

# THE HISTORICAL EVOLUTION OF THERMAL BATHHOUSES IN BUDAPEST: A COMPARATIVE STUDY OF THERMAL BATHHOUSE ARCHITECTURE OF THE ROMAN AND OTTOMAN ERA

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**Abstract:** *This paper examines the historical differences between thermal baths constructed during the Roman era and the Ottoman era in the city of Budapest. With the city of Budapest experiencing the rule of both mighty empires, the cultural, social, and architectural characteristics of each era are reflected in their baths. Incorporating evidence of what these baths looked like during their times and also studying what survived these baths today, a comparison is drawn to see the similarities and differences between the two styles. Our analysis shows the developments made by the Romans and Ottomans for thermal baths, and also how the Ottomans were influenced by their predecessors.*

**Keywords:** *Thermal baths / Ottoman Baths / Roman Baths / Budapest / Architecture*

## 1 INTRODUCTION

Although the nation of Hungary is landlocked, it is studded with more than 1300 thermal water springs [1]. The capital, Budapest alone has 123 of these water sources, thus, rightly nicknamed “the thermal capital of the world”. These water sources have differing amounts of dissolved minerals based on location; some are sulfurous in smell, some salty, and others have varying characteristics [1]. The nature of the water springs has made them centers for therapeutic healing and for hundreds of years a thriving spa culture in Hungary. Soaking in the warm mineral waters may feel decadent, but these spas aren’t seen as indulgences. In Hungary, they are just part of a balanced life [2].

Throughout history, the Hungarian people have experienced the rule of different empires and rulers including the Romans and the Ottomans. The nature of these thermal baths is subjected to the different cultural impacts of the inhabitants of Hungary throughout the different ages as is the case for art, architecture, culture, politics, and the overall lifestyle of a people highlights the uniqueness of each era.

## 2 HISTORY OF THERMAL BATHS

The history of thermal baths consists of a wide spectrum of advancements from each historical period, with some contributions more than others. For the sake of this research, the Greek origin of baths, and the development of baths in Budapest distinctly during the Roman, Árpád, and Ottoman periods are highlighted.

### ***2.1 Origin of baths***

Originally, bathing was a very popular treatment for diseases during classical times. Physicians recommended baths for the cure and prevention of diseases. The Greeks initially confined bathing to the affluent, but later it became accessible to the public [3]. These baths became sacred housing for Greek deities.

In Roman times, baths at home, private baths, and public baths became a societal norm. With the introduction of aqueducts, the public baths later developed into huge and impressive edifices

(thermae) with a capacity for thousands of people [3]. The ancient Romans believed that daily exercise and bathing were necessary components to maintaining a healthy lifestyle; which is not so different from us today [4]. Baths gradually morphed from places of medical treatment to ones of relaxation and pleasure.

## ***2.2 Roman era in Budapest (AD 1<sup>st</sup> century- AD 4<sup>th</sup> century)***

Aquincum, part of modern-day Budapest (Obuda) was occupied by the Romans in the AD 1<sup>st</sup> century under the Pannonia province [5]. It is a monumental example of the achievement of the Roman empire. Inhabitants enjoyed benefits such as central heating in their homes, temples, amphitheatres, and also public baths. The first thermal baths in the Hungarian region were built in the ancient Roman province of the Carpathian basin, but when and how they were built is still unknown [2].

“Bathing was an important part of the Roman way of life, which, in addition to cleansing and physical and mental refreshment, was also a place for active social life for the citizens of the empire” [6]. In Pannonia, baths were first introduced by the military; Aquincum later became rich in thermal baths for both military and civilians [6]. Baths were built by the wealthy in their private mansions.

## ***2.3 Arpad dynasty in Budapest (1000-1301)***

During the Árpád dynasty, there is little evidence to represent the further development of thermal bath culture as their Roman predecessors. In the age of the Árpáds, baths were connected to healing and were not the scene of social life [6].

According to writings, the medicinal value of thermal springs was revered during the early middle ages. For example, the springs in Rózsadomb were the water source from which Saint Elizabeth was said to heal lepers and lazars [6]. In the middle ages, Hungarians still valued thermal baths but the construction and further development of baths were not important.

## **2.4 Ottoman era in Budapest (1541-1699)**

The reign of the Roman empire saw the rebirth of baths and bath culture in Budapest, but the Ottoman empire presided over the development of this phenomenon. The 16<sup>th</sup> century saw the construction of some of the most astonishing baths constructed, some of which are still in use today. The Turkish subjection saw the flourishing of baths.

The development of baths was connected to Pasha Sokollu, the leader of Buda who envisioned a stable military center and a flourishing city [6]. The three Hévíz baths and the ilicas (the Turkish word for spas) of Buda during the Turkish era were also considered landmarks by contemporaries. The Kucsuk ilica, located on the site of today's Rác spa, was the closest to the castle quarter, and the green columned ilica, the predecessor of today's Rudas spa, was not too far from it [6].

An interesting pattern about Turkish baths is that many of them were built on previously known, and occupied bath locations. Some of these were previously hospitals, while others were built on deteriorating Christian buildings. In addition to laying down the footing for thermal baths, the Turks also introduced the Hungarians to various 'wellness' routines such as massages and the use of oils and creams as part of bath time; they were skeptical at first when these were introduced [2]. It is important to mention that Hungarians were only allowed to use these baths during the night.

## **3 ROMAN BATHS**

To have a clear understanding of what thermal baths were like in Budapest under the Romans, it is important to have a picture of what baths were like in other parts of the empire. In this section, the baths of Caracalla, Rome is introduced and described as a foreign sample. The baths of Aquincum is used as a Roman example of thermal baths in Budapest.

### **3.1 Roman bath characteristics**

#### **3.1.1 The structural and Spatial context of Roman baths:**

Apodyterium (changing room): This is the changing room, and it is the first place the users of the baths would go to upon arrival. These rooms usually had benches and cabinets for the users to keep their belongings, but of course at the risk of the belongings being stolen (baths were a common place to find thieves). However, privately owned slaves or those rented at the baths could watch over the belonging of the users [7].

Palestra (open exercise space): Before getting into a series of baths, users usually prefer to exercise in outdoor spaces which were usually surrounded by columns called palaestrae. These exercises were not competitive or intensive, rather, exercises to maintain health.

Caldarium (hot bath): This was the hottest room in Roman baths with air and water temperature reaching above 100 Fahrenheit. The rooms and the waters were heated by the hypocaust [7]; the furnace system.

Tepidarium (warm bath): This was a warm bath; the tepidarium may serve as the transition pool between the caldarium and the frigidarium (cold water pool) [4]. Some users make use of this pool before and after warm baths to transition between temperatures with ease.

Frigidarium (cold bath): This is the ‘cold water room’ in the baths. After visiting the caldarium, users of the baths would cool off in the frigidarium pools to help close all the pores that were opened.

Natatio (outdoor pool): Unlike the other baths, the natatio was open-to-air and unheated. This pool is nearly identical to modern-day swimming pools.

#### **3.1.2 Heating system**

Hypocaust: This is the underfloor heating system that was used to heat the baths in the Caracalla, it is a system of hollow chambers underneath from which hot air flowed through to heat the baths.

The source of the generated heat was a furnace [8]. The heat traveled through terracotta pipes to the various spaces to warm the spaces and the water. The hypocaust was below ground and worked by slaves who heated the tanks that were transported by water pipes to the respective pools.

The Romans were the inventors of this technique which is the predecessor of modern-day heating systems.

### ***3.2 Roman bath example in Europe***

#### ***3.2.1 The baths of Caracalla***

In 206 A.D. Emperor Septimus Severus began construction of a thermal bath complex which was to become the largest and most beautiful in Rome [9]. Sited on eleven hectares, this bath took 9,000 workers to complete. The baths at Caracalla could accommodate 1,600 people at a time including men, women, and children both free and enslaved [10]. A daily total of 8,000 visitors were expected daily [4]. Inside the confines of the thick rectangular walls was the main building surrounded by gardens, a library, an entertainment room, and a gymnasium. On the opposite side was the heating reservoir fed by the 'Aqua Mania' [9]. A venue bustling with activities, you would find masseurs, poets, musicians, and food vendors to mention the least.

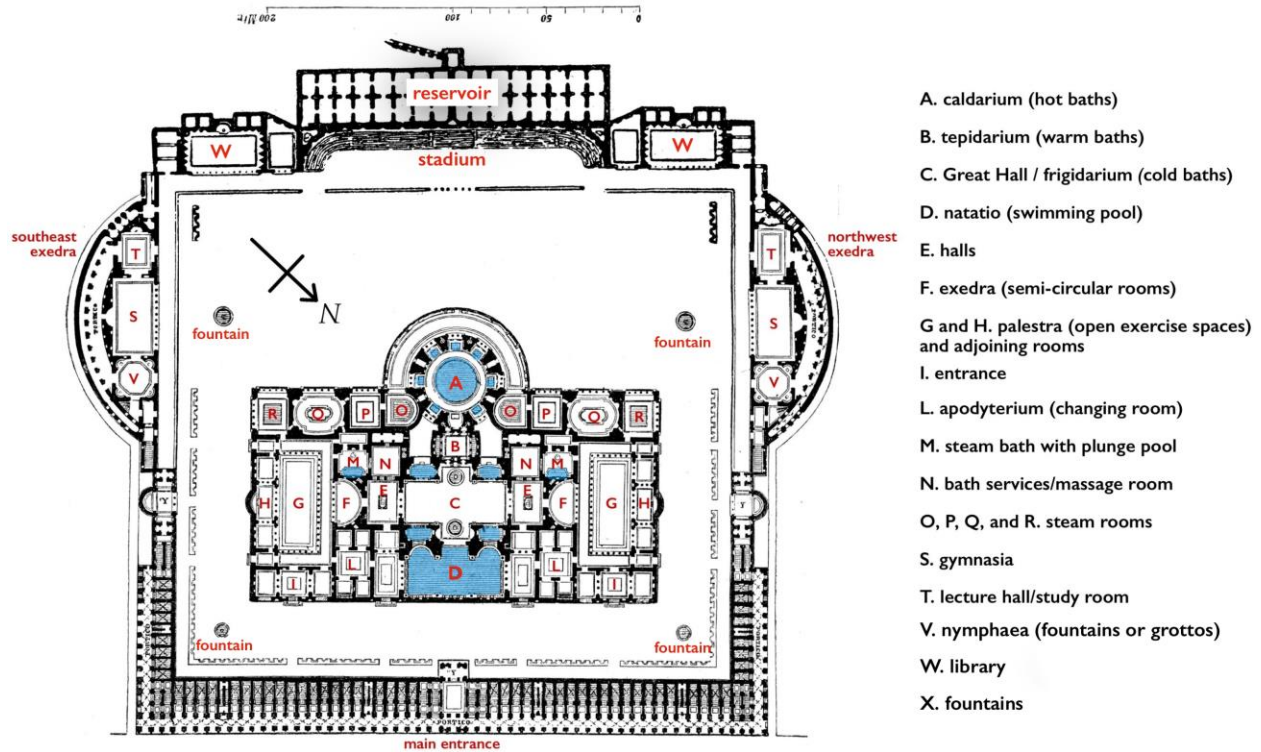


Figure 1 Plan of Caracalla Baths (Mingioia, 2022)

### 3.2.1.1 The structural and spatial context of Caracalla baths

Apodyterium (changing room): There are two changing rooms in the building placed symmetrically in the building each serving the opposite genders.

Tepidarium (warm bath): The tepidarium was a small room with two pools. It served mainly as a transition space between the cold and hot baths due to the moderate temperature.

Caldarium (hot bath): This was a large circular room roofed with a 40-meter dome. The Caldarium had three large glass windows facing the southwest to receive more sunlight during the day and also warmth [4].

Frigidarium (cold bath): The frigidarium was in the middle of the structure close to halls that extended to the palestrae; one on each side.

Palestra (open exercise space): There were two palestrae in the Caracalla used for exercising. Some users also chose to run in the stadium alternatively.

Natatio (outdoor pool): This large open-to-air pool was similar to today's Olympic swimming in by dimension (at 50 meters in length, 22 meters in width, and 1 meter in depth). Surrounded by four walls, it was divided by colossal granite columns into three sections [4].

### 3.2.1.2 Heating system

Hypocaust: The hypocaust heating specifically heated the walls and floors of the tepidarium and the caldarium.

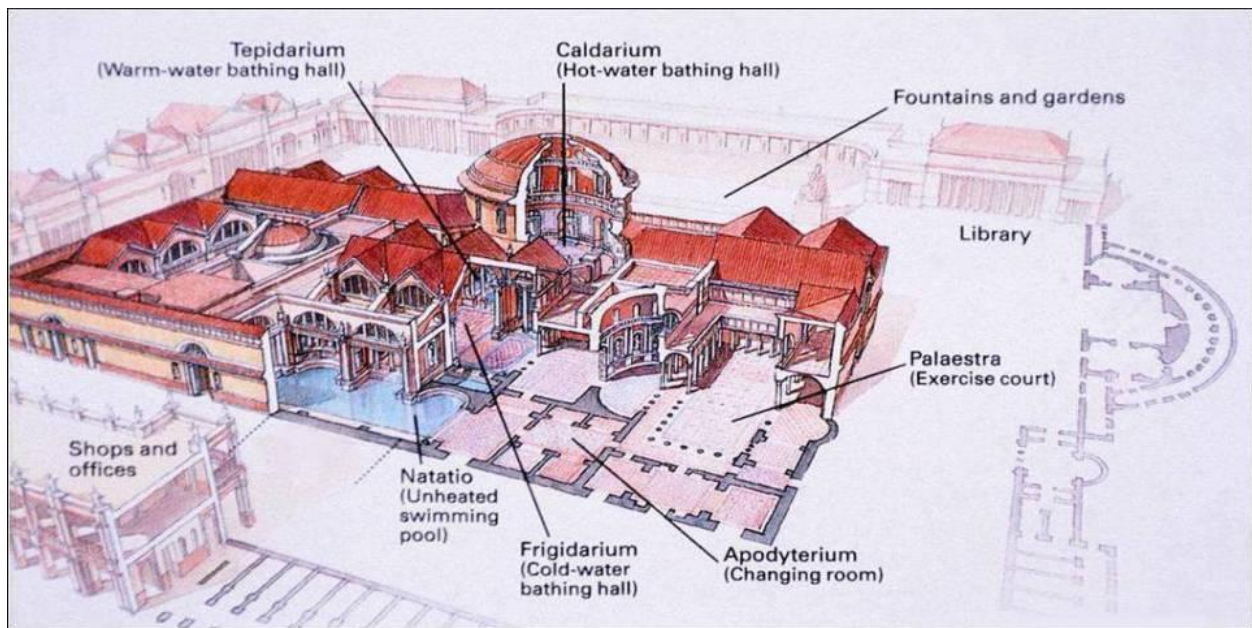


Figure 2 Caracalla Baths (Zusmann, n.d.)

### 3.2.1.3 Materials

Floors: The floors were made of marble mosaic which often depicted art of mythical sea creatures or fish scale patterns [11].

Walls: An estimated 6.9 million bricks lined with marble and granite were used in the construction of the wall [11]. Marble slabs decorated the walls of the Caracalla, and in some places, stucco paint covered the upper parts of the walls.



Ceiling: “The ceiling was decorated with glass mosaic which reflected light from the pools in an iridescent effect” [11].

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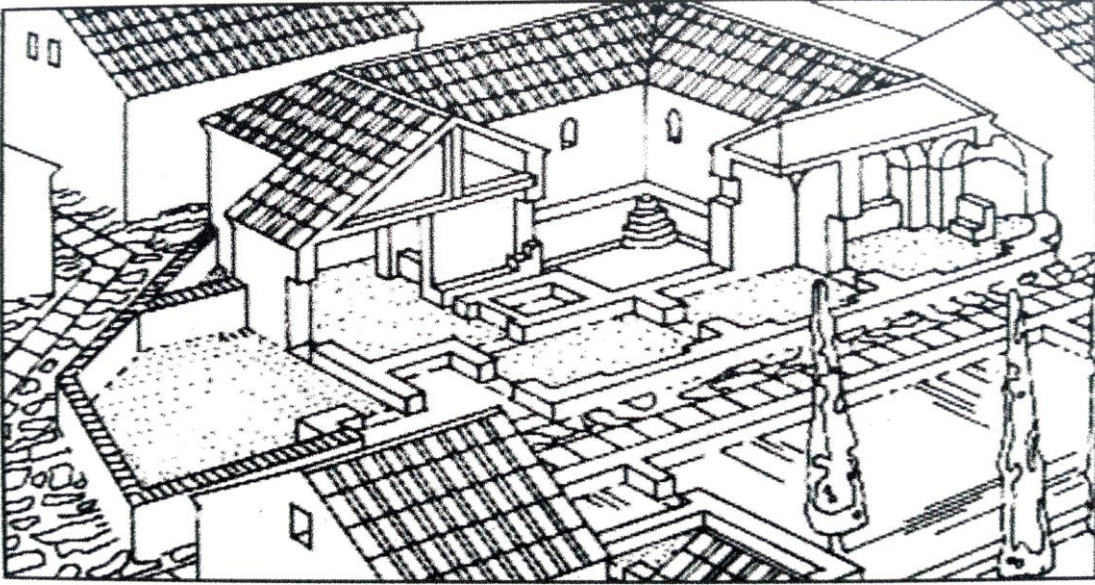
### **3.3 Roman bath example in Budapest**

Although the city is no longer in existence, archeological work on the remains has helped us better understand what the city was like. The Aquincum Museum provided a lot of information for this section of the research carried out on thermal baths from the Roman era.

The city of Aquincum had 9 public baths and four private baths. The archeological ruins of Aquincum has a public bath called Kettós fürdő (Double bath).

#### **3.3.1 Aquincum Kettós fürdő (Double bath)**

Kettós fürdő which got its name from the two rows of rooms arranged on the axis of the building was probably one of Aquincum’s finest baths. The layout of the bath suggests men and women may have used the baths simultaneously, but separately. The vestibule of the bath is opposite the western rows of rooms, while the eastern side does not have a vestibule.



*Figure 3 Reconstruction drawing of the double bath( Aquincumi Múzeum)*



*Figure 4 Interior of the double bath*

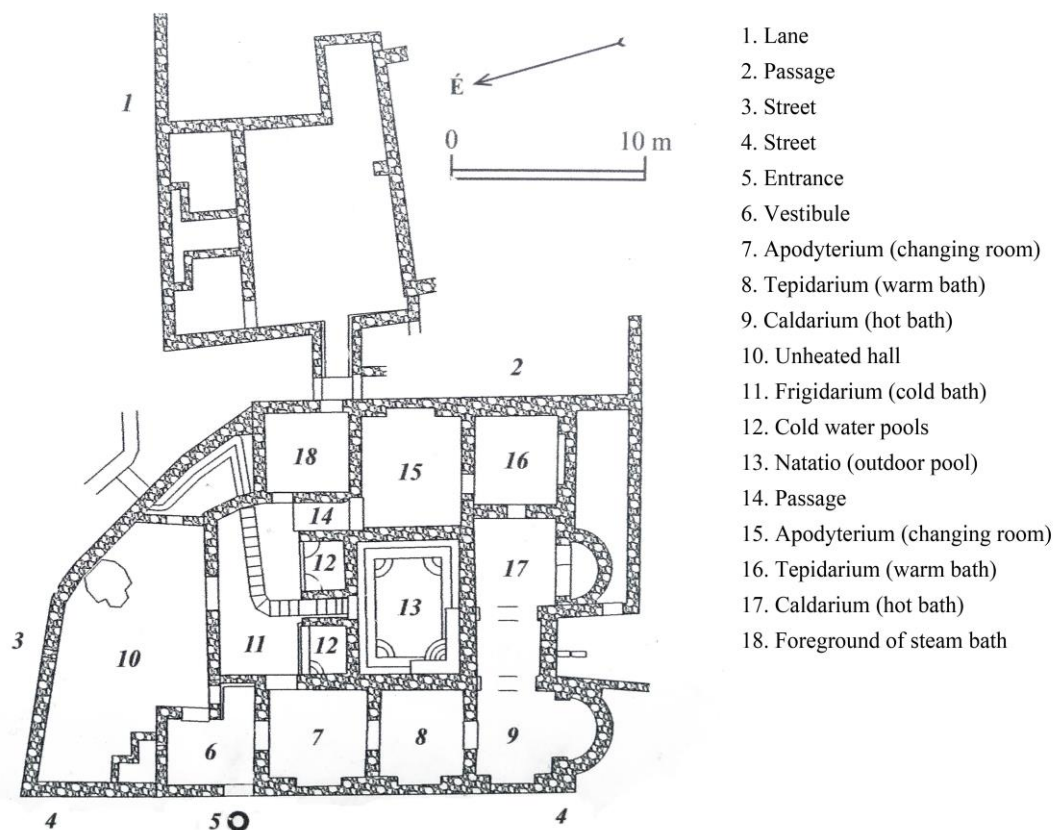


Figure 5 Layout drawing of the double bath (Aquincumi Múzeum)

### 3.3.1.1 The structural and spatial context of Kettős fürdő

**Apodyterium (changing room):** There are two changing rooms in the building. There is a changing room to the right of the vestibule of the western wing, and another on the eastern wing which is accessed from the passage which connects to the frigidarium. These rooms were heated.

**Tepidarium (warm bath):** The warm bath is accessed from the right of the apodyterium on the western wing. The tepidarium is right next to the apodyterium of the eastern wing as well. This bath served as a transition bath between the cold and bath for the users.

**Caldarium (hot bath):** The hot bath is to the right of the tepidariums, and contained two pools; one on the eastern wing, and another on the western wing of the building.

**Frigidarium (cold bath):** There are two cold water pools in the cold bath which were separated by a path that leads the users to the outdoor pool.



Palestra (open exercise space): The bath does not have a palestra.

Natatio (outdoor pool): The large central outdoor pool is accessed through the passage from the frigidarium. It was the only bath that had one pool.



*Figure 6 Natatio of the double bath*

### **3.3.1.2 Heating system**

Hypocaust: The hypocaust heating system was adopted for this bath. There are arched openings at the bottom of the pools which suggests there were elevated floors to properly accommodate the hypocaust system.



*Figure 7 Arched openings of the hypocaust system*

### **3.3.1.3 The materials**

Floors: The floors of the swimming pools were made from terracotta floor tiles.



*Figure 8 Terracotta floor tile finish*

Walls: The walls were constructed with stone and cement as seen in the figure below. There are marble plaques in some parts of the ruins which suggests marble may have been used to cover some of the walls in the building.



*Figure 9 Stone wall structure with marble plaque*

Ceiling: There is no existing ceiling structure to accurately illustrate the material used for the ceiling in the bath.

#### 4 OTTOMAN BATHS

Generally, the structure of Ottoman baths follows the classical scheme similar to Roman and Byzantine baths. The Turks took advantage of the hot springs in Hungary. They built medicinal baths, hammams, and steam baths.

These hammams served three functions: religious, as the Quran emphasizes personal cleanliness; social, as the baths served as meeting and discussion spots; and medicinal due to the thermal waters' curative effects (Korchnak P. 2013)

## **4.1 *Ottoman Bath characteristics***

### **4.1.1 *The structural and Spatial context of Ottoman baths***

It is possible to notice that the bath schemes have architectural characteristics, both in terms of plan layout, cross-section, and frontal view. These properties can be handled in a structural and spatial context [12].

In the structural context, the use of walls as a carrier, the choice of domes as the top cover, and the inclusion of marble coverings on both walls and in the courtyard inside. At the same time the use of stone and brick building materials in general, are some of the characteristics that constitute the structural value of Turkish baths.

In the sense of spatial value, the original spatial arrangement of these structures and the interrelationships between the spaces in this arrangement are some of the important features constituting the cultural heritage value [12].

Turkish baths are classified according to their plans, which creates a certain typology. This typology has importance to the social use of Turkish baths too. These typology types are:

- a) Cruciform, four eyvans, corner washing part type
- b) Stellate heat part type
- c) Washing parts around a square heat part type
- d) Multicupola heat part type
- e) Middle domed, double washing parts and transverse heat part type
- f) Cold, heat parts and washing parts, which are like the same room type.



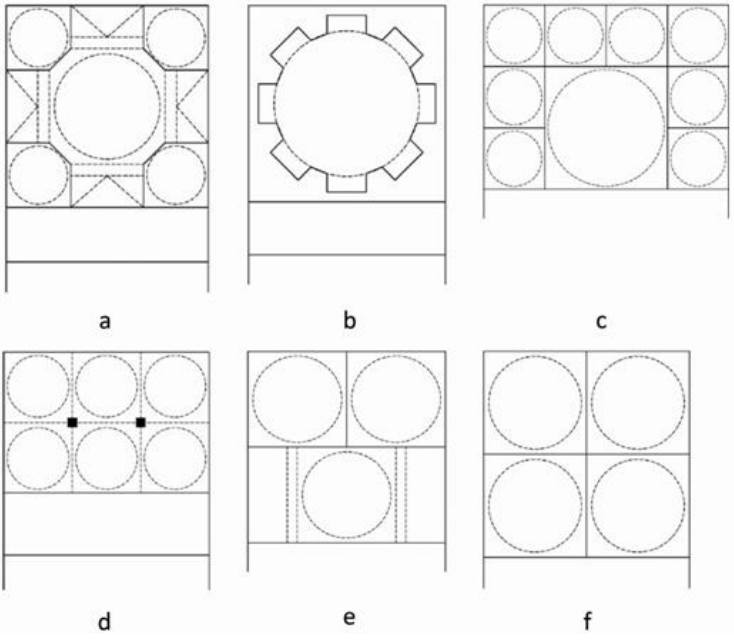


Figure 10 Schematic drawings of Turkish baths' plans (Karatosun M. & Nur Baz T, 2017)



#### 4.1.2 The Morphology:

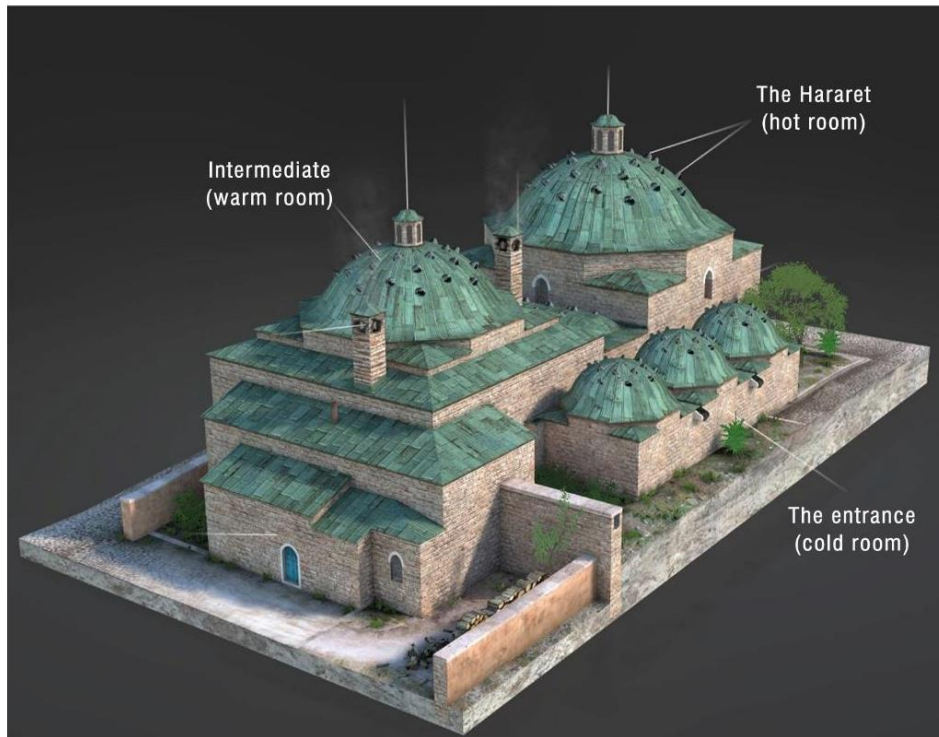


Figure 11 Morphology of an Ottoman bath- the main distribution of rooms (Mozaik Digital Education and Learning)



Figure 12 Section box (Mozaik Digital Education and Learning)



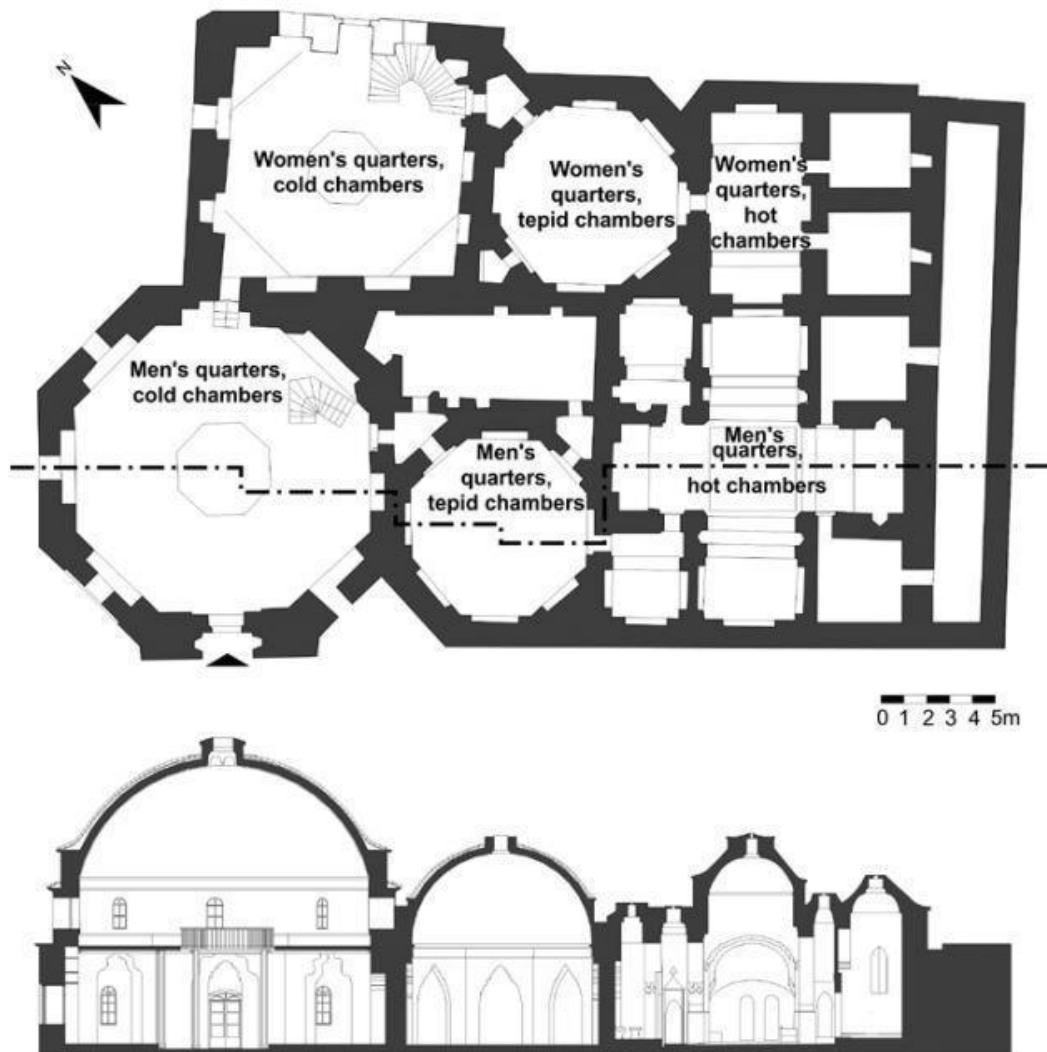
*Figure 13 Thermal heating system- behind the walls (Mozaik Digital Education and Learning)*

## **4.2 Ottoman bath example in Europe**

### **4.2.1 Bey Hammam**

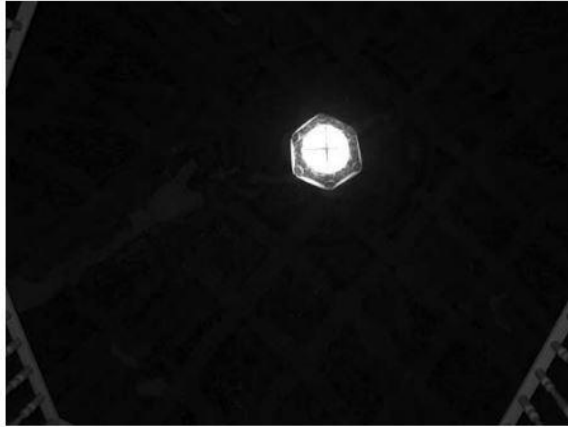
Bey Hammam is one of the first hammams of the Ottomans. It was built in 1444 with the classical period hammam typology and construction technique of the empire. It had been in use with the name Baths of Paradise until 1968.

Bey Hammam is a classical double bathed hammam, with two separate parts for men and women; the male quarters are the most spacious and luxurious, but both follow the succession of three parts, the cold, tepid and hot rooms [13].

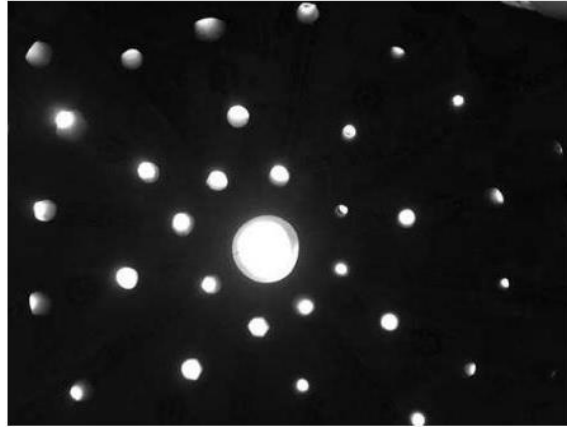


*Figure 14 The ground plan of Bey Hammam (Tsikaloudaki, K. Et Al. 2013)*

The male quarters include a large octagonal-shaped cold room, where lateral windows arranged in two levels on the external masonry provided daylight to the interior. Four windows are located on the ground floor on each free side of the octagonal envelope, while eight shorter windows are positioned on each side of the octagonal envelope at the upper level. An oculus at the top of the vault helps towards achieving uniformity of daylight across the height of the room [13].



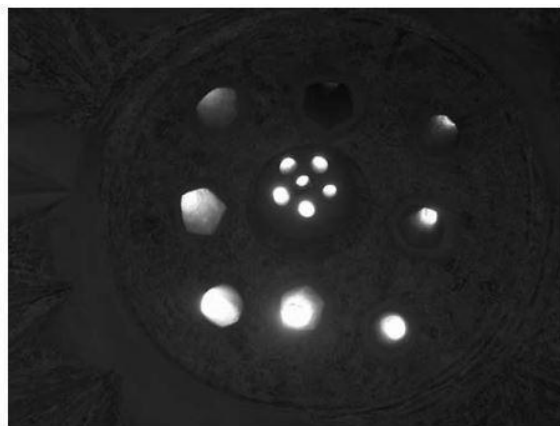
*Figure 15 The light openings on the dome of the cold area of Bey Hammam.*



*Figure 16 The light openings on the dome of the tepid area of Bey Hammam.*

Further to the east lies the complex of hot chambers, ordered around a large cruciform room, where the massage table stands in its center. Eight smaller areas open in this space, each of which is covered by a separate dome. Light openings are located on each dome, as well as between adjacent arches supporting the domes.

It is characteristic that only the central dome of the hot area, which is directly above the massage table, is equipped with an oculus; 24 circular light openings distributed in two concentric circles provide daylight to the heart of the hot chambers [13].



*Figure 17 The configuration of light openings on the central (a) & on one of the peripheral domes (b) of the hot chambers in Bey Hammam*



### 4.3 Ottoman bath example in Budapest

#### 4.3.1 Király Bath

Király bath is one of the oldest Ottoman hammams in Budapest. In 1565, a quarter of a century after the fall of Buda, Arszlán Pasha began to build it, in a rather special place, as there were no heat sources nearby. The bath was built here because the area was already inside the castle walls, so the Turks could bathe peacefully even when the soldiers were killing each other outside. For the Turks, the spa had a sacred role, which is why they brought the thermal water to the Király from a distance of about one kilometer, from the area around Lukács [14].



*Figure 18 Király bath Exterior*

As we can see Ottoman baths' layouts are organized by room temperature. The air in hammams is heated by a system of heating built under the marble floors in the rooms.

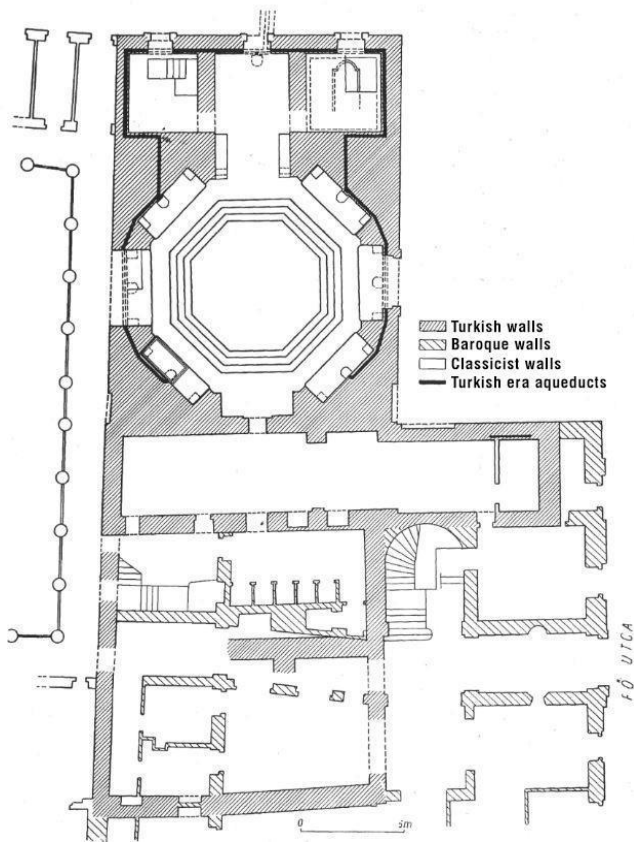
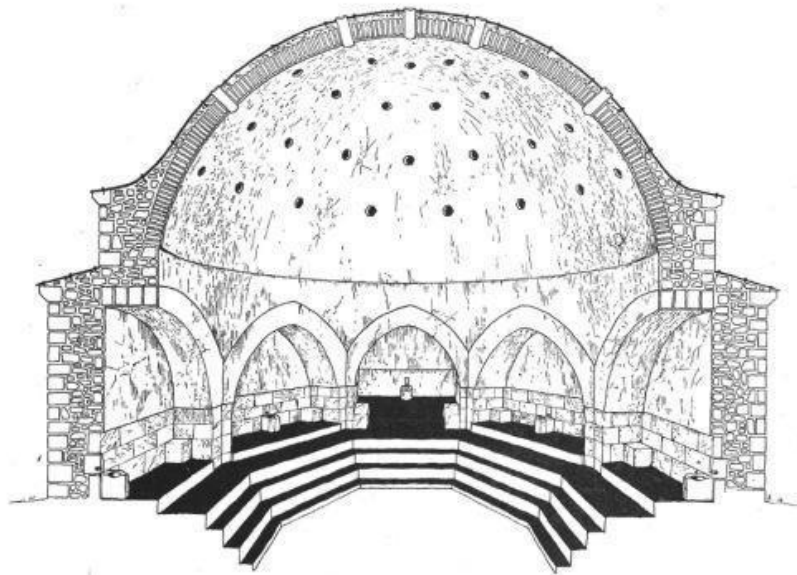


Figure 19 Király bath Plan. (A Törökkori Király Fürdő. II.)

Domes were an integral part of Ottoman architecture. The central dome over the main pool in Kiraly Baths has holes to let natural sunlight into the bath. Around the pool are colorless arches, complimenting the Ottoman-style architecture. The floors are marbled, and baths tiled. There are benches around the main pool for visitors to rest [15].



*Figure 20 The dome hall after restoration (A Törökkori Király Fürdő. II.)*

The overall design of the building is typical of the baroque style Ottoman architecture that prevailed in the period, and the same can be found in the design of the courtyard, small pools, and hallways [15].



*Figure 21 Interior of the octagonal bath[15]*

There are four pools in the Király Baths. The main pool resides beneath a quintessential Turkish dome. The bath area is lit only by natural sunlight that seeps in through the holes of the Turkish dome which creates a beautiful effect. The thermal baths at Király maintain temperatures

between 78.8°F and 104°F and the medicinal waters that come from deep hot springs of the neighboring Lukács Baths contain minerals such as sodium and calcium [15].



*Figure 22 Interior style of arches in the hot room [15]*

Kiraly Baths are authentic Turkish thermal baths from medieval times. Turkish thermal baths, however, are not the same as the Turkish steam bath, also known as Hammam. At Budapest thermal baths, warm water with medicinal properties is used, while Turkish Hammam uses steam and hot water. Turkish thermal baths such as Király Baths are known as Ilidzas [15].

Temperatures in the four pools vary, the recorded normal temperatures are between 78.8°F and 104°F.





*Figure 23: One of the small pools[15]*



*Figure 24 Sunlight through the dome holes [15]*



*Figure 25 Stairs [15]*



*Figure 26 Columns [15]*

## 5 CONCLUSION

After the analysis and comparison of the spatial and architectural styles of the thermal baths, we can conclude that there are certain differences in the use of spaces, heating methods and the uses that were given to the thermal baths, likewise the users who made use of these thermal baths also had their particularities.

With these comparisons we can deduce that culture and the main focus that has been given to both Roman and Ottoman thermal baths is similar. Both have some similarities since certain details were taken from by the Ottomans from their Roman predecessors.

The quality of the baths architectures that are the subject of this work isolates the bather from the outside world with the thickness of their walls and the waters, regardless of their scale or formal solution. The custom of bathing may have begun as a civic act, however, today it has become a recreational activity.

The low cost of maintenance of these infrastructures due to the abundance of thermal waters in Budapest, has made possible the continuity of the tradition of the baths in this city. The culture of the thermal baths promotes an exhilarating experience and of self-complacency. From its traditional role as a social condenser, now a phenomenon for socialization.

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