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## ARCHITECTURE OF HERAKLEIDES BATH AT GADARA ANALYSIS AND COMPARATIVE STUDY

Mohammad NASSAR<sup>1,\*</sup>, Zeidoun AL-MUHEISEN<sup>2</sup>, Arabiya AL-BATAYNEH<sup>3</sup>

<sup>1</sup>School of Arts and Design, The University of Jordan, Amman, Jordan

<sup>2</sup>Faculty of Archaeology & Anthropology, Yarmouk University, Irbid, Jordan

<sup>3</sup>Faculty of Architecture and Design, Jordan University of Science & Technology, Irbid, Jordan

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### **Abstract**

*Roman baths, the cultural and athletic centers, which were designed to support entertainment, political, social, and physical activities, stood at the heart of Roman community life. Roman bathing traditions obviously appeared in the East only in the 2nd century AD. In Gadara (Umm Qais) three bathhouses at least were erected during the classical periods. The city center bath (the Byzantine Bath), bath of Heraklides, Al-Qasr bath (local name) and Hammat Gader in the near vicinity. Here, the main aim of the article focus is on Heraklides bath which was excavated since 1966 without a final publication. The architectural plan and the descriptions of the remains made in the field provide an overview of the structures as they are preserved today. Then an analysis of the archaeological material is presented. Following that an analytical study was made to determine the typology of this bath. Heraklides bath is thought that had been designed according to the hall-type which was common in the Roman East such as Cilicia, Antioch, Lyica, Anatolia and Northern Syria. Some architectural elements in Heraklides bath when compared to baths in other provinces of the Roman Empire show similarity of development of bath architecture. Gadara as a city in the Decapolis has elaborate big imperial looking baths. The development of these buildings, both in terms of size and number, illustrates the success of monumental bathhouses which were built in the second century AD and enlarged to a monumental scale in the third century. It is the result of competition between neighboring cities.*

**Keywords:** Architecture; Heraklides bath; Gadara (Umm Qais); Byzantine; Roman.

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### **Introduction**

Bathing the activity which serves for both cleanliness and pleasure, has been almost practiced by nearly every civilization. The most ancient records mention bathing in the rivers Nile and Ganges. It is known that Jews, Greeks, Persians, Punic, Roman, Byzantine, and Muslim all practiced bathing either swimming in running water, or in private and public baths [1]. Public baths were among the most complex examples of large-scale planning from classical antiquity, they were center for the life of the city inhabitants. On the architectural dimension they were landmarks because of their massive scale, their rational plans, and their complex spatial sequencing [2]. They were designed, developed, and adapted to the local culture with many features absorbed from predecessors' history. It seems the Roman and Byzantine Baths were not only places for hygiene, but they were also cultural and athletics centers. They were designed to support entertainment, social, and physical activities. They had a lot of rooms and

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\* Corresponding author: mohammadnassar@hotmail.com

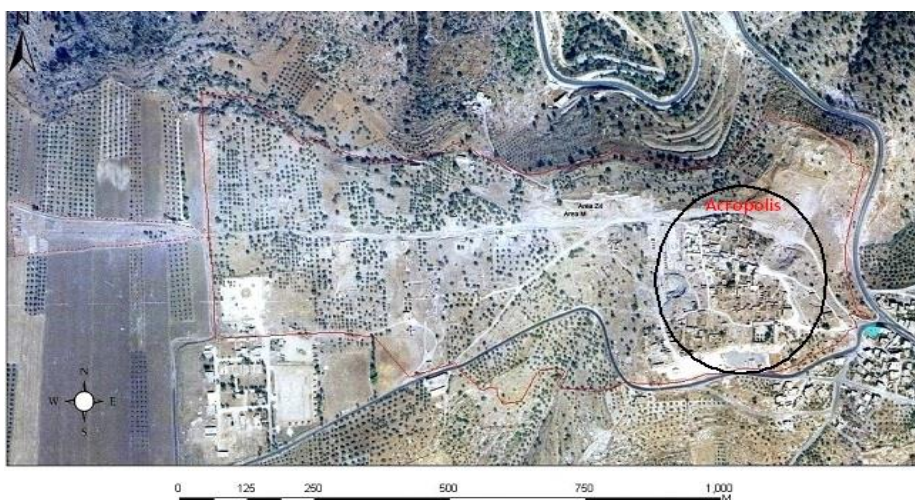
spaces in different sizes, experiences, and roofing systems, so they are rich in architectural elements and principles.

Roman baths were spread widely. They were to be found in every type of settlement, from cities to small villages, and from villas to forts. Herakleides Bath has been selected as a case study among of another baths at Gadara because the study in the bath was not complete before, so this study came to clarify the architecture in it, and this contributes to the analytical and comparative study of this research.

## Presentation of archaeological sites

### *Location and History of the exploration*

The Herakleides Bath located at Gadara (Fig. 1) a height of 350m above sea level, and its vicinity to Yarmouk River and Lake Tiberias gave the city its unique significance. The site is located near the northern border of Jordan, about 120 kilometers to the north of the capital, Amman, in the northern part of Irbid district. Archaeological evidence indicates that the beginning of settlement in Gadara is due to Greek/Roman city, founded by the Ptolemais, reaching its peak of prosperity in the Roman and Byzantine period, and finally come to an end after the Muslim take-over in 634/636 AD. As part of a Roman political and cultural unit, the Decapolis, Gadara is considered an entirely Hellenized city within its Semitic surroundings [3].



**Fig. 1.** Aerial view of Gadara (Mwaffaq Batayneh/ Yarmouk University)

In 1806, Ulrich Seetzen was the first scholar to visit Gadara. He described the city [4]. After that, many travels and scholars visited Gadara, as among them, J. Burchardt (1822) [5], W. Bankes and J. Buckingham, Schumacher 1886, he described remain of the city [6]. The first excavations and restoration works were at Gadara started during the 1930s by the Jordanian Department of Antiquity [7]. Between 1965 and 2017, there are many archaeological excavations and conservation continued works in Gadara [8-14], including its baths, among which is the Herakleides Bath, which is the subject of this study [15-17].

### *Description of the Herakleides Bath*

Herakleides bath is in the northern area of the lower town, about 100m northeast of the decumanus maximus within an area of olive and oak trees (Fig. 2). Within the urban planning this bath seems to be a public- privately funded -facility for the residents of the northern residential quarters [18]. The date of the bath of Herakleides is still unknown. U. Wagner-Lux thought the origin of the bath could be from the late Roman period of the 3rd Century AD [19].



Fig. 2. Aerial view of Herakleides bath (Arabiya Al-Batayneh 2019)

The excavation works of the Herakleides bath by the Jordanian Department of Antiquities discovered the bath complex in 1959 on a private property and partially uncovered it at that time [20]. In 1965 U. Wanger-Lux carried out the first excavation work of the bath in particular the large hall and its east annex room with the mosaic floor and she published it in 1966. In the years between 1966 and 1974, the Jordanian Department of Antiquities uncovered further parts of this bath three pools with marble floors [21]. The dimensions of the exposed parts of the bath are 30.0m long from western side and 28 m long from eastern side, 24.0m wide from southern side and 17.0m wide from northern side. The remains of the bath exposed in the excavations formed a rectangle. In order to gain a comprehensive understanding of the bath, it was necessary to redraw the plan with all the architectural remains exposed in the site which are not presented in the plan of 1966. It must be said here that the thickness of the outer walls is unknown and the thickness within the plan is representative and not real.

The site was divided into 11 areas, according to the architectural division of the structure. Each area was designated by a letter of the alphabet (Fig. 3).

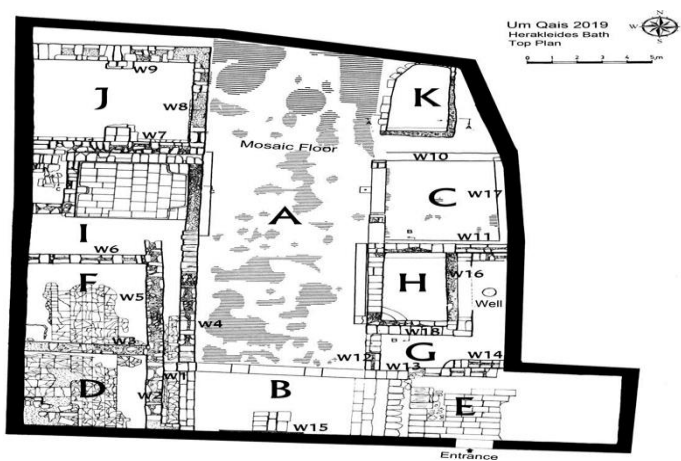


Fig. 3. New plan of the exposed remains of Herakleides bath (Arabiya Al-Batayneh 2019)  
After U. Wanger-Lux 1966

The letters A, B, and C were used by U. Wanger-Lux and in order not to conflict with her plan used them in the same rooms. The walls were given numbers to facilitate their describing. For practical reasons, the description will not be made in the order of scoring for the rooms, but from the patrimonial point of view and the excavation period.

#### **Area E**

The entrance hall, located in the southern part of the bath, it consists of a paved space and a flight of stairs. The paved space dimensions are not less than 3.5m in width, and 4.7m in length. It's paved with well-smoothed basalt slabs (Fig. 4). The average size of the stones in this section is 0.4x0.8m. the basalt slabs are laid in parallel rows at right angles to the bath building. The paved stones are carefully dressed; their upper face is smooth. The slabs are 0.15m thick.



**Fig. 4.** Stone pavement of entrance E (Arabiya Al-Batayneh 2019)

The southern entrance in W15 (B) is relatively narrow opening ca. 1.5m. The area outside the door is full of debris especially pottery sherds and it was not clean during the work, so we do not have evidence or indication for a door presence. The flight of stairs connecting the pavement level of the entrance with area B floor level which is higher by 0.90m (Fig. 5). Six steps were thus built to the full width of the entrance, two of which are still in situ. The tread varies from 0.41 to 0.46m wide, and the riser is uniform 0.15m high. The basalt stones of the steps are finely dressed. The staircase is flanked by two walls W13 (G) and W15 (B).



**Fig. 5.** the staircase of the bath (Arabiya Al-Batayneh 2019)

#### **Area B**

It is from here that the bathing and the visitors began. The area is rectangular, its length is 6.2m from east to west and its width is 4.3m from north to south, its overall area is thus ca. 26.5m<sup>2</sup> (Fig. 6). Area B is higher than area A by 0.08m and separated from it by two columns or pillars with a space of 2.0m between them. The distance between the column and the wall is



about 1.6m. Parts of the square plinths are still preserved with a dimension of 0.6m (Fig.7). The pedestals for the columns that separated area B from area A were cladded in marble. It's probable that this part formed a columned portal.



Fig. 6. Area B, From west (Arabiya Al-Batayneh 2019)

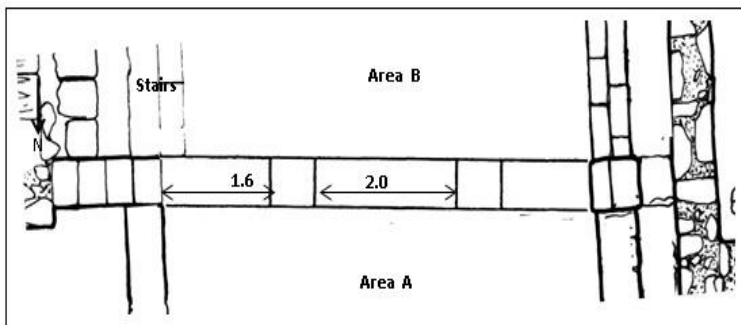


Fig. 7. The columns that separate the areas A and B (Arabiya Al-Batayneh 2019)



Fig. 8. Platform in Area B (Arabiya Al-Batayneh 2019)

The original wall W15 in this area is preserved to a height of 0.6m. It was built from basalt stone and cladded using large panels on stone which in part still existed in situ. A platform was also found in this area (Fig. 8). It is an addition in later phases because it is not in direct contact with the wall and the stone cladding separates it from the wall. This is also can be proven by its construction. Stone slabs of different dimensions were put above this platform

with irregular arrangement. Its function is unclear, but it could be used as a base for a statue. Maybe for the nobleman Herakleides who made restorations for this bath.

#### **Area A**

Area A is an elongated rectangular space (Fig. 9). It could be called the central hall, according to its location between the different areas: Area G, C, and K to the east, Area F, I, and J to the west, Area B to the south, and from the south the bath was not fully excavated.



**Fig. 9.** Area A (the central hall), from south (Arabiya Al-Batayneh 2019)

From this layout, it appears that the hall served not only as a bathing hall but also as an intersection from which one could proceed to many parts of the complex. Area A is the larger space in the bath. Its length from north to south is 24 m, and its width from east to west is 6.6m (interior dimensions). South of it was the main entrance (Fig. 10) - the columned portal (proposed). There was free passage between area A and Area C, the width of this passageway is 3.4m and it permitted the bathers to move freely between the two halls.



**Fig. 10.** Area A (the central hall), from north (Arabiya Al-Batayneh 2019)

Marble-edged gutters, are seen on both long sides of room A in front of water basins (Fig. 11), were used to drain the water. The width of the eastern gutter is 0.4m, and its length is 5.0. The western gutter in front of basin I is not fully preserved but according to the plan of 1966 the width is 0.4m and the length is 5.8m. The plan also shows the existing of rectangular drainage plates inside these gutters with a dimension of 0.4x0.48m, unfortunately there is no clues in the site prove that. The two gutters are covered with white mosaics. There is also a white marble drainage plate with a circle hole in its center immediately before the entrance to

Area C. The plate is square with a dimension of 0.4m and the hole is 0.1 m in diameter (Fig. 12).



**Fig. 11.** A. Marble-edge gutter in front of basin H with white mosaics. B. remains of marble-edge gutter in front of basin I. (Arabiya Al-Batayneh 2019)



**Fig. 12.** Drain plate in front of Area C. (Arabiya Al-Batayneh 2019)

#### **Area D**

This room is to the west of Area B. It is a rectangular room with a dimension of 6.9x5.4m (Fig. 13). No traces for a wall that separate Area B from Area D which permits free circulation between both areas. The floor of this area is made of well-dressed limestone slabs, the slabs are rectangular, measuring ca. 0.45 x 0.20m, and are laid in parallel rows at right angles to the long wall W15. Most of the slabs have remained in situ. It was noted that most parts of the pavement had been damaged, most probably because of the collapse of ceilings and upper parts of walls maybe during the earthquake of 749 C.E. Wall W2 in its location which is around 1.3m from the eastern edge of the room give an indication that this wall was an addition in one of the phases of the bath. This assumption could be ascertained by the presence of the same floor pavement on both sides along W2. But according to the level that had been taken using total station there is a difference of 0.09m.

#### **Area F**

Area F is almost a square room with a dimension of 6.0m (Fig. 14). It seems that both areas D and F were one room but at later periods they were separated by intermediate wall W3. It is paved with the same stone tiles used in Area D. The northern wall W6 is 0.65m thick and 4.7m long, semi parallel to it is W3 in the southern side of the room which is 0.6m thick and 4.9m long. Two adjacent walls W4 and W5 0.6m thick are on the eastern side of Area F with a space separating them 0.6m width with remains of stone tiles. The function of these adjacent walls is not clear. The walls were built of limestone.





**Fig. 13.** Area D. (Arabiya Al-Batayneh 2019)



**Fig. 14.** Area F. (Arabiya Al-Batayneh 2019)

### ***Area G***

This Area is a longitudinal room. Its width is 2.7m from its western side and 1.7m from its eastern side that is due to the presence of W13 and W14 attached to each other (Fig. 15). Its length can't be determined for sure because there are no traces for the wall at the end of this area but a projecting stone from W16 inside this area could define the room's edge with a length of probably 3.3m.



**Fig.15.** Area G. (Arabiya Al-Batayneh 2019)



The eastern wall W12 of the area A is preserved to a height of 0.50m, its thickness is 0.6m. An entrance leading into Area G was discovered in wall W12. A recess for a door was found in its threshold, which is built of well-dressed basalt stones, the opening is 1.50m in width, and there is a recess in its doorposts which preserved to a height of 0.5m, and thus the entrance was not open to free passage, the entry from the area (A) into Area (G) was restricted (Fig. 16).



Fig. 16. Remains of a door between Area A and Area G (Arabiya Al-Batayneh 2019)

### Area H

Small bathtub was built between W11, W16 and W18 which all had the same width (0.6m). This bathtub measures (5.1 x 2.5m) and is 0.7m deep (Fig.17). The sides of the tub were covered with a layer of plaster, and in the bottom an inclined layer of mortar was executed to prevent seepage (Fig. 18).



Fig. 17. Area H - Water basin (Arabiya Al-Batayneh 2019)



Fig. 18. A. marble fragments with cornice reliefs. B. marble fragments with a representation of a Triton blowing a horn used as floor pavement in basin H (Arabiya Al-Batayneh 2019)

This floor is well preserved. It is composed of irregularly shaped marble fragments (spolia), some of which have reliefs reused from other parts of the building (Fig. 18). The original pavement probably was regular tiles either from marble or stone. One remarkably slab is that with a representation of a Triton blowing a horn. It can be concluding that this bath was rehabilitated in later phases.

Descent into the tub was via semicircular corner staircase. The radius of the top step is 0.5m, and the riser is 0.2m high. The second step is larger – 0.5m wide and 0.35m high (Fig. 19). A bench was built along the northern side of the tub, 0.35m wide and 0.4m high. The stairs and the bench were covered with slabs of marble at the top, which are 2.5cm thick.



**Fig. 19.** Semicircular staircase in basin H (Arabiya Al-Batayneh 2019)

In the east and west sides of the tub, at floor level, a small outlet was found (Fig. 20). The western outlet is circular made of terracotta with a diameter 0.08m. The eastern one is semicircular with a diameter of around 0.1m. It must be mentioned here that there is well to the east of basin H and the semicircular hole could be inlet for water directly from the well.



**Fig. 20.** Eastern and western water inlet and/or outlet (Arabiya Al-Batayneh 2019)

### *Area C*

This room is located to the east of room A. it is higher by 0.08m and was separated by columns or pillars from it (Fig. 21), part of the pedestal is preserved in the site with a dimension ca. 0.5m (Fig. 22). It's surrounded by walls W10, W11 and W17. Wall W10 which is 0.6m thick and 4.5m long was added at one phase, and a later basin north of the room C probably destroyed a considerable part of this space, so it is only 6.0m long today, whereas originally it could have a length up to 12.0m (Wanger- Lux, 1966). The width is 5.0 m. Marble-edge gutters are also existed here, with a width of 0.5m. It wraps around room C from its eastern and

southern sides (Fig. 23). It is covered with white mosaics. The floor of this room was paved with colored mosaics. They were removed from the site to keep them from the uncontrolled vegetation. The floor will be described later. Some stones in wall W17 are preserved to a maximum height of 1.2m, it was built of large, dressed stones (Fig. 24) the walls were covered with marble slabs. They were held in place by bronze nails, several of which are preserved in situ. The space between the wall and the marble slab was filled with mortar. The pedestals for the columns or pillars that separated area C from area A were clad in marble.



Fig. 21. Area C. From west



Fig. 22. pedestal found between Area A, C



Fig. 23. Marble edge gutters in Area C (Arabiya Al-Batayneh 2019)



Fig. 24. Part of original wall with traces of nails holes (Arabiya Al-Batayneh 2019)

### Area I

The pool in this area is almost square (4.1 x 4.4m) and 0.8m deep (Fig. 25). Its floor is made of irregularly shaped stone slabs, probably resulting from alterations and renovations made in the pool's pavement over the years; it is probable that the original pavement was



regular and precisely laid. The two corner staircases were used both for entering the pool and sitting in it while bathing (Fig. 26). The riser of the top step is 0.15m high. The tread of the second step is 0.4m wide and its riser is 0.5m high (this step was possibly intended for sitting).

The water was probably fed into the pool through a single fountain, the remain of its base was found on the central western side of the pool. The base of the fountain is square (0.45 x 0.45m) and its height is 0.3m. the water probably flowed through an opening in the statue found in the bath (Fig. 27). The water was probably led to the fountain via a lead or terracotta pipe.



**Fig. 25.** Basin in Area I (Arabiya Al-Batayneh 2019)



**Fig. 26.** Corner steps in basin I. From west. (Arabiya Al-Batayneh 2019)



**Fig. 27.** Statue base was found in basin I (Arabiya Al-Batayneh 2019)

### ***Area K***

This bathtub in this area resembles the one in area H. It measures 4.9 x 2.3m and is 0.85m deep (Fig. 28). Descent into the tub was probably via semicircular corner staircase as in the tub in area H, but no remains are still in situ. A bench was built along the southern side of the tub, 0.25m wide and 0.45m high. It was covered with tiles of marble at the top, which are 2.5cm thick (Fig. 29).



**Fig. 28.** Basin in Area K (Arabiya Al-Batayneh 2019)



**Fig. 29.** The bench in basin K (Arabiya Al-Batayneh 2019)

### Area J

There is not a lot of things to be said about Area J. It is almost square with a dimension of 6.0 x 6.2m (Fig. 30). This area may be subjected to vandalism because the floor is not preserved, and its function is not clear. It probably was another basin, or in it was the hypocaust system for heating the hot sections within the bath. Its structure in its northern and southern sides resemble the one used to carry arches or barrel vaults, but it is unclear if it is from the first phases, or it is an addition in later phases (Fig. 31).



**Fig. 30.** Area J (Arabiya Al-Batayneh 2019)



**Fig. 31.** Base to support arch or barrel vault (Arabiya Al-Batayneh 2019)

## Discussion and analysis

There are many aspects of the bath which could be subjected to a comparative analysis, such as the structure's type, size, location, building materials, and date of construction and renovation. Although the previous mentioned aspects allow comparisons to be made between baths from any period or any location, but in my case, it will be more convenient to compare the plan outline of Herakleides bath in addition to single architectural element because some of the previously mentioned aspects were not included in excavation reports and cannot be known in the current time. Comparing single distinguished architectural elements is useful to draw hypothesis and to understand the regional effects. As a starting point many of the known catalogues that includes plans for the Roman baths were checked out and excluded the descriptive ones which lack photos or drawings because they do not serve the purpose of the comparison which depends mainly on the plan morphology. These catalogues belong to authors such as D. Krencker, I. Nielsen and S. Hoss. Unfortunately F. Yegul's in his works he particularizes a kind of baths which Herakleides baths in somehow can be compared to it. This type is called the "Hall- type", it was broadly known in the Roman East such as Cilicia and its leading city Antioch, Anatolia, and Northern Syria. Other examples were found in Greece. Lycia and Pamphylia with parallel and projecting apsidal halls can be considered as regional variations of this type [22].

This type is distinguished by the middle large rectangular hall into which several heated rooms on one side were open and unheated rooms on the other. The cold pool of the frigidarium may be treated as an extension of this middle hall or as a separated unit by a colonnaded screen. From their location in the plan, these halls provided an effective center for the multipurpose functions of the bath and ordered circulation [8-13]. The entrances into the main halls are by way of a vestibule or corridor.

In Lycia most baths consist of a row of three or four adjacent rectangular rooms, on parallel axes. These rooms are roughly equal in area, and the ratio of the short walls to the long ones varies from 1:1 to 1:3. When a room or row of rooms were found set at right angles behind the main row of rooms this indicate a later addition and remodeled of the plan. In some cases, palaestra could be found adjoining the bath block by one of its walls. Most Lycian baths belong to a period between about 70 and the early second century. The rectangular rooms except the middle one is divided into smaller rooms, in some cases a small apse could be found embedded within the wall, projecting externally from the wall or even occupies the whole length of the short wall of a room. If the middle hall was roofed using vaults, then the width of hall must not exceed 7m with walls bearing vaults are two meters thick. In case of the room is more than 7m then the roof is almost flat. Most of Lycian baths have vaults about 6-7m width [23-25].

As regards size, Lycian baths vary in floor area, but in general they are smaller than baths of many of the neighboring areas. Seven of them lie between 75 – 252m<sup>2</sup>. Five lies spread broadly between 600 – 1000m<sup>2</sup>. The most popular orientation as a Roman bath in general is between south-east and south-west [26]. Other baths Located in small, provincial towns such as Anemurium and Iotape show distinct design characteristics of the "hall-type" such as Baths II-7A in Anemurium, Baths I-12A in Antioch-ad-Cragnum and Baths II-1A in Syedra [27, 28]. Other public baths correspond to the same layout is Bath E at Antioch (first half of 4th century) and Bath A (early 3rd century. Main Social Hall has served a variety of generalized functions - including that of a frigidarium [11-14, 26-28]. The outline of baths at Serdjilla, a prosperous agricultural and trade town in northern Syria, shows two parallel rectangular rooms in the same type of hall-type: the northern large rectangular hall (B) with adjacent space (L) which was separated with Corinthian columns, probably was used as a changing room; on the south, several smaller spaces serving the functions of hot and cold bathing. In this building no vaulting was used, they used instead gabled roofing system [11-14, 26-28].



The outline of Placcus baths at Gerasa-Jerash shows the arrangement of three adjacent rectangular rooms as in the hall-type. The bath occupies an area of about 830m<sup>2</sup>. The atrium A52b serves two sides spaces with the same length. The room A51 to the east was divided into three rooms, each one opens at the central hall. The western room A52a has two cold pools and provides access to the hot section. According to T. Lepaon, Placcus baths on the regional scale do not have any obvious morphological similarity with the Byzantine baths characterized by the presence of three hot rooms in a row. In his opinion this bath fit well into the corpus of Byzantine- Umayyad establishment that developed in the region between the 5th and 8th centuries AD [29]. In my opinion this bath was designed according to the scheme of the hall-type bath. When comparing the previous mentioned hall-type baths with Herakleides bath with its three parallel rows of spaces it is obvious how similar they are in the layout of the plan. The reason for use such layout in design this bath is still unclear, but according to F. Yegul the Eastern baths during the Late Roman era tended to reduce the size and importance of the frigidarium, so it was transformed from a major hall containing large cold-water pools to a multi-functioned hall [26-28].

Through the studying of Herakleides bath it is clear according to the absence of any installation related to the hot sections such as the hypocaust or tubuli that the uncovered part resembles the cold section (frigidarium). So, the concentration of comparison in terms of single architectural elements will be exclusive to the frigidarium.

Hammat Gader with its geographical location which was built in the 2nd century AD and still in use until 749 AD shows in some of its architectural elements a similarity with those existed in Herakleides bath. One main distinctive feature existing in Hammat Gader is the colonnade screen. The colonnade was an architectural element designed to ornament an empty space in the hall. It consisted of three elements: the original pillars, which were attached smaller, pilasters, and two central columns. Traces of probably the same element could be seen in Herakleides bath. From here is the main entry to bath facilities in both baths. In Hammat Gader this colonnade screen separates the upper part which contains shops and some amenities from the frigidarium, in my case this architectural element separates the main hall (frigidarium) from Area B which is in direct connection with the entrance. Within Herakleides bath there are two column bases separate Area A Form Area B, the dimension of the space between the columns is 2.0m. The columns are about 1.6m from the sides' walls. This composition resembles a triple entrance towards the main hall. The column base is square with a dimension of 0.6m. So, the whole screen width is about 6.4m.

In Hammat Gader, the space between the two columns is 2.5m, the distance between the column and the pilaster is 1.8m. The dimension of column base is 0.8m. The base of the pilaster is 0.9m. So, the width is about 9.5m. The bases and the columns' lower sections in Hammat Gader were discovered in situ, while the upper portions were found in the debris over the floor. Among these pieces were two Corinthian capitals, one of the pilaster capitals and all the sections of articulated lintel [30].

Another example with the same element according to the plan was found in Palestine too, the Caesarea Maritima founded between 22 and 10 BC. Caesarea served as the main harbor on the Mediterranean coast and capital city of Herod's kingdom, and of the later Roman province of Iudaea/Syria Palaestina. The city named after emperor Caesar Augustus, Herod's patron in Rome [31]. A Roman public bath was discovered in 1992. It was built in the first half of the 4th century and remodeled in the Byzantine period. It is composed of frigidarium, tepidarium, caldarium and palaestra. The frigidarium as described by the excavator consists of a row of rooms south and west of a small courtyard. The rooms had white mosaic and benches along the walls. The courtyard and the rooms had pools [31].

The entry through the frigidarium is from triple entry (colonnade screen), it consists of two columns with 2.0 m space between them; a pilaster attached the wall with a dimension of 0.8m. The space between the column and the pilaster is 2.0m. The columns' base is 0.6m. So,

the width of this screen is 8.0 m. From studying the tubs in Herakleides bath the tubs could not accommodate more than three people simultaneously. This is a trend that started in the 3rd century. The collective piscinae are gradually replaced by individual tubs. The cold room (frigidarium) was increased in area and importance when compared to the heated section and became a multipurpose room. Most often provided with one or two small immersion basins. At the same time the heated rooms tend to be smaller. Several alternative explanations can be supposed to explain the introduction of these small pools which is considered a sign of the decline of the bathing culture [32]. The main explanation is the breakdown of the water supply systems during Late Antiquity due to the destruction of aqueducts resulting in a direct reduction in the size of the pools [33]. R. Ginouvès proposed different theory in which the small pools would have been the result of an evolution in the tastes of the bathers. Other theory considers it an economic choice, to reduce the operating costs of buildings.

## Conclusions

Some of the architectural elements used in Herakleides bath have parallels in the region; one of these elements is the colonnade screen which was found in Hammat Gader and in Caesarea Maritima in Palestine. In Hammat Gader it was an addition in later phases, therefore it can be concluded that it's an element that appeared in certain time and became common after that. One noticeable element in the baths of Herakleides is the small bathtubs that could not accommodate more than three people simultaneously. This phenomenon was common in the 4th century AD. Many explanations were supposed such as the breakdown of the water supply, or to reduce the operating costs of buildings. So Herakleides bath can be considered as an exception in Umm Qais with its Hall-type plan. This is a special case. Clearly, there is vogue for use such inspired design for the bath which is come from remote provinces. One could suggest through morphological comparisons that there is a cultural connection between Gadara and the Northern provinces. This study nonetheless could not determine the date of this bath. Although the ornamental patterns used in the mosaics floor were not established before the 4th century, but the pavements could be replaced, so dating of the mosaics cannot be used as an indication for the age of the building. In addition, it is not possible to determine the period in which Herakleides bath was built depending in determine the typology because Hall-type layout was not restricted to specific time, this type appeared in the first century AD to the Byzantine period.

Incomplete excavation of the facility hampers our ability to fully understand its occupational history. The site needs more investigation by conducting excavations to understand its occupational history and to propose precise dating for the different phases of construction. The results form a preliminary study that may be tested against new data as they become available.

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