ABSTRACT: The public bath, or hammâm, is a building type which has been integral to the urban fabric of Islamic cities. Whereas other building types have attracted much attention and research in the past, studies of hammâm buildings have remained scarce and far apart.

Based on surveys carried by the author on the historic public baths of Damascus and Fez, this paper highlights the characteristics of this building type as a sustainable urban facility which not only promotes cleanliness and health of the urban dwellers but also social interaction and a support for a rich intangible heritage. The paper also highlights the lessons that this building type provides in terms of thermal comfort, under-floor heating system, water heating and management and recycling of by-products from local small industries. The paper then discusses possible future adaptive re-use of this building type in the light of Sustainable Development Agenda.

Keywords: public bath, hammâm, Islamic city, lessons of sustainability, water management, thermal comfort, appropriate building materials

1. INTRODUCTION

Bath houses, or public baths, have existed since the Hellenistic period and flourished throughout the time of the Romans and Byzantines. Although the bathing tradition died out in the West, it continued in the Levant after the arrival of Muslim Arabs. The period following the rise of Islam witnessed a rapid development in the history of public baths and a change from Roman to Islamic bathing habits. A process of assimilation of the Roman and Byzantine baths has taken place during which features which responded to the needs, traditions and religious beliefs were retained, while others were discarded.

During the first century of the Islamic calendar (622 AD) there was a wide spread of Roman baths with a three room composition (frigidarium, tepidarium and calidarium) and the first Islamic hammâms consisted of a linear progression of rooms with varying temperatures. The most well known surviving example is Qusayr Amra in the Jordanian Desert (figure 1).

The religious requirements for washing in Islam played an important role in the way hammâms developed. For example, the cold plunge pool, a major feature of the Roman baths, disappeared in the Islamic baths. Although pools existed in some hammâms of Palestine and Greater Syria, bathing by immersion was not common during the Islamic period as it was considered inappropriate. Instead, bathing in running water became the norm.

The Islamic public bath forms part of the triad of essential urban facilities in the Islamic city - the mosque, the hammâm and the suq. It is an urban facility which not only facilitates the accomplishment of the great ablutions (hence its location near mosques) but it also plays an important social function as it serves as a meeting place for both male and female society. Despite the importance of this building type, the hammâm as an institution has been
in decline since the 19th century, particularly with the introduction of private bathrooms facilities in modern housing. Many hammāms have closed, fallen in disrepair or have been completely destroyed. The rate in which evidence of this important building type is being removed is alarming, particularly as this building type presents unique lessons of environmental, social and economical sustainability.

This paper is based on surveys carried out by the author on the hammāms of Fez and Damascus, in 2000 and 2004 respectively. The work was carried out as part of research projects funded by the Arts and Humanities Research Board (now Research Council) in the UK. It presents the main characteristics of this building in two world heritage cities located in distinct geographical areas.

2. THE PUBLIC BATHS OF FEZ


The majority of historic hammāms in the medina of Fez have managed to survive and continue to function today. This is mainly due to the fact that the medina of Fez has managed to survive in its integrity and is still inhabited today. The peripheral location of the Maghreb shielded it from major geographical conflicts which hit the Fertile Crescent and Egypt, such as the crusades and the two waves of Mongol invasions leading to the destruction of earlier historic structures. When Morocco fell under the French protectorate in 1912, the colonial city of Fez was established away from the historic urban fabric. These factors played an important role in the preservation of the urban integrity of the medina of Fez and its traditional urban facilities such as the hammāms. The prosperity of Fez during the rule of various dynasties was expressed in the number of public baths that the city enjoyed [7]. It was estimated that ninety-three hammāms existed in Fez during the Almohades period in the 12th century. During the Merinide dynasty, established in 1248, Fez acquired the status of a capital and continued to flourish as did its public baths.

In 1999-2000, 30 historic hammāms were still operating and half of them were visited by the author.

2.1 Urban location and water distribution system

The old city of Fez is situated in a bowl with a plateau above it receiving the river of Fez. The traditional water distribution system was based on the gravity system whereby the river was divided at the top plateau into various underground channels which descended to the different quarters of the Medina. The hammāms are located along the under-ground water channels and are built on sloping sites to help with water drainage. Some hammāms are located next to existing natural springs or wells and offer a public fountain. This is the case of Hammām Moulay Idriss and Seffarine in Fez. The location and frequency of the hammāms depended also on their proximity to large mosques, commercial districts (or suks) or neighbourhood centres.

Hammāms are generally well embedded in the traditional urban fabric of the city. Their position is never prominent, their entrance is discreet and their facades are totally blind. Their presence in the urban fabric is more evident at roof level because of their pierced domes and vaults that are specific to them and are not found in any other building type (Fig. 2).

Figure 2: Hammām Seffarine in Fez evident by its roof domes (photo taken by the author)

2.2 Form and function

Unlike the Roman baths, Islamic baths are much smaller and more frequent within the urban fabric. They are never free-standing structures but are surrounded by other buildings, reducing the area of their exposed external walls to that of the entrance façade only.

The form and function of the hammām in Fez has remained constant from medieval times onwards. While the Mamluk and Ottoman public baths in Damascus tend to have a central organisation of the bathing spaces, the hammāms surveyed in Fez have maintained a linear and axial organisation reminiscent of the first Umayyad public baths (Fig. 1). They all follow the same configuration of four sequential rooms, Mashlah or Goulsa – the Roman apodyterium – al-Barrani – the Roman frigidarium – al-Wastani – the Roman tepidarium – and al-Dakhli – the Roman caldarium. This is illustrated in the plan and section of Hammām Seffarine (Fig. 3), one of the most well-known hammām in Fez, located near the main religious center of the Qarawyyine mosque. The undressing/dressing room is usually accessed from the street through a bent entrance which prevents visual intrusion into the internal spaces. This room is usually covered with a high dome and is the largest and most decorated space in the hammāms of Fez. It usually displays a beautiful fountain built against the
wall separating the undressing room and the bathing spaces and has beautiful carved stucco and cedar decorations. The walls are covered halfway down by finely coloured locally produced ceramic tiles locally known as Zellidj. The changing areas are slightly raised from centre of the room and consist of seating and lockers along the peripheral walls of the undressing space. The reception area is located within the same space, next to the entrance of the hammâm. The access to the cold room is through an intermediate corridor where toilets are located. Next is the first room or Barrani, which consists of a small space used by clients to rest from the heat of the warm and the hot rooms. The next space is the Wasti or warm room and is usually the largest and main bathing space covered by a pierced dome. Buckets of hot water are filled from the basin in the hot room and placed in the warm room for washing, since there are built in washing basins and no pipes circulating the water. Instead, the water is scooped from the buckets by a small brass bowl called tassa. Hot water was traditionally collected from the hot water basin in the hot room, using a special traditional wooden bucket called the kebb which has a capacity of twenty litres. The amount of water each client received was limited to four to six traditional buckets – anything above this quantity had to be paid for. Plastic buckets have now replaced the traditional wooden ones although these are still being made in the medina. The final room, the hot room or dakhli, is adjacent to the furnace and contains a large basin of hot water locally called burma. The hot water arrives directly from the cauldrons placed in the furnace.

Figure 3: Hammâm Seffarine ground floor plan and section

2.3 The heating system

The heating section of the hammâm, the furnace, or furnatchi, is built against one of the walls of the hot room. It has its own entrance for the delivery of the fuel and has no access to the bathing spaces. The furnace is sometimes combined with a public bakery to make economic use of the furnace and the firewood. The fire is lit under two or more large brass cauldrons measuring two meters in diameter and three to four meters in height. These cauldrons are locally made in the neighbouring Seffarine square.

The warm and hot rooms are heated using the hypocaust system traditionally used in the Roman baths. The hot smoke from the fire travels under the floor of the hot and warm rooms before rising up a chimney in the walls (Fig. 4). Once the air has passed under the floor, it is drawn into the walls and up the flues due to the hot air already rising in the flues creating a partial vacuum. The heating system is a labour intensive device as it requires constant attention to feed the fire and remove the ashes. The furnatchi attendant works from four o’clock in the morning until 10 o’clock at night, keeping the furnace fire going by throwing fuel into the furnace on a regular basis (Fig. 5).

Figure 4: The ancient Roman Hypocaust system
Source: http://romans-in-britain.org.uk

Figure 5: The furnace and the delivery of fuel in Fez (photos taken by the author)

In addition to wood, different types of by-products from local small industries are recycled as fuel for the furnace. These include wood shavings (from the local wood workshops) and olive pits (from nearby olive oil presses). Straw and peat are also used. All the furnatchis visited in 2000 in the Medina of Fez were still operating in the traditional way. The fuel is
transported to the hammâms on donkey backs and dumped in heaps in the furnatchi (Fig. 5).

2.4 Social customs and habits

The vast majority of the historic public baths of Fez consist of a single hammâm, i.e. they do not have two separate sections for men and women but operate different schedules for them. They allow for the easy accomplishment of the great ablution and for maintaining cleanliness and health for a poor population. Furthermore, the hammâm forms an important part of the lives of Moroccan women and is associated with the celebration of important life events such as weddings, the birth of a child and circumcision. A number of customs, traditions and rituals have been transmitted from one generation to another and are still alive today. Some hammâms are associated with a religious figure for which an alcove is allocated in the hot room and where customers light candles as prayers. It was evident during the field work that hammâms in Fez have sustained their function until today. This can be explained by the fact that they are still very much needed by the local poor population. Furthermore, the hammâms are still very much alive in Morocco. Such a practice is not limited to the poor population, as new public baths are being built in new neighbourhoods where dwelling units have their own private bathroom facilities. Furthermore, private steam baths are also being built in large villas and hotels and their benefits are widely acknowledged today. In addition to cleanliness and beauty, steam baths provide a number of health benefits in terms of reducing muscle tension and stress, improving skin blood circulation and eliminating toxins through perspiration.

There are no clear guidelines for the maintenance of the historic structures or the design of new ones. Direct observation revealed that some of the historic structures are in danger of collapse, particularly in the furnace area. In some cases domes have collapsed and have been replaced by reinforced flat concrete slabs which lack the thermal characteristics of the original construction. A number of other insensitive alterations have taken place, particularly in the entrance and reception areas. The original layout has been altered by opening new passageways or dividing the spaces. However, the internal bathing spaces, have, by and large, retained their original characteristics.

3. THE PUBLIC BATHS OF DAMASCUS

A survey of the public baths of Damascus was conducted by the author in 2004 and provided an updated list of the historic public baths of Damascus and their condition and usage in the 21st century. Of the 40 operating hammâms identified in the 1940’s [2] only 13 were still operating in 2004 with the remainder being either demolished or changed function. It is clear that the rate at which this building type is disappearing in Damascus is alarming. The few surviving examples are usually located within the walled city and are near major commercial or tourist areas.

3.1 The Evolution of the hammâms of Damascus

Unlike the public baths of Fez which have retained the early configuration of the first Islamic baths, those in Damascus have evolved and changed over the centuries. Ecochard and Le Coeur produced the most comprehensive record of the historic public baths of Damascus [2]. Detailed drawings were produced for 29 hammâms dating from the 14th century to the 19th century. A careful analysis of their layout was carried out highlighting a slow evolution of their internal organisation. They have evolved away from the Roman baths: the bathing spaces in general and the hot room in particular have become dominant over the other spaces. The proportions of the bathing spaces and their arrangements have also witnessed variations throughout different historic periods. It is evident that the hot room develops over the centuries at the expense of the other washing rooms and becomes the only washing space in the 19th century (Fig. 6). Whereas the pre-Ottoman hammâms displayed a clear sequence of warm and hot room, with associated side chambers, the Ottoman baths consist mainly of a simple hot room and side chambers.

Figure 6: Evolution of the hammâm layout in Damascus between the 12 and 19th century. Adapted from Ecochard and le Coeur [2]

In addition to the changes in the importance and proportions of the bathing spaces, their spatial organisation has also seen various developments. Two typical organisations can be found in the pre-14th century hammâms: a sequential, linear one where the bathing spaces are organised along an axis and a central one where the spaces are organised around a main octagonal room. Both types of organisations co-existed simultaneously between the 12th and 14th centuries, after which only the
central organisation remained until the 18th century when the internal organisation reverses back to a linear organisation with a loss of complex architectural forms (Fig. 6). The co-existence of both linear and central organisations within the same city between the 12th and the 13th century can be explained by the existence of two sources of influences in the antiquity. The octagonal compositions with diagonal extensions of bathing spaces (Fig. 8) are reminiscent of Byzantine architecture whereas the linear organisation is reminiscent of the early Umayyad baths (Fig. 7).

Figure 7: Linear organisation and duct heating system in hammām Fethi (18th Century)- adapted from Ecochard and le Coeur (1943) [2], pp.100-102

3.2 Form and function

As in the case of Fez, a typical hammām in Damascus consists of two activity areas: the undressing room or rooms (Meshlaḥ) and the washing areas (al-Berrani, al-Westani and al-Dakhīl). The undressing room is usually the largest space covered by a dome and has raised stone benches (or mastabas) around the walls. All the hammāms of Damascus have a central water feature in their undressing room and their washing areas contain stone or marble washing basins (jurns) receiving hot and cold water from clay pipes inbedded the walls. The hot room or bayt-al-nār is the bathing space adjacent to the furnace. The furnace or gannim is built against the hot room. The fire is lit under two or more large brass cauldrons built into the furnace, and the whole of the upper furnace serves as water reservoir.

Figure 8: Central organisation of bathing spaces and roof architecture of the bathing spaces with pierced domes and vaults- adapted from Ecochard and le Coeur (1943) [2] pp.66

3.3 The duct heating system

Whereas the hammām of Fez maintained the heating system of the early Umayyad baths (a hypocaust system inherited from Roman and Byzantine times), the heating system of the medieval hammāms of Damascus used smoke ducts travelling under the floor of the washing rooms (Fig. 7). The smoke from the fire in the furnace passes along a duct under the floor of the hot room and rises up in a chimney in the wall (Fig. 7). The duct branches out into the side chambers and its presence is made evident by the way the floor is paved with a black stone tiling. The floor over the duct is known as the fire slab or bilāt al-nār. The furnace is kept working late at night allowing the structure to remain warm. Unfortunately all the surviving and working historic hammāms of Damascus have abandoned the traditional heating system and replaced it by a boiler fuelled by diesel. Concerns about air pollution and pressure from local authorities have led to this change of heating system. There is however one exception and that is hammām Ammuna located outside the city walls and which continues to recycle wood shavings and garbage as fuel for its furnace. It is clear that the replacement of the heating system by a boiler is not necessarily environmentally friendly. Furthermore, the under-floor heating system which allowed for the spaces to maintain comfortable warm temperature is completely abandoned. The rooms are
heated by allowing steam from the boiler to enter the bathing spaces. However, as soon as the boiler is stopped during the night, the bathing spaces cool down rapidly and take more time to heat again the next day.

3.4 Natural lighting and ventilation: The pierced domes and vaults

The most distinctive feature of the hammāms is the way the domes over the washing rooms are pierced with circular or star-shaped roof lights, forming intricate patterns. Whereas Roman and Byzantine bathhouses are naturally lit with a central lantern at the top of the dome and windows placed at the lower edge of the dome, the Islamic bath houses are characterised by multiple circular or star-shaped openings over the whole surface of the dome and closed by glass caps. These openings consist of pottery tubes built into the domes, closed by glass covers and arranged according to various decorative patterns. Some of these glass bulbs are removable in order to allow for natural ventilation to take place when the bathing spaces are not used.

These features can be found as early as the 7th century as evidenced in Qusayr Amra. They allow for daylight to enter the bathing spaces and create a special atmosphere enhanced by the high concentration of steam in the bathing spaces.

![Figure 9: The pierced domes and vaults in hammām Fethi in Damascus (photos taken by the author)](image)

3.5 Construction systems

One of the main requirements of the building envelope is to have a high level of thermal mass in order to keep the heat in. The walls are traditionally of a thick stone or brick construction and the domes and vaults are built with bricks. The floors are tiled with stone or marble or with ceramic tiles as is the case in Morocco. Special water-proof renders and plasters are made from a lime mortar to which ashes from the furnace are added. In the case of Fez, egg yolks are added to lime plasters in order to provide a smooth water-proof finish to the walls.

3.6 Current usage and transformations

Unlike in Morocco, the tradition of going to the hammām is disappearing in Syria. There are no new hammāms being built in new residential areas and many of the historic ones are used as storage spaces or workshops. The few surviving ones are struggling to continue as the rising cost of water, fuel and personnel are making them uneconomical to run. Those located near the touristic, historic areas have been restored and have introduced new functions such as massage rooms, showers and a pool. Others have changed function and are used for storage or as workshops. Most of those still operating have ceased to receive women, closing their doors to the few remaining female users and contributing to the disappearance of a rich intangible heritage associated with their usage by women.

4. FUTURE DEVELOPMENTS

It is clear that the hammām as a traditional building type offers a number of lessons of sustainability in terms of construction, heating system, water use and management, cleanliness, well being as well as social and economic sustainability. Although there are clear regional variations in terms of contemporary usages and perceptions of these facilities as one moves from the Middle East to North Africa, there are common opportunities that can be developed based on water storage and management (in countries where water cuts are frequent) and the use of solar energy at the scale of a neighbourhood. The hammām as a building type could be reinterpreted for the development of a new urban facility that can be easily built in tight urban infill plots, making good use of derelict urban sites. They could provide an essential facility for women and children which in addition to the washing and beauty treatment functions could combine other functions such health awareness, education, recreation and social gatherings and recycling. There is however a need for developing new guidelines for both the restoration of historic hammām structures and the construction of new ones. Those guidelines should not only be based on the various lessons the historic hammāms present in terms of architecture, construction technique and space and water heating systems but also on the new health and safety regulations and new building technologies that can be appropriately applied in this building type.

REFERENCES