, in very poor condition. Opposite is a segmental arch, leading into the furnace room where the water was heated, with two doors: one giving on to the stockyard and the other on to a lane with a *rincón de claustro* or sail vault. In the alcove on the right there is another horseshoe arch with a little bathroom, which would have had its own pool.

Juan Manuel Barrios Rozúa (1999, p. 197) writes about the state of neglect of the buildings in 1905, when the owner of one of the houses living there informed the city Monument Committee of his intention to demolish it because it was in ruins. In 1921 another of the owners told the same committee he wished to refashion the interior of his house completely. On neither occasion was much sign of interest shown in saving or documenting the building. In the mid 20th century, the scholar Antonio Gallego Burín (1982, pp. 318-319) referred to the information given beforehand by Gómez Moreno and spoke of the more and more precarious state of the building.

It was not until the end of the 20th century that the regional administration showed an interest in it by proceeding to expropriate the houses and demolish them down to the vaults of the baths, as a preliminary step to drawing up a meticulous study and carrying out research, before continuing to retrieve the baths and restore them to turn them into a museum.

APPLICATION OF THE STRATIGRAPHIC READING METHOD

In fact the regional administration has recently expropriated these houses and initiated a retrieval process on the whole ensemble, comprising archaeological excavation, metric mapping, a historical study, a stratigraphic study of the preexisting structures and a project to refurbish it and turn it into a museum. The stratigraphic study, which was commissioned to the authors of this paper, was seen as

a useful tool for distinguishing the different building stages and the posterior domestic additions. Their primary objective was to draw up complete documentation of the site, and their secondary one was to avoid errors that had gone unnoticed in the demolition process to clear the Arab baths of the posterior constructions during restoration.

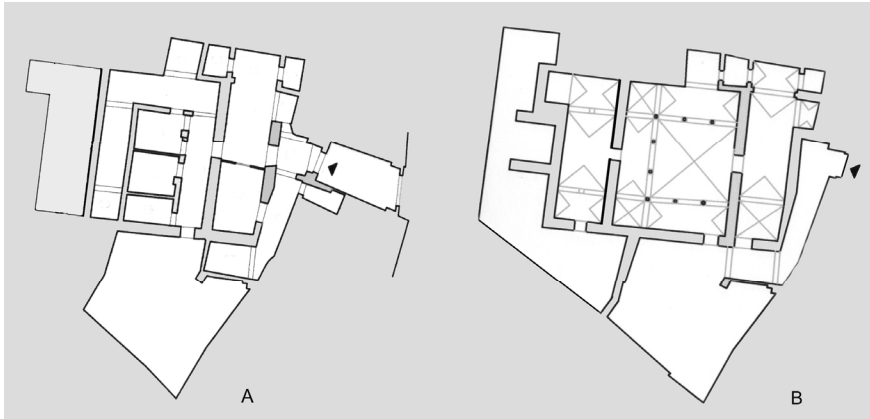


Figure 3. Lay-out of the baths before (A) and after (B) the demolition of domestic additions and expropriation of the *caldarium* area



Figure 4. Images of the demolition to clear the Arab baths from domestic additions

The stratigraphic study of architecture, whose current form arose from the application of studies by Edward C. Harris (1989), constitutes a method that makes it possible to identify, document and place in chronological order the material data that can be found in the fabric, in the case either of an archaeological site or a building. Harris himself was responsible for introducing the stratigraphic study of walls as elements usually present in archaeological sites.

In any case, the first applications, the systemisation and development of the methodology of stratigraphic studies of architecture is mainly attributable to a group of Italian archaeologists like Parenti, Francovich, Mannoni or Brogiolo, who started to work and initiated a debate about the subject in the nineteen eighties and published their findings in the magazine *Archeologia Medievale* (Mileto 2000, pp. 80-93).

Nevertheless, there are important differences between the stratigraphic study of archaeology and architecture that must not be underestimated (Doglioni 1997, pp. 131-160). In archaeology stratification produces deposits arising from natural causes, usually brought about by the law of gravity, whereas stratification in architecture comes about due to artificial criteria caused by the hand of the builder on creating and modifying spaces.

This singularity of architectonic stratification involves the existence of many more surfaces than in archaeology, legible or concealed. Furthermore, the deposition process of the layers is not verified in a single direction, as is the case in archaeology, but depends on the will of a human being. Besides, there is a fundamental difference in the operative process of both disciplines. The stratigraphic reading of an archaeological site necessarily involves excavation, that is, the progressive destruction of the layers that are successively discovered and examined.

On the contrary, the stratigraphic reading of a building, regardless of its state of conservation, does not require excavation or any other process of demolition or progressive removal. In the case of architecture, the layers can be read simultaneously and never integrally, so that it is worth taking into account that the stratigraphic reading of a building may be more or less exhaustive depending on the legibility of the stratification.

This is tantamount to saying that a stratigraphic study usually goes as far as the visibility of the stratum allows, without having to eliminate anything. This statement is paradoxical in the case of the stratigraphic study of the Hernando de Zafra Baths in Granada, where this procedure of interpreting the building history of an edifice has been an exceptional device used precisely to free the Islamic building from the layers later superimposed when adapting it for human habitation.

TECHNICAL AND BUILDING DATA

The stratigraphic-constructive study of the Hernando de Zafra Baths was carried out in two stages, prescribed by the progressive rhythm of the expropriation process of the private houses where the

baths stood, which was necessary to allow the researchers and technicians appointed to do their work and restore the baths and set up the museum. In this way, a first study phase, focused on the *bayt al-marid* or *frigidarium* and the *bayt al-wastani* or *tepidarium*, was carried out in 2001. Once the expropriation process had been completed, the second study phase was begun, in 2004, on the *bayt al-sajun* or *caldarium* and the furnace area, then called *al-furn*, a term directly taken from the Latin word *furnus*. Only after the second phase was it possible to gain a general overview of the built site and reach reasoned conclusions about building aspects.



Figure 5. Stratigraphic study of the South wall of the *caldarium*

The walls of these baths bear testimony of the solidity of the building, since they are made both of thick, lime-crusted pisé-de-terre and robust brick fabrics bonded with lime mortar. Brick fabric sail vaults lie over them, except in the central room of the *frigidarium* and the central space of the *tepidarium*, which had collapsed probably because it was larger in size. In some cases, the springing of the vaults can still be seen, as they were marked by the prominence of the first row of bricks above the wall.

In the sail vaults still conserved there are many little orifices or skylights (in Arabic *midwa*, singular, and *madwani*, plural), in geometrical star shapes, made out of special ceramic pieces. At the time of the study, they were mostly covered over, but integrally conserved. These skylights played a double role: in the first place, with their top part in multicoloured stained glass, they illuminated the different rooms in the baths and, in the second place, they made it possible to regulate the heat or steam in the rooms by opening them for ventilation.

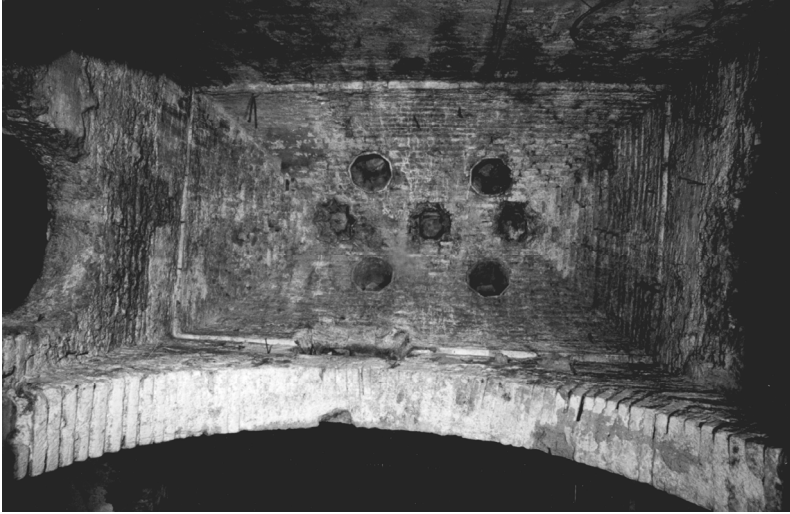


Figure 6. Sail vault with its skylights

Furthermore, the different spaces in Arab baths are divided by arched porticoes over columns and capitals and arches between walls forming alcoves for privacy. In this case, the columns of the porticoes are made of marble and sometimes of brick –perhaps as the result of removal and/or substitution– and the arches between them and the fabric of the walls are built out of plain bricks bonded with lime mortar, mainly horseshoe- or segmental-shaped.

To judge from the remains conserved, the interior surface of the brick fabrics was protected by a layer of light beige-coloured lime mortar of excellent quality. In the case of the lime-crustrated *pisé-de-terre*, the outer crust acted as plaster with extraordinary structural qualities. Lime-crustrated *pisé-de-terre* is made by applying wedge-shaped coats of lime mortar to the plank before pouring on the layer of soil, which is then tamped and enclosed by a thick wedge-shaped layer of lime mortar. The tamping process causes the lime wash to flow onto the exterior plank moulding, thus creating a very smooth finish (López 1999, p. 81).

The archaeological excavation carried out at the same time as the stratigraphic-constructive study allowed us to discover the constructive secrets of its foundations. The foundations of the brick walls are made of uncut stone with earth mortar about 70 cm high, the last row of which was made flatter by placing little stones and broken ceramic pieces before laying the brick fabric on top. The foundations of the *pisé-de-terre* walls had a first layer similar to the former and a second layer of about 40 cm of brick fabric that acted as a socle on which the *pisé-de-terre* fabric was placed.

The archaeological excavation also revealed the false heating floor underneath the pavement of the *caldarium* or hypocaust, which, as is usually the case, contained remains of the little brick walls and

pillars that supported the pavement, among which hot air circulated from the furnace area. In this spot the level of the hypocaust flooring was also found, made up of a brick base with a coat of lime mortar on top, added simultaneously or later either as a surface finish or a base on which to place the marble flooring.

In comparison to other known Arab baths where only *pisé-de-terre* fabric is generally used, it is interesting to observe in this case the use of two different building techniques to erect the walls, that is, brick and *pisé-de-terre*. The location of these baths on a lower level than calle Elvira, which was already so in Islamic times, perhaps justified by the need for an easy water supply to the furnace zone as well as an efficient evacuation of this water towards the garden, provided a possible explanation for this peculiar alternative presence of brick and *pisé-de-terre* walls.

Indeed, *pisé-de-terre* fabric is known to be deficient as regards lateral retention of soil because of constant contact with damp, which could destroy the wall eventually. In the ground plan of these Arab baths, the walls on calle Elvira, where the ground dips, are made of brick fabric, whereas practically all the walls in the interior are made of *pisé-de-terre*.

This phenomenon responds to the building custom that we could call *material specialisation*, that is to say, the specific use of a material because of its qualities and building possibilities. This different use of materials can also be clearly seen in other parts of the baths, where *pisé-de-terre* was used for the main walls but the openings (for example, the bays between the cold room and the warm room, and between the latter and the hot room), the vaults, the alcove arches, the hypocaust, the chimneys and the back wall of the furnace were made of brick fabric. Material specialisation at a stratigraphic level may give rise to misunderstandings in the interpretation of the building stages. As a matter of fact, if this traditional building custom is not taken into account, the difference of materials could be interpreted as belonging to consecutive building stages (*pisé-de-terre* and brick fabric). This case affords a clear example of the need for the person performing the stratigraphic study of the site to be familiar with architectural building techniques.

SUPERIMPOSED BUILDING STAGES

It is always preferable to find a new use for historical architecture, however prosaic it may be, rather than demolishing it, because in the former case, the transformation conserves it and, sometimes paradoxically, enriches it, while in the latter, all material traces of its existence are eliminated.

The most surprising example we know of, absolutely unrelated with the case in study, is the Huaca Pucllana pyramid in Lima (Peru), which was used as an artificial hill for motocross racing until the 1980s. However absurd or contradictory it may seem, without this hazardous activity, this great adobe pyramid, now restored and the Peruvians' pride and joy, would have been knocked down and the site would have been used for urban development, as has occurred in many other cases.

As regards Hernando de Zafra Arab Baths, the fact that they were used as dwellings or warehouses after they had been closed down did not bring about great transformations inside them. The visits of Giménez Serrano in 1846 and Gómez Moreno in 1892 bear witness to their poor state of conservation, although they were practically integral. To judge from the descriptions they made, the only irreversible acts that resulted in the demolition of vaults and other original elements of the baths took place at the beginning of the 20th century.



Figure 7. Pisé-de-terre with an arch made of bricks, both built simultaneously

According to the definition made by Harris (1989, p. 158), a period is “the broadest division of stratification of a cultural layer and is made up of different phases; whereas a phase would be the set of positive or negative actions (addition, elimination or modification) that presumably form part of a single building action”. According to this hypothesis, after the stratigraphic-constructive analysis of the baths, three major periods in the life of this building were distinguished and put in chronological order in relative succession, and were in turn subdivided into several building phases. Afterwards the relative chronology resulting from the stratigraphic study was compared to the historical data and local chronotypological information (types of fabric, rendering, bays...) to assign a concrete date to each abstract period within the succession of vicissitudes that the building has undergone. Below is a brief chronological outline of the periods discovered for the building history of the baths and more detailed information may be found in the plans.

The first period goes from the actual building of the baths, possibly between the 12th and 13th centuries, during the Almohad period, until the late 15th century, at the decline of Nasrid domination, when, after the conquest of Granada by the Christians, the baths were banned from use and the building lost its original function. This period of the birth and original operation of the building is marked by the presence of different building techniques physically unrelated to each other. During this period we find the different building characteristics of the original construction of

the baths described in the section above, with the peculiar alternation of pisé-de-terre and brick walls described, according to their position. From the point of view of architectonic stratigraphy, there are no clear indications of the possible change of the different levels of flooring and the substitution or addition of new capitals on the columns suggested by the scholar Gómez Moreno at the end of the 19th century and which, if it had been verified, caused hardly any change in the fabrics.

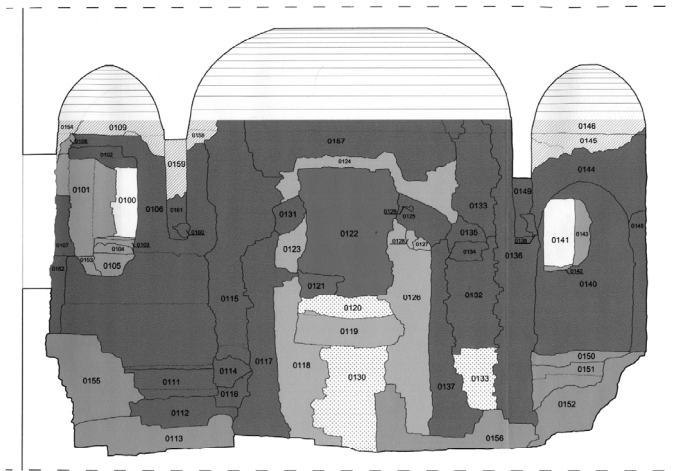
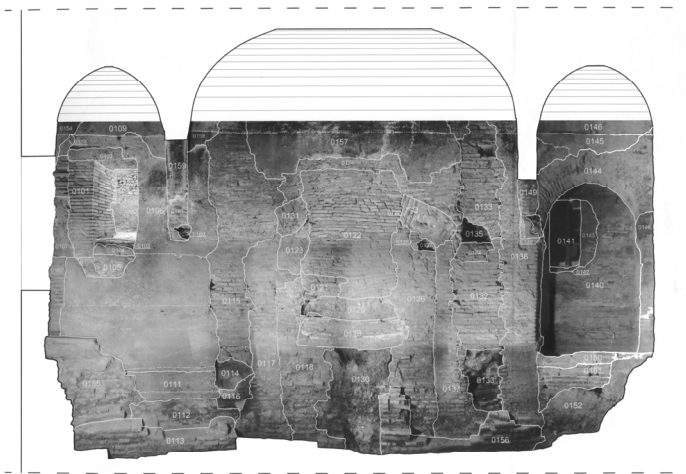
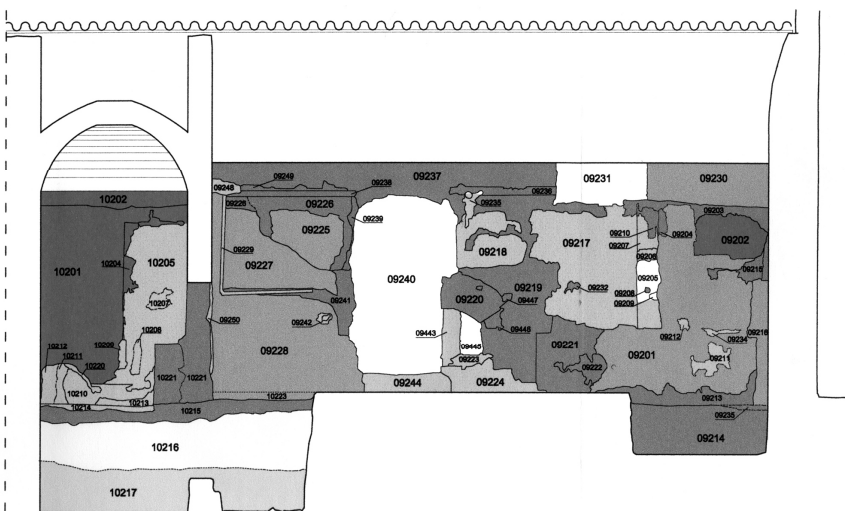
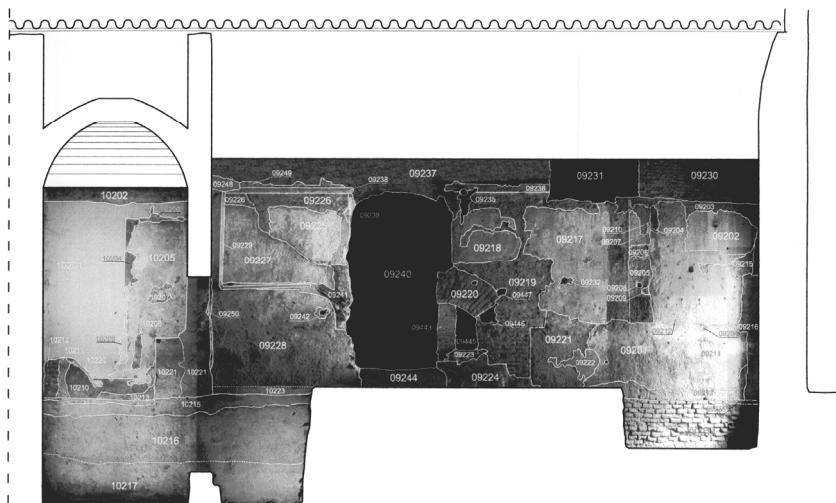
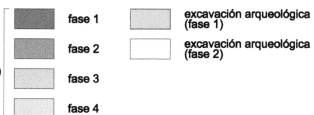


Figure 8. Stratigraphic study and hypothesis of constructive periods of the North wall of the *caldarium*



PERIODO I
(... - hasta S. XV)



PERIODO II
(S. XVI - ...)



PERIODO III
(... - S. XIX y XX)

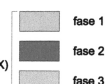


Figure 9. Stratigraphic study and hypothesis of constructive periods of the South wall of the *frigidarium*

The second period was probably when, having lost their original function, the first transformations were made on the baths in order to adapt them to their new use, which, in any case, did not bring about great changes to the original building. This period can be placed approximately between the 16th and 19th centuries, and has been divided into three phases with subtle differences between them and involving physical superposition. This period, for example, saw the insertion of the south wall of the baths, built with a fabric of brick piers and mortar and ceramic cases, later plastered with lime mortar. To build this biased wall, it was necessary to chip the walls to reduce the section of the adjacent wall and make it less thick to allow people to pass through.

The third constructive period goes from the works performed in the early 20th century to our day, and has been divided into three phases. This period includes the works carried out at the beginning of the 20th century, when the baths were converted into three-storey dwellings and their spaces were divided up to form small rooms. These divisions comprised above all a series of fairly thin partition walls made of brick, subdividing the large spaces and, for the same purpose, the horseshoe arches and the columns of the warm room were covered over. Also in order to turn the baths into residences, a number of bays were opened in the perimetral walls. During this phase, the large vaults of the warm room and the cold room were demolished to add another storey to the building.

CONCLUSION

In this particular case, the authors of this article believe that freeing the Arab baths from the posterior stratifications, particularly those added during the third building phase, was wholly justified in order to recover their original layout and open them for the public to visit this Islamic site, which has lain concealed and unknown among the buildings of the city for over four hundred years. The usually risky act of giving priority to one building stage of a building over others according to changes in architectonic or artistic taste is not so risky on this occasion because of the contrast between the original Arab bath building and the prosaic splitting up it underwent up turn it into popular dwellings.

Once the site had been studied in detail, the progressive liberation of the old Arab baths revealed their original layout, with their furnace and their cold, warm and hot rooms, apart from the space for the garden that traditionally accompanied them. The dressing room or *al-bayt al-maslaj*, customarily located just before the cold room, was either lost forever at some point in the building's agitated history or never existed in the first place, since in some small baths the cold room used to be used as a dressing room. There is no documentary or material evidence to date to support either hypothesis.

In this case, the methodology used in the stratigraphic analysis revealed interesting information about the different stages of the baths, from their Islamic foundation to the domestic transformations that did away with the different rooms to convert them into three-storey dwellings.

Besides, this study has made it possible to identify the materials, tools and building methods used at the baths' different occupation stages, and this information has been added to the corpus of material culture of the city of Granada, especially during the time of Islamic occupation.

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