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Ph.D. Dissertation

Roman *Nymphaea* in the East – Origin, Development, and Cultural Resource – study case: *Nymphaea* located in Jordan.

Római nymphaeumok Keleten - eredet, fejlődés, kulturális erőforrás. Esettanulmány: A jordániai nymphaeumok

Supervisor:

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Dedication

To those who never doubted me and always shielded me from worries—my late father, whose enduring belief in me continues to be my guiding light, and my devoted mother, whose boundless love and support are the pillars of my strength.

To all who have stood by me—my beloved brothers, Malik, Salim, Alaa, and Ahmad. And to my dear friends who encouraged me at every step.

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Chapter One

Introduction

1.1. Preface

During ancient times in the Near East, water served a dual purpose: a necessity for daily life and a highly prized luxury. In many parts of the region, water shortages connected the rise of civilization with the development of water management technology, requiring significant labour to maintain consistent water systems. Hence, complex water management systems in agriculture often relied on the organisation and control of a central authority.[1]

The importance of water manifested in different architectural forms in ancient civilizations. This research explores a significant structure that holds immense value in modern-day Jordan. It served a dual purpose: a religious one related to the cult of *nymph* deities and a practical one as a water fountain that showcased the luxury of Roman cities. These functions are explored in following sections of this research.

This study thoroughly investigates the *nymphaeum*'s structure, origin, and evolution over different periods. After explaining the Roman *nymphaeum* as a structure, it examines the four *nymphaea* located in Jordan (Amman, Gerasa, Gadara, and Petra) as well as the so-called *nymphaeum* of Pella, which appears only on a Roman coin, as further discussed in this dissertation.

The *nymphaeum* structure can be defined as a water fountain, which holds a sacred role, as these structures were meant for the *nymph*a deities. However, an exact direct definition of the Roman *nymphaea* raises a dilemma.[2] During Roman times, the structures developed more secular roles and were not built near or above natural water sources and grottos.

[1] For Further details: Shqiarat 2019: 1-2.

[2] See chapter Three of this research.

This development also manifested in the architectural display, as the *nymphaeum* became a broader and bigger structure and an often-found structure in Roman urban cities in the East. Hence, it is argued that some of the *nymphaeum* structures were not functioning as *nymphaea* due to the lack of the religious purpose they initially held. Instead, they functioned as monumental fountains designed for secular purposes. Therefore, this raised the argument that the use of the word "*nymphaeum*" appears to be more frequent than the required necessity. Although this makes a good argument, nevertheless, in most cases, the broader scope of literature addresses these monuments and describes them as *nymphaea*, and in some monuments, an inscription or a coin indicates that the nymphaeum structure was, in fact, used for religious purposes during Roman times. For instance, the *nymphaeum* of Pella, which is not yet to be unearthed or found, has two coin types that indicate that it was erected at some point, as does the *nymphaeum* of Gadara, whose inscription mentions that it was meant as a *nymphaeum*.[3]

The research went to the origin of the structure of *nymphaea* and went through the development it faced to reach its zenith during the Roman period, mainly the 2nd and 3rd centuries AD. This study discusses mythologies and tales that mention the *nymphae*, the deities of nature, and their relationship with the formation of the *nymphaeum* structure. It also mentions the use of the word *nymph* in different areas of today's dictionary. In this research, the author leans more towards describing the monumental fountains as *nymphaeum* monuments based on the data and evidence in hand.

In this research, "*nymphaeum*" is meant for the artificial Roman *nymphaeum* structure, which does not necessarily need to be erected around a grotto and a running water source and does not necessarily obtain a sacred function, although it is a *nymphaeum* structure.

However, the author states that it was a secular structure during Roman times and became an important urban structure in planning the cities in the East. It is worth noting that the *nymphaea* were used later during Renaissance times, and the development they faced

[3] See Chapter Five of this research.

during the Roman period impacted the development of *nymphaea* of the Renaissance, which were usually structured in villas for the wealthy elite in Italy.[4]

Jordan's *nymphaea* are of great value because of their good condition, which is still visible in both the *nymphaea* of Amman and Gerasa. In contrast, most of the *nymphaea* of the region had faced destruction. The *nymphaeum* of Petra did not survive architecturally. Its location and the base structure which are still visible provide some valuable data. The *nymphaeum* of Gadara is considered an essential structure because of the water system covering the city of Gadara, the basalt stone used in constructing it, the inscription found in it, the marble usage, and the fragments of statues.[5]

The *nymphaeum* of Gerasa holds a grand façade that we can rely on in exploring the design of other *nymphaea* structures in Jordan, as the *nymphaea* of Jordan- except for the Amman *nymphaeum*- shares the same approximate period of construction and the same main architectural element, being of an exedra *nymphaeum*, with a half dome covering its half circled façade. In contrast, the Amman *nymphaeum* combines a façade *nymphaeum* with an exedra; this will be thoroughly discussed in the upcoming pages of this thesis.

Another value of the *nymphaea* of Jordan is that they represent the wealth of the people of the cities during the construction of the *nymphaea* in Jordan; it also sheds light on how a *nymphaeum* to be constructed needs the city to reach a certain level of population, and that in the case of *nymphaea* of Jordan, these monuments and the decoration they present and the fact that one of the *nymphaea* was used on coins manifests the importance and the greatness of these monuments. For instance, Gerasa had a population of 10,000- 25,000 in the 2nd year AD. Thus, we can connect this with the development of civic structures in the city.

The *nymphaea* of Jordan had Corinthian-decorated columns standing within their boundaries. They had a tremendous artistic decoration of the Corinthian type, with the Acanthus plant engraved in the frieze of its structure, as seen in the Gerasa *nymphaeum*. In addition, in some cases, marble was used in the shafts of columns, and statues were

[4] See Neuerburg: 1960.

[5] See Chapter Five.

found at the site, such as the *nymphaeum* of Gadara. Although the *nymphaea*, in general, faced a great deal of damage, we can extract a great deal of data on the structures that survived to this day, which gives a glance at the marvellous structures that once stood in the Roman cities of the East.

It is worth noting that some *nymphaea* structures in the East were referred to by some scholars as kalybe structures; this structure is only found in the Eastern part of the Roman empire. It does not necessarily, according to evidence and literature, have any function other than displaying statues and being of a galleria structure. However, the kalybe does share elements of structure with the *nymphaeum*, the size and the location at the main *decumanus*. Also the display of statues on its facade, however, the sacred value and water streaming are not within its function. It is also suggested that the artwork of the structure is influenced by the Nabataean structure.[6]

It is worth mentioning that some exedra structures that were not described as *nymphaeum* did have water running within them and provided water and displayed statues, yet were not described or titled as *nymphaea;* for instance, the exedra of Herodes Atticus in Olympia, this is reason why it was attributed to Zeus and displayed statues that portrayed the household of Herodes Atticus, thus the religious role intended for the *nymphae* deities was not found, and the title *nymphaeum* is not used for it. No *exedra* monuments of this type were found in Jordan,. However, the term is used in describing other structures, such as the exedra "bishop's seat" found in a cathedral in Gerasa, and dates to the 4th century AD, but did not have running water in it.

Another value of the *nymphaea* of Jordan comes from the fact that Jordan is poor in water, and the techniques used in structuring the *nymphaea* of Jordan indicate the essence of water to the people who lived in these cities. It also manifests how both East and West emerged in the development of the Roman *nymphaeum*, and the continuity of the fountain usage in the Levant, which displays the attachment the local people had with the fountain, which developed into different shapes and structures, which will be discussed further in this research.

[6] See Segal 2001:91-110 & Ball 2002: 282.

The *nymphaeum* of Gerasa has another value: in addition to it's good façade condition, it is located in one of the major Roman archaeological cities, which enhances our understanding of its location and importance in Roman urban planning.

Until today, the importance of water can be sensed in countries such as Jordan, one of the world's poorest countries in terms of water.[7] Jordan is considered one of the Middle Eastern countries. It lies on the east bank of the Jordan River. Officially, it is termed the Hashemite Kingdom of Jordan, and its capital city is Amman.[8] Thus, Amman is the most crowded city in Jordan, and the Downtown of the city, where the *nymphaeum* is located, is considered one of the city's most crowded areas.

Historically, Jordan is considered a rich country in heritage as it contains many archaeological sites discovered, with many other sites still unearthed by excavations. Humankind inhabited Jordan since the Palaeolithic period and continued during the Bronze and Iron Ages. Nestled within its boundaries lies the historical city of Petra, the capital of the Nabataean kingdom.[9]

Since Pompey's arrival in Syria and landing in Damascus in 64 or 63 BC.[10], the Romans governed part of the contemporary territory of today's Jordan.[11] Later, in 106 AD, the Romans conquered the Nabatean kingdom, incorporating it into the Roman Empire under the name province of Arabia.[12] Thus, many Roman heritage sites are in Jordan, Including the *nymphaeum* structures distributed in different areas of Jordan.

It is worth mentioning that from a climatic perspective, a notable difference can be observed in northern Jordan and the centre of the country, where Amman, Gerasa, and Gadara are located, where a wet rainy season spans from November to April; relatively

[7] Nortcliff et al. 2008: 3.

[8] McColl 2005: 498–500.

[9] Gates 2011: 392-393.

[10] Van Wijlick, 2020: 25-60 See also Jones 1979:158.

[11] Hoade 1954:35.

[12] Gates 2011: 392-393.

arid conditions characterise the remaining months of the year.[13] While southern Jordan, where Petra is located, can be considered arid or semi-arid,[14] Jordan generally has a wide range of climate diversity while leaning towards warmer weather. Hence, the need of water reservoirs and water artificially structured water sources was needed for to maintain the life of the cities were these nymphaea were found.

1.2. Aims and goals.

The Roman presence in contemporary Jordan manifested through the spread of various architectural remnants dispersed across different regions within the Hashemite kingdom. The Roman *nymphaeum* structures are a collection of architectural structures classified as monuments from the Roman period. They are frequently described as monumental fountains of the Roman period, as will be discussed later in this research. According to Feather, cultural heritage can be marked as a product of human ingenuity that imparts knowledge and understanding.[15]

To address these aims, this thesis investigates the following key research questions:

- What are the origins, historical development, and typological characteristics of Roman nymphaea across the Roman Empire, and how are these reflected in the nymphaea found in Jordan?
- What cultural, religious, and practical roles did nymphaea serve in Roman cities, particularly in relation to water management, urban planning, and societal dynamics in Jordanian cities such as Amman, Gerasa, Gadara, and Petra?
- How does the integration of archaeological findings, architectural analysis, and virtual reconstruction enhance our understanding of the design, functionality, and significance of the nymphaea in Jordan?
- What are the key challenges in preserving and managing the Roman nymphaea in Jordan, and how can cultural resource management strategies address these effectively?

[13] Potter et al. 2007: 5.

[14] For further details Touchan & Hughes 1999: 291-303.

[15] Feather 2006: 4.

Therefore, the primary objective of this study is to investigate the Roman *nymphaea* structures in Jordan, focusing on their significance as an archaeological heritage resource. By employing theoretical analysis methods and examining the available evidence, historical sources, and published data from previous research concerning the *nymphaeum* monuments, particularly those erected and discovered in Jordan, this research aspires to shed light on the cultural and historical value of *nymphaea* within the broader context of Jordan's landscape.

This research will also examine the origin and evolutionary path of the *nymphaeum* structure, providing insights into its primary purposes throughout history. This investigation thoroughly examines diverse historical sources and archaeological findings and explores the intrinsic architectural traits of the *nymphaea* under study. In addition, light will be shed on the cultural, political, and economic worth linked to these constructions in Roman times to comprehend their importance within the societal framework of that period.

Moreover, this study aims to determine the distinctiveness of every analysed *nymphaeum*, unveiling the attributes that differentiate them. Furthermore, employing a hypothetical reconstruction, the destroyed *nymphaea* structures in Jordan shall be visually showcased to provide valuable glimpses into their initial configuration and artistic qualities. Finally, this study assesses *nymphaea* structures in Jordan through the lens of cultural resource management (CRM). This part of the study evaluates their present condition, preservation, and conservation strategies.

1.3 Justification

Despite their inherent value, objects of historical importance frequently need to garner the recognition they genuinely merit; this can be ascribed to the prevailing emphasis of archaeology, ethnology, and history on the intangible elements of culture, such as its societal, financial, governmental, and philosophical constituents. Due to this, previous

civilisations' remaining physical traces have been neglected, as experts and the wider population have not fully recognised their significance.[16]

The emphasis on intangible cultural elements often leads to the neglect of physical artifacts and historical structures, resulting in their undervaluation. Enhancing the recognition and examination of these tangible remnants is imperative to gain a comprehensive understanding of our collective past. Archaeological remains such as *nymphaea*, pottery, and inscriptions illuminate the daily lives, technological achievements, and aesthetic ideals of ancient civilizations. This is particularly true for structures like *nymphaea*, which remain understudied and sparsely researched despite their potential to illuminate the ways ancient civilisations influenced one another and exchanged cultural practices. Therefore, understanding such historical monuments is crucial.

The Roman civilisation significantly impacted humankind. The *nymphaeum*, an intricately constructed architectural feature, is frequently observed across various regions of Roman urban development in the East. Hence, this construction type holds significant cultural value, as it showcases Roman architectural ingenuity and represents the cultural exchanges that enriched Roman and local traditions. In this way, *nymphaea* illustrates the ancient Roman civilisation's socio-economic influence within the geographical confines of Jordan and its surrounding regions, demonstrating a vibrant exchange that contributed to the cultural enrichment of the East and West. In this context, 'cultural value' refers to the role these structures play in enhancing our understanding of historical intercultural interactions, serving as physical manifestations of how diverse societies influence and adapt to each other's cultural and technological advancements.

Our scientific data concerning the *nymphaeum* and to broaden our understanding of what this monument meant for people who lived during that time and had a regular encounter with the *nymphaeum* structure. In her reflection on Roman culture, the acclaimed Classics professor Mary Beard described the Romans as a subject "not just for history and inquiry

[16] To empower this statement, see: Ferguson 1977: 6.

but also of imagination and fantasy, horror, and fun."[17] This study briefly considers these elements in the context of Roman *nymphaea* to illustrate their broader cultural significance. While *nymphaea* are often associated with myth and leisure, symbolizing places of communal joy and imaginative folklore, they also embody the Roman architectural genius and their strategic role in urban development. This analysis underscores how these structures facilitated both practical and cultural exchanges within Roman society.

Limited research has been dedicated to comprehensively examine *nymphaea* in Jordan. Most existing studies have primarily focused on Amman *nymphaeum*. This can be due to the lack of resources and the demolished statues of the ruins of *nymphaea*, especially at Petra and Gadara, as the superstructure is in a demolished state. However, the *nymphaeum* of Gerasa is in good condition. Unfortunately, the so-called *nymphaeum* of Pella is yet to be found, as no structure has been connected to the Roman coins that displayed the façade of the structure.

In summary, the main aim of this research was to provide a narrative of the history of the *nymphaeum* and how its structure evolved. This research begins with the origin of the myth of the *nymph*, which originated the structure of the *nymphaeum*. Later, it goes into the *nymphaea* of the scope region of this study, then moves towards detailing the *nymphaea* structures located in Jordan. This research intends to identify the four *nymphaea* of Jordan, in addition to the coin-manifested *nymphaeum* of Pella.

1.4. Methodology

This thesis shall rely upon the employment of two fundamental sources of data to enrich its scholarly inquiry:

First, the literature data component shall encompass collection and interpretation of extensive information from various written sources, including books, scholarly papers, and academic journals. The extensive literature review was the backbone of this study, allowing for an in-depth analysis of the background and current scholarly discussion by

[17] Beard 2016: 535.

collecting scattered data from different sources. This research aims to add to what is already known about *nymphaea* by examining various written sources, thereby developing a more detailed understanding of their role in ancient architecture's larger context. This study focuses on the structure of the *nymphaeum* during the Roman period, focusing on the written literature concerning Amman's *nymphaeum*, Gadara, Gerasa, Petra, and Pella. This research sheds light on other *nymphaea* of the region to provide better-enhanced knowledge of the *nymphaeum* structure. The textual repositories will be subjected to thorough and repeated examination to extract indispensable insights and key findings relevant to the subject under consideration. Through a comprehensive exploration of profound intellectual repositories, this study excavates the erudite dialogue that encompasses the subject under investigation. Simultaneously, it endeavours to actively interact with diverse theoretical frameworks, analytical perspectives, and scholarly deliberations that have significantly influenced our current comprehension.

At the beginning of this research, the author began collecting literature concerning the history of the cities where the *nymphaea* are located to provide a comprehensive understanding of the development of these areas during different periods and how the people who lived on the soil of the examined sites devolved. And how, when the Roman conquest came, they combined different cultures of East and West; thus, the fusion of architectural structures such as the *nymphaeum* was erected, as further details will be discussed in this study. Then, the author began to gather data concerning the *nymphaeum* monument from ancient periods and delved into the world of *nymph* mythology, which is essential for the narrative of this research.

The mythology is crucial as it explains the development of the ideology and sacrificial practices associated with the *nymphaeum* structure and its connection to the *nymphae*. This mythology informs both the architectural design and the ceremonial functions of these monuments, reflecting their significant role in Roman society. The literature provided by the author within the pages of this study aids in understanding the significance of the *nymph* and the reasons why the ancient people revered and feared these deities. The author gathered significant data from various literature sources concerning the structure and architecture of the *nymphaeum* and how it reformed during

the Roman period and became a more sophisticated secular monument, explaining the main changes. The author describes the *nymphaea* structures in the region surrounding Jordan based on different literature sources. This is important for the research to provide a better insight into the central theme of the *nymphaeum* in the East and to provide the reader or future scholars with collected data concerning the *nymphaeum* structure in the East. Then, the author managed to gather a great deal of resources concerning the *nymphaea* of Jordan, although research that deals directly with the *nymphaea* of Jordan is somewhat scarce. However, the author based his work on collecting data from scholarly works and books that refer to and describe the *nymphaeum* to obtain a collectable amount of data concerning the *nymphaeum*. Finally, based on this significant amount of literature, the author presents his results with the collected literature as the backbone of the conclusions and results he reached in this research.

Secondly, data collection for this research involved the author's physical exploration of the examined sites through field visits. During these visits, the author meticulously documented site features and details through observation, note-taking, and photography using a Nikon D3500 camera. The abundance of pictures captured proved invaluable for conducting the research, allowing for detailed examination of the nymphaeum.

This documentation serves a crucial role in the ongoing preservation and analysis of archaeological sites, facilitating comparison of data and images and identification of potential damage. The research adopts a transparent approach, providing a foundation for future scholars to build upon. Additionally, it contributed significantly to the Cultural Resource Management (CRM) analysis of the nymphaea in Gerasa, Gadara, and Petra.

Furthermore, the field visits and the high-quality images resulting from them helped to draw illustrations concerning the *nymphaea* structures of the visited area. These illustrations were conducted by artist Lamara Dagistani, based on descriptions and instructions given by the author depending on the site visits and photographs taken to give a broader perspective of understanding the remarkable characteristics of the *nymphaeum* structures. It was developed by designing a basic sketch of what might have

been the *nymphaeum* structure in the cities of Gadara and Petra, based on the current *nymphaeum* of Gerasa, as seen in the result chapter of this thesis.

1.5. State of Art

State of Art concerning *nymphaea* of Jordan

The earliest accounts were related to the Amman *nymphaeum,* and they date to the early 19th century, when Johann Ludwig Burckhardt, a Swiss traveller and explorer, specified the location of the *nymphaeum* in Amman as a public building while exploring the region.[18] The American archaeologist and explorer Selah Merrill followed Burkhardt's steps in describing Amman's *nymphaeum* as a public building.[19]

Later, during the late 19th century, the English soldier-explorer Claude Conder concluded that the monument in Amman was more than just a public building by describing it as a bath. He also furnished a comprehensive depiction of the edifice.[20] In the early years of the following century, an American archaeologist, Howard Butler, postulated that the structure could be identified as a *nymphaeum* mason.[21] In 1970, Adnan Hadidi authored a dissertation entitled "The Roman Forum at Amman," wherein he explores the status of the Amman *nymphaeum* and provides detailed documentation about this structure.[22] Hadidi published an academic work entitled "The Roman Town Planning of Amman," in which he discusses the Roman *nymphaeum* of Amman and draws comparisons to the *nymphaeum* constructed in Jerash.[23] Adnan Hadidi's work did not focus directly on the *nymphaeum* of Amman; the central theme of his work was documenting and investigating the ancient city of Philadelphia, focusing on the Roman Forum of the city. Nevertheless, his work is valuable as it provides a plan for the urban structure of the Roman city of Amman.

[18] Burkhardt 1822: 358.

[19] Merrill 1881: 400.

[20] Conder 1889: 41.

[21] Butler 1909: 59.

[22] See Hadidi 1970.

[23] Hadidi 1978: 210-222.

In 1993, M.B. Kadhim conducted a study entitled "The Roman *Nymphaeum* of Amman: A Neglected Primary Artefact," highlighting the significance of the *nymphaeum* site in Amman's contemporary visual landscape. His study emphasises the unfortunate neglect and deterioration that the *nymphaeum* site in Amman currently experiences, particularly regarding its status. The outcome of Kadhim's paper is that the Roman *nymphaeum* represents a significant artefact in Amman. He highlights the importance of revitalising the surrounding area for the city's future prosperity; while acknowledging the presence of obstacles that may impede a significant renovation and development endeavour, he notes that it is widely recognised that the potential challenges and associated expenses would be outweighed by the substantial physical, historical and symbolic advantages that would accrue to the surrounding area and the city as a whole, provided that these obstacles are successfully overcome.

Kadhim adds that this lamentable condition of the *nymphaeum* is incomprehensible and can only be comprehended within Amman's expeditious and somewhat disorderly expansion. Preserving, rehabilitating, and advancing conservation efforts for this principal artefact and various other artefacts adjacent to Amman constitute an essential concern for the municipal administration. Providing robust support and encouragement to local governments in undertaking these endeavours is imperative.[24] However, the author must note that Kadhim's work was conducted before the developing project 2014, which is mentioned below. The result of the project was enhancing the condition of the structure. However, some issues remain visible at the site, such as the difficulty in working in the area due to traffic, as mentioned in Chapter 5.

Mohammad Waheeb thoroughly examined the site while serving at the Department of Antiquities of Jordan in the 1990s. In 1995, a preliminary report was published by Waheeb and Zu'bi, documenting the excavations conducted at the Amman *nymphaeum*. The excavation project was conducted by a team from the Department of Antiquities (DoA) under the leadership of Dr. Mohammad Waheeb. This report provides a comprehensive depiction of the *nymphaeum* structure in Amman, detailing the excavated

[24] Kadhim1993: 283-287.

artefacts discovered during the excavation process, including the identification of two human statue heads. The report explains that large-scale buildings surpassing their immediate surroundings was a common phenomenon, and the abundance of such structures in relatively compact regions is noteworthy.

The *nymphaeum* exhibits a substantial scale in its architectural composition, thereby warranting its classification as a monumental edifice despite its potential lack of a distinct functional purpose. Without inscriptions or literary references, the sole means of establishing the *nymphaeum*'s construction date is through analysing stratigraphic evidence and applying stylistic criteria. [25]

Subsequently, Waheeb embarked on an extensive investigation to meticulously document the discovery of Amman's nymphaeum and the excavation efforts conducted over several years. With exceptional kindness, Waheeb granted the author of this thesis the privilege of employing his oral information and unpublished results which were a valuable resource.

Mohammad Waheeb and Raed Al-Ghazawi examined the Roman *nymphaeum* in Amman.[26] The article focuses on the functional aspects of the *nymphaeum* and analyses its architectural remains. In addition, the authors provide a comparative analysis by examining similar structures.

This study sheds light on the *nymphaeum* of Amman; it states that the *nymphaeum*, which can be traced back to the early 2nd century AD, was built on top of a preexisting watercourse. It showcases three spacious apses on its upper level, each embellished with two tiers of recesses designed to accommodate statues. The paper notes that the structure remained operational until the early Islamic period, extending beyond the decline of the Byzantine Empire. The article provides an analysis of recently discovered instances of architecture. The updates have provided additional information regarding the construction techniques and materials employed at the *nymphaeum* of Amman, as well as elucidated the purpose and target audience of the site.

[25] Waheeb& Zu'bi, 1995: 229-238.

[26] Waheeb& AlGhazawi, 2014.

The article notes that the *nymphaeum* of Amman exhibits distinct variations in its physical form and size. This structure, believed to have been constructed by local inhabitants, has understandably led to its classification as predominantly Eastern. This architectural masterpiece exhibits imperial characteristics and was constructed when diverse artistic influences from the Mediterranean region were beginning to converge. Undoubtedly, this assertion holds true for architectural carving and specific design aspects.

It is relevant to contemplate the nature of the activities that may have transpired within this edifice and to determine whether this structure can be classified as a "*bona fide" nymphaeum*. This determination hinges upon the presence of a water basin and niches for statues or if it deviates slightly from the conventional *nymphaeum* style and assumes a more monumental form. Typically, the architectural design of a building does not inherently indicate a limited scope of purpose. Based on our initial evaluation, the remnants embody a distinctive monumental edifice in Philadelphia. The Philadelphia *nymphaeum* had a similar counterpart in Philippopolis (Shahba), Syria, which served as an imperial monument. Waheeb & AlGhazawi research strongly suggests that preserving and conserving Philadelphia's distinctive monument is imperative, alongside implementing aesthetically and archaeologically suitable enhancements. By doing so, the monument can regain its status as a prominent feature of Roman Philadelphia in downtown Philadelphia, akin to the Theatre and the Odium. The proposed endeavour necessitates the development of comprehensive conservation and management plans for the identified site, as well as detailed interpretation schemes that elucidate the distinctiveness of the site and its characteristics within its existing landscape.[27]

In 2011, Fadi Khalfieh researched the impact of air pollution on the deterioration of limestone buildings at the *nymphaeum* of Amman as a part of his master's thesis at Yarmouk University in Jordan. The main objective of this study was to examine the air pollution levels at the *nymphaeum* site, which is located in a densely populated area of Amman. In addition, this study investigates the harmful effects of pollution on the

[27] Waheeb& AlGhazawi 2014: 131-142.

degradation of the surrounding environment in this particular region. To investigate the chemical effects of different pollution sources on limestones, X-ray diffraction was employed. This study focused on analysing the influence of pollution sources, including layers of varying colours, salt and crystallisation, on limestones.[28]

Between 2014 and 2018, an extensive restoration and rehabilitation initiative was undertaken for the *nymphaeum* of Amman. Funding for the project was provided by the U.S. Ambassadors Fund for Cultural Preservation (AFCP). While, the implementation was carried out by the Hamdi Mango Centre for Scientific Research at the University of Jordan. The project led by Professor Abeer Al Bawab held considerable significance as it conducted a great deal of conservation for the site; by using various techniques, including aerial photography, drawing, and 3D modelling, the project successfully sustained the monument and documented its findings. It must be noted that a handbook was issued concerning the project's outcomes.

In summary, this results of the project describes the Restoration and Rehabilitation Project at the Roman *nymphaeum* in Amman, representing an endeavour to achieve sustainable preservation of cultural heritage. The project is a noteworthy illustration of innovative management practices and applied methods for revitalising urban heritage. Furthermore, the project functions as a methodology aimed at conserving urban heritage. Throughout the project, the site and its surrounding vicinity were comprehensively documented using state-of-the-art 3D laser scanning technology. This process facilitated the creation of architectural renderings depicting the monument's plans, elevations, and sections, which served to record and document its existing state of preservation. The scattered architectural fragments found at the site were meticulously reconstructed, assigned new numerical identifiers, documented through photography, and rendered through drawings before their exhibition at the site. A comprehensive cleansing of the entire monument was conducted, employing various mechanical methods alongside low-pressure water pumps to eliminate the deposits accumulated on the facade due to air pollution. Many tools, including small brushes, were employed to eliminate crusts,

[28] Khalfieh 2011.

externally crystallised salts, and any vegetation or fungi that may have developed on the stone surface. Chemical cleaning was employed in certain sections of the monument, accompanied by wet bandages. The project effectively safeguarded the internal environment of the site by eliminating extraneous structures and visual pollution.

Additionally, the front area was cleared of debris, landscaping was conducted, and terraces were installed that harmonised with the site and demonstrated efficacy in the winter. Gravel overlapped the *nymphaeum*'s exposed sections and a basin segment. The actions mentioned above were undertaken to establish a cohesive aesthetic, enhance visitor flow, and minimise the probability of vegetation growth in the regions. In conjunction with digital and physical promotional materials, arrangements have been made to create nine comprehensive bilingual site interpretive panels and a 3D-printed reconstruction model of the *nymphaeum*, which will be included as an appendix in this thesis. In addition, a separate 3D-printed reconstruction model of the *nymphaeum* has been prepared. This project presents a novel approach to downtown Amman, as it effectively revitalises and converts urban heritage into a publicly accessible space, fostering cultural engagement and serving as a platform for various cultural activities. In alternative terms, it can be characterised as a novel paradigm.[29]

Abeer Al-Bawab Mohamed El Khalili and Nizar Al-Adarbeh researched the *nymphaeum* of Amman, documenting their methodology, findings, and the implications of their work on the project of 2014-2018 *nymphaeum*, publishing their results in various articles after conducting the project, their work is considered a significant reference when scientifically dealing with the Amman *nymphaeum*.[30]

Mwfeq Al Haddad and other scholars published a paper that examines the notion of "humanisation" as a collection of specific actions and strategies that seek to establish a hospitable environment for residents and tourists. The study mentions the *nymphaeum* of Amman. The term "humanization" is defined in this study as a coordinated effort to make

[29] Al Adarbeh et al, 2019.

[30] El Khalili et al, 2013: 36-45 El Khalili et al 2018 & Al Bawab et al 2018: 321-329. & Al Bawab et al 2020. & El-Khalili 2014: 341-358. & El Khalili 2016.

a place more pleasant to live in and visit. Physical and visual accessibility for locals and visitors to a city is a major factor in the quality of life there. Modern city planning in Jordan has either directly incorporated or closely intertwined with Jordan's architectural heritage sites.

Therefore, to address the human inhabitation of the city, it is crucial to gain an appreciation for the significance of architectural heritage sites already present in the urban fabric. According to the article, the *nymphaeum* Archaeological Park is one of Amman's most comfortable historical sites. Due to the complex urban structure of Downtown, field research indicates that finding an object in the city is difficult. The site's small size, on the other hand, makes it easy to get to and around, there's plenty of information to read before you go, getting your bearings is simple, the ground is firm and suitable for wheelchair use, and the wooden bridge has a ramp for those who need it. The paper mention that the project (the above mentioned 2014-2018 restoration project) also funded the creation of bilingual informational boards with project text and figures explaining the project's implementation process and results at various stages of development. As a result of the completion of this project, the environment in the heart of Amman has been improved and made more human.[31]

Concerning the so-called *nymphaeum* of Pella, Bluma Trell, an American archaeologist, mentions the *nymphaeum* that is believed to have been erected in Pella in the north of Jordan in her 1978 research "*Epigraphica numismatica monumental nymphaea on ancient coins*." She mentions the characteristics of the Pella *nymphaeum* as seen on two Roman coins. Her study on numismatics, particularly focusing on the *nymphaea*, stands out as one of the early investigations in this field; the author highlights the insufficient attention given to this topic in the past and notes its continued lack of significant examination in contemporary times. Trell's research is considered an important reference concerning the *nymphaeum* of Pella due to the absence of the structure which was never found, and is not yet visible, no certain answer can be given if the structure is still buried or not, but, according to Trell; Two distinct variants of coins bearing the name "Pella"

[31] Al Haddad et al, 2022: 2847-57.

were minted. The inscriptions on these coins indirectly reference the presence of a *nymphaeum* structure. Both monetary artefacts exhibit architectural elements indicating a *nymphaeum*.[32]

Concerning the *nymphaeum* of Gerasa, Carl Hermann Kraeling mentions the *nymphaeum* of Gerasa in his work "Excavations at Gerasa." in 1936.[33] In his book The Architecture of the Roman Empire"; William MacDonald mentions the Roman *nymphaeum* structure in general and the *nymphaeum* of Gerasa in certain pages.[34]

Thomas Lepaon provided a great deal of literature concerning Gerasa, his main field was the Roman baths in Gerasa, and he provided some data that came in handy for this research. Thomas Lepaon served as the leader of the French archaeological mission in Jerash known as the Mission Archeologique Francaise de Jerash (MAFJ). Although his work did not focus directly on the *nymphaeum* monument of Gerasa, nevertheless, while investigating the Roman baths, and during the missions along with DoA he conducted there in his work he mentions the *nymphaeum*, and this became of help while conducting this research, as his data was considered a great information and source for this thesis.[35]

Achim Lichtenberger and Rubina Raja, and other scholars go into detail about the Roman *nymphaeum* of Gerasa in different papers conducted by them about Jerash in Jordan.[36] Their research hovers around the water systems during Roman times, they frequently stumble into the *nymphaeum* structure. Thus, the mention of the *nymphaeum* of Gerasa. The evolution of water management systems and the ideas that underpin them in historical societies' early civilizations. Their research focuses on the northern Jordanian city of Gerasa (Jerash), one of the medium-sized Decapolis cities that thrived from the Roman era (first century AD) until the end of the Umayyad period, when a devastating earthquake struck the city in 749 AD and virtually stopped urban life. Their research

[32] Trell 1978: 147-161.

[33] Kraeling 1936: 7-10.

[34] See MacDonald 1986: 23,38, 55-80, 100- 110, 170-73, 190-211, 270-300.

[35] Lepaon 2008: 51-70, 2011: 409-420, 2012, 2015:105-121. ,2018: 477-501.

[36] Lichtenberger & Raja 2016& 2020, and Lichtenberger et al. 2019.

looks at two inscriptions from the second century dedicated to the god Pakeidas.[37] According to the text, the *nymphaeum* was built around 2nd AD. The research paper says that archaeologists still don't know if the writings on the *nymphaeum* wall are from when the building was first built or from when it was later fixed up. The research group also suggests that the *nymphaeum* structure's presence there may indicate that sacred rituals were carried out there in the past. The *nymphaeum*'s central location on the main road suggests that it was built specifically to pay tribute to the *nymphae*. It also emphasizes examining fragmentary archaeological evidence, which is commonly excluded from publication by archaeological projects due to its limited significance. However, this research seeks to demonstrate how such evidence can provide valuable insights into water management in urban environments, specifically in semiarid regions akin to the geographical location of Gerasa. Same as other researchers no direct focus was given into the *nymphaeum* monument by the scholars, however, within their research the *nymphaeum* is frequently mentioned even if briefly, and this assisted the author of this thesis through his work.

David Boyer's scholarly work[38] was essential for this thesis, as he investigated the *nymphaeum* more comprehensively and provided additional information concerning the *nymphaeum* of Gerasa in Jordan; he also investigated the *nymphaeum* application of water system, although due to the lack of excavation, many details are yet to be found. Nevertheless, his work shed light on many aspects concerning the *nymphaeum* in Gerasa. Boyer's dissertation provides a comprehensive analysis of the water supply, distribution, storage, and employment within the geographical area of Gerasa. Boyer concluded his study by analysing pre-existing data accessible to him. The contextual, interdisciplinary approach integrates evidence obtained from recent ground surveys, a meticulous analysis of existing literature, and new interdisciplinary studies that contribute geoarchaeological and historical perspectives. According to Boyer's research, the water management system in Gerasa exhibits evidence of careful planning, emphasising efficiency and cost-effectiveness, and potentially traces its origins back to the pre-Roman period. In his

[37] Kubiak-Schneider & Lichtenberger 2022: 224-26.

[38] Boyer 2014: 517-531, Boyer 2016: 517–531, Boyer 2017: 375-411, Boyer 2018: 347-368, Boyer 2019.

thesis, Boyer posits that the *nymphaeum* and the fountain located in Fountain Court exhibit similar maximum flow rates, despite significant disparities in their respective sizes. The projected upper limit of the daily water supply demand for these two fountains ranges from 38 to 44 litres per second, equivalent to cubic metres per day (m3/day). While conducting this thesis, Boyer published 2022 an article that is titled "Gerasa's '*Nymphaeum*': a reappraisal of its History and Function" the article is a valuable refrence for this research, and shed light on many areas concerning the *nymphaeum* of Gerasa.[39]

Boyer clarifies the architectural features, historical background, and functional aspects of the two-story *nymphaeum* of Gerasa. The compact size of the 2nd-century AD fountain indicates the spatial limitations imposed by the surrounding structures. The structure was linked to a water distribution system dating back to the 2nd century, located in the northwestern region of the city, which provided water to bathhouses and fountains. The *nymphaeum* supply was distributed to lower-storey spouts through an internal distributor channel. The architectural design of the *nymphaeum*'s spout block, like that of other nearby fountains, exhibits a distinctiveness exclusive to the Empire. In contrast to the other *nymphaea* of the Decapolis, the *nymphaeum* lacked draw basins and featured a mere seven frontal spouts. Upon reappraisal, several potentially distinctive characteristics were identified. The original *nymphaeum* served decorative and functional purposes, providing ornamental features, and serving as a public water supply.[40]

The *nymphaeum*'s basin is commonly regarded as a terminal installation. However, its depth and capacity do not align with the hydraulic functioning of the frontal spouts. This discrepancy implies that the basin may have served a third purpose, namely the storage and distribution of water to multiple fountains along *cardo*. This combination of functions efficiently solves practical challenges.

The presence of an ancient Roman *nymphaea* that served as a facility for storage and distribution is a scarce occurrence. According to Boyer, the draw basins were substituted by these secondary fountains, effectively harmonising the aesthetic and functional aspects

[39] Boyer 2022: 406-429.

[40] See Boyer 2017: 375-411, Boyer 2018: 347-368, Boyer 2019.

of the monument. The act of increasing the height of the parapet wall serves to enhance the *nymphaeum's* authority in regulating the distribution of water within the central city's fountain network, thereby facilitating the provision of additional fountains within the *cardo*. The priorities on water supply underwent modifications in response to climatic and social transformations, consequently impacting the functioning of the fountain network.

Stephen Savage and other scholars[41] examined the water system of the city of Gadara and mentioned the *nymphaeum* of Gadara, providing theories about the city's water reservoir. stating that the main east-west thoroughfare and the north-south thoroughfare that follows the western incline of the Acropolis hill intersect at the location of the *nymphaeum*. The *nymphaeum* is thus located at the intersection. Adding, that the Roman era marked a crucial turning point in the city's overall development trajectory as it saw the beginning of the city's expansion towards the western plateau. The lower channel, which rises at the base of the Acropolis hill, supplies most of the city's water. This channel begins its ascent through the terrain at the highest point of the western terrace, directly across from the *nymphaeum*. The research strongly stresses the importance of critically analysing and building upon the current understanding of the interconnected water distribution system.

Khaled Al-Bashaireh investigate the *nymphaeum* of Gadara in his research on the marble usege and the statues of the city of Gadara. The *nymphaeum* is mentioned in another research he conducted along with other scholars, their work was used in detail while conducting this research.[42] Patrick Keilholz's contribution was essential as he provided great literature concerning water supply and distribution in the ancient Decapolis city of Gadara, describing the conductions to the *nymphaeum*.[43]

Charles Orloff, in his "The water supply and distribution system of the Nabataean city of Petra (Jordan), 300BC–AD 300." Research provides important data concerning the water

[41] Savage et al 2005: 527-555. Especially 530-532.

[42] Al-Bashaireh 2011, Al-Bashaireh et al 2019:354-55, Al-Bashaireh 2022: 1-15.

[43] Keilholz 2017: 147–168.

system of the Nabatean capital, the city of Petra, and he points out the *nymphaeum* of Petra.[44]

Mansour Shqiarat also describes in his study "Water Management in Petra, Greece: An Overview of Nabataean Hydraulics." Some information concerning the *nymphaeum* which was found in Petra.[45] However, much of the data was extracted from various resources that, luckily to the author of this research, had incidentally referenced the nymphaeum of Petra.

In 1981, Arthur Segal conducted a comparative analysis of the urban architectural features of Philadelphia, Gerasa, and Bostra in his paper titled "Roman Cities in the Province of Arabia."[46] The presented study examines and contrasts the *nymphaea* found in the urban areas of Amman, Jerash, and Bostra. Segal characterizes the *nymphaea*, which are known also as fountain buildings, as prominent elements within the urban landscape of Arabian cities; he describes that the *nymphaea* exhibit a common structure while varying primarily in scale and grandeur, connected to the economic capacities of the cities of where the monument was erected. The architectural anatomy of the *nymphaea* structures, according to Segal, exhibited a verticality of two to three stories, boasting embellishments in the form of pilasters and intricately designed niches that served as pedestals for the placement of statues. In close proximity to their location, there was typically a body of water situated in an opposing position. These establishments were strategically positioned to attract the attention of passersby and serve as a visual spectacle in the heart of the urban landscape. The architectural design of these buildings was carefully crafted to resemble theatrical scenery, further enhancing their role as a captivating backdrop to the bustling city centre.[47]

Roman *nymphaea* literature review These are the sources which managed to examine and research the *nymphaea*, and mentioned the *nymphaea* of Jordan as part of the wider

[44] Ortloff 2005: 93-109.

[45] Shqiarat 2019: 5-10.

[46] Segal, 1981: 108-121.

[47] Ibid.

nymphaea structures in the East. These scholarly work were essential as they go through different *nymphaea* as well, not only the ones found in Jordan, another type is the literature that deals with the mythology of the *nymphaeum* structure and the architecture of the *nymphaeum* structure from a general perspective of the monument. This literature work was the backbone of this thesis.

Arther Segal also mentions the *nymphaeum* of Amman as other *nymphaea* structures in the East in his 1997 work "From Function to Monument: Urban Landscape of Roman Palestine." *Syria and Provincia Arabia*", he examines and provides essential details concerning the region's different *nymphaea*; in Jordan, he mentions the *nymphaea* of Amman, Gerasa, Gadara, and Petra, as well as other *nymphaea* mentioned in this thesis.

Segal's book is one of the most significant works concerning the *nymphaea* in the East, and was essential for this research, as he gave a whole chapter on the *nymphaeum* structure within his book, which describes that the architectural tradition of the Roman *nymphaeum* can be traced back to the Classical periods, where it finds its origins in the well-known "sanctuary of the *nymphae*." Ancient *nymphaea* were regarded as sanctified locations that were established in proximity to wells or within caves containing springs. These locations serve as prime examples of the purported correlation between springs and *nymphae*, as described in mythology. During the Roman era, public thoroughfares and primary streets were adorned with *nymphaea*, and the water that filled the pools of these *nymphaea* was sourced not from wells but rather from water that had been transported through dedicated conduits. He then describes the main elements of nine *nymphaeum* monuments located in the Levant Region, and concludes his subchapter concerning the *nymphaea*, stating that the *nymphaea* structures found in the urban areas of Roman Palestine, Syria, and Provincia Arabia are notable for their ornamental and dramatic architectural features.

Segal notes that the *nymphaea* described in his book are located within the Middle Eastern region. Moreover, despite their visually striking appearance, these buildings conceal a modest flat wall that extends vertically behind them. These structures could be aptly referred to as "urban embellishments" due to their primary function of offering

respite and hydration to weary travellers navigating the urban landscape. Positioned at the foot of aesthetically pleasing facades, these structures provide a cool and shaded environment. Segal describes the *nymphaea* as functional structure of relaxation.[48]

Another study that helped the author in conducting this research by providing a wider knowledge of the Roman *nymphaea* was the work of Nur Banu Uğurlu, which was titled "The Roman *Nymphaea* in the cities of Asia Minor: Function in Context". This study examines the role of the *nymphaea* in the context of urban design. In order to delineate the Roman urban context, a preliminary examination of the Roman city and its accompanying infrastructural elements is initially presented.

In this particular framework, the *nymphaea* are perceived as elements of urban infrastructure within a proficient urban public domain, serving as prominent features for cognitive mapping of the city. Six sample cities have been selected as case studies. The aforementioned sites encompass Miletus, Perge, Hierapolis, Laodicea, Pisidian Antioch, and Ephesus.

Based on the findings of the study, it can be inferred that the presence of water sources did not consistently influence the distribution of *nymphaea* within the urban environment. In order to enhance visibility and leave a lasting impression, they were frequently positioned alongside the armature. In conclusion the research determined that the Roman *nymphaea* held a significant position within the historic urban scenery in the ancient Roman cities, serving as a notable reference point and being a landmark of some kind. Due to this circumstance, *nymphaea* fulfilled both functional and artistic functions within the urban setting, owing to their role as embellishments.[49]

A book that came in handy while conducting this research was the work of Jennifer Larson; her book “Greek *Nymphs*: Myth, Cult, Lore” provided a respected insight into the cult of *nymphae* and how and why they were connected to the *nymphaeum* monument and the importance they had in ancient rituals. The book begins by exploring the intriguing and complex subject of taxonomy and definition concerning the *nymphae*. To

[48] Segal 1997.

[49] Uğurlu 2004.

truly grasp their significance within Greek culture, it becomes essential to distinguish *nymphae* from other similar entities.

As the discussion unfolds, the book thoroughly analyses both the conceptual and physical settings in which *nymphae* engage in their activities. One fascinating aspect covered in the book is a concise summary of how *nymphae* were portrayed in Greek poetry during the Hellenistic era. It delves into the evolution of these portrayals over time, as different authors and historical periods shaped their characteristics. Moreover, the book highlights the popularity of *nymphae* across various literary genres. An interesting and vital part of the book focuses on the relationships between heroes (and heroines) and *nymphae*. This section sheds light on the dynamics and interactions that existed between them, offering unique insights into Greek cultural beliefs and practices. Equally captivating is the examination of how *nymphae* interacted with other deities within the Greek pantheon, as depicted in mythology and religious rituals.[50]

The book "Rome in the East" by Warwick Ball, provides a comprehensive account of various *nymphaea* monuments in the Eastern regions. This scholarly work serves as a valuable resource for the present study. Ball presents valuable information on the history of the Roman Empire in the Eastern region. Specifically, as he discusses the *nymphaeum* structure in a dedicated subchapter, providing a more comprehensive description of the monument, and the function of the structure and main elements. Furthermore, the work of Ball offers additional insights into the specific sites where each studied *nymphaeum* is situated. The book not only describes the locations in detail but also delves into their historical significance and key elements, including the *nymphaeum* present at each site.

Therefore, this book holds a significant importance, the author of this research expresses a high regard for the contributions of Warwick Ball as a crucial scholarly resource for any individual engaged in the study of Classic archaeology related to the Eastern Roman Empire. However, it is noteworthy to highlight that Warwick mentions that the *nymphaeum* monument of Amman was described as a Kalybe structure. Ball Argues that it should not be classified as a *nymphaeum*, a viewpoint that is also acknowledged by

[50] Larson 2001.

Julian Richard. However, the architectural composition of the monument and the archaeological remnants discovered within it indicate that it is indeed a *nymphaeum* monument.[51] This will be further discussed in this research.

Another reference, was the splendid work of Julian Richard.[52] His informative book "Water for the City, fountains for the People: monumental fountains in the Roman East: an archaeological study of water management" played a great role while conducting this research and was considered an important resource for the author of this research, he describes most of the *nymphaea* structures in the East, although he argues that the name *nymphaeum* is not always applied correctly, as many of these structures are monumental fountains and that was merely their main purpose and were not of religious function.

According to Richard, Roman fountains may initially appear to be a traditional research topic compared with the newest subfields of so-called "Classical" archaeology and the volume of studies already conducted. This is the main justification for recommending an original study on this kind of monument, whose purely practical dimensions have, up until now, largely been disregarded. In fact, despite recent attempts to approach Roman fountains contextually, studies have yet to sufficiently emphasise their technical characteristics and wide range of functional applications. He continues that the type, content, and scope of the publications that are currently available serve as illustrations of the difficulties associated with studying Roman monumental fountains. Monumental fountains are among the least researched architectural types compared with other public, practical, and/or decorative amenities in Roman cities.

One of Richard's main points is that, aside from the much more typical urban fountains, the term "*nymphaeum*" has long been associated with exclusive grottoes and water displays. Unfortunately, this etymological definition was later applied to nearly all monumental fountains without carefully assessing its applicability. This was the start of a long-lasting but false scholarly tradition that is still alive today in many ways. Richard's monograph displays how the Roman monumental fountains "The so-called *nymphaea*" in

[51] Ball 2002.

[52] Richard 2012.

the East had a very active role within the ancient cities where they were located. He adds that in the past, people used to live in cities and show off their wealth, the building of the *nymphaeum* is a way of doing so. These structures were perfect compromises that met both the physical and social needs of urban populations and institutions. These structures did a good job of showing how people and urban communities in the ancient world saw themselves and their role.[53]

Another essential research that investigated the *nymphaea* structure and its development from ancient Greek until the Renaissance was the dissertation titled "The Architecture of Fountains and *nymphaea* in Ancient Italy." it is the work of Norman Neuerburg.[54] This book provides detailed and comprehensive data concerning the *nymphaeum* structure; it describes how it originated and how it evolved, and the architectural features of the *nymphaeum* during different periods of times, weather it is of a grotto *nymphaeum* or monumental fountain. Neuerburg's work and the work of Richard are important references for anyone interested in the *nymphaeum* monument.

Neuerburg mentions that although it would be overstating things to say that fountains are a major trend in Roman architecture, they do reflect more significant developments and frequently fill knowledge gaps in minor, if not significant, details. Planning aside, the ongoing complexity and elaboration of Roman architecture can frequently be closely observed. It is so clear how tastes have changed from more straightforward rectangular shapes to curves and arches.[55]

Nevertheless, it is noteworthy that Neuerburg's work mainly focuses on the *nymphaeum* in Renaissance villas in Italy, however, he establishes a typology concerning the main elements of the *nymphaeum*, although his typology as aforementioned is based on Renaissance *nymphaea*, but it was very useful to this research, as no Roman *nymphaea* typology with obvious elements has been established and this is regarded to the absence

[53] Ibid.

[54] Neuerburg 1960.

[55] Ibid.

of the ruins of the structures dating to Roman era, also, that no particular shape of the *nymphaeum* were usually established.

Chapter Two

Historical Background

2.1. Preface

Topographically, Jordan is divided into the following zones: the Jordan Valley, the plateau, the mountains, and the desert.[56] Many archaeological sites were discovered in Jordan, indicating that humans have been inhibiting it since the Palaeolithic period, continuing in the Bronze, Iron Ages, and Classic periods. The city of Petra was the capital of the Nabataean kingdom in southern Jordan; it was defeated and conquered by the Roman Empire in 106 AD.[57] The Roman-Byzantine era ended with the start of the Islamic period after the battle of Yarmouk in 636 AD.[58]

This chapter will present the historical context for the five regions housing the *nymphaea* constructed in present-day Jordan.

During the Roman period, Amman, Gerasa, and Gadara, accompanied by other cities in the Levant, were referred to as the Decapolis cities (Plate 1), a league of cities that formed a loose confederation on the eastern frontier of the Roman Empire described as: "a league of Greek cities against the Semitic influences east and west."[59] The term "Decapolis" means a group of ten cities (Δεκάπολις or Dekápolis in Greek).[60] However, there is ongoing scholarly discourse regarding the precise count of Decapolis cities. While the name implies an initial formation of ten cities, it is possible that the number expanded over time, resulting in a range of 12 to 15 cities. These cities were situated in eastern Palestine and southern Syria.[61] The Decapolis cities were indirectly under Roman jurisdiction during the first century BC. and the first century AD.[62] This collection of

[56] Hadidi, 1982, 15-21.

[57] Gates 2011, 392-393.

[58] Nicolle, 1994, 64-65.

[59] Smith, 1894: 596.

[60] Parker 1975: 473.

[61] See Parker 1975: 473 & Kennedy 2013: 10.

[62] Ball 2002: 181.

cities can be regarded as a mystifying occurrence. However, the general agreement among scholars is that it represented a form of alliance or confederation.[63]

Although the Decapolis cities are Hellenistic, historical evidence suggests that they were part of Pompey's invasion of Syria. Thus, they cannot be described as either Seleucid in the establishment or Hellenistic in nature.[64] Decapolis cities were privileged with some autonomy. After conquering Petra, the Decapolis cities ceased to lose their autonomy in 106 AD, when Trajan attached the Nabatean Kingdom to the Roman Empire. Subsequently, Trajan repositioned the Decapolis cities. Some cities were annexed into Arabia's province in the south. The remaining cities remained under the jurisdiction of the Syrian province.[65]

Decapolis cities, including Gerasa (modern Jerash), Gadara (modern Umm Qais), Philadelphia (modern Amman), Pella (Tabaqat Fahl), and Petra, were strategically positioned along key trade routes and benefited from their agricultural hinterlands, which supplied essential goods to urban markets. After the annexation, they were integrated into the Roman provincial system. Gerasa became part of the province of Arabia, reflecting its role as a financial centre, while Gadara was part of the province of Syria, it was assigned to Palaestina in the 2nd and 3rd centuries AD. Petra, the Nabataean capital, emerged as a significant urban and religious centre within the province of Arabia.[66]

The Decapolis cities exhibited a diverse cultural blend comprising Greek-Macedonian, Arab, and Jewish populations. Arabs constituted the majority, and Hellenized Arabs held administrative positions. The cities retained or subtly reflected their Semitic names and, beneath Roman rule, retained an Oriental architectural essence. The notion of the Decapolis as a purely Hellenistic enclave or "unmistakeably Greek" in public character is problematic and not well supported.[67]

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[63] Parker 1975: 473.

[64] Jones et al, 1971: 258–9.

[65] Khouri 1985:19.

[66] See Bowersock 1983: 91–92; Issac 1981: 67-74; Millar 1996: 408-10; Ball 2002: 181–8.

[67] See Millar 1993: 412–13 Bowsher 1987 & Ball 2002: 181.

2.2. Amman

The city of Amman is in the centre of Jordan. Throughout its history, the capital city of Jordan, Amman, has been historically referred to by various appellations, During the Iron Age, it was called Rabbat Ammon by the Ammonites, indicating its status as their royal city, this name is also historically recognized in religious texts, including the Torah, where Rabbath Ammon is described as the capital city of the Ammonites.[68] It was also titled the city of waters, and Philadelphia.[69] These names symbolise the city's historical importance during different periods. Urban changes began with the advent of Ptolemy, a triumphant sovereign, who arrived sometime between the years 263 and 265 BC.[70] Under the rule of Ptolemy II Philadelphus, Philadelphia underwent significant construction or reconstruction, and acquiring its nomenclature Philadelphia. The Seleucids, a ruling dynasty, conquered the city in approximately 218 BC.[71]

The city of Amman lies on Seven hills, in Arabic "Tilāl." The city's original downtown or city centre is 750–800 m high; steep and narrow valleys determine the city's topography.[72] Excavations revealed that Ain Ghazal, dates to the Yarmokian period and Pre-Pottery Neolithic (PPN"A-B-C").[73] The cemeteries and residences on the hills of Amman indicate habitation from the Bronze Age (3200–1200 BC).[74] During Iron Age I (1200–1000 BC), only limited evidence is available to enhance our understanding of this period.[75] By Iron Age II (1000–600 BC)" Amman remained under Ammonite influence until the 7th century BC, when successive conquests brought the region under Assyrian, Babylonian, and later Persian control as part of a satrapy.[76] In 312 BC, Alexander the Great's conquest initiated the Hellenistic period, after which the city fell under the

[68] See Second Book of Samuel 12: 26-31. & www.sefaria.org (Entered August 2023).

[69] See Gharaibeh 2019: 2.

[70] Tell 1969: 28.

[71] Ibid.

[72] Rollefson, et al. 1992, 443-470.

[73] Ibid.

[74] See Yāsīn, 1991. 45. & Najjar 1991: 95.

[75] Dornemann 1983:107.

[76] Kadhim, Rajjal. 1988: 318-325. See also: Sauer 1986: 18. & Al Ábdī 1971: 12.

Ptolemaic dynasty. Ptolemy II Philadelphus renamed it Philadelphia in 255 BC, symbolizing its rising prominence, though the older name, Rabbath-Ammon, persisted, reflecting its royal heritage and the citadel's association with the Ammonite king.[77] The Seleucids later ruled Amman, though their decline after the death of Antiochus IV in 164 BC left the region fragmented, with some inhabitants seeking independence.[78] Before the Roman annexation under Pompey in 63 BC.[79] the Nabateans likely governed Amman, ensuring stability during this transitional period.[80]

In 63/4 BC, after the Romans managed to annexe Syria, Amman's importance was raised as it became the southern gate of the Decapolis cities and the border between the Nabatean Kingdom and the Roman Empire. In 106 AD, it became a Roman city in the Roman province of Arabia after the Romans defeated the Nabataean Kingdom.[81] Under Roman rule, Philadelphia/Amman gained a new role due to its location along the Via Nova Traiana. This is documented by milestones on the north side of Amman.[82] Hence, Amman flourished during the second century, and many buildings were constructed during the second and third centuries, such as the Citadel, the Roman Theatre, and the *nymphaeum*.[83] Amman has witnessed significant population fluctuations over time. In the pre-Hellenistic era, it is suggested that the population reached about 3,000.[84]

The adoption of Roman urban planning increased the population to approximately 5,000, with potential estimates ranging even higher, possibly reaching 8,000 to 10,000. However, accurately estimating historical populations poses challenges.[85] Amman

[77] Jones et al, 1971:240 See also Shea 1979: 17-25.

[78] Salles, 2013. 134-141.

[79] Jones, 1979:158 See also, Van Wijlick, 2020: 25-60.

[80] Ball, 2002. 192.

[81] Hadidi 1970: IV.

[82] Ball, 2002: 192.

[83] Waheeb, AlGhazawi 2014: 132.

[84] Kennedy, 2017: 239.

[85] Pierson 2021: 161.

remained under Roman authority until the 6th century AD. During their long-term presence, the Romans led Amman to become a marvellous urban city.[86]

Amman's distinctive topography, which played a pivotal role in its urban development. Built across a series of hills, the most prominent among them was the Citadel hill, serving as the acropolis and housing key administrative and religious structures. This elevated position provided notable defensive advantages and offered a commanding view of the surrounding landscape. The lower city developed within the valleys between the hills, with the main urban hub centred around a vital water source in Wadi Amman. Archaeological findings reveal that the Romans made extensive use of the natural terrain, adapting existing constructions and reshaping the landscape to meet their architectural needs. The later construction of the Umayyad Palace complex during the Islamic period on the northern part of the Citadel, atop the remnants of Roman and Byzantine structures, underscores the continued habitation and strategic importance of this prominent site.[87]

The city of Amman is divided into two major sections: the top section (Plate 2), which features the principal Roman Temple of Hercules, and the lower section, which comprises two typical colonnaded streets along the *cardo* and *decumanus*. Less than half a kilometre east of the Roman forum of Amman stands the *nymphaeum*; the structure dates to the 2nd century and is situated above the brink of a stream, and a cliff rises directly from the opposite bank.[88] The frontispiece of the *nymphaeum* overlooks the northwest, while its rear is upon the water edge; however, a small stream that on rainy days floods southward down the valley that opened in the direction of the north passed directly below one end of the building and emptied into the Valley of Amman.[89]

The hill where Amman's citadel is located is an L-shaped, oblong plateau that looks out over the forum to the south. The hill comprises two rectangular parts that do not share the same size. The first part faces east-west and is about 900 m long and 60 m wide. The second part faces north–south and is about 400 m long and 80 m wide, where Hercules's

[86] Nicolle, 1994, 64-65.

[87] Ammann 1995: 553-4.

[88] Kadhim 1993: 283-84.

[89] Segal: 1997: 162.

temple is located. The forum is in the middle insula of the southern half of the lower ancient city, on the south side of the stream that separates from the main road between the east and west gates. [90]

The Corinthian columns that surround the forum have different sizes. The columns to the east and south are more extensive than those to the west and north. The odeum is near the forum and faces west, its axis is almost perpendicular to the axis of the *decumanus maximus*, which in turn is almost perpendicular to the axis of the theatre. The theatre is on a hill to the south of the forum, carved into the hillside, demonstrating the Romans' skill in employing the natural contours of the land for monumental architecture, it has the same semicircular shape as the odeum and three rows of seats across the width of the building.[91] The *nymphaeum*, which is further west, is near where the *cardo* meets the main road, the decumanus. The *nymphaeum* faces northwest, and the long axis of the building is parallel to the long axis of the *cardo*. The *nymphaeum* was right next to the main road. In winter, a small branch of this stream that flows from north to south goes under the middle of the *nymphaeum* on its way to the mainstream. The layout of the Roman city of Amman was based on the shape of the land in the lower part of the city, but the position of the Acropolis hill and the lines of its walls were even more essential. The *decumanus maximus* follows a straight line broken in a few places to fit the irregular shape of the east-west rectangle of the hill and the axes of the acropolis walls on the south side.[92]

Hadidi offers a detailed look at how the Romans reshaped Amman's landscape. He points out specific engineering efforts like filling valleys and cutting edges to alter Amman’s original layout, demonstrating the Romans' strategic modifications to fit their urban plans. A particularly striking example is the forum's trapezoidal floor plan, an unusual choice in Roman architecture. This design was probably selected to work around Amman's natural terrain, showing how the Romans adapted to local environments. Hadidi also brings up the 'principle of an axial cemetery,' adding more proof of the deep

[90] Hadidi 1992 295-298.

[91] Al-Rawashdeh 2013: 241-246.

[92] Ibid.

Roman impact on Amman. He notes key landmarks such as the Roman theatre, the Nymphaeum, and the Odeon. Each of these structures underscores the thorough and thoughtful Roman approach to planning the city.[93]

2.3. Gerasa (Jerash)

The Roman archaeological city of Gerasa is considered one of the biggest, most well-preserved ancient Roman cities outside Rome. Jerash is an essential site that still stands, witnessing the Roman imperial grandeur.[94] It is located 48 km north of Amman. Jerash is a Decapolis city that presents a magnificent Greco-Roman urban pattern similar to other Decapolis cities.[95] The city flourished during the first century AD. And it remained inhabited until 749 AD. when an earthquake struck the area and quickened the neglect it faced.[96]

Throughout centuries, the wars, neglect, and natural disasters faced by Gerasa wiped out many traces of its history. Nevertheless, Gerasa survived and gave many stories to unearth within its temples, theatres, and ruins. It contains churches, paved colonnaded streets, oval plazas, and streets.[97]

Gerasa lies on a prolific land, eastern to the Ajlun highlands, nestled in a quiet valley among the mountains of Gilead, with water provided to the land year-round.[98] The 500 m altitude provides a perfect climate temperature and visibility over the surrounding areas. According to Kirkbride, the natural environmental advantages of the land have attracted human habitations since the Lower Palaeolithic.[99] According to archaeological data, Gerasa was occupied during the Bronze and Iron Ages.[100]

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[93] For further See Hadidi 1992: 298.

[94] Khrisat et al. 2012: 43-61.

[95] Raja 2012: 137–189.

[96] Barfod et al 2018: 623– 640.

[97] Rostovtzeff 1932: 73-90.

[98] Boyer 2016: 279.

[99] Kirkbride 1958: 9-11.

[100] Braemer 1989: 318.

Archaeological evidence dating to the Neolithic Age, (7500–6500 BC) was found in Gerasa.[101] studies indicate that the site was continuously inhabited from the Middle Pre-Pottery Neolithic Phase B (MPPNB) to the Yarmoukian period of the Pottery Neolithic era.[102] Findings at Tal AlSowan (Flint Hill) date back to the Bronze Age era (1200-2300 BC). The findings were discovered particularly at the current Jerash public hospital site.[103] During the Iron Age, the occupation spread further, expanding towards the southern city area hill, where the historical museum is located.[104] Jerash experienced intermittent periods of settlement from the Bronze Age through the Hellenistic period (333-63 BC), but it was during the later Roman era that the city was significantly developed into the classical city we see today.[105]

Although some historical tales suggest that Gerasa was founded by Alexander the Great or his general Perdiccas during the 4th century BC as a Macedonian military detachment, it is argued that these theories were not proven by archaeological evidence.[106] Nevertheless, much of the city still needs to be discovered.

The city of Gerasa was established during the 2nd century BC, known as "*Antioch on the Chrysorrhoas*."[107]: (*Antioch on the Golden River*.)[108] This river runs in Wadi Suf.[109] The city became a substantial centre under the rule of the Seleucid king Antioch IV; the discovery of a stone floor dated to the Hellenistic period enforced the theory that the oldest Hellenistic urban settlement in Gerasa was established during the second century BC.[110]

[101] See Lichtenberger and Raja 2014: 643.

[102] For further See Al-Nahar 2010: 1-18.

[103] Al Adwan 2015: 20.

[104] Ibid.

[105] Watts, 1997: 446.

[106] For further See Raja 2015: 285.

[107] Lichtenberger & Raja. 2019: 109.

[108] For further see McEvedy 2011.

[109] Holdridge et al. 2017: 1.

[110] Khouri 1985: 20.

The Hellenistic city existed around and on "Camp Hill", with scenery from the east side towards the Oval Plaza. The main temple of the city was dedicated to Zeus. It was located where the Roman temple of Zeus is today.[111]

It must be pointed out that the earliest historical reference to Jerash by Josephus Flavius, the famous historian, dates to the 1st century BC.[112] The city mentioned by Josephus is "Gerasa, the Decapolis city".[113] Certain scholars argued that Gerasa, as mentioned in the Josephus manuscript, was a Greek town in Palestine. These scholars suggest that a potential error may have occurred while copying the manuscript, proposing that "Gezer" could be a more accurate reading.[114] Nonetheless, the probability of this occurrence was exceedingly low, as Gezer had already been brought under control before the conquest of Gerasa took place.[115]

In 63 BC, Gerasa was annexed to the province of Syria after the arrival of Roman general Pompey; with his influence, Gerasa became one of the Decapolis cities.[116] Pompey's arrival changed the city's name from the ancient Arabic name "Garshu" to the Roman name Gerasa.[117]

After being annexed by Pompey, as one of the great cities of Decapolis, for the next 170 years, Gerasa began to increase in wealth and size, benefiting economically and culturally from the other Decapolis cities. Business relationships and trade flourished with the Arabian kingdom of Nabataea to the south.[118]

It is worth noting that the famous mathematician Nicomachus of Gerasa was born in Gerasa/Jerash.[119] He is recognised for his work "Introduction to Arithmetic."[120] He is also

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[111] Ibid.

[112] The Jewish War 4.9.1 & See Thackeray 1957: 145.

[113] The Jewish War 4.9.1 & See Thackeray 1957: 145.

[114] For further see Simchoni 1968: 545.

[115] Klein 1939: 106.

[116] Khrisat et al. 2012: 44.

[117] See Qaddhat 2021: 251.

[118] Qaddhat et al. 2019: 71.

[119] For further See Taran: 1970.

known as a Neopythagorean and for writing about the mystical properties of numbers.[121] Thus, it firmly suggests that the city had reached a stage of development where the pursuit of science and knowledge was highly valued, and its inhabitants held a positive attitude towards knowledge spread, resulting in its widespread adoption among the population.

After Trajan created the Arabian province, Gerasa became the centre of the province of Arabia, not far from the capital, Bosra, in today's southern Syria. This is a threshold for the history of Gerasa, distinguished by a long era of stability; the trade routes formed the city into a connection centre, which led to prosperity and wealth for Gerasa, which witnessed the burst of construction works that shaped the city. Granite began to be imported from Egypt, and temples were rebuilt. Most of today's Gerasa is dated back to the second and third centuries AD.[122]

Another boost in stature was received by the city of Jerash when Emperor Hadrian visited the city in 129/130 AD.[123] To honour the emperor's arrival, the citizens of Gerasa erected a Triumphal Arch at the southern end of the city, which still stands today. In addition, an inscription found near Gerasa,[124] dedicated by his *Equites Singulares Imperatoris* (The emperor's personal cavalry), suggests their temporary winter presence by the Chrysorhoas River(Modern Jerash). This inscription underscores their loyalty to the emperor rather than a political message, expressed through a dedication for his health and safety. Although undated, it likely belongs to Hadrian's reign (117-138 AD), and aligns with his

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[120] Dillon 1996: 352–361.

[121] Bell 1940: 83.

[122] Khouri 1985:19.

[123] See McCown 1933: 77-88.

[124] "*Pro salute / Imp(eratoris) Caes(aris) [n(ostri)] Traian(i) / Hadriani Aug(usti) p(atris) p(atriae) Deaniae(!) Aug(ustae) / equites sing(ulares) eius qui / hibernati sunt Antioch[i]/ae ad Chrysorrhoan quae / et Gerasa hiera et asylo(s) et au/tonomos quorum curam agit M(arcus) Cal(purnius) Venetus viator |(centurio) leg(ionis) V Ma/cedonicae turmae V[III] / Flavi <T=I>i<t=I>i Statili Roma[ni] / Val(eri) Bassi Cani August[ini?] / [---] Paterni Ulpi Festi / Ulpi Victoris U[l]pi Agrippini / v(otum) s(olverunt) l(ibentes) m(erito) / honoris et pietatis causa*." (https://edh.ub.uni-heidelberg.de/edh/inschrift/HD029295 Entered 2024). For further see: Jones 1928: 146-47, n. 3, Kennedy 1980: 297-99 & Urloiu 2010: 72-74.

visit to Gerasa.[125] The visit highlights the city's prominence, and the arch may signify the people's loyalty and respect for the emperor.

Gerasa thrived during the Roman peace under Roman Emperors Trajan and Hadrian at the beginning of the 2nd century AD. The population was a mixture of native Aramaic-speaking Arabs, Hellenic and Roman people. Governing was left to a Hellenized elite who spoke Greek and used Latin for state affairs. Gerasa grew wealthier and more sophisticated during the next two centuries. Note that most of the monumental structures on the site today date initially to the Roman era of the 1st and 2nd centuries AD, such as the Roman Theatre, the Oval plaza, and Hadrian's Gate.[126] The ancient city still visible today is a collection of administrative, commercial, civic, and cultural centres; thus, most citizens lived on the east side of the Jerash Valley.

During this period, it is suggested that the population reached between 15000-25000.[127] However, no precise number can be given on how many people lived in the city during this period, as it is also mentioned that Gerasa reached a population of 8,000 to 20,000 people; this number was narrowed down to about 10,000 inhabitants.[128]

Periodic changes occurred to the city plan during Roman control, as attested by the excavation in the North Theatre, *cardo* area, South *Tetrapylon*, and the documented *macellum*.[129]

The third and fourth centuries AD witnessed a shortage of monumental construction and architectural improvement.[130] Moreover, the city may have started to decline during the beginning of the Byzantine era. Due to the decrease in the value of the city as a result of shipping, the main route for commerce started to change. Thus, Jerash started to decline

[125] Stinespring 1939: 360-365. See also, Cheesman 1914: 13-16 & Offord, 1916: 38.

[126] For further see Khouri 1988.

[127] Speak 2014: 363-366.

[128] Pierson 2021: 164.

[129] Clark et al., 1986: 205-302 & Kraeling 1938a: 27-69.

[130] Boyer 2016: 279.

due to the lack of a common trade route.[131] However, the Byzantine period brought some peace and economic stability to the area. [132]

Nevertheless, In the late fourth century, the construction of churches started in Gerasa. It kept on going until the seventh century AD. Christianity became the prime faith in the region and the Roman Empire. Some structures from pagan times were dismantled during Byzantine times, for example, the *macellum* of Gerasa.[133]

Gerasa started to prosper in the late 5th and 6th centuries AD. Most architectural construction was dated to that area, designating the wealth increase that the town witnessed during this period.[134] In the 6th century, an earthquake destroyed parts of Gerasa and other surrounding cities. However, some city sections were reconstructed, and new monuments were erected during the late 6th and 7th centuries, such as the Church of St. Cosmas and Damianus, and the complex of three churches near the Temple of Artemis were erected.[135]

In 614 AD, Gerasa was pounding further with the Persian invasion, which lasted for a few years.[136] During their thin settlement in Jerash, the Persians destroyed many random buildings.[137]

In 636 AD, Muslim troops took control of Jerash after their triumph in the battle of Yarmouk.[138] Although Gerasa declined after the late Byzantine period, an excavation in the 1980s discovered that Jerash gained some importance during the Islamic period.[139]

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[131] Meyer, 1988: 176.

[132] See Bührig, 2009: 372-373.

[133] Uscatescu & Martín-Bueno 1997: 67.

[134] Kraeling 1938b: 66.

[135] See Khoury, 1995.

[136] Uscatescu & Martín-Bueno 1997: 81.

[137] Al Adwan 2015: 21.

[138] Meyer 1988: 184.

[139] Gawlikowski 2004: 469.

Many ceramics in different shapes were studied and dated precisely to the early and late 8th centuries, and the difference is cognised.[140]

The transformation of Gerasa from a Byzantine city into an Islamic city was established in the same form as other cities in Syria and Jordan.[141] The series of earthquakes that struck during 746/7 AD significantly impacted Gerasa.[142] Many scholars connect the natural catastrophe to the vast decline that faced the city in the second half of the 8th century. It is worth noting that since the Late Byzantine period, political conflicts within the city and earthquakes have resulted in Jerash's population dropping to 4000.[143]

The city remained in decline and was abandoned in the second millennium AD. In his description of the city in 1225 AD, the famous Arab geographer Yaqut Ál Hamwi wrote: "What was once a mighty city but is now a total ruin."[144]

Evidence indicting some habitation in Jerash during the late Mamluk period (14th-15th centuries) were discovered in different areas of the city.[145] According to the Ottoman census records, it is suggested that some modest settlement in the area was a village with a dozen families documented.[146] Finally, in the late 19th century, Circassian immigrants from Caucasus found the ruins before settling in Jerash.[147]

Conecerning the topography of the site; the Roman Gerasa is situated in a valley and dramatically surrounded by hills. The Wadi Jerash that flows through its centre significantly influenced the city's urban design. This geographical setup was crucial for placing major public structures and roads on the flat valley floors, while the sloping terrains were skillfully used for residential and smaller public buildings. The city's plan centres around the Cardo Maximus, a column-lined street running north to south, which

[140] Walmsley 1995: 657-668.

[141] Tsafrir & Foerster,1994 95-115.

[142] Meyer 1988: 176.

[143] See Grau 2018.

[144] Yaqut al-Hamawi, Mu'jam ul-Buldān. In: In Le Strange 1890: 462.

[145] Stewart 1986: 239.

[146] Hütteroth and Abdulfattah 1977: 164.

[147] Gawlikowski 2004: 469-79.

connects key landmarks from the South Gate to the North Tetrapylon. Significant structures such as the South Theatre, the Oval Plaza, and the Nymphaeum are strategically positioned along this main artery. The city walls, featuring prominent gates like Hadrian's Arch, clearly mark the urban boundaries. Gerasa's layout demonstrates how Roman urban planning harmonized with the natural landscape, facilitating smooth transportation, effective water management, and creating aesthetically pleasing views.[148]

2.4. Gadara (Umm Qais)

In the north of Jordan, in the northern part of the Irbid district, the ancient city of Gadara is situated, approximately 110 km from Amman.[149] The city is on a spur, high above both rivers, Yarmouk and Jordan, with annual rain enabling agriculture without irrigation.[150] The natural characteristics make Gadara different from other Decapolis cities.[151] Gadara was incorporated into the Roman province of Palaestina during the 2nd and 3rd centuries AD, reflecting its administrative and political role in the region.[152]

Nowadays, the area of Gadara (Umm Qais) splits into three main territories: the archaeological site (Gadara), the traditional village (Umm Qais), and the modern town of Umm Qais. This geographical setting overseeing Wadi Al-Arab, the Jordan Valley, on a terrace edge of mounts opposite Lake Tiberias and Golan Heights, along with the magnificent historical ruins, makes the site a valuable historic site.[153]

Gadara's site contains archaeological monuments and findings dating to the Classical periods (Greek, Roman, and Byzantine) and the Islamic period. The layout of the city suggests that it was influenced mainly by the mentioned eras.[154]

[148] See Lichtenberger et al 2019: 1-7 & 223. Makhadmeh et al. 2018: 2.

[149] Ababneh 2016: 52.

[150] Kerner et al 1997: 265

[151] Shiyab et al 2017:183

[152] El Khouri 2008: 73

[153] Alawneh, Almasri 2018: 83

[154] Ababneh 2016: 52

Evidence of human presence at the site suggests occupation during the 13th and 14th centuries BC.[155] The Greek name of the site, "Gadara", might relate to the Semitic origin, which is suggested to be "Gadar", which means “fortification.” This theory is strengthened by the locative ending "a", which relates to a Semitic place named by the Greeks.[156]

Gadara is mentioned in the Bible.[157] It is the spot where Jesus cast out the devil from the possessed by demons. After stepping ashore in the land of Gadara, Jesus was confronted by and spoke to the leader of a group of demons that possessed violent and uncontrollable people. The Bible also mentions the cities of Decapolis: “*And he departed, and began to publish in Decapolis how great things Jesus had done for him: and all men did marvel*.”[158]

Gadara's oldest historical reference dates to the second half of the 3rd century BC, when the Greek historian Polybius described the region as under Ptolemaic rule during that time. Polybius focuses on the military aspect of the site, as he mentions that Gadara was one of the conflict areas between the dynasties that succeeded Alexander the Great's rule in the area: the Ptolemaic and the Seleucid.[159] During the 3rd century BC, it was formed as a military colony by the Ptolemaics with other cities (Gerasa, Pella, and Abila) to protect the northern border against the Seleucids.[160] The oldest archaeological findings at the Gadara site were pottery sherds unearthed near the acropolis and dated back to the 3rd century BC.[161]

[155] Vieweger& Häser 2008: 379

[156] Blass, et al 1976: 42 See also https://whc.unesco.org/en/tentativelists/1558/ (Entered 2023/August)

[157] Mathew 8:28-34

[158] Mk. 5:20 See also: Willmington 2018: 1-4

[159] Polybius, Hist. V: 69-70.

[160] Mershen &Knauf 1988:130.

[161] Alawneh& Almasri 2018:83.

The Ptolemaic rule remained until the Seleucid ruler Antiochus the Third conquered the area in 218 BC. During the Ptolemaic occupation, Gadara did not have the right to be titled a city; however, it gained that right during the Seleucid period.[162]

In 63 BC, with Pompey's arrival to the area, Gadara became under Roman rule and joined the Decapolis. Gadara prospered during the Roman/Byzantine period until the Muslims took over the land in 634/636 AD.[163]

During the 2nd century AD, the city of Gadara flourished the most; Rome promoted intensive urbanisation in the eastern provinces, and an economic increase occurred that was demonstrated by an increase in architectural construction such as the market basilica on the northwestern terrace, the West Theatre, and the *nymphaeum*, along with the colonnaded streets that were gradually constructed. Also, the city witnessed a development phase in the eastern city area' where a new *podium* temple was built. [164]

According to Keilholz, ingenious networks of cisterns and aqueducts ensured an ample daily water supply of approximately 1000 litres per person daily. The Roman city of Gadara, based on the city densities, likely hosted a population of 7,000 to 9,000 people. [165]

During the 4th century, Gadara, under the Byzantine Empire, experienced peace and economic growth and became a parish within the Holy Land.[166] According to Claude, it was common to modify the structure and function of the Roman theatres during the Byzantine period; this is considered a method used by the people to demonstrate the wealth and importance of their city.[167] The change in the structural-functionality of the buildings is connected to the Christianization faced by the city. Thus, the number of churches constructed during the Byzantine era increased.

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[162] Mershen &Knauf 1988:130.

[163] Wagner-Lux et al. 1978: 135.

[164] See Wagner-Lux et al. 1978: 135. & Keilholz, 2017: 155 & Pierson 2021: 167-8.

[165] Keilholz, 2017: 155 & Pierson 2021: 167-8.

[166] Bührig, 2009: 372-373.

[167] Claude 1969: 74-76.

In 636, Muslims annexed the area of what is today's Jordan. The capital was moved to Damascus during the Umayyad Dynasty (661-750). Therefore, Jordan became closer to the centre of power; its importance increased as it was situated on the pilgrimage route to Arabia. Hence, Jordan remained at a certain level of prosperity.[168] Cities continued to function or were reoccupied during the Umayyad period, in addition to the new towns and cities constructed.[169]

As mentioned earlier, a great earthquake struck Jordan during the Umayyad period, and this caused a massive population decline in many Jordanian cities and villages.[170] During the Abbasid period, the capital of the Caliphate was moved to Baghdad. Thus, the importance of the geographical region of today's Jordan began to decline. Although findings relating to the Ayyubid/Mamluk era were unearthed, only some coins and pottery sherds were found in the excavated findings.[171]

On August 24, 1516 AD, the Ottoman Turks defeated the Mamluk armies in a crucial battle that led Syria to fall under Ottoman rule.[172] Hence, Jordan became part of the Ottoman Empire.

2.5. Petra

Petra is an ancient city in the southern part of Jordan and is considered the most acclaimed archaeological site in the Kingdom of Jordan. It is also one of the World Heritage Sites, and UNESCO regards it as "one of the most precious cultural properties of man's cultural heritage."[173] Yaqut Al-Hamawi mentioned it under the name Ṡal.[174] Petra is intrinsically linked to the Nabataean Kingdom, as it served as the capital city of this historical realm. Consequently, the Nabataean Kingdom's historical narrative is inseparable from Petra's history.

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[168] Tawalbeh & Zayadine 2002: 621.

[169] Sauer 1986: 304.

[170] Johns 1992: 363.

[171] Tawalbeh & Zayadine 2002.

[172] Al-Bakhit 1982: 362.

[173] World heritage site. Retrieved July 29, 2021, from https://www.worldheritagesite.org/list/Petra.

[174] Yaqout Al Hamawi Mu'jam ul-Buldān & See also ʿAli 2001: 57.

The Nabateans established a great civilisation backed by a kingdom recognised by the Roman Empire. It is mentioned that The Nabataeans, under King Aretas, engaged with Rome during Pompey's campaigns in the Levant, establishing their position within Rome's network of client and allied states in the region.[175] According to historian Ihsan Abbas, one of the difficulties in studying Nabatean culture is that the Nabateans did not leave written chronologies, nor did they leave written history that could be used as a dating source.[176]

The Nabatean kings used coins to demonstrate their power, political influence, and the richness of their reign. They also used it to reflect their cultural and religious values, such as putting a goddess portrait on a coin to seek protection and show appreciation. Modern-day research benefited greatly from the excavated coins, as they provided a critical understanding of the Nabatean way of life.[177] The scholarly exploration of Nabataean numismatics and analysis of the Nabataean regal efforts to develop and employ coins to promote personal agendas and political propaganda yields significant data on their lives, politics, and economy. Additionally, the study of coins greatly aids in establishing a basic chronology for the Nabataean kings.[178]

The first historical reference concerning the Nabateans and their nomadic lifestyle is given by Diodorus Siculus, copied from the Greek historian Hieronymus, who mentioned a military campaign in 312 BC and named them the Nabateans.[179]

Diodorus clearly stated about the Nabataeans that "it is their custom not to plant grain, set out any fruit-bearing tree, use wine, or construct any house; and if anyone acts contrary to this, death is his penalty."[180] However, the Nabataeans have kept those laws and rules

[175] Evans 2011: 110-111

[176] Abbas 1987: 9.

[177] Athamneh 2017: 58.

[178] Athamneh 2023: 30.

[179] Diodorus XIX: 94-100 & see also Geer 1933: 94-100.

[180] Geer, et al 1933 2-5 & Diodorus XIX: 94-100.

only briefly. Archaeological and epigraphic sources indicate that they have improved water-collecting technology for agricultural purposes.[181]

According to Joukowsky, Petra gained eminence from the 2nd century BC to the 1st century AD, potentially accommodating a population of up to 30,000 Nabataean inhabitants.[182] However, Appleton considered this number a matter of speculation, as no decisive population record can be found.[183] Based on the great size of the archaeological site of Petra, being on the trade routes and being a centre of the spice trade that involved such disparate realms as China, Egypt, Greece, and India, it is therefore acceptable that the population swelled to between 10,000 and 30,000.[184]

The Nabateans were peaceful people who maintained their lifestyle as nomadic tribes. Nevertheless, the economy grew with time as they started to work in commerce. Diodorus mentions that a group of Nabatean people worked in transporting incense and other goods; in addition to their involvement in trading, the Nabateans took control of the trade routes, the protection taxes were taken from convoys that ran on routes under the Nabatean jurisdiction, and it made a good profit for the Nabataean kingdom.[185]

In order to state the development from a social perspective, the economy's improvement reflected the Nabatean Kingdom's structural and cultural development. For instance, women in the Nabatean kingdom obtained good status within the Nabatean society. Some inscriptions emphasise that women had equality with men in some aspects of life; they could own land, manage their possessions, and represent themselves in courts.[186]

In 106 AD, the Nabatean Kingdom's independence ended during the era of Rabbel II Soter, the last known Nabatean king. Cornelius Palma the Roman army leader and governor of Syria entered, along with his armies, the Nabatean land without any

[181] Alzoubi: 2018: 487-488.

[182] Joukowsky 2001: 2.

[183] Appleton 2015: 6.

[184] See Britannica, July 3, 2023. https://www.britannica.com.

[185] See Almḥīsn 2004: 17,23,93, 236.

[186] Alzoubi et al. 2013: 159.

opposition, the Roman Empire annexed the Arabian kingdom, naming it the province of Arabia.[187]

The Romans took over the Nabatean trade roads and managed to Romanize the kingdom of Nabataea to a certain extent. It is strongly suggested that the Romans planned to develop the city baths and other public areas, such as colonnade roads and the *nymphaeum*.[188] An inscription mention "(Me)tropolis Petra - (μη)τρόπολη πέτρα", which emphasize that after the Romans took over Arabia, the city of Petra was known as the Metropolis or "chief city".[189] It is thought that around the time of Hadrian's rule, the development plan stopped due to decreased resources, as most of the resources were deployed to the Danube area.[190]

Later, in the 3rd century, the city of Petra sank into neglect, and Palmyra became more controlled of economic resources such as trade routes and commerce.[191] On the 19th of May, 363 AD, an earthquake struck the area, destroying it more; thus, many people abandoned the city.[192]

During the Byzantine period, some pagan buildings were converted into churches. The Urn Tomb was transformed for ecclesiastical use in 446 AD.[193] Excavations discovered few churches belonging to the Byzantine era.[194] During the Umayyad dynasty, Petra was away from the centre of power. In the medieval period, the Crusaders built some military constructions; during the 13th century, it was on the route of the caravans.[195] Although it

[187] Fiema, 2003: 38.

[188] Peacock 2013: 169.

[189] Peacock 2013: 169-172 See also Tracy 1999: 54 & https://universes.art/ (Entered 2023 August)

[190] Peacock 2013: 172.

[191] See Finlayson 2002: 1.

[192] Peacock 2013: 173.

[193] See Al-Nasarat 2018: 221.

[194] For further see Bikai: 2002: 271-276.

[195] See Zayadine & Hadidi 1985: 159-174.

never gained the same glory it once had. Later it was only occupied by local nomads and remained absent from the western sight until Burckhardt arrived in 1812.[196]

In conclusion, Petra was an ancient city characterised by its prosperity, affluence, and remarkable resourcefulness, enabling the Nabataean civilisation to establish and prosper within an exceedingly hostile ecological setting.[197]

The urban settlement emerged as a pivotal hub for commercial activities connecting the Middle East and the Roman Empire, thereby bestowing its inhabitant's substantial affluence and influence. Additionally, it facilitated the acquisition of resources necessary for creating impressive tombs, monuments, and urban centres, effectively transforming the arid desert into a flourishing oasis. Furthermore, the convergence of diverse cultures gave rise to the distinctive Nabataean art style, which integrates prominent architectural elements from various ancient civilisations. This artistic expression has indelibly shaped the unforgiving desert environment.[198]

The city managed to maintain its status even after the move of the capital of Petra to Bostra. However, Petra experienced minimal alterations until a significant seismic event transpired in May 363 AD, destroying most of the city's architectural landmarks.[199] Thus, most of the populace vacated Petra, and the fallen Nabataean structures remained unreconstructed. Despite some activity and the reconstruction of a few shops, the downtown area of Byzantine Petra remained a mere fraction of its former grandeur.[200]

The main Roman street in Petra, is lined with columns, links significant architectural and public sites, such as the *nymphaeum*, Grand temple, reflecting a sophisticated urban layout within Petra's steep and rocky landscape, defined by Jabal Al-Madbah and Jabal Al-Khubtha. The area's topography, with its natural cliffs and gorges, directly influenced the city's design and defensive strategy. Petra's climate, characterized by hot, dry

[196] Paradise 2016: 209–224.

[197] Reynolds 2012: 11-12.

[198] Ibid.

[199] Ossorio 2009: 49.

[200] Reynolds 2012: 9.

summers and cool, wet winters, necessitates effective water management systems, exemplified by the *nymphaeum's* function in providing water at the entrence of the city. This integration of architecture and environmental management demonstrates the Romans' strategic use of Petra's geographic and climatic conditions to sustain urban life.

2.6. Pella

Pella, an ancient city within the Decapolis, commonly known as Tabqat Fahl in modern days, it is located in the eastern foothills of the northern Jordan Valley. It is approximately 5 km from the Jordan River. The primary settlement location, boasting a height of 30 m and an expansive area of roughly 8 hectares, holds significant historical significance as one of the foremost ancient settlements in Jordan. Pella, an ancient settlement, was established during the Neolithic era approximately 8,500 years ago, around 6500 BC. [201]

Since its inception, Pella has maintained a consistent state of habitation throughout its extensive history. However, it is worth mentioning that Pella possesses an extensive pre-classical historical background spanning the Late Neolithic, Chalcolithic, Bronze, and Iron periods.[202] Thus, it is considered one of the sites in Jordan with a connected, extended history. According to Stephanus, it has been claimed that the original name for Pella in antiquity was Butts or Botis.[203]

Pliny the Elder noted that Pella in Jordan was well-known for its abundant water resources, a feature that might draw parallels to Pella in Macedonia, also celebrated for its rich water landscapes. Such a comparison is intriguing because both cities not only shared the name 'Pella' but also boasted similar natural advantages. As a member of the Decapolis, the abundance of water in Jordan's Pella could have been a critical factor in its

[201] Bourke 2013: 1.

[202] Gor further see Bourke 2015: 138.

[203] Stephanus Cellarius, lib. iii. 13.

historical significance and livability, echoing the prosperity of its Macedonian counterpart.[204]

During the Bronze Age, the town became a walled settlement with extensive trade links to neighbouring regions. Ancient Egyptian texts referred to it as 'Pahel,' from which the modern name 'Fahl' is derived.[205] Following the fourth-century BC Macedonian conquest, a new Seleucid settlement centred around the main mound of Tell Hosn was established.[206] This new settlement was named 'Pella,' inspired by the city in Macedon, although it also approximated the native name. Pella experienced prosperity and growth In the Roman period, along with other Decapolis cities. Numismatic evidence portrays a grand temple atop Tell Hosn and a monumental *nymphaeum*.[207] Recent discoveries include fragments of the possible temenos wall surrounding the temple and remnants of a civic complex that featured an odeon.

However, unlike its counterparts in the Decapolis, Pella exhibits a scarcity of Roman monumental structures. Fragments suggest the presence of early Roman constructions; notably, an atrium was discovered, which could indicate a Roman temple in the city. Additionally, the Middle Church was constructed atop what might have been an earlier Roman civic complex, possibly a plaza, and included a small Odeon. While there is no conclusive evidence of colonnaded streets at Pella, their existence cannot be ruled out. Future excavations may uncover such structures, and the presence of Byzantine roads built upon what are believed to be Roman road foundations suggests that Roman-era colonnaded streets could lie beneath them.[208]

The outback of Pella has presented an astonishingly rich range of agricultural activity that peaked in the ‘Byzantine’ period, during the Hellenistic period, the area was heavily fortified with relatively large-scale defensive systems, indicating considerable rural instability. These gradually gave way to smaller fortified posts in the earlier Roman

[204] Pliny, lib. v. 18. See Also: Rennell 2008: 141.

[205] See Albright 1923: 7 & Van der Steen 2004: 16.

[206] Ball 2002: 195-196.

[207] See Trell 1978 for numismatic figures. And chapter four of this thesis.

[208] Ball 2002: 195-196. & See also Smith 1980: 315-318.

period and eventually to open farmsteads in the late Roman. The rural area so far surveyed included for this period a large 'villa,' several smaller farmsteads, and a number of indeterminate structures, at least twenty-two wine presses, water installations (basins, cisterns, reservoirs), several open enclosures (presumably animal pens), and agricultural terraces and field walls scattered over the landscape.[209]

Nevertheless, the excavations at Pella did not reveal evidence of a colonnaded street atypical of Eastern Roman cities. However, it is worth noting that Beirut also does not possess such a feature. However, these structures were likely either disassembled during ancient times or remained buried rather than never being constructed. Notably, Pella, which existed from the first to the fourth century, underwent significant reconstruction between the fifth and seventh centuries, resulting in the near obliteration of the original city. Despite the detailed depiction of its *nymphaeum* on coins, evidence of this structure has yet to be discovered through excavation.[210]

[209] For further see: Watson & Margaret 1996: 63-75.

[210] For further see: Ball 2002: 262; Smith & McNicoll 1992:119–44; Segal 1997:152.

Chapter Three

Water, Myth, and Architecture: The Evolution of *Nymphaea* from Mythical Origins to Architectural Monuments

3.1. Water and the Origin of the N*ymphae* and *Nymphaea*

There would be no life without water, water availability is crucial to human survival. Hence, water has had a massive impact on human life since the beginning and our entire culture relies on efficiently managing this precious resource.[211]

In the Levant, where rain is relatively light and most streams are intermittent, springs are vital. In ancient beliefs, tutelary deities, notably *nymphae*, have guarded these sources since early times.[212] The earthly manifestations of water are strongly associated with fertility and growth. A singular element has the potential to act as a catalyst for mortality and devastation.[213] Water is an essential element fundamental to both sustenance and mortality. The symbolism of water has historically been associated with peril and fatality, with mythological narratives often centring around demise, metamorphosis, and rejuvenation.[214]

The abundant availability of water has been a vital aspect of a refined way of life throughout different historical periods. For instance, the Roman civilisation relied heavily on copious amounts of water for their public baths and hygienic purposes.[215]

The archaeological and written sources regarding sanitation and water supply began throughout ancient Greek and Roman times.[216] Alcmaeon of Croton is considered the

[211] Vuorinen, et al 2007: 49.

[212] Lanciani 1909: 47-8.

[213] Taylor 2009: 21-22.

[214] Ibid.

[215] Vuorinen et al. 2007: 55.

[216] Ibid: 50.

earliest Greek doctor to argue that the purity of water could affect the well-being of individuals.[217]

Pliny the Elder, who lived during the first century AD, discussed competing theories about the ideal water quality in his writings.[218] The water's flavour, aroma, visual appeal, and thermal stability were evaluated. The water source's effect on human and animal health was also considered.[219] In ancient times, flavourless, odourless, colourless, and refreshing water was prised, whereas sluggish, marshy water was shunned.[220]

Thus, a type of sacred admiration for water sources developed within the human cultural context, which we can still witness today. Above all, springs of water were essential during ancient times, providing fresh water and containing minerals that were glorified due to the healing power they obtained.[221]

In ancient times, people believed that to maintain these springs that provided water and healing, they had to appease the deities that presided over these natural water sources; the method was by votive tossing gifts to them.[222] It is worth mentioning that many coins were found in some springs, which is believed to be the origin of the tossing coin tradition into wells and fountains, but these coins might not have been tossed intentionally in this large amount into freshwater springs, as it was highly desirable to maintain the purity of water. However, contamination of water by these coins may have occurred through the accidental fall of jars and similar objects that contained coins.[223] These carriers might have been installed near the water as gifts for the deities of natural water springs.

[217] Aetius, On the Opinions of the Philosophers V.30.1. In King, 1999: 31.

[218] Plinius NH, XXXI, xxi–xxiii.

[219] Vitruvius, De architectura, I, iv,9,10; VIII, iv,1,2.

[220] Vuorinen et al. 2007: 50.

[221] Neuerburg, 1960: 5 See also Håland 2009: 104.

[222] Lanciani, 1909: 48.

[223] Neuerburg, 1960: 6.

In ancient times, people firmly held the belief that the water sources linked to a *nymph* and her sacred spring had an innate purity, reserved for specific purposes and vulnerable to contamination from pollutants.[224]

This notion of safeguarding water purity finds its significance in an inscription from the fourth century BC, unearthed at the *Asklepieion*; the inscription lays down the requirement that anyone casting an object into the revered water must dutifully perform the customary purification ritual at the sanctuary dedicated to the *nymphae*.[225] This practice underscored people's reverence and respect for these sacred waters and the *nymph* overseeing them.

The origin of the mythology surrounding *nymphae* can be traced back to ancient mythology.[226] In Greek mythology, *nymphae* were considered minor deities who personified different aspects of nature, such as the forests, rivers, and mountains. They were also associated with specific activities, such as hunting, dancing, and singing.[227]

Nymphae are mythical female nature spirits believed to inhabit various natural settings, including forests, mountains, and bodies of water. They were often depicted as beautiful young women, and their stories have been passed down through various cultures for centuries.[228] The *nymphae* had a great connection with water and were connected to fountains. Offering sacrifice to the *nymphae* of the spring was a customary practice among travellers. The rationale behind this practice was probably rooted in the belief that the *nymphae* were responsible for providing and maintaining the spring water; Ballentine asserts that certain scholiasts establish a connection between the *nymphae* and water, similarly as *Dionysus* is associated with wine.[229]

[224] Genov 2023: 23.

[225] Sokolowski 1962: no. 152 See also: Genov 2023: 23-25.

[226] Smith 1849: 45.

[227] Harrison, 2018:13.

[228] Dowden, 1992: 1-2.

[229] Ballentine 1904: 81.

The *nymphae* were frequently associated with washing places. According to the ancient Greek lyric poet Pindar, the *nymphae* can give and take away bathwater.[230] In ancient Greece, individuals who exhibited a strong inclination towards the veneration of *nymphae* were referred to as *nympholeptoi*, meaning "seized by the *nymphae*."[231] And water *nymphae* will punish a lover who ignores them; any man who comes into contact with a *nymph* is said to have become "possessed by *nymphae*," and the *nymphae* abduct mortals whom they love.[232]

The mythology surrounding the origin of *nymphae* is rooted in the belief that nature was alive and inhabited by supernatural beings.[233] In ancient times, people revered the natural world profoundly and believed that various spirits and deities inhabited it.[234]

The stories about them explained various aspects of the natural world.[235] For example, the *nymphae* associated with bodies of water are believed to be responsible for the ebb and flow of tides and the growth of aquatic life.[236] The *nymphae* associated with forests are believed to be responsible for the growth of trees and the abundance of wildlife.[237] Because of their connection with freshwater, *nymphae* are commonly viewed as healing deities close to a water source, preferably one with peculiar elemental properties or high temperatures.[238]

It is highly likely that during periods of drought, the Greeks practised directing their prayers towards the deities associated with well-springs, fountains, sources of streams, and the streams themselves, rather than directing their supplications towards Zeus,

[230] Ibid: 88.

[231] Dillon 2019: 6.

[232] Håland 2009: 105.

[233] Gottlieb 2006: 7 & See also Stehberger 2013: 1-5.

[234] Eller 2009: 91.

[235] Hamilton: 1942: 23 See also: O'Flaherty 1995: 57.

[236] Graves 1960: 44.

[237] Frazer 1922: 87.

[238] Larson 2001: 6.

Jupiter, or any other deity to invoke rain. In other words, they would offer vows and prayers to the *nymphae*, *lymphae* and other similar divinities.[239]

As ancient societies evolved, they evolved into more complex forms, and the mythology surrounding *nymphae* continued to be passed down through various cultures. However, the basic premise remained: these mythical beings were believed to inhabit the natural world, influence its various phenomena,[240]and continue to captivate the human imagination.[241]

Most of the extensive legends about the governing deities in Greek and Latin literature sources were collected right after the first World War I.[242] According to Smith, two main classes of *nymphae* are: The first one includes nature *nymphae*; this class adopts the ones recognised in the worship of nature; this comes from the early Greek belief that natural events were a type of demonstration of the deity.[243] These *nymphae* can be categorised according to where they lived into five groups[244]:

- The Dryads lived in woodlands and trees.
- The Napaeae and Alseides lived in glens and groves.
- The Oceanids, or Nereids, lived by the sea.
- The Oreades lived in mountains and lakes.
- The Naiads lived near springs, streams, and lakes.

The second class of *nymphae* is the personification of tribes, races, and states, for example, *Cyrene*. The general name Naiads denotes freshwater *nymphae*.[245] The ancient Greeks and Romans regarded the Naiads as symbols of the female reproductive process,

[239] Morgan 1901: 108.

[240] Hansen 2005:112.

[241] Graf 1993:178.

[242] See Smith 1922: 17-19.

[243] Smith 1853: 561-563.

[244] Alvarez 1981: 2.

[245] Smith 1853: 561-563.

the water cycle, and marital bliss. The *nymphae* and the Muses, formerly the *nymphae* of mountains, rivers, and springs, were often paired together. [246]

Nymphae are frequently depicted as descendants of Zeus, Ge, or other diverse river deities. *Achelous*, a deity commonly associated with river domains, is often identified as the forefather. However, various divinities are also revered, contingent on location.[247] In contrast, heroines are typically portrayed as the offspring of male protagonists; the longevity of *nymphae* was a subject of discussion among classical writers; however, it was evident to them that *nymphae* had an extraordinary lifespan that exceeded that of human beings.[248]

Nymphae originated from the Greek pantheon of gods; they were youthful goddesses that grew near Mount Olympus (Plate 3).[249] One myth of the origin of the spring *nymphae* is that of young Amymone, who was sent in vogue to seek water but fell asleep while doing so; a satyr found her. However, the satyr did not seduce her. Poseidon prevented the satyr from doing so and sent it away, thrusting his trident into a rock, and creating a spring to honour Amymone. Poseidon eventually ended up seducing Amymone.[250] Noting that both *nymphae* and *satyrs* are frequently represented together, they are mythological archetypes of the wild.[251]

A second tale is the myth of *Byblis*, which mentions how she was turned into spring as an act of chastising due to her forbidden love for her brother.[252] However, many stories have been written concerning the *nymph* presiding over water sources in Greek and Roman literature.[253]

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[246] Alvarez 1981: 2.

[247] Larson 2001: 4.

[248] Ibid.

[249] Larson 2001: 1-10.

[250] MacDougall 1975: 363 & Larson 2001:4-5.

[251] Larson 2001: 92.

[252] Ovid, Metamorphoses IX. 452.

[253] For further details concerning the nymphae: See Smith, 1922: 8-24, 97-119, 209-234, 320-321, 360-384, 419-433, 583-608, 667-674.

It is worth noting that the term "*nymph*" presents a taxonomic conundrum due to the ambiguity surrounding the designation and characterization of traits associated with the word "*numphê*," which is employed to denote lesser female deities. Simultaneously, it could also denote a young woman who is sexually mature or, potentially, a bride who is about to be married, thus, the term *numphê* is not explicitly used to refer to virginity.[254]

In the Odyssey, Penelope is declaimed as *numphê* by *Eurykleia*, and on classical Attic inscriptions presented to the *nymphae*, the contracts permitted sculptors to show the three *nymphae* as women of different ages but not as crone. The main point is that when applied to a mortal woman, *numphê* refers to her status as a sexual being.[255] The etymology of *numphê* is unknown though some scholars, including Chantraine, suggest thematic links to the Latin *nūbere* ("to marry"), though no definitive etymological connection exists.[256]

The central theme of the early fountains of *nymphae* is derived from one nature, and the literary sources mention that the domus *nymphae* described by Virgil in the Aeneid was the *locus classicus*, in addition to the cave of the *nymphae* mentioned in the Odyssey.[257]

It is worth mentioning that in ancient beliefs and mythology, the majority of *nymphae* are helpful to humans; moreover, nymphae are typically sweet, youthful, and beautiful. However, some nymphae can be harmful.[258]

Nevertheless, *nymphae* are shady and sexually appealing but rarely domesticated and escape mortal women's familial constraints. *Nymphae* are promiscuous and aggressive in transient relationships with humans; such relationships can kill men. Unlike *nymphae*, mythological heroines are punished for promiscuity and violence. Cult heroines often demonstrate their vulnerability to male aggression and are passively available to men.[259]

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[254] Larson 2001: 3.

[255] Andò 1996: 52.

[256] Chantraine Dictionnaire étymologique (1968–80).

[257] MacDougall 1975: 361. See also: Homer, Odyssey XIII & Aeneid I. I66-68.

[258] See also Håland 2009: 105.

[259] For further See; Larson, 1995: 131–44.

In the genealogy of heroes in the Iliad, Homer included *nymphae*, mentioning that human men had intercourse with *nymphae* to produce spectacular children.[260] According to some literary examples, men demanded sex with a *nymph* as a reward, demonstrating the *nymph*'s attractiveness to males.[261] However, Hylas's abduction seems to be the most prominent example of a *nymph* being represented as a sexually active person or predator.[262]

Nymphae have greater bodily autonomy than adolescent mortal women raised in family households; they also have greater sexual promiscuity than goddesses because they live on Earth rather than on Olympus.[263]

Thus, In contemporary contexts, the term *'nymphomania'*—originally derived from the mythological *nymphae* known for their vibrant sexuality—has evolved to describe an exaggerated, insatiable sexuality in women. This modern usage, however, diverges significantly from the more nuanced roles *nymphae* played in ancient mythology, where they were often seen as embodiments of nature's beauty and fertility.[264]

Although there are many tales of heroes who cure, heroine healers are less common. Kearns speculates that this discrepancy is due to societal restrictions on female doctors.[265] Similarly, *nymphae* and heroines seldom share information regarding gaining creative insight or even minor forms of precognition.[266]

It is worth noting that the water lily, scientifically referred to as *nymphaea*, is named after the Greek term νυμφαία (*nymph*aia).[267] Therefore, one possible reason for this connection is that water lilies grow on water surfaces such as springs, which are frequently linked to Greek *nymphae*. Thus, the scientific name of the water lily can be traced back to Greek

[260] Larson 2001: 94.

[261] Ibid.

[262] Theocritus, Idyll 13. See also Ingleheart 2015: 125-153.

[263] Larson 2001: 94.

[264] For further see Luta 2017: 35-50. & Groneman 1993: 337.

[265] Kearns 1989: 19.

[266] For further see, Ibid.

[267] Kiranmai 2023: 226.

origins since the name of the flower itself is rooted in the Greek term "*nymph*aia," denoting the water lily. Also, the *nymphaeum* flowers were frequently linked to the Greek *nymphae*. Hence, the *nymphaea*.

The Roman interpretation of *nymphae* was similar to that of the Greeks, and they were often depicted in artwork and literature as beautiful women associated with various natural settings.[268] The Romans also believed that *nymphae* could influence the fertility of the land, and they would often pray to them for bountiful harvests.[269] This comes from the fact that the Romans frequently adopted Greek divinities.[270] Thus, the continuity of the presence of *nymphae* in Roman mythology is a matter of reasoning.

During the Roman Empire, the worship of the *nymphae* persisted, *nymphae* were depicted and Roman burial inscriptions explained toddlers' inexplicable disappearance, symbolising that the *nymphae* had abducted the children.[271] Nevertheless, it is worth mentioning that several *nymphae* were revered for their *kourotrophic* — divinities who protect young people — qualities, aiding women in childbirth and nurturing their offspring.[272]

Data and historical references about the *nymphae* suggest that the *nymphae* had a penchant for erotica; for instance, the image of the *nymphae* relaxing (see Plate: 3) bares a left breast, may have alluded to the *nymphae*' sensual enjoyment.[273] It is mentioned that the emperor Tiberius dressed young men and women as pansies and *nymphae* and placed them before the grottos in the Capri woodlands to provide sensual pleasures.[274]

The Romans equate the *nymphae* with water, similar to the sense that Hephaestus is with fire or Demeter is with grain. The Romans prayed and made vows to the *nymphae*, or *lympha*, and comparable divinities during drought, much as the Greeks had done before

[268] Beard 2009: 72.

[269] Lefkowitz et al 2016: 29.

[270] Dillon 2019: 4.

[271] Larson, 2001: 70.

[272] Dillon 2019: 6.

[273] Newby, 2016: 85.

[274] Ibid: 131. See also, Suetonius, Tiberius: 43.2.

them. Marcus Varro first recorded the Romans praying to the *lympha* for water.[275] According to Varro, water's *lapsus lubricus*, or "slippery gliding," is the source of the word "*lympha*," which means "water-*nymph*." He mentions that deities are often attributed to various bodies of water, such as Tiberinus, which is associated with the Tiber River; *V'elinia*, with the *V'elinus* lake[276]; and the *Commotiles'* Restless *nymphae*, which are linked to the *Cutilian* Lake. He mentions Juturna, a *nymph* whose primary role is to aid, as indicated by the Latin term "*iuvare*."[277]

Consequently, numerous individuals who are unwell tend to seek water from her spring due to the association with her name.[278] It must be noted that Juturna is an archaic deity from Roman mythology associated with springs. According to certain legends, Jupiter transformed her into a Naiad, or water *nymph*, and bestowed upon her a hallowed well in Lavinium, Latium.[279]

Throughout the Roman Imperial era, the veneration of the *nymphae* persisted. Nevertheless, *nymph*olepsy was commonly perceived as a mental disorder or madness devoid of any positive connotations of imaginative inspiration.[280]

Notably, in ancient times, a prevalent belief existed that an individual who catches a glimpse of a *nymph*'s apparition in a fountain would suffer from complete insanity and mental derangement. This discourse pertains to the cohort of individuals commonly denoted as "*numpholêptoi*" in Greek and "*lymphatici*" in Roman culture. The semantic shift of the expression "seizure by the *nymphae*" to acquire negative connotations seems to have primarily solidified during the Byzantine period.[281]

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[275] Ballentine 1904: 88-90 See Marcus Terentius Varro on the Latin language Book V: 70-73.

[276] "Lake Ventina (VENT) and Lake Piediluco are remnants of what was historically known as Lacus Velinus." See La Porta et al. 2013: 127.

[277] Varro, Ling. V: 70-73; See also Quartarone 2015: 387.

[278] Varro, Ling. V: 70-73.

[279] For further see Seyffert et al 1882: 340.

[280] For further reading See Connor 1988: 882-884; Larson 2001: 62 &288. & Charry-Sánchez et al. 2021: 343-345.

[281] Larson 2001: 62-63 & 288.

3.2. Development, Function, and Architecture of the Roman *Nymphaeum*

The *nymphaeum* is a unique architectural structure that has undergone significant changes in design and function throughout history. Originating in ancient Greece, the *nymphaeum* evolved through the Roman period and into the Renaissance, ultimately becoming a frequent feature in the design of public and private spaces.

The nymphaeum originated in ancient Greece as a grotto or shrine dedicated to the nymphae, believed to be the protectors of springs and other water sources. These early nymphaea were typically small, enclosed spaces with a fountain or pool. In later periods, the nymphaeum was sometimes incorporated into larger public buildings, such as gymnasiums for instance, in Anatolia.[282] Or theatres. In the Asia Minor provinces, the semicircular nymphaeum built at the Ariassos theatre in Pisidia.[283] The concept evolved significantly in Roman times, where nymphaea became more monumental and were often elaborately decorated public fountains, serving both practical and ornamental purposes in urban settings.[284]

Richard summarised the definition of the monumental fountain (*nymphauem*) as follows[285]: a structure intended to hold and flow water, in which water was visible, had artistic appeal, and was incorporated into an architectural and decorative structure that took the form of a façade. This framework was unnecessary because it did not affect the operating ability of the installation.[286]

[282] Kolanci 2020: 84.

[283] Aristodemou 2011(A): 176.

[284] Kolanci 2020: 84 & Burrell 2006: 437-61. See also concerning the Greek grotto nymphaea, Walker 2016.

[285] Richard argues that the term "*nymphaeum*" is used too frequently, applying the term to structures not originally designated as such in antiquity. This research uses the term "nymphaeum" anyway. (See state of the art.)

[286] Richard 2012: 30.

It is necessary to discuss the terminology of Roman water displays briefly. The ancient Romans used approximately 21 distinct designations to refer to fountains, indicating their proficiency in lexical variation when describing their water exhibits.[287]

Nymphaeum in all its terms *(nymphaeum, nymphium, nymfeaum, nymfium, nimfium*) is a transliteration of the Greek "νυμφαῖον". The religious meaning of the word "*nymphaeum*" is "a shrine of *nymphae*." The religious connotation of the name remained intact throughout the imperial era. Throughout the writings of Latin authors, there is a devout preference for the pure, unpolluted stream of water. Frontinus, a historian writing in the second century, uses the word "*nymphaeum*" in its original religious sense, *"fontium memoria cum sanctitate adhuc extat et colitur*"[288], prompting the French academic Pierre Grimal to provide some reasonable criticism of the frequently inappropriate use of this term in modern literature.[289] Grimal criticises the misuse of the term '*nymphaeum*' by certain scholars, particularly its inappropriate extensive application in referring to Roman fountains in general, as observed by both Grimal and Richard.[290] The word was found in Pliny the elder manuscripts, as he mentions the *Nymphaeum* of Corinth.[291]

In the 'Dictionnaire des Antiquites Grecques et Romaines,' the entry for '*nymphaeum*' demonstrated, for the first time, an interest in Roman installations other than the various structures collectively referred to as '*nymphaea*.' Despite this, Monceaux continued to adopt an etymological approach, distinguishing the '*nymphaeum*' portion from a section encompassing lesser fountains grouped under the term *'fons*.' Here, *'fons'* is a Latin term signifying 'spring' or 'fountain', referring to natural water sources that flow from the ground, often giving rise to small streams or pools. This distinction emphasises

[287] The terms include: *alveus, cantharus, castellum [aquae/divisorium], cisterna, concha, crater, euripus, hydreion/ὑδρεῖον, hydrekdocheion/ὑδρεκδοχεῖον, labrum, lacus, Meta Sudans, munus, nymphaeum/νυμφαῖον, phiala, puteus, saliens, septizodium, silanus, and solium. Extracted from: Rogers, 2018. 46.*

[288] Frontinus Book. IX; See also Aken 1951: 272.

[289] Grimal 1943: 324.

[290] Ibid & Richard 2012: 3-8.

[291] Pliny, Hist. Nat., XXXV, 43.

Monceaux's focus on the continued significance of springs and fountains, cherished for their sanctity and memory.[292]

The term νυμφαῖον was also used by the Greeks to refer to a structure designated for hosting weddings. The correlation between water and the processes of creation and renewal resulted in the *nymphae* being linked to the institution of matrimony and the ceremony of bathing the bride.[293] During the Hellenistic era, it encompassed residential areas and public fountains emulating natural surroundings. These features served as avenues for physical and spiritual rejuvenation; references to artificial grottos during the Hellenistic era are obscure and pertain to Ptolemaic-era residences.[294] According to Tell, the *nymphaeum* during Roman times was a remarkable architectural structure commonly used to celebrate marriages.[295]

Based on Callixenus of Rhodes, a simulated cavern was erected to facilitate a procession in honour of Ptolemy II Philadelphus, according to an inscription.[296] Another *nymphaeum* was consecrated to Ptolemy IV Philopator and Queen Arsinoe at Itanos, Crete.[297]

Nymph worship, traces back to Corinth and its colonies such as Syracuse and Corcyra, with significant cultic activity also concentrated in Attica, where numerous sanctuaries and caves dedicated to *nymphae* and Pan were established post-Marathon (490 BCE); this cult spread widely across the Greek world, including notable sites like the Corycian Cave above Delphi's Apollonian sanctuary.[298]

The Roman period saw the *nymphaea* develop in size and complexity. The Romans incorporated the *nymphaeum* into their public urban architecture, often featuring it as a central element in their public baths, which served as social gathering places. The

[292] Monceaux 1877-1919: 129-132.; See also Pliny, Hist. Nat., XXXV, 43-4. And Grimal 1943: 324.

[293] For further see Settis, 1973: 687 &Kopestonsky 2016: 715 & See Genov 2023: 9.

[294] Callixenus of Rhodes, FGrH 627 F2= Athen. See Popescu & Futre. For Further Longfellow 2005: 334.

[295] Tell 1969: 32.

[296] See PHRC 015/ Permanent ID http://s.phrc.it/phrc015. (accessed 13/June/2023)

[297] For further See Callixenus of Rhodes, FGrH 627 F2= Athen. & Settis 1965: 247-257 & Longfellow 2005: 334.

[298] Genov 2023: 40.

nymphaeum's architectural elements became more decorative, featuring intricate carvings and mosaics.[299]

The evolution of the fountain's architecture and the worship of the *nymphae* were distinct processes. The designation "*nymphaeum*" was initially used to denote grandiose public fountains in the eastern and North African regions before it gained popularity in Rome.[300]

According to Kolanci, *nymphaea* were strategically placed near other significant public buildings within the city, such as gymnasiums or theatres, as part of a thoughtful urban design. The primary purpose of this arrangement was to proudly showcase the city's prosperity and grandeur, emphasising how these impressive structures harmoniously coexisted with one another.[301]

During the Renaissance, the *nymphaeum* was revived as a decorative element in private gardens and villas. The architectural elements of the *nymphaeum* were refined, with a greater emphasis on symmetry and proportion. The *nymphaeum* also symbolised wealth and luxury and was often used to showcase the owner's taste and refinement.[302] However, it is suggested that the term "*nymphaeum*" gained popularity during the modern era, particularly in the Renaissance, as it was used to denote fountains that often featured a grotto-like aesthetic in Italian villas.[303]

However, the term *nymphaeum* only surfaced in literature in the late decades of the 2nd century AD. It was used only to refer to monumental fountains. Therefore, the term *nymphaeum* has been applied to enormous public water fountains since Roman times. However, besides its essentially religious connotation, the term "*nymphaeum*" came to be employed in a far broader sense throughout the years.[304]

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[299] MacDonald, 1986: 93.

[300] See Lavagne 1988: 300 & Longfellow 2005: 335.

[301] Kolanci 2020: 84 & Forschungen 1953: 27.

[302] For further see Alvarez 1981: 2 & Rodrigues, and Carmen 2020: 253-279.

[303] Richard 2012: 4-6 See also concerning the Greek grotto *nymphaea* Walker 2016.

[304] Aken 1951: 272.

Most Latin authors during the first and second centuries AD upheld the Greek and Hellenistic connotations of the term. Specific authors employed the term to denote indigenous religious customs of an ambiguous nature.[305] The word in Latin did not share the same indication as that in Greek, which is of a religious cave of the *nymphae*—being used for artificial caves, not only the natural sanctuaries for the *nymphae* found in nature. According to Lugli, *nymphaea* became known as fountains and, more generally, any elaborate fountain design or garden memorial, places where the Romans went to get away from heat and to relax, where the religious aspect was often replaced, if not entirely, at least to some degree, by the need for adornment and pleasure.[306]

It is imperative to note that the cave is referred to as a *'nympharum domus*,' meaning 'house of *nymphae'* or 'dwelling of *nymphae'* in the chapter of Vergil's Aeneid that is based on Homer, although the term *'spelunca*,' meaning 'cave' or 'grotto' in Latin, as well as the term 'antrum,' meaning 'den' in Latin, are applied to characterise caves elsewhere; they are not inherently linked to a *nympho*, but they might have fountains.[307]

According to Jean Pierre-Adam, the term *nymphaeum* is used for ornamental fountains and the presence of muses The Pirene fountain at Corinth, which is the most significant ancient fountain still standing, reveals how the Greeks influenced the Romans. The Romans renovated it by applying a massive façade facing a vast basin.[308]

Due to philological controversy, "*nymphaeum* "and "fountain" are used interchangeably to describe archaeological monuments that emulate *nymph* caves and grottos. However, the term *nymphaeum* needs to be more suitable and dismissed for usage in simple fountain pools and other architectural forms of fountains; thus, one cannot help but lament the tendency to use the word *nymphaeum* for any structure uncovered.[309]

[305] Pomponius Mela 2.3; Plin HN 35.151; Lucr. 5.948-51; Apul. Met. 2.4.23.

[306] Lugli 1938: 156.

[307] Ovid, Metamorphoses. I l l, 157-162. & Neuerburg, 1960: 29-30.

[308] Adam 1994: 237-238.

[309] Ibid.

According to Richardson, the term '*nymphaeum'* is an umbrella term for decorative fountains.[310]

Due to the lack of ancient usage of the terms concerning *nymphaeum*, the term *nymphaeum* raises a bit of a dilemma. Thus, the Renaissance definition of the word is more straightforward, based on Greek rather than Latin philology, and is used to describe the water fountains in villas of that time.[311] Thus, the Renaissance adaptation of the term inspired the architects who often placed *nymphaea* in enormous villas.[312]

The *nymphaeum* was initially employed as a detailed and honoured sanctuary building dedicated to the *nymphae*.[313] Hence, *nymphaea* were built in sacred matter around wells or freshwater sources during ancient Greek and Hellenistic times. However, during Roman times, the *nymphaeum* structure was not necessary to be placed near or surrounded by a water spring. It was erected alone in Roman cities and main streets. The *nymphaeum* is a frilly construction and consists of a public fountain and piscina; however, its function was not necessarily to provide water. It is mainly used to garnish the main streets.[314]

Many classical cities had a *nymphaeum* structure within their boundaries, such as Tipase, Olympia, Ephesus, Gerasa, and Amman; the structure of the *nymphaeum* usually contained not less than one row of niches, orders, and statuary constructed behind a basin.[315]

Water was always an essential ingredient in rituals, particularly in the cults of the healing gods; hydraulic systems were frequently installed in these sanctuaries.[316] Hence, many *nymphaea* were constructed in different Roman cities during different periods. For instance, an Antonine *nymphaeum* was erected within the region of the Apollo sanctuary

[310] Richardson 1992: 152.

[311] See Alvarez 1981: 2-4.

[312] Neuerburg, 1960: 5-14.

[313] Yegul 1992: 492.

[314] Segal 1997: 151.

[315] Macdonald 1986: 103.

[316] Ginouvès et al. 1996: 25-27.

beside the Praetorium at Gortyn; it is mentioned that *Marcus Aurelius* asked to put up a *nymphaeum*, too, in honour of the local *nymph* Dictynna.[317]

The acclaimed Roman architect Marcus Vitruvius Pollio affirms the importance of water as an essential life feature and the delights and infinite services it provides because of its gratis. He describes it as a chief requisite for life.[318] Therefore, according to Coulton, an elaborate *nymphaeum* has a pleasant effect on the cities in which it is present..[319]

The *nymphaeum* contributed to society by being more than a visual monument. It provided recuperation to the city's people and visitors, giving a sense of comfort acoustic-wise by the sound of the streaming water. In addition, when people's eyes meet a streaming water source, a sense of tranquillity is felt, learning that water is available within the city.[320] According to Yang and Kang, including water elements in urban squares enhances the acoustic environment by significantly improving the soundscape quality in these areas.[321]

Not only were the previous functions served by the *nymphaea*, but it was also a pooling area and assembly. *Nymphaea* were erected near or inside an agora, sometimes at the city's gateways or on the side of central streets in ancient Greek cities, as most people gather in these places daily.[322] The previously mentioned remarks concerning Greek *nymphaeum* also apply to Roman *nymphaea*.

During the Roman era, monumental fountains often included an open-air basin to display water rather than a covered portico. A cascade of water might also be created by raising the water level over the basin to a particular point. Water falling in various forms, producing different visual effects and noises, is another aesthetic effect creation method. Water flowing slowly into the basin created a tranquil, harmonious water curtain. In

[317] Longfellow 2011: 136-139.

[318] See in Pollio translation 1914: 223-225.

[319] Coulton 1987: 82.

[320] Uğurlu 2004: 29.

[321] Yang & Kang 2005: 78-79.

[322] Crouch 1993:284.

contrast, the rapid pouring of water via a significant and/or high-pressure conduit transformed the stream into a frantic, white, and chaotic cascade. A similar appearance was produced when water overflowed the parapet enclosing the basin.[323]

The *nymphaeum* building was a gathering place for poets, philosophers, and other cultural participants. The site of the *nymphaeum* had political importance; politicians used it to campaign themselves by paying reasonable amounts of money to structure these masons, thus increasing their political status in the eyes of the public, who used the *nymphaeum* structure for different purposes. In addition, the *nymphaeum* buildings spread vitality vibes within the city of its presence.[324]

The *nymphaeum*, a public fountain, plays an amenity role in serving the public. Susan Walker notes that there is a certain population level that the people of the city must fulfil for such an investment to be set; she adds that erecting a massive fountain supplied by well-designed aqueducts requires sufficient money, expertise, and effective control over the province in question, bearing in mind the capacity to maintain a complex system and a population, whether resident or visiting, of sufficient size to merit the investment.[325]

Uğurlu states that integrating passage buildings may effectively tackle the issue of monotony in urban design and accommodate diverse architectural contexts. This integration facilitates the organisation of the urban environment into cohesive and comprehensible entities. Consequently, the readability, distinctiveness, and prominence of the urban fabric are enhanced through the emergence of a unified effect.[326]

It was notably more common in the eastern regions for Roman *nymphaea* to be situated near the market and crowded areas, mainly near the *cardo* and *decumanus* crossing

[323] Richard 2012: 30.

[324] Waheeb 2006: 7-8.

[325] Walker 1987: 61.

[326] Uğurlu 2004: 29-31.

points.[327] For instance, the Amman *nymphaeum* was structured on the south side of the *decumanus maximus* and very close to the crossing point of *cardo* and *decumanus*.[328]

A landmark is an element in an urban setting that is external to the observer and that marks the location of other objects or sites. A landmark might have visual characteristics, have a unique intent or meaning, or be centred on a prominent location that makes it effective as a landmark.[329] Not only might massive architectural structures be considered landmarks, but street furniture may also act as landmarks.[330] Thus, the *nymphaeum* can be regarded as a significant landmark or a form of street furniture. Its strategic placement contributes to its visual prominence and fosters its role as a focal point that draws people for relaxation and social interactions. Therefore, *nymphaea* align with the concept of landmarks as visual foci, reinforcing their significance within urban landscapes.

Predominantly in Eastern nymphaea, the nymphaeum serves as a significant passage structure that helps break up the cityscapes' monotony by providing a unique architectural focal point. It divides the city into manageable sections that can be understood at a glance, consequently producing a cohesive effect that aids in navigating and memorizing the urban fabric.[331]

The nature, scope, and substance of these accessible publications highlight the difficulty of investigating monumental Roman fountains. In contrast to other public, functional, and ornamental facilities in Roman towns, massive fountains are among the least researched structures. Compared with other water-related systems, such as cisterns or bath facilities, monumental public fountains are not generally among the most well-preserved remains of historical towns, except in the eastern Mediterranean.[332]

Most of a passage's architectural features are ancillary, representing different varieties of "half-buildings" that neither have entrances nor interiors; like entrances, they are public

[327] Waheeb 2005: 71.

[328] Hadidi 1970: 79.

[329] See Sadalla, et al. 1980: 516- 528. & Appleyard 1969: 131-156.

[330] For more see Moughtin 1992: chapter XI.

[331] Uğurlu 2004: 30.

[332] Richard 2012: 1.

facilities that should not be used as such. Most often observed at armature junctions and deflections, at entry and crossroads, and along thoroughfares and plazas, passage structures represent a halt along the armature without obstructing movement.[333]

The passage buildings were identifiable in their immediate surroundings, even as they contributed to the city's overall architectural harmony and cohesion. They were there so that others would know where they were and could be identified. The apparent intent of the passage architecture was to be observed by the public. The Roman metropolis was built with visibility, recognition, and awe in mind. Therefore, the "mobile" urban design that promotes circulation would have effectively raised public awareness inside the city. No matter how beautiful a building may be, its overall appeal will be enhanced if it also offers features such as easy access and the provision of public facilities.[334]

Street furniture elements inside a city are essential in increasing the *city's genius loci* in its modern term, “the spirit of the place” or *genius loci* emphasises the idea that a place has a spirit or essence that goes beyond its physical attributes. By being part of the city's urban fabric, street furniture provides the city with more cultural value and asserts the city's visual image. Hence, providing a better understanding of the site and surroundings. *Nymphaea* are usually located at the base of a city and are structures of purpose and function; They are considered valued landmark due to their uniqueness. Therefore, *nymphaea* provided a certain amount of *genius loci* to the cities it stood in, as it is highly possible that by functioning as a fountain, it was used by the people who came near it for drinking or any other leisure or resting needs. Thus, an emotional bond might grow in people towards the *nymphaeum*.[335] In addition to the *nymphaeum*'s role in bringing nature to the city, it was "the civilising presence of water" within the city.[336]

Nevertheless, it is worth mentioning that *genius loci* is used also to describe another divinity of the Roman period, although *genius loci* as divinity were not typically associated with *nymphaea* in the same way as *nymphae* were, the shrine located in

[333] MacDonald 1986: 74.

[334] Uğurlu 2004: 31-32.

[335] See Uğurlu 2004: 30-33.

[336] Yegül 1994: 107.

Carrawburgh was dedicated to the *nymphae* and *genius loci*, it stands out as the Roman site in Britain with the highest quantity of inscriptions specifically dedicated to *nymphae*.[337] Thus, the inclusion of both the *nymphae* and the *genius loci* in the dedication may suggest the presence of a distinct regional belief system or customary practise. However, that cannot be determined, and the term is used in this dissertation to describe the sense of "the spirit of the place.

It is important to note that in the Eastern context, the *kalibé* structure becomes a subject of debate when attempting to define it within the framework of a *nymphaeum*. Questions arise as to whether this structure should be classified as a *nymphaeum* or a *kalybe*. Therefore, it is crucial to clarify the definition of a kalybe and some of its main elements. The *kalybe* stands out for having a raised, tripartite, open structure accessible by a staircase. This structure likely served the purpose of showcasing statues.[338] The *kalybe* is atypical regarding religious public buildings commonly functioned as gathering spaces, although certain scholars have posited their inherent sanctity.[339] According to Ball, the structure is posited to be a Nabataean architectural design and may be related to Petra's rock-cut facade.[340]

Scholars identify certain buildings as kalybe masons due to their resemblance in architectural design to structures bearing this appellation in ancient inscriptions, such as Umm As Zeitūn and Shaqqā; they are all situated in southern Syria. [341] Such an example is that Butler asserted that the Exedra of the forum of Philip the Arab at Shahbā and the *nymphaeum* at Bosra were kalybe structures.[342] Ball adds that the *kalybe* mason exhibits a solid resemblance to the *nymphaeum* and may have potentially undergone evolutionary changes from it, noting that it possesses distinct characteristics that set it apart. Primarily,

[337] Collingwood & Wright 1969: 1526-1547; See also Jones-Williams 2020: 20.

[338] Mazzilli 2018: 2 -3.

[339] For the sacred nature of kalibé: Clauss-Balty 2008: 271–3; For further see Mazzilli 2018: 2-3.

[340] For further see Ball 2002: 193, 292-293.

[341] Mazzilli 2018: 2-3.

[342] Butler 1904-09 PAAES II: 382.

the kalybe functions as a public facade or a stage-like structure, exclusively intended to exhibit statues devoid of any water fountain features.[343]

3.3. The Typology and Chronology of *Nymphaea*

From its early expressions in the sixth century BC to the twenty-first century, the notion of a public fountain has altered tremendously, leading to an almost complete lack of practical purposes that distinguish the fountains that decorate our contemporary avenues.[344]

Establishing a unified classification system for the diverse types of *nymphaea* proves challenging because of their wide-ranging architectural and functional characteristics. *Nymphaea* structures underwent evolutionary changes across different cultural contexts, spanning the Greek, Hellenistic, and Roman periods. Introducing distinct features and styles during each era poses a classification challenge within a singular typology.

From a social perspective, two primary classifications of *nymphaea* exist: public and private. The Romans added elaborate embellishments to public *nymphaea* to express their pride or pay tribute to significant individuals. Private *nymphaea*, typically situated on exclusive properties, served as recreational spaces for leisure and amusement. Certain private *nymphaea* were used in religious rituals to pay homage to deities or revered figures.[345] An example of private *nymphaea* are The four *nymphaea* at Villa Hadriana originate from the villa's earliest construction phase in the early first century BC. Similarly, the two *nymphaea* at the Villa ad Esedra near Anguillara were built during Sulla's era in the late second to early first century BC.[346] However, many *nymphaea* dating to the renascence period were constructed in villas all around Italy.[347]

As this research revolves around the *nymphaea* of Jordan, the exact typology of the *nymphaeum* remains a matter of debate. Thus, one can argue that the *nymphaea* in Jordan

[343] See Ball 2002: 292.

[344] Richard 2012: 28.

[345] For further See Neuerburg 1960 & Richard 2012.

[346] Van Aken 1951, 273.

[347] See Neuerburg 1960.

combines different types of *nymphaea* architecture forms. For instance, the Amman *nymphaeum* is the result of a combination of different masons, and some theories mentioned in this research[348] suggest that the Amman *nymphaeum* might have been a *kalybe* structure that evolved architecturally into a *nymphaeum* structure. This thought is legitimate, as the massive size of the monument does not align with the main features of the *nymphaeum*.

In the following section, this research attempts to make a typology that the author has derived merely from scholarly discussions on *nymphaea* and fountains in ancient Greek, Hellenistic, and Roman contexts. This classification explains the varied architectural forms and functions of these structures. Our analysis aims to clarify the historical and architectural elements of the subjects. To begin with, it may be observed that the basic chronological order of *nymphaea* evolution can be set as follows:

- The Greek *nymphaea* were generally characterised by their modest size and relative simplicity; for instance, Theagenes' fountain.[349] These structures were usually constructed within grottos and caves, functioning as sanctuaries or providing access to drinking water while serving as sites for various ritualistic practices.
- The Hellenistic *nymphaea* exhibited subtle enhancements that strongly emphasised ornamental elements and grand architectural features. During the Hellenistic era, the *nymphaeum* monument did not hold significant prominence within the architectural landscape. Nonetheless, this architectural edifice exhibited a remarkable octagonal or polygonal configuration, showcasing a grandiose scale of construction, which can be seen in the late-Hellenistic niche *nymphaeum* at the archaeological site of Sagalassos, which dates back to the 1st century BC.[350] Another example of this period is the Winged Victory of the Samothrace

[348] See Chapter One the Introduction and Chapter Five, the nymphaeum of Amman in this research.

[349] Neuerburg 1960: 76.

[350] For details concerning the *nymphaea* of Hellenistic period See Wikander 2000:429,442- 447 & see Richard 2012: 38-40, For Sagalassos Hellenistic period *nymphaeum* see: Van Balen, and Semih. 1999: 105-118; and Patrício & Martines 2010: 78-80.

Fountain, which is a new development of the Hellenistic period, due to the Hellenistic taste for combining sculpture with water culminated in new developments such as the integration of dynamic sculpture with water features in *nymphaea*, and fountains, significantly enhancing their aesthetic and functional impact within architectural settings..[351]

- The Roman *nymphaea* had more elaborate and grandiose characteristics than the *nymphaeum* structures of prior periods, featuring multiple levels, elaborate facades, and ornate sculpture. The Roman *nymphaea* were used as fountains, monuments, or public spaces for social and cultural events; this will be emphasised in upcoming chapters of the research. The Roman *nymphaea* exhibited a variety of styles and functions, as evidenced by their construction and operation. During the ancient Roman era, these edifices were used to embellish gardens and courtyards, cities, fora. The structures consisted of diminutive chambers designed to accommodate sculptures and aquatic elements. With time, *nymphaea* were transformed by Roman architects and builders into imposing structures featuring vaulted ceilings and columns reminiscent of basilicas.[352] *Nymphaea* were installed in public structures such as baths, monuments, and sites of glorification for *nymphae*.

Concerning the typology of the *nymphaea*, Richard contends that an excessive emphasis on architectural typology related to the *nymphaea* can lead to methodological challenges, as it can be challenging to differentiate the *nymphaeum* from other fountains and grottos, mainly because of the widespread presence of big and tiny fountains from different periods.[353] However, typological categorisation serves a dual purpose: to aid architectural and stylistic comparisons for chronology and enable diachronic analysis of evolutionary trends. However, a significant concern arises as these approaches can fragment architectural ensembles, subjecting them to isolated analyses of style and time. Notably, attention to distinct ground plans, façade shapes, and storey counts often results in

[351] Richard 2012: 39.

[352] For further See Aken 1951: 273.

[353] For further see Richard 2012: 7-15.

ensembles detached from broader chronological contexts. This propensity for excessive analysis and categorisation is evident in publications, yielding intricate yet unproductive classifications. Consequently, understanding fountains as functional and artistic urban elements remains constrained.[354]

Thus, typological classifications often stand strong until emerging research suggests a requirement for revised typologies. However, it is vital to understand that the intricate features of *nymphaea*, which include a variety of architectural details and subtle contextual influences, introduce hurdles that can complicate the process of classifying *nymphaea*.[355]

Neuerburg outlines several common architectural styles and layouts in fountains and *nymphaea*. According to him, the evolutionary roots of the *nymphaeum* design can be traced back to springs in caves that formed the foundation of various types. The primary type emerges as an artificial transformation of natural caves that previously housed springs, representing the most fundamental form. Neuerburg also classifies rock-cut chambers as cave *nymphaea*.[356] An example of this type of *nymphaea* is the *Castalia* at the *Delphi* rock-cutfountain.[357]

The "Chamber *nymphaeum*," a later development according to Neuerburg, evolved from the cave *nymphaea* and rock-cut chambers. It encompasses a rectangular space with niches in the walls, often featuring an apse or rectangular recess at the rear. Some structures of this type adopt a central nave with side aisles divided by colonnades. Such designs metaphorically mimic natural caves and are occasionally adorned with grotto stones to enhance the effect. However, the popularity of chamber *nymphaea* wanes as the

[354] Richard 2012: 13-15.

[355] See Ibid.

[356] Neuerburg 1960: 15-18.

[357] For further Ibid: 22-23.

Empire declines.[358] An example of this type of *nymphaea* is the Kanatha (Qanawat) *nymphaeum* in Syria.[359]

The exedra *nymphaeum* has a semicircular design comparable to a typical niche-filled, half-domed ceiling design. Straight wings are constructed on each side of the exedra, or a series of pillars are set up in the vicinity of the curve. According to Neuerburg, it appears that the Eastern Empire was where the exedra *nymphaeum* began. The exedra *nymphaeum* is a type of *nymphaeum* that is more frequently used because of its open design. It suits larger schemes and is preferable to the chamber *nymphaea* type.[360] Examples of this type include the *nymphaeum* of Lepcis Magna.[361]

The aedicula *nymphaeum*, a simplified variant of the more elaborate exedra *nymphaeum*, features a central niche that evokes the original cave setting. Sharing both a cave origin and a semicircular layout with the exedra *nymphaeum*, the aedicula or niche fountain is conceptually aligned, as it also adopts an open-air design, and the aedicula *nymphaeum* is considered one of the most approachable among various types. Neuerburg notes that the "round *nymphaea*" or "polygonal *nymphaeum*" represents a more challenging architectural form due to its less typical appearance.[362] Neuerburg explains that these *nymphaea* are examples of the middle-class *nymphaeum*, an ornamental fountain catering to the general populace or the working class. The fact that they can be found in Pompeii lends credence to his claim that the city was inhabited primarily by people from this social class.[363] An example of this type is the Casa Della Fontana Grande in Pompeii.

Given that they are not widespread as a classification, many supposedly recognised *nymphaeum* structures had other purposes. The last type is the façade *nymphaeum*, which appears farther from the actual holy grotto of the *nymph* than any other form. While this fountain style was typical across the Roman Empire, it was incredibly well-liked in the

[358] Neuerburg 1960: 32.

[359] Bruennow & Domaszewski 1909: 142-45 for further See also Neuerburg 1960:34-41.

[360] Neuerburg 1960: 50.

[361] See Chapter Four of this research.

[362] Neuerburg 1960: 60-70.

[363] Neuerburg 1960: 60.

Eastern provinces, where it could better accommodate the larger populations. The original development of the façade *nymphaeum* occurred in the east, similar to the Exedra *nymphaeum*.[364] A famous example of this type of *nymphaeum* is that of Alexander Severus in Rome.

In this research, the main types of *nymphaea* structures discussed in the coming chapters from Neuerburg's typology are the exedra and façade *nymphaea*, since the *nymphaeum* structures found in Jordan fall into this category. Gerasa's *nymphaeum* is an exedra *nymphaeum*, so are both Gadara and Petra's *nymphaea*. Although no structure is visible or above the surface of the *nymphaeum* of Pella, the coinage with its figure displays its resemblance to the Severian *nymphaeum* exedra type, the same as Gerasa. Amman's *nymphaeum* fits within the category of façade *nymphaea*. However, it consists of a unique polygonal shape.

Longfellow mentions that monumental *nymphaea* are displayed much more within the Mediterranean area than in any other place in the Empire.[365] Longfellow states that Neuerburg employs the term *nymphaeum* for all monuments that emulate *nymphae*' caves and fountains of a particular architectural nature.[366]

Correspondingly, Richard highlights that the uncritical and exaggerated use of ancient terminology often obscures the more nuanced reality of building typology, noting that such terms are too vague.[367] Hence, the attempts to clearly define the monumental Roman fountain on the basis of antique and modern terminology still need improvement. The only valid alternative is a definition based on the material evidence itself. Two classifications can be proposed: a definition based on architectural typology or a classification based on functional and decorative properties that go beyond the level of building types. Thus, a more direct definition of the installations structured on

[364] Ibid: 76-80.

[365] Longfellow 2005: 342.

[366] Ibid: 336.

[367] Richard 2012:7.

architectural bases instead of a definition based on terminology attracts more flexibility and exhaustiveness to research than older research.[368]

Richard provides an overview of the different monumental fountains in the Eastern Mediterranean during the Greco-Roman period and mention the following types of monumental fountains in the Roman imperial period:[369]

To summarize the various types in the forthcoming discussion, Table 1 has been prepared to categorize the different nymphaea as classified by scholars. This serves as a foundation for a detailed comparison of the differing typologies identified across the literature.

- **The Curved monumental fountain.**

This type of fountain is found in the record in Asia Minor 1st AD, a potential modern development in the Levant, where it is only attested from the early 2nd century AD. Onwards. Far away from the spring, the structure is semi-circular, with a back wall framing a water basin dosed off at the front with a parapet plain back wall, no statuary is visible, upper half-dome, omega-shaped variant, with lateral wings.[370] An example of this type is the Pergamon fountain in the Demeter Sanctuary (plate 4).

Richard further explains that the monumental, curved fountain entered a second phase of evolution in the 2nd century AD, onwards. This evolution occurred in Asia Minor and probably the Levant, indicating that the improvement in the structure is found in the use of statuary niches and tabernacles. Some fountains have begun to become of open-air type fountains. Richard notes the omega-shaped fountain variant in the Levant, adding that this type was structured in different areas of the Empire during the early *Antonine* and *Severan* periods. According to him, one of these monuments is Gerasa's *nymphaeum*.[371]

- **Façade *nymphaeum***

[368] Richard 2012: 8-10.

[369] Ibid:41-45.

[370] Richard 2012: 40-45.

[371] Ibid.

The façade *nymphaeum* is a monumental fountain complex with a facade decorated with sculptures, fountains, and paintings, "Façade *nymphaea*" indicates a monumental fountain construction that embraces a columnar facade shaping exedrae and *aediculae*, niches in the rear wall, and often side wings.[372] According to Richard, this type is subdivided into two categories: the first is the flat façade *nymphaeum*, while the second is the Pi *nymphaeum*. Both categories, the flat and the Pi, were constituted in Flavian times.[373]

The "flat façade" *nymphaeum* development occurred in Asia Minor during the first half of the 1st century AD. The structure is a flat, single, or two-storied façade fronted by a quadrangular open-air basin, tabernacle architecture, and the development of large-scale statuary programmes.[374] A great example of this type is the famous *nymphaeum* of Sagalassos, which dates to the early 2nd century AD.

The Pi-shaped (Π) façade *nymphaeum* was also found during the first half of the 1st century AD. However, to some degree, its architectural characteristics differed. It had a façade with perpendicular projecting wings framing an open-air water basin; it could have reached three stores high, not just two, with a statuary displaying tabernacle architecture. An example of this type of *nymphaeum* that dates to the Flavian period is the Miletos *nymphaeum*. It is worth noting that according to Aristodemou, the façade *nymphaea* are divided into three categories: semicircular (sigma) *nymphaea*, *nymphaea* with apses, and rectilinear *nymphaea*.[375]

- **Circular fountain**

The circular fountain is Monopteros, a Tholos architectural shape, it evolved through the late Classical/early Hellenistic period. However, the formal transfer to fountains is unknown; the shape contains a Circular row of columns associated with a rounded water basin inside, forming the Monopteros. It might also contain a Circular row of columns

[372] Aristodemou 2011: 165.

[373] Richard 2012: 40-45.

[374] Ibid.

[375] Ibid & Aristodemou 2011: 165.

with room inside and a basin around it, thus, the tholos shape.[376] The presence of this type has been documented in Asia Minor, Greece, and the Levant.[377] An example of this type of *nymphaeum* is the Argos's monopteros fountain on the agora, which dates to Flavian/ Antonine period.[378]

Dorl-Klingenschmid introduced a basic typology rooted in architectural principles. The classification of fountains can be categorised into four main types according to her: the plain fountains with steps, the stoa-type fountain house seen in the Classical and Hellenistic periods, the sigma-type or monumental fountain with a semicircular plan, and the facade-*nymphaeum*, which includes fountains with a rectilinear facade, with or without protruding lateral wings.[379]

Ginouvès et al. note that the functional specification of the monumental Roman fountain should be based on two factors:

1. The fountain's practical features include its symbolic significance and hydraulic, architectural, and aesthetic elements.
2. The size and scope of these factors, which might vary greatly, will aid in distinguishing between "monumental" and "simple" fountains. Regardless of its dimensions or style, a fountain is an artificial structure that enables water extraction.[380]

Looking into *nymphaea*'s typology reveals the diverse nature of these structures. The *nymphaeum* structure's design and functions made Roman landscapes look better. It was also shown in both public and private settings. The previous subsection discussed the different types of *nymphaea* and their uses, from simple Greek structures to more complex Roman fountains. It displays those different types of *nymphaea*, aligned with the

[376] Richard 2012: 40-45.

[377] Ibid.

[378] Ibid.

[379] Dorl-Klingenschmid 2001: 39-60. & See also Jacobs and Richard 2012: 10-70.

[380] For further see Ginouvès et al 1998: 92-95.

role they were meant for, and how in ancient civilisations they affected art, culture, and city planning.

Table 1: The Varied Types of Nymphaea as Classified by Scholars

Type	Description	Author(s)
Cave *nymphaeum*	An artificial transformation of natural caves that previously housed springs. Often features niches and a pool.	Neuerburg (1960), Longfellow (2005)
Chamber *nymphaeum*	A rectangular space with niches in the walls, often featuring an apse or rectangular recess at the rear. May have a semicircular apse at one end.	Neuerburg (1960)
Façade *nymphaeum*	A *nymphaeum* that appears farther from the actual holy grotto of the *nymph* than any other form. Often has a columnar facade with niches and a pool in front.	Neuerburg (1960), Richard (2012), Longfellow (2005), Dorl-Klingenschmid (2001)
Aedicula *nymphaeum*	A simplified variant of the more elaborate exedra *nymphaeum*, features a central niche that evokes the original cave setting.	Neuerburg (1960)
Round *nymphaeum*	A circular or polygonal fountain. May have a central pool or basin.	Neuerburg (1960), Longfellow (2005)
Curved *nymphaeum*	Semi-circular, with a back wall framing a water basin dosed off at the front with a parapet. May have statuary or other decorative elements.	Richard (2012)
Based on functional specification *nymphaeum*	Fountains with a large scale and complex architectural design, with a focus on their symbolic significance, hydraulic, architectural, and aesthetic elements.	Ginouvès et al (1998).
Plain fountains	Fountains with a simple design, consisting of a basin and a few steps.	Dorl-Klingenschmid (2001)
Stoa-type fountain house	A fountain that is part of a stoa, a covered walkway. Often has a colonnade and a water basin.	Dorl-Klingenschmid (2001)
Sigma-type or *nymphaeum* with a semicircular plan	A fountain with a semicircular plan, like the exedra *nymphaeum*. Can be considered type of the exedra.	Dorl-Klingenschmid (2001), Neuerburg (1960), Richard (2011)

Chapter Four

Beyond Jordan: Roman *Nymphaea* in the Southern Levant and other regions of the Roman Empire

Today's north and southwest Jordan were part of Roman Syria and the Roman Province of Arabia. Thus, many archaeological relics are found in Jordan, mainly in the major cities that flourished during the Roman era, such as Gerasa (Jerash) and Philadelphia (Amman). However, this chapter investigates the *nymphaea* outside today's Jordanian borders and within the same Roman region in the Levant. This broader examination allows for placing the studied nymphaea within a wider architectural and cultural context, facilitating a more comprehensive understanding and enabling future researchers and scholars to make more informed comparisons.

The Roman *nymphaea* of the southern Levant shares some elements in the architectural design and the dimensions of buildings. Thus, mentioning other *nymphaea* in the same region is essential when investigating the Roman *nymphaea* of Jordan. The *nymphaea* structures of the southern Levant contain a basic design; they are usually considered a facade *nymphaeum*, as these monuments commonly contain a straight wall, niches in the centre, and two floors. Ahead of the wall, a pool is streaming with water. *Nymphaea* are usually situated at the city's centre or near its gates. The *nymphaea* are considered valuable to the people of the city. Also, it is an excellent display of wealth and luxury; the city of its construction has the presence of water, the essential element of life.

4.1. Suweida *nymphaeum*

Suweida, formerly known as Soada, is located on the western slopes of Jebel al-'Arab, with an elevation ranging from 1000 to 1100 metres. The ancient name Suweidā' is supported by inscriptions, and its name as Dionysias during Roman times is confirmed by inscriptions from the era of Emperor Commodus.[381] The evidence for Suweida's transition to city status could be more precise. The notable aspect of its history is its connection to Canatha, 1250 metres away. Canatha probably achieved city-state status

[381] See IGLS (inscriptions grecques et latines de la Syrie) XVI 321& Bowersock 2003:345.

under the governance of Aulus Gabinius in Syria from 57-55 BC. Excavations conducted in the 1990s revealed the city layout of Suweida. However, during the 2nd century AD, the city came to be known as *Dionysus*, while in the Nabatean era, it was referred to by its Semitic name, *soada*. Recent archaeological excavations challenge the notion of substantial cultural influence by the Nabateans, suggesting that their political impact was limited in places like Damascus and Canatha, even after their victory over Herod.[382] Ball mentions that the Roman architecture of southern Syria and northern Jordan is a fusion of Hellenistic, Nabataean, and Roman styles.[383] He adds that the influence of both cultures, the Roman on the East and the Eastern on the Roman, is a process that was invariably two-way; however, he describes the Eastern element as predominating.[384]

The archaeology indicates two significant moments in Suwayda's urban development; the first occurred during the middle of the 1st century BC, marked by the abandonment of the Citadel and the disappearance of the chiefdom that resided there. The second moment occurred at the end of the 1st century AD or the beginning of the 2nd century, with the establishment of an extensive urban plan to build a new district in the Roman style.[385]

The *nymphaeum* of Suweida has been described by scholars such as Brünnow, Domazeswski[386], and Sartre.[387] The *nymphaeum*, now in ruins, stood on a major street that ran from northeast to southwest, close to the city's northeast gate. The *nymphaeum* is of the exedra type.[388] It features a crescent shape with a semicircular, large-sized exedra and three smaller niches. A half-dome covers the central niche. Among the remains of the *nymphaeum*, Corinthian capitals and a few architectural profiles have been discovered.[389]

[382] For further see: Bowersock 2003:345-46 & Sartre 2001: 709 & Sartre, 2013: 123-138.

[383] Ball 2002: 238.

[384] Ibid: 450.

[385] Sartre 2013:123-138.

[386] Brünnow & Domaszewski 1904: 90.

[387] Sartre 1992:133-151.

[388] Richard 2012: 97.

[389] Richard 2012: 280.

An inscription found at the *nymphaeum* was dated to the time of Emperor Trajan and the governor of Arabia's province Cornelius Palma, which is around 104 – 108 AD.[390]

According to Sartre-Fauriat, the water systems of Canatha and Suweida are connected, and the water supply network of Canatha was constructed around 105-106 AD, which brought water from mountain springs to Canatha. However, some portions of the network were also intended for Suweida, directed explicitly towards its *nymphaeum*, built in 106 AD, and potentially the location of thermal baths.[391] The dating of the *nymphaeum* is confirmed by the suggestion that the city's architectural style corresponds to the late 1st century or early 2nd century AD.[392]

The Suweida *nymphaeum* stands apart from grander examples such as those in Gerasa or Amman,[393] as well as the *nymphaeum* of Pella of Decapolis, which is only known and described in a coin from the *Commodus-Elagabai* era.[394] These three *nymphaea* (Gerasa, Amman, and Pella) offer different architectural compositions that are more complex and grander than the one in Suweida, with colonnades on the facade and a superposition of niches and columns on several levels;[395] this might be due to the construction period of the *nymphaeum* of Suweida, as it was built at the beginning of the 2nd century AD, while other *nymphaea* were constructed during the late 2nd century AD.

Suweida's *nymphaeum* (Plate 5) is an apsidal room inscribed in a rectangular space. The apsidal part is preserved from the time of Augustus, thus forming a fountain niche. This architectural evolution would only be a return to the Hellenistic traditions of the genre, whose origins were perhaps found in Alexandria in the third century BC.[396]

According to Neuerburg, from the time of Domitian, the *nymphaea* of semicircular form covered with a vault, with niches not yet decorated with columns, imposed themselves in

[390] For further; Ibid. And Brünnow & Von Domaszewski 1904: 90. See also Dentzer et al. 2010: 176.

[391] Sartre- Fauriat 2004: 133-151.

[392] Dentzer. et al. 2010: 147-158.

[393] See Kraeling 1938C :21& Butler, 1909: 54-59.

[394] Seyrig 1959: 68.

[395] Sartre 1992: 141.

[396] Settis 1965: 247-257.

Rome and Italy. These monuments were built under Trajan's reign, constituting the most beautiful examples, such as the fountain with the exedra of Ostia.[397]

According to Bankes, the dimensions of the *nymphaeum* were as follows: the front width was 6.14 m, and the sides were 3.12 m, with a minimum height of 6.09 m.[398] In 1816, a portion of the base could not be measured due to limited accessibility. The facade featured slightly protruding pilasters at each end, crowned with Corinthian capitals. A large, moulded arcade measuring 3.86 m in length and 3.23 m in height flanked the entrance.[399]

Pilasters and Corinthian capitals adorned both the left corner of the facade and the side wall, while the back and right-side walls lacked pilasters at the corners. This might indicate that the *nymphaeum* may have been connected to an adjacent wall or an existing structure from the same or an earlier period. Bankes' analysis shows no signs of post-demolition damage based on the well-preserved state of the back wall on the left side and the absence of pilasters on the back and right walls. Pilasters and Corinthian capitals adorn the facade's left corner and the side wall. Nevertheless, pilasters at the corners were absent on the back wall and the right-side wall.[400]

The interior of the *nymphaeum* had a hemicycle with a semicircular dome. The rear wall featured three arcades that housed niches. The central niche had dimensions of 1.38 m by 0.83 m, and the two lateral niches measured 1.05m by 0.48 m, respectively. All niches were 3.23 m tall and spaced 0.70 m apart. 0.40-metre-tall Corinthian capital pilasters divided the niches.[401]

Bankes noted the absence of basins, indicating that the niches were possibly designed for use as fountains.[402]While the association between *nymphaea,* or water sanctuaries, and the cult of emperors is not extensively documented in the east, Sartre implies that the

[397] See Neuerburg, 1960: 52, 96, 286, 305.

[398] The original measurement was in inches and feet!

[399] William John Bankes:1816 et 1818. In Sartre 2004, 1992.

[400] For further see Sartre 1992: 134-150.

[401] Ibid.

[402] Ibid: 136.

choice to build a *nymphaeum* in Suweida was likely motivated by deeper reasons.[403] These could include a desire to mimic Roman architectural styles and city planning, to showcase the city's wealth and sophistication, or to create a public space for social and ceremonial events. Additionally, constructing a nymphaeum might have been aimed at boosting the city's status and making it more comparable to other significant cities in the Roman Empire.

4.2. *Nymphaeum* of Bosra

The city of Bosra was a member of the Decapolis League. Bosra, an important centre of Nabataean culture and trade, maintained its Nabataean Arabic identity despite being incorporated into different empires and undergoing significant architectural development throughout its history. The city's cultural heritage continued to influence it even after the Roman Empire's conquest in the 1st century AD. Bosra experienced notable architectural advancements in the Roman and Byzantine eras, including the creation of large-scale public structures such as the theatre and cathedral.[404]

However, Ball has expressed uncertainty regarding Bosra's status as a member of the Decapolis League. While some have considered it the tenth city of the league, Ball suggests it may have been an associate member instead because Canatha was the primary Decapolis city of Hauran (Plate 6) in the 1st century BC. The Via Traiana Nova connected Bosra and Aqaba.[405]

The *nymphaeum* of Bosra is an ancient structure found in the southern region of Syria. The structure was built in the 2nd century AD and was dedicated to the water *nymphae*, believed to protect fountains and water sources. It is an excellent example of Roman architecture and engineering techniques from that period.[406]

The *nymphaeum* is constructed on the *cardo maximus*, and at the *decumanus maximus* crossroad in front of it lies a *kalybe* structure (Plate 7). It contains a façade, a portico of

[403] Sartre 1992: 148-151.

[404] Ball 2002: 204,237,285-286.

[405] Ibid.

[406] Ball, 2002: 110.

four columns that extends obliquely towards the intersection, and a small-scale square, triangularly bounded to the south by the colonnade of the *decumanus maximus* and to the northwest by the façade of the *nymphaeum*.[407] Makowski suggested that, according to a dig conducted in Bosra, Butler proposed rectifying the plan.[408] Instead of two oblique walls framing a single niche, Makowski restores rectilinear sidewalls, which are preceded by the four Corinthian columns still visible on the façade.[409] The length of the facade and upper basin both measure 23.80 m, while the width of the upper basin is 2.70 m. The initial construction phases occurred in the late 1st or early 2nd centuries AD. Renovation phases followed in the early 3rd century AD and after the earthquake of the early 4th century AD.[410]

The *nymphaeum* of Bosra was positioned at the convergence of the primary east-west thoroughfare and the route leading towards the military camp situated beyond the northern city gate. It was incorporated into the lateral colonnades added to the street during the Severan period. While the facade aligned seamlessly with the north-south portico, adjustments were introduced on the southern side. This involved an inclining wall segment with two niches, which caused an imperfect connection between the fountain and the portico. The fountain needed to be integrated into the street's colonnades, leading to its somewhat detached placement. Despite this architectural disparity, the fountain occupied a strategically exposed location within the city, in proximity to the two principal bathing complexes.[411]

Unfortunately, the damage and later conquests in the area of the *nymphaeum* at Bosra prevented a complete understanding of the site, both architecturally and in terms of how it was supplied. Its poor condition meant that Butler had to rely mainly on the surveys of those who came before him, so he could not rebuild a plan based on its original form. The only remaining pieces of the Bosra *nymphaeum* are the four columns of the portico, next

[407] See Segal 1988: 59-63 & Segal 1997: 155.

[408] See Butler 1914: 252-53.

[409] Makowski 1980:113-124.

[410] Richard 2012: 262.

[411] Richard 2012: 203.

to a contemporary structure. Early 20th-century scholars found that the *nymphaeum* had been destroyed. However, it appears that the *nymphaeum* of Bosra is a straightforward structure, with the semicircular niche with the half dome roof and the two short, diagonal walls next to it making up the majority of its main form, according to Butler's reconstruction based on those who came before him and his examination of the site. In addition, the portico columns bore an entablature and a Syrian gable. The façade of the *nymphaeum* and the portico's columns supported the roofing, which once produced shade above a pool that seemingly lay between them.[412]

Owing to the poor condition of the *nymphaeum* structure and the lack of relics and evidence concerning the *nymphaeum* of Bosra, a specific, precise date for it is a matter of scepticism. However, following the similarities with other capitals of the entrance of the Sanctuary of Artemis in Gerasa, it seems that around the second half of the second century AD, seems like a reasonable date.[413]

The comparable alignment observed between the fountain and the earliest edifices affiliated with the neighbouring South Baths strongly implies their inclusion in a unified construction initiative, estimated to have occurred in the late 1st or early 2nd century AD. This undertaking may have occurred shortly before the city's annexation into the province of Arabia in AD 106. The Bosra fountain was a grand structure characterised by a three-level design and a flat facade measuring 23.80 metres in length. Additionally, the fountain featured two water basins with stepped features. The architectural category is noteworthy for its Roman-style grandiose water features in the Levantine region.[414]

According to Richard, the *nymphaeum* of Bosra features a three-story straight façade, which deviates from the common practice of constructing curved fountains. The dimensions of the main draw basin exhibit a notable incongruity with the altitude, as the basin's length of approximately 23.80 metres is juxtaposed with a mere width of merely 2.70 metres, thereby appearing diminutive compared to the grandiose facade. No

[412] See: Brünnow & Von Domaszewski 1904: 20-22. Segal 1997: 157 & Richard 2007: 263-284 & Burns 2009: 69-71.

[413] Butler 1914: 252.

[414] Richard 2012: 56.

measurements are available for the lower basin. It is unlikely that the visual impression conveyed by the ensemble was altered by the small, elongated draw basin along its front.[415]

Grooves on the parapet's top surface replaced the lower basin's nine spouts, situated one metre above. Subsequently, the grooves became obsolete as a layer of recycled Nabatean moulded blocks was installed on the parapet; this allowed water to flow over it in a curtain-like cascade and into the secondary draw basin in front. This phase dates back to the early 4th-century AD. These modifications may indicate the instability of the fountain's water supply.[416]

The building underwent initial construction in the late 1st or early 2nd-century AD, followed by refurbishment phases in the early 3rd century AD, and post-earthquake repairs in the early 4th century AD.[417]

4.3. *Nymphaeum* of Canatha (Qanawāt):

Canatha today is usually referred to as Qanawat, and it is considered one of the Decapolis cities. Despite that, it might have been slightly culturally distinct due to its geographical location far from the other Decapolis cities (Plate 8). It is in today's Syria, in the Hauran. In Canatha, different Roman structures were found.[418] The ancient black basalt edifices and archaic sculptures in Qanawat have a magnetic appeal to a diverse range of individuals. The site is located 7 kilometres northeast of the district capital of Suweida.

It is located at a distance of 85 kilometres in the south-east direction from Damascus. Located on the northwestern volcanic basalt massif of Djebel el-Arab, the site's is 1200 m above sea level. The presence of multiple springs in the city's southern suburb has rendered the location attractive for habitation since antiquity. A sophisticated network of canals was used to transport water from the hills in the south, west and east to the northern valley for storage. The nomenclature of the entity in question is derived from the

[415] Richard 2012: 96, 115, and 262. For further; Dentzer et al. 2002: 75-154. & Dentzer 2005: 53-75.

[416] Richard 2012: 144, 233 & 262.

[417] Dentzer et al. 2002: 75-154. & Dentzer 2005: 53-75 & Ibid.

[418] Bowsher 1997: 230-231.

hydraulic infrastructure used for water distribution. The toponyms "Kanatha" in Aramaic and "Qanawat" in Arabic are semantically related to the concept of canalisation.[419]

Little is known about Kanatha during the Hellenistic period. However, the site's archaeological significance began in the 1st-century BC. It became a part of the Syrian province that Pompey established in 63 BC. The only settlement of the Auranities, now Djebel el-Arab, to become a polis was Kanatha. Throughout the early imperial period, it retained this status. Kanatha was the region's leading city until the 7th-century AD.[420]

The Qanawat region exhibits a certain degree of geographical and cultural differentiation from the wider Decapolis region. Some sketches of Qanawat include theatres and Serai complexes. These sketches also show that Qanawat's upper west church wall existed during the period under consideration.[421] According to Bowsher, Qanawat was not vastly populated or overgrown during the Roman imperial period.[422]

The lack of excavations at the *nymphaeum*, resulted into an unknown architectural layout. Alongside the *nymphaeum*, the theatre was situated in a river valley.[423] Ball argues that no theatre is found in Canatha, only an *odeon*.[424] The *nymphaeum* was found to be associated with a small *odeon* that had been cut into the rocky slope, situated at a distance of 70 m towards the north. The linkage was established through the use of a water canal system.[425] Although definitive explanations are lacking, it is possible that this association used the natural topography for efficient water management and reflected the Roman practice of combining functional public spaces with areas for leisure and cultural activities.

Nevertheless, a significant portion of the *nymphaeum* remains concealed by fallen masonry (Plate 9). The wall section is divided into two horizontal portions by a simple

[419] Freyberger, 2003: 4.

[420] Ibid.

[421] For further See Bowsher 1997: 230-31.

[422] Ibid.

[423] Segal 1995: 93.

[424] Ball 2002: 304.

[425] Freyberger 2003:4.

cornice.[426] The upper portion displays three rectangular niches, whereas the lower portion includes a large central semicircular niche topped by a half-dome. Regrettably, the presence of dislodged stones hinders the ability to fully understand the structure's intricacies, leading to uncertainties regarding the possible presence of a pool next to the facade.[427]

According to Nuremberg, the Qanawat *nymphaeum* is a subset of the chamber *nymphaea*, with a well in the chamber's centre.[428] The lack of references and comprehensive data regarding the *nymphaeum* of Canatha, has resulted in a limited understanding of its characteristics and historical significance.[429] Further details cannot be discerned, nor can it be determined whether there was a pool in front of the façade due to the collapsed stones.[430]

According to Eltas and Shraydeh, the construction methodologies used for the walls and the architectural features in this edifice strongly correlate with those evident in the Odeon and the "southern temple" of the Severian period in Qanawat. As a result, based on the architectural style of the chamber *nymphaeum*, it is reasonable to date this building to the early third century AD. The entire *nymphaeum* complex was most likely built in the Severian era, replacing an earlier structure.[431]

The foundation components of the *nymphaeum* appear to align with what seems to be a preceding religious structure. This alignment suggests that the nymphaeum could have retained a religious function, particularly since nymphaea were often dedicated to the nymph deities and served as sites for ritual purification. Thus, the erection of the nymphaeum is a noteworthy demonstration of traditional cult places in Kanatha during the Severan era.[432]

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[426] Segal 1997: 152

[427] Ibid.

[428] Neuerburg 1960: 39.

[429] Segal 1997: 152.

[430] See Butler 1914: 21, Brünnow & Von Domaszewski, 1904: 142-143, Segal 1997: 152-153.

[431] Eltas & Shraydeh 2001: 4-5.

[432] Ibid.

4.4.Beit She'an/ Beisan *nymphaeum*

The *nymphaeum* of Beit She'an, also known as Scythopolis, is situated west of the colonnaded street (plate 10). The colonnaded street ends at the base of Tell Beit She'an and intersects with two other streets, which appear to comprise the nucleus of the Roman-Byzantine urban settlement. Despite the need for a comprehensive investigation into the city plan, the *nymphaeum* is probably situated at the city's epicentre, intersecting three colonnaded streets where the primary municipal edifices were erected.[433]

The *nymphaeum* was excavated between 1986 and 1988, and preliminary reports facilitated the determination of the structure's architectural layout and construction techniques.[434] The Beit Shean's *nymphaeum* exhibits similarities with other *nymphaea* in the Levant region, including Gerasa, Bosra, and Petra. These similarities include the architectural style, such as the use of grand façades with niches for statues, elaborate decorative elements, and the integration of water features that serve both aesthetic and functional purposes. Additionally, like the *nymphaea* in Gerasa and Petra, Beit Shean's *nymphaeum* incorporates elements of Roman urban design aimed at enhancing the public space and reflecting the city's wealth and cultural sophistication.

The structure comprises a 23-metre-long solid wall that is linear in shape. A semicircular niche is positioned at the centre of this wall, the aperture of which measures 8.80 m. A rectangular podium measuring 0.85 by 3.70 m was constructed at the centre, although its intended purpose remains to be determined.[435] Richards gave the following potential dimensions for the fountain: an approximate length of 23 m, while the exedra has a length yet to be specified. The structure in question has an approximate height of 8.80 m, estimated at 13 m. Its upper parapet measures 0.52 m and is accompanied by very low parapets.[436] As per the excavation conducted in 1992, it was observed that the

[433] Segal 1997: 157.

[434] Ibid: 157.

[435] Segal 1997: 159.

[436] Richard 2012: 279 & see also Segal 1997: 158-160.

nymphaeum of Scythopolis was adorned with limestone (Plate 11) sourced from the Gilboa quarries (Mount Gilboa).[437]

The evidence suggests that the *nymphaeum* possessed a height of two stories and featured a half-dome covering its niche. It is plausible that the *nymphaeum* contained sculptures. Its façade was adorned with opulent decorations similar to those found on other *nymphaea* in the surrounding area, such as Gerasa and Amman. According to Segal's account, remnants of columns and other architectural artefacts of exceptional artistry were discovered at the base of the *nymphaeum*. Two rectangular podia on both sides of the central niche accommodate carved columns adorned with Corinthian capitals. The vertical extent of the columns exceeded 8 m, and when combined with the height of the entablature, the *nymphaeum* might attain a total elevation of 14 m. A customary decorative pool was in front of the *nymphaeum*, which was rectangular and extended along the entire length of the *nymphaeum*'s façade. However, it appears that the pool was subsequently eliminated during a later phase, potentially resulting in the *nymphaeum* losing its initial purpose.[438]

It appears that the *nymphaeum* structure was erected during the 2nd century AD during the Antonine dynasty; the exact dating of the *nymphaeum* is yet to be determined. However, an inscription found at the location dates the structure to the 4th century AD (Byzantine period); however, this cannot be an sufficient indicator as many people of power used to restore buildings in order to indicate that they were the ones who erected them; this was a common occurrence during Roman and Byzantine times as well.[439] Therefore, it is worth mentioning that the 2nd-century Beth-Shean *nymphaeum* was destroyed by Governor *Artemidorus* and rebuilt in its place about 400 AD as part of an urban building programme, including rebuilding a porticoed street and a bathing structure.[440]

[437] Excavations of the Hebrew University Expedition 1992: 15-17 & Fischer 2007: 258.

[438] Segal 1997: 159.

[439] Further See: Salama 1955: 231-261, 329-363.

[440] Tsafrir – Foerster 1997: 106–116. & See Lamare 2020: 42.

Thus, based on the architectural style, the façade, and the exedra shape, along with the similarities of the sculptures included in the niches (Plate 12), which align with other *nymphaea* of the region, such as Gerasa, Bosra, and Petra, and the location of the site within the city planning, it is possible to label the site as a 2nd-century Roman structure.[441]

Nevertheless, according to Richard, the monumental fountain in Scythopolis underwent two distinct construction phases. The initial construction phase occurred during the latter half of the 2nd century AD, while the later conversion phase occurred during the late 4th or early 5th century AD. Further examination is warranted regarding the historical background of the Scythopolis fountain, which dates back to the 4th century AD.[442]

It is likely that during the early 4th century, most of the inhabitants of Scythopolis adhered to pagan beliefs; the urban region has been found to contain five pagan temples through archaeological means, while epigraphic evidence has revealed the existence of seven temples. Scythopolis gained renown for its textile manufacturing during the Roman Empire's era, which resulted in affluence and opulence.[443] Scythopolis was a prime example of a prosperous Hellenistic city, boasting a theatre, an odeon, a *nymphaeum*, and bathhouses.[444]

The adherence to classical aesthetics thus serves as evidence of cultural continuity; the destruction of sites associated with pagan worship indicates that the pagan community's influence on societal issues decreased during the 4th century. Nevertheless, this may not necessarily indicate Christianity's success during this time. The Samaritans lacked the inclination to revive heathen shrines; a few builders were followers of Christianity. One was Artemidoros, inscribed alongside a cross on the renovated *nymphaeum*.

[441] For further see; Thomas & Witschel 1992: 135-177. Segal 1997: 160.

[442] Richard 2012: 117, 201, 203, 279.

[443] Heyden 2010: 304.

[444] Ibid.

Notwithstanding, it should be noted that the dominant religious affiliation of urban elites was not necessarily limited to Christianity.[445]

4.5. *Nymphaeum* of Susita (Hippos)

The city of Susita lies on the foothills of the Golan Heights; according to Segal, it is considered one of the least archaeologically investigated cities among the Roman Palestine sites.[446] The establishment of the Susita location dates back to the Hellenistic era. Following Alexander the Great's demise, Palestine was partitioned between the Ptolemaic and Seleucid Empires. During the third century, there was a conflict between two dominant powers vying for authority over Palestine's region.[447] During the 2nd century BC, Susita was founded by the Seleucids, the city was named "Hippos Antiocha," and its walls were expanded. However, the name "Hippos" remained in use over time, while Sussita is the Aramaic name for Hippos.[448]

During the affluent period of the 2nd century BC, the urban area underwent enhancements, such as adopting a Graeco-Roman street arrangement and constructing Graeco-Roman style edifices. The *decumanus* Street, which is still visible today, is a major east-west street that was built during this time.[449] During the 100–76 BC period, Hippos underwent a conquest by Alexander Jannaeus, who imposed the acceptance of Judaism upon the populace.[450]

Following this time period, the Romans ruled Palestine. The Roman general Pompey conquered the region at the start of this period, in 63 BC. The possession was transferred from a certain group of people residing there for a while. Following the demise of Herod

[445] For further see Foerster -Tsafrir 1997:85–146. & Foerster -Tsafrir 1988: 53–58 and Heyden 2010: 312-313.

[446] Segal 1997:15–16.

[447] Roemen 2004: 1.

[448] For further See Tzaferis 1990. See also; Kowalewska & Eisenberg 2019: 109.

[449] Roemen 2004: 2.

[450] Epstein 1993: 634-36.

in the year 4 BC, it was incorporated into the Syrian Province. After the subjugation by the Romans, Hippos was included among the urban centres of the Decapolis.[451]

The town intersects with a colonnaded *decumanus*, a *nymphaeum*, and a church that dates back to the Byzantine period, has been identified within the site.[452] The *nymphaeum* is a site not thoroughly examined; therefore, data concerning the Susita *nymphaeum* are absent. Nevertheless, an excavation did occur by Arthur Segal, who referred to the *nymphaeum* as the monumental building of the Roman period. The excavation started in 1999 and extracted some data concerning the building. The site of the alleged *nymphaeum* is at the centre of Susita, beside the city's main thoroughfare; its course is still visible today. However, its façade faces east, enclosing the forum, which contains a rectangular paved area, while it is introspective on the north by the *decumanus maximus* and to the south by a natural escarpment. The eastern façade of the monumental structure was fully unearthed; on an upright range, two bed stone courses were constructed; the down course was not constructed in the same manner as the upper one. In the centre of the façade, on the top of the two courses, a semicircular niche had approximately 1 m of floor on top of the paved vault.[453]

The opening of the niche was not homologous, and it is likely that the construction of three semicircular steps gradually decreases its lower part. In the middle of the second step, a small niche is found; however, its use is ambiguous. According to the order of the ruined structure in the niche area, it is evident that a half-dome of basalt ashlar stone covered the niche. Among the ruins, a few corbels were found. The eastern façade was empty of anything that might indicate the function of the building. The space east of the building had shredded fragments of grey granite columns. The northern side of the structure was fully excavated; however, it was not assembled in the same manner as the southern side. It was not in a straight line, and why this lack of symmetry occurs is still unknown. A prop was constructed on the eastern part of this site.[454]

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[451] Ibid.

[452] Ball 2002: 197.

[453] Segal 2001: 16-21.

[454] Ibid.

To the west side of the building, hundreds of basalt ashlars were found; it seems that they collapsed during an earthquake that struck the region. An entrance to a room was discovered. According to Segal, the fundamental structure of the building is like the *nymphaeum* of Gerasa, Bet Shean, and Bosra. In addition, its proximity to a considerably massive water reservation strongly suggested that it is a *nymphaeum* structure.[455]

Nevertheless, despite the resemblance mentioned above, the building might not be a *nymphaeum*; after all, excavations did not indicate nor find the presence of water reservoirs inside the building; thus, it is strongly suggested that the building might not have functioned as a *nymphaeum*, but more likely as an open temple of an imperial cult, similar to the temple in Bosra and Amman, where it might have been a kalybe structure. As these structures were similar to the *nymphaeum* in quintessence, Philippopolis had a wide façade with a semicircular niche in its centre, covered with a bisection dome, where a statue of the emperor was installed. The front of the structure resembles the façade of a *nymphaeum*.[456] Therefore, although Schumacher had suggested that the building is a synagogue, Segal did mention in his 1997 research that it is a *nymphaeum*; however, in more recent research, he disagrees with his previous theory, suggesting strongly that the so-called *nymphaeum* of Susita is not a *nymphaeum* in its original essence but an imperial building.[457]

*4.6.*The Antonine *nymphaeum* of Sagalassos

Sagalassos, an ancient site of historical significance, is situated in the southwestern region of Turkey, near the present-day settlement of Ağlasun, located within the province of Burdur, during the Roman period, it was part of the province of Pisidia.[458] The distance between Antalya's prominent port and a tourist destination is approximately 110 kilometres. The spatial extent of the urban region spans approximately 2.5 kilometres in an east-west orientation and 1.5 kilometres in a north-south orientation, situated at elevations ranging from 1300 to 1600 m above sea level. The geographical setting is

[455] Ibid.

[456] Ibid.

[457] See Schumacher 1888: 184-185, Segal 1997: 151-152 & Segal 2002: 14-15.

[458] Metin 2020: 83.

highly intriguing, given that Sagalassos flourished as an urban settlement for a considerable duration, encompassing the ancient Greek era, until it encountered a devastating seismic occurrence in the 7th century AD. During that period, the urban region experienced depopulation and disappeared completely, leaving no evidence of its existence. The construction of the *nymphaeum* occurred during the ancient era of the city, more precisely within the reign of Emperor *Marcus Aurelius* (AD 161–180).[459] The *nymphaeum*'s 81 m3 fountain basin is among the largest in the world.[460]

The Antonine *nymphaeum* (Plate 13) was situated on the northern side of the Upper Agora. The fountain had a rear facade with two *aediculae* on either side, a central niche, and four tabernacles surrounding it. The architectural features served as protective structures for a diverse collection of statues, some of which were integral to the initial design, while others were added at a later stage. The preservation of the mixed statuary programme exhibited a high level of meticulousness.[461]

Based on the stratigraphical sequence, the establishment of the *nymphaeum* and the raising of the terrace likely occurred near or shortly after the midpoint of the second century AD. A scholarly investigation into the ornamental components of the *nymphaeum* has established a temporal framework for its erection, specifically spanning from 160 to 180 AD. The temporal accuracy of this period has been further substantiated through the unearthing of a coin dating back to that specific era within the urban settlement.[462]

A parapet with a distinct profile bordered the water basin's front edge, which had an elongated shape and extended between two lateral *aediculae*. The basin effectively assisted the movement of water, which was provided through a cleverly incorporated cascade-shaped inlet located within the central niche. Intermittent modifications were made to the parapet of the basin throughout its operational duration. The construction dimensions are recorded as follows: a length of 27.70 m, a width of 3.94 m at the

[459] Mueller, et al 2004: 1.

[460] Richard 2012: 113.

[461] Richard 2012: 276.

[462] Waelkens & Poblome 1997: 142-47.

aediculae, a height of 7.80 m, and a parapet height of 1.23 m.[463] Thus, the *nymphaeum* may be considered a façade-type *nymphaea*.[464]

The structure was constructed in the mid-2nd century AD, and the programme concerning statuary had modifications over the period spanning from the late 4th century to the early 5th century AD. Furthermore, the parapet underwent unidentified alterations at various points in time.[465] Waelkens & Poblome mention that the architectural feature commonly referred to as the *nymphaeum* experienced a process of partial disassembly followed by subsequent restoration. A selection of slabs originating from the posterior wall of the eastern aedicula were used for alternative purposes. Analogous to the slabs close to the enclosures, one of the planar stones exhibits a vertically oriented, contoured pillar at its posterior aspect.[466]

The Antonine *Nymphaeum* of Sagalassos stands out as a particularly remarkable example of *nymphaea* from the Roman imperial era. This architectural marvel boasts Corinthian pillars and intricately crafted niches. These niches exhibit recurring motifs across the *aediculae*, featuring elements such as Medusa heads and ornamental Doric and Corinthian designs. The focal point of the *nymphaeum* is a central curved niche embellished with a fluted concha, which adds to its visual grandeur.[467]

4.7. *The nymphaeum* of Miletus

The architectural edifice in Miletus is widely attributed to the construction period of the 2nd century AD. The fountain's construction is attributed to Trajan, who likely intended it as a tribute to his father, Ulpius Traianus, the proconsul of the province of Asia from 79 to 80 AD. The decorative facade was embellished with architectural features, columns, alcoves, and depictions of celestial entities and legendary creatures. The water feature exhibited an impressive demonstration of architectural design within a distinct

[463] Richard 2012: 276.

[464] See chapter three of this thesis & Aristodemou 2011(A): 165.

[465] Aristodemou 2011(A): 165 & Richard 2012: 276.

[466] Waelkens & Poblome 1997: 142-47.

[467] For further reading see Mueller et al 2004 & Richard 2012.

geographical area, highlighting a specific style of stone craftsmanship. The outward manifestation exhibited a remarkable similarity to the ornamental facade of a theatre in ancient Rome.[468]

The *nymphaeum* features statues with spouts and inlets within the podium that cause water to cascade and can be controlled; the conduits for the erupting statues are positioned higher than those for the lower cascades, indicating a water flow priority where, during low water levels, only the lower chutes receive water. The architecture of the *nymphaeum* (Plate 14) is of the PI-shaped type, with a three-story façade surrounding a square reflection pool. The back wall of the façade has niches, and the sides of the building stand out in front. The water comes from the end of the aqueduct, which is behind the façade. The water enters the reflection pool through holes in the lower podium and statues that shoot water up from the lower floor. The water flows into the frontal draw basin through waterspouts with lion heads. The building is 20.45 m long, has an estimated height of 16.90 m, a reflection pool that is 16.15 m long and 6.39 m wide, an intermediate parapet that is 1.18 m high, a draw basin that is 15.60 m long and 1.60 m wide, and a lower parapet that is 0.87 m high.[469] Notably, the capacity of the water basin is 127 m3.[470]

Ugurlu stresses that it is essential to acknowledge that the intricate design of a three-story building serves a purpose beyond the mere provision of water to people in general. The *Nymphaeum* functioned as a remarkable exhibition of the achievements of Roman civilisation. The structure was situated at the urban area's geographical midpoint, northeast of the Southern Marketplace, and directly facing the council chambers.[471]

4.8. Severan n*ymphaeum of* Lepcis Magna

During the period commonly associated with Augustus, Lepcis Magna underwent expansion and notable advancements in its architectural landscape. The urban growth

[468] Coulton 1987: 81 & UĞURLU 2004: 69-70.

[469] Ugurlu 2004: 68-71 For further check Hiilsen 1919; Kleiner 1968: 114-118; Tuttahs 1997: 163-179; Dorl-Klingenschmid 2001: 215-216 In Richard 2012: 272-3.

[470] Richard 2012: 113

[471] Ugurlu 2004: 69-70

observed on the western side of the Wadi Lebdah exhibited a systematic arrangement characterised by a network of streets organised in a grid-like manner. The road system was planned with a focus on two main axes, specifically the *decumanus maximus* and *cardo maximus*.[472]

The water displays of Lepcis Magna are notable for their distinctive design elements, which demonstrate a fusion of ancient Greek influences and distinctive characteristics of the Eastern Roman Empire. The city of Lepcis Magna boasts a notable architectural *nymphaeum* (Plate 15).[473]

Parallel to the wadi, a street with columns stretched from the harbour and ended in a large open square embellished with a notable *nymphaeum*. The *nymphaeum* stands before what is believed to be a kalybe structure on the Plaza (Plate 16). Similar to the imperial fora in Rome, the forum, in its architectural layout, consisted of a central plaza encompassed by porticus. Positioned at the southern extremity of this space, the temple dedicated to Septimius Severus was erected, serving as a testament to his eminence.[474]

Although there is a lack of unearthed sculptures or inscriptions explicitly confirming the *nymphaeum*'s function as a venue for displaying statues, scholarly speculation suggests that it could have potentially accommodated statues meant to complement those of the Septizodium in Rome.[475]

The exedra *nymphaeum* in Lepcis Magna is a large-scale installation consisting of a prominent central structure flanked by two angularly extended side sections; the front of the structure featured a display consisting of two levels measuring 48 metres in width, emphasising the architectural elements.[476] The *nymphaeum* (Plate 17) comprised a central semicircular space (with a radius of 7.70 m) positioned behind a shallow trapezoidal area that was open at the front. The side walls of this trapezoidal space were set at right angles

[472] For further See Mugnai 2021: 87-118.

[473] Agusta-Boularot 1997: 441 See Also Richard 2012: 85.

[474] Segal 1996: 223.

[475] Tomasello 2005: 17-22; Longfellow 2011: 183-185 & Olson 2013: 266.

[476] Richard 2012: 85.

to the adjacent colonnades along the street. Within both the semicircular area and the trapezoidal section, basins were situated. The basin within the semicircular space was positioned at an elevated level and served as a settling tank for removing lime from the water. The other basin, which is now enclosed by a secondary stone balustrade adorned with lattice-patterned panels and herm-adorned pillars, was present in the trapezoidal area.[477]

The rear walls of this complex formed an intricate facade akin to the *scaenae frons* of a Roman theatre.[478] These walls, constructed using finely cut stone blocks, were initially overlaid with marble and adorned with stacked tiers of columns. The lower order of columns was of the Corinthian style with cipollini shafts, while the upper order also followed the Corinthian style, featuring shafts made of red granite. The intercolumnar spaces were filled with arched niches, which most likely held statues in the past. Providing support to and situated behind this facade was a solid mass of concrete, constituting the core of the structure and likely bearing the pressure tank.[479]

The southern portion of the semicircular space has collapsed and now rests on its side at the edge of the wadi; in contrast, the northern portion remains almost entirely intact, reaching a height of 16 m with the ashlar facade extending to that point. The concrete core remains intact, offering a stairway for higher levels from the rear. The rear side of the structure is clad in well-arranged rubble, periodically interrupted by courses of tiles, with a protruding course of precisely cut stone blocks positioned approximately 8 m above ground. Additionally, the ashlar wall to the right (south) of the semicircular space, along with the side walls of the trapezoidal court, remain standing.[480]

The exact nature of the statues that once occupied the niches at Lepcis remains speculative; however, it is plausible to assume that portraits of members of the imperial family were included. Comparatively, the *nymphaeum* statues at Olympia showcased

[477] Barri Jones and Roger Ling in Ward-Perkins 1993: 79-86.

[478] For further information concerning the link between *nymphaeum* and theatre; see Aristodemou 2011 (A): 163-197.

[479] Barri Jones and Roger Ling in Ward-Perkins 1993: 79-86.

[480] Ibid.

portraits of the benefactor and their family alongside those of the imperial family to enhance the benefactor's status. Given that the monument at Lepcis was likely a donation from the emperor himself, it is probable that imperial portraits adorned the monument. [481]

The architectural composition of the *nymphaeum* of Lepcis Magna exhibits a more remarkable resemblance to the elaborate *nymphaea* found in the Eastern region of the Roman Empire, as opposed to the more common fountains observed in the Western territories. The object in question is similar to the distinctive architectural style known as *kalybe*, which is designed to serve as an impressive facade for displaying sculptures. The architectural style under consideration, which is exclusively located in a specific region of ancient Rome referred to as Syria, needs a similar design within the architectural tradition of the Western Roman Empire.[482]

The *nymphaeum*, hypothesised to have been constructed during the Severan era, is evident in a considerably degraded state adjacent to the column-lined thoroughfare in the northeastern section of the site. This structure could potentially be classified as a kalybe. Regardless of their categorisation as *nymphaeum* in the conventional sense or as kalybaea by Syrian practices.[483]

4.9.The So-called *Septizodium nymphaeum*.

The Septizodium was a three-story, monumental façade building with three apses that was located in Rome. The Septizodium *nymphaeum*, which Septimius Severus constructed next to his triumphal arch in the Forum Romanum, is a major monument of his reign. Although it no longer survives above ground, its basic form and location can be reconstructed from surviving evidence.[484]

After coming to power following a civil war, Septimius Severus sought to establish his legitimacy and authority by promoting the perception that he would restore the prestige and harmony of the Roman state. One of his attempts to do so was through a programme

[481] Richard 2012: 86.

[482] Ball, 2002: 419-426.

[483] Ibid.

[484] Gorrie 2001: 653.

of constructing new buildings and planning an extensive restoration of buildings in Rome.[485] The Septizodium was one of these massive structures. The Septizodium was primarily intended to function as a grand architectural feature positioned at the hill's intersection, making it visible to all people approaching Via Appia. Additionally, it was designed to serve as an entrance to the imperial precinct.[486]

Ammianus Marcellinus provides an important reference to the structure; he referred to it as an *operis ambitiosi nymphaeum* which is translated into "*nymphaeum* of rivalrous work" Ammianus mentions that the structure served as a gathering place for people; and mentions the presence of wine consumption at the site. However, he notes that it was structured during the period of *Marcus Aurelius*, but that needs to be corrected.[487]

The potential confusion surrounding Ammianus can likely be attributed to the initial mention of Marcus in the dedicatory inscription. Nevertheless, Ammianus describes that the structure was a *nymphaeum* of considerable scale and visual appeal, and a septizonium "Septizodium" at Lambaesis had an 'aqueductus et *nymphae*i opus' attached to it.[488]

The author suggests that this connection between the Septizodium in Rome and the *nymphaeum* at Lambaesis lies in their similar architectural features and functions as monumental water displays, due to the fact that both structures served as grand architectural elements designed to impress and provide a sense of prestige. The Septizodium in Rome, mightve influenced similar constructions in other parts of the Roman Empire, including Lambaesis. The mention of an 'aqueductus et *nymphaei opus*' at Lambaesis indicates that such structures were part of a broader Roman tradition of incorporating elaborate water features into public and ceremonial architecture.

The Septizodium *nymphaeum* can be reconstructed to some extent from drawings and sketches of its remains that were made before the monument was torn down at the end of

[485] For further details concerning Severus reign see: Benario 1953: 712-722.

[486] Platner 1929: 473-475.

[487] Ammianus Marcellinus. Book XV.7.3 See also Lendon 2015: 143.

[488] Platner 1929: 473 & Ammianus Marcellinus. Book XV & see also Lendon 2015: 142-144.

the sixteenth century (Plate 18).[489] These drawings display that the Septizodium was a monumental façade building of three storeys, punctuated by three apses.[490]

The plan of the Forma Urbis, a Roman map of the city, and the Renaissance drawings also indicate that the Septizodium stood at the southeast foot of the Palatine hill. Foundations have been discovered in this area, which reveal that the Septizodium was approximately 93–95 m long (Plate 19) and extended from the corner of the Palatine almost up to the curve of the Circus Maximus.

Two portions of the structure survived into the Middle Ages: the larger portion was destroyed in 1257 and the smaller portion in 1588–89. In addition, some evidence suggests the presence of water within the structure.[491] Richmond describes the Septizodium *nymphaeum* as a free-standing ornamental façade and a *nymphaeum* dedicated by Septimius Severus in 203 AD.[492]

The monument's design resembles the large civic *nymphaea* constructed in the eastern Mediterranean during the 2nd century AD, as it shares the façade and the monumental fountain system, as the architectural structure known as the *Septizodium*, featured intricate columnar facades that drew inspiration from the *scaenae frons,* which were commonly found in theatres, the structures were strategically positioned within the urban layout to serve as a concealing screen and a backdrop for the street. Additionally, they fulfilled the roles of landmarks and symbols of civic pride and patronage.[493]

The Corinthian type columns, and the impressive height of the monument displays a unique style. The *nymphaeum* can be described as a merge of multiple *nymphaea*; as mentioned by Richmond it does display an ornamental façade, nevertheless, it also carries the elements of a rectangular chamber *nymphaeum*.[494]

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[489] Gorrie 2001: 654-658.

[490] Ibid: 654-658.

[491] Ibid: 654-658.

[492] Richmond & DeLaine 2016. See: CIL 6. 31229.

[493] Gorrie 2001: 658.

[494] For further See Richmond & DeLaine 2016.

4.10.Other Notable *Nymphaea* in the Roman Empire

One of the examples of these *nymphaea* was constructed around AD 100 in Miletus (Chapter Four, subchapter 4,7). Its purpose was to function as a scenic element in a public square located across from the *bouleuterion* and the West Gate of the Agora. The *nymphaeum* inside, believed to have been built during the Antonine period, featured a three-tiered façade similar to that of the *Septizodium*. It also had projected wings and was situated near the primary city gate, near the intersection of the two main colonnaded thoroughfares. At the archaeological site of *Aspendos*, a similar *nymphaeum* structure was strategically positioned in an orthogonal manner, situated between the basilica and the market hall.

During the Hadrian period, two significant *nymphaea* were constructed at Perge, located in modern-day Turkey, situated at the terminus of the colonnaded street, acting as visual focal points and aiding in the mental mapping of the city.[495] Both public fountains served practical and symbolic roles within the urban environment. The most notable is the Northern *nymphaeum*, also known as Hadrian's *nymphaeum*, constructed during the first half of the 2nd century AD. The Emperor Hadrian is depicted by two statues: one nude and one in armour. The overwhelming presence of the reclining River God Kestrus is undeniably evident. His figure, situated at the monument's core, is intrinsically linked to the flow of water. This graphic statement asserts that Perge is a resilient city whose inhabitants rely only on its natural resources, particularly the Kestrus River.[496]

The other nymphaeum which is refered to as the southern nymphaeum is located between the Hellenistic Gate and the Plancia Magna Gate, on the western section of the trapezoidal square known as the Square of Septimius Severus. It is classified as a form of nymphaea featuring a rectilinear aedicular façade. The structure is situated adjacent to the propylon of the Southern Baths complex in Perge, whose hydraulic system supplied water to the fountain. The South Nymphaeum of Perge is a grand fountain, built of bricks adorned with marble slabs that augmented its striking aesthetic appeal. It comprises two

[495] For further See See. Mansel 1963: 66-74. Ward-Perkins & Bryan 1981: 286-303. & Richmond &DeLaine 2016.

[496] Aristodemou 2011 (B): 149-56

levels and a water reservoir. It is plausible that the statues of further Severan family members, together with those of the founder's family, were situated in the remaining niches of the façade. The female figure, which closely resembles Julia Domna, is undoubtedly a member of her family.[497]

Notably, the ancient civilisations of Greece and Rome were characterised by remarkable fountains, commonly referred to as *nymphaea*; occasionally, an ancient *nymphaeum* aligns with the criteria of a *mostra*. In other words, it serves as a visually striking decorative fountain and explicitly commemorates the aqueduct situated in its vicinity through inscriptions or statues.[498]

[497] For further See, Aristodimou 2002: 1-6

[498] Neuerburg 1965:5 & Ibid: 340.

Chapter Five

Exploring Roman *Nymphaea* in Jordan: Heritage Assessment, Virtual Restoration, and Cultural Resource Management

5.1. Roman *nymphaea* of Jordan

In this conclusive chapter, which is divided into three parts, the author examines the Roman *nymphaea* situated in the region of Jordan as well as the broader subject matter of *nymphaea* structures. The first part of this chapter sheds light on the Roman *nymphaea* erected in Jordan (Figure 1). This study investigates the different elements of each *nymphaeum* in Jordan by examining historical sources, epigraphy, and published data from previous archaeological research to better understand the architecture and cultural perspective of *nymphaea* in this region. Jordan contains the ruins of four *nymphaea* (Gerasa, Amman, Gadara, and Petra). The existence of a fifth *nymphaeum* in Jordan at the city of Pella (Tabaqat Fahel) is only attested to by ancient Roman coins. Regrettably, it no longer survives on the surface, and no physical remains of the *nymphaeum* have been found.

The primary type of *nymphaea* in Jordan is the semicircular exedra *nymphaeum*, although the *nymphaeum* of Amman fits within the category of "façade *nymphaeum*. However, it has a unique polygonal shape, which is not typical of the facade *nymphaea*; this has led some scholars to suggest that it is a kalybe structure.[499]

The second part of this chapter will present a compilation of findings about reconstructing a fundamental architectural framework for the dismantled *nymphaea* in Gadara and Petra, located in Jordan. These findings are derived from an analysis of the extant *nymphaeum* in Gerasa. Additionally, the third section of this chapter will include an assessment of these architectural formations' condition from the perspective of managing and preserving cultural heritage. A plethora of invaluable insights have been acquired through a comprehensive analysis of the historical context surrounding the emergence of monumental fountains in the Roman era. Furthermore, it is imperative to

[499] See Chapter three of this thesis, subchapter 3.2. & Athamneh 2022: 417-18.

acknowledge the significance of effectively overseeing the allocation of land to safeguard and preserve cultural artefacts. Each *nymphaeum*'s status will be discussed within its subchapter.

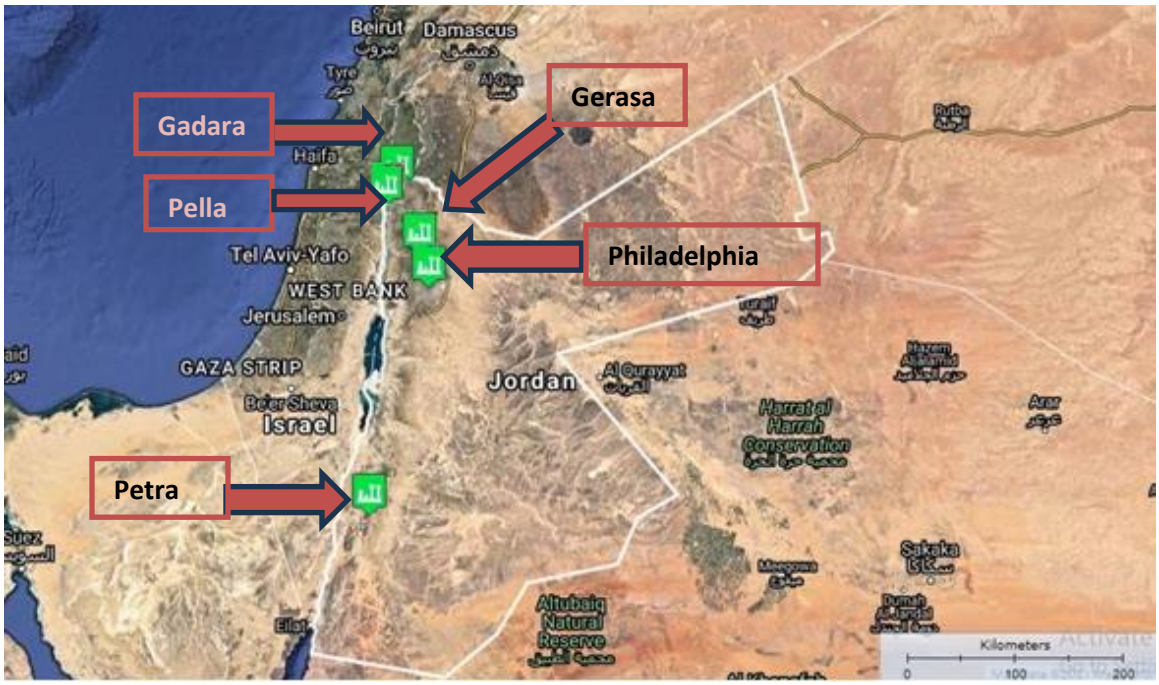

Figure 1. Nymphaea in Jordan from the North "Um Qais, Jerash, Amman, and Petra" Map: Mega Jordan. Accessed and edited by the author 2022.

5.1.1. Nymphaeum of Amman (Philadelphia)

Identifying the structure of the Amman *nymphaeum* was a matter of divergent perceptions among experts and travellers. The Swiss traveller Johann Ludwig Burckhardt identified the *nymphaeum* as a public structure in the nineteenth century.[500] Likewise, the American explorer Merrill.[501] Later in the 19th century, the English soldier-explorer Claude Conder advertised that it was more than just a public building by describing it as a bath.[502] Condor also provided a thorough description of the building. At the beginning of the following century, the American archaeologist Howard Butler concluded that the

[500] Burckhardt,1822: 358.

[501] Merrill, 1881: 400.

[502] Conder,1889: 41.

monument was a *nymphaeum* mason; he also drew a plan and elevation sketch for the structure upon his visit (Plate 20).[503]

In its semi-octagonal shape, the *nymphaeum* has three large recesses. The central niche is bigger than the two next to it, which are 10 m apart. The building is made up of four walls that meet at an angle, giving it a semi-octagonal shape that becomes smaller as you go up. The facade of the *nymphaeum* faces northwest towards the *decumanus maximus*. According to Macdonald, the Amman *nymphaeum* is the largest of its kind in the Arabian province.[504]

Roman *nymphaea* were built near the market and crowded areas, mainly near the *cardo* and the *decumanus* crossing points.[505] The *nymphaeum* of Amman was constructed near the intersection of *cardo* and *decumanus*.[506] It is located on the city's edge (See Plate 2), and its spatial location is not in the city's centre, like other *nymphaeum* structures such as Gerasa and Gadara.[507] The *nymphaeum* of Amman is found in the lower city of the Roman city of Amman (Philadelphia). However, the Roman city planning of Amman may have conformed to the usual urban planning of Roman cities during the High Roman Empire.[508]

The *nymphaeum* of Amman is located on Quraish Street, which is a roofed street built over where the Amman River used to flow. The author proposes that this location for the nymphaeum of Amman is likely due to the city's topographical position as a hilly city, with the water source outside the city, as the lower position allowed easy access to the Amman River, historically flowing through Quraish Street. This placement aligns with Roman practices of adapting urban planning to local geography, ensuring efficient water supply and minimizing the difficulty of uphill water transport. Thus, the nymphaeum's location was a practical decision driven by the city's topography and infrastructure

[503] Butler,1909: 59.

[504] Macdonald, 1986: 173.

[505] Waheeb 2005: 71.

[506] Hadidi 1970: 79.

[507] Segal 1997: 162.

[508] Waheeb& Zu'bi, 1995: 229.

requirements. Nevertheless, it is necessary to mention that modern Amman is difficult to excavate; necessary extended research that might add more details to this matter is thus prevented. (Plate 21)

Some distance separates the structure of the street itself; two colonnaded Roman streets were set in the city of Amman.[509] One began at the present-day Raghadan bridge and proceeded west, through the Municipal Library and the Great Husayni Mosque, until finishing in the vicinity of Ras al-Ayn. The other street began at a point on the previous Roman street near the Husayni Mosque, followed the route of King Hussein Street, and ended at the current building of the Jordanian Central Bank.[510]

The architecture of the Amman *nymphaeum* contains a complex construction, which is natural due to its history of construction. The unique design does not represent a specific type of function; its remains suggest a unique monumental system at Amman, as it defines its function as a *nymphaeum*, but it was also a structure meant to display statues. The size aligns differently from other forms found in Gerasa, Petra, and Gadara, suggesting that it might have a more cultural role as a place for people gathering and where politicians and public figures might have used it to attend and address the masses through speeches.[511] Hence, Its spacious design could accommodate large crowds, implying that it was a venue where politicians and public figures might have addressed the masses, making it not just a decorative fountain but also a focal point for public and political life.

Kadhim mentioned that the *nymphaeum* was a public fountain and a meeting place for citizens to collect their daily water supply and socialise. It also served as a place of leisure and recreation, particularly for the young and physically fit, with its lower floor housing water basins, steam baths, massages, and other health facilities.[512] Segal stresses

[509] Segal 1997:162.

[510] Waheeb &AlGhazawi 2014: 133.

[511] Waheeb & Zu'bi 1995: 238.

[512] Kadhim 1993: 283.

that the plan and measurements of the Amman *nymphaeum* are unusual compared to other *nymphaea*.[513]

According to Waheeb, the current structure of the Amman *nymphaeum* rises 20 m from the flood point; it consists of two long walls and one short wall meeting at an open angle; the elongated section contains eleven niches.[514] The structure's entire length measures 68.58 m, while the diameter of the niches reaches 8.53 m. In addition, twelve smaller niches are present, each with a diameter of 1.37 m.[515] In total, the structure features twenty-three niches. Notably, these niches have been meticulously engineered with regular geometric precision. The front façade features pilasters on either side of the niches, in contrast to the rear outer façade.[516] The larger niches' empty spaces were filled with two rows of smaller niches. Vestiges of two columns measuring up to 10 m in length are on the building's façade, representing remnants of a missing column row.[517]

The monumental structure in Amman might have been a *kalybe* structure, which is an Eastern Roman building that evolved from the *nymphaeum* and serves only as a public facade. The first discovered *kalybe* was in Bosra, and one was found in Shahba.[518] The *kalybe* is also described as a 2nd century AD temple dedicated to the imperial cult and used as an imperial shrine.[519] However, it is difficult to distinguish a *kalybe* monument from a *nymphaeum* due to their similarities, such as the half-octagonal architecture and the stage. The presence of water usage in the Amman *nymphaeum*, leads most researchers to describe the monument as a *nymphaeum* structure.[520] Yet, it is worth considering that the *nymphaeum* might have initially been intended as a *kalybe* and was later modified during its construction to function as a *nymphaeum*. Note that perhaps the *nymphaeum* is

[513] Segal 1988: 9- 11.

[514] Al Adarbeh et al 2019: 17.

[515] Waheeb & AlGhazawi 2014: 133.

[516] Waheeb 2006: 19-23. (unpublished manuscript).

[517] Ibid.

[518] For further see Ball 2002: 193, 292-293.

[519] Segal 1998: 98-99.

[520] See Hadidi 1970, Browning 1982, Waheeb& Zu'bi 1995, Segal 1997, & Al Adarbeh et.al 2019.

positioned in an unusual location, above a stream bed and without an ornamental pool.[521] However, according to Waheeb, the *nymphaeum* had a pool, but it was not fully constructed and was demolished during the subsequent periods of reconstruction, yet the nymphaeum contains a basin that water runs through.[522]It is noteworthy that there is an assertion that the Amman *nymphaeum* is not a *nymphaeum* monument due to its enormous size of more than 67 m.[523]However, it is possible to argue against this assertion based on the fact that other massive structures were documented as *nymphaea* in the Roman Empire, such as the *nymphaeum* of Septizodium.[524]

Consequently, the features of all other *nymphaea* in the vicinity indicate that the Philadelphia *nymphaeum* is near its Hellenistic source of inspiration. Hellenistic architecture, known for its emphasis on decorative exterior walls and the use of the Corinthian order, significantly influenced Roman architecture. The widespread adoption of the Corinthian and Ionic orders during Roman times, replacing the *Doric* order, reflects this influence. Additionally, Hellenistic architects were innovative in their use of ashlar masonry and the development of complex vaulting techniques, which were later adopted and adapted by Roman builders. These architectural innovations were integral in the construction of *nymphaea*, where the aesthetic and structural elements of Hellenistic design played a crucial role.[525] The open exedra layout of the *nymphaeum* is more akin to that of the *nymphaea* in Asia Minor. For instance, the *nymphaea* in Aspendos and Miletos were constructed around the same period as the *nymphaeum* in Philadelphia, specifically during the 2nd century AD.[526]

Waheeb stresses that the structure has undergone a series of designations, initially characterised as a bathhouse, later identified as a basilica, and recognised as a palace. Nevertheless, articulating a precise depiction of the structure is a challenging task,

[521] Segal 1997: 164.

[522] See Waheeb & AlGhazawi 2014.

[523] Darrous & Jérôme 2004: 15.

[524] See chapter 4.9.

[525] Waelkens 1989: 79-81.

[526] Darrous & Jérôme 2004: 15, and Waelkens 1989: 87.

primarily due to the extensive devastation that has befallen a significant portion of its architectural facets. In addition, the residual fragments have experienced metamorphosis, serving as dwellings and stables.[527] Notably, the overall condition of the edifice has gradually faced destruction due to successive residents in the vicinity who repurposed the building's stones, transforming them into smaller units for their daily needs.[528]

The *nymphaeum* of Amman consisted of ground and upper floors (Plate 22), and the different layers of the complex were not constructed within the same time frame, but were constructed during different phases. Despite an incomplete grasp of the natural topography, it is clear that different construction phases took place during the development of the Amman *nymphaeum*.[529]

In phase one, the arch system was built, possibly dating back to the early Roman period. Owing to dateable pottery and coin finds, the simple moulding suggests a similarity to early Roman period architecture.[530] Phase two demonstrates the construction of the upper floor and its three recognisable apses, according to the architecture method, and the pottery manifests new techniques during this phase.[531] The *nymphaeum* monument was likely built in the second century AD, during a time of prosperity. Other contemporary structures in Roman Philadelphia, such as the theatre and the odeon, were also built during this time as part of a remodelling of the lower city.[532]

While a comprehensive understanding of the precise natural topography underlying the structure's location remains elusive, the bedrock elevation at the site underwent significant fluctuations, and the *nymphaeum* was built on a slope from northeast to southwest. The bedrock elevation necessitated the incorporation of a series of vaults and a road across the wadi. The arches mark the second developmental phase, with the first three having joints in the middle and no keystones. The fourth arch has a keystone,

[527] Waheeb 2006: 19 (unpublished manuscript).

[528] Ibid.

[529] Waheeb & AlGhazawi 2014: 133.

[530] Waheeb & AlGhazawi 2014: 140-1.

[531] Ibid: 133.

[532] Ibid: 141.

signifying an earlier developmental phase. The incremental addition of arches with midpoint joints and keystones fortified the foundation and established the groundwork for the first-floor edifice.[533]

Jean Pierre-Adam theorised that the Romans remodelled the fountain by adding a prominent facade overlooking a large basin.[534] The main design of the monumental masonry can be defined as follows: the bottom portion of the monument is built on sloping ground to the southwest, atop a cave with running water underneath.[535] Thus, the structure's base was built on a humid circumference with a set of vaults to level the slope of the water basin, allowing the southwest stream water to flow underneath the structure without causing any damage to the monument.[536]

A route was executed across the shallow valley over a bridge constructed using the arch principle. Four medium-sized arches and one prominent arch were built at the site; this might indicate that the main structure was constructed by erecting these arches. The *nymphaeum* was built by widening the foundations and adding arches joints at the mid-point to the thrilling arches with keystones to create the first level, the *nymphaeum* building. A group of niches measuring 1.25 m in width and 2.10 m in height may be seen above the arches. Eleven niches were discovered above the arches.[537]

Waheeb highlights early descriptions of the site, emphasising the remarkable features of the upper level. It comprises a massive half-octagon with a length of 68 m and three prominent semi-domed apsidal recesses, each featuring two square props extending from the corners of the apses. The highest point reaches approximately 12 m, and encircling each apse are two tiers of four niches. These small recesses, measuring 1.25 m in width, likely once housed statues.[538] According to Butler's interpretations, a double-pitched roof

[533] Ibid: 133-134 & Waheeb 2006: 18-28 (unpublished manuscript).

[534] Adam, 1994: 237-238.

[535] Waheeb & Zu'bi 1995: 229-230.

[536] El-Khalili 2014: 343.

[537] Waheeb & Zu'bi 1995: 230.

[538] Waheeb & AlGhazawi 2014: 134 & See also Waheeb & Zu'bi 1995: 230-232.

covered the main portion of the construction with its columns and arched central intercolumniation.[539]

In front of the apses, large Corinthian columns approximately 10 m high were installed, the very same as in the first story; however, not many of the columns were detected — mainly a few bases, drums, and capitals, which were a matter of destruction due to causes of nature, i.e., earthquakes, also the reuse of the of them in constructing Umayyad walls according to what had been found at the courtyard of the *nymphaeum*.[540]

A colonnade ran parallel to the façade on all four sides, 4.5 m away. According to three fallen capitals discovered before the structure and reused by the Islamic fortifications, the intercolumniation is 3.5 m, and its order is Corinthian.[541] Six columns were opposite the central wall, two opposite each diagonal, and four opposite each of the perpendicular walls, totaling 18 columns, all crowned with Corinthian capitals. The entablature was primarily horizontal, except for the parts opposite the three large niches, where larger spaces display the semicircular niches.[542]

The angle of the platform wall, the reverse angle, and the bases on both ends would recreate a third apse, where the foundations indicated a westward expansion beneath a current street, resulting in balance on the east side of the central apse.[543]

The The basin was partly excavated, revealing dimensions of approximately 26 m east-west and 15 m north-south.[544] It is in front of the northern apse on the site's north-western side. Its asymmetrical design, while intriguing, lacks a clear explanation. It is possible that this asymmetry resulted from construction faults or may have been intentionally designed to challenge the principle of symmetry. Moreover, the basin's location on a slightly elevated terrain near a water source allowed it to be regularly flooded, serving

[539] Butler, 1909: 58.

[540] Waheeb & AlGhazawi 2014: 134 & El-Khalili 2014: 344.

[541] Waheeb 2006: 27-30, 93. (unpublished manuscript) See also: Butler 1912:56.

[542] Segal 1997: 163.

[543] Waheeb & Zu’bi 1995: 232.

[544] Waheeb & AlGhazawi 2014: 134.

various aquatic-related purposes. Such an unusual design feature could be attributed to geographic factors influencing the architectural planning of the site. However, further investigation is required for a conclusive understanding.[545] Even though no trace of hydraulic systems was found in the *nymphaeum* structure, the building's proximity to a water source indicates that the purpose was to channel water into the basin. Nonetheless, the evidence is insufficient to conclude whether this was the intended strategy.[546]

When the Jordanian Department of Antiquities (DoA) conducted excavations at the location in the 1990s, they found fragments of ceramic roof tiles; it was clear that these tiles had fallen from the ceiling as a result of earthquakes, structural damage, and movement of the stones. Examining these tiles and comparing them with other Roman site tiles indicates that the tiles were Roman.[547] A great deal of destruction occurred to the structure due to the earthquakes of 631-641, 659 AD, and 747 AD; however, the northern section managed to remain standing.[548]

Due to the unstable conditions and water flow in the *nymphaeum*'s lower levels, further excavation of the site and its environs encountered a few challenges. The modern urban architecture of Amman resulted in the removal of a substantial portion of the structure's southern and northern portions.[549]

The area framing the *nymphaeum* was levelled using fill, increasing its height to level with the crown of the ground floor arches.[550] It seems that a good number of attempts and expenses were made to bring the *nymphaeum*'s paved courtyard up the slope of the valley and maintain it at one level, particularly the expansion towards the colonnaded street, the most active section of the city during that time.[551]

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[545] Waheeb & AlGhazawi 2014: 134-135.

[546] Waheeb & AlGhazawi 2014: 134-135.

[547] Ibid: 136.

[548] Amiran, 1950: 226. See also Waheeb & AlGhazawi 2014:136.

[549] See Waheeb & Zu'bi 1995. See El Khalili 2014: 345.

[550] Ibid 1995: 234.

[551] Waheeb 2005: 79.

The written notes of travellers to the site during the late 19th and early 20th centuries attest that initially, from the *decumanus maximus* to the steep hill on the stream's south side, both banks of the stream adjacent to the *nymphaeum* were kept at a level surface. The stream itself was covered with a series of barrel vaults. The stream was covered in portions, and the space above was levelled and paved.[552] The basic paving at the *Nymphaeum* consists of white lime flagstones, ca. 1.50 cm long and 0.88 cm wide, placed in rows with long sides parallel to the basin walls.[553]

Thus, in the areas where the stream passes naturally southwest and south of the *nymphaeum* building, a significant amount of beauty is added to the site, which may help safeguard the water from pollution while also providing additional space between the *decumanus* and the *nymphaeum*'s southern part. Unfortunately, the vaults and pavement vanished, and their presence is only seen through old photographs.[554]

A few decorative parts have been unearthed, primarily found in the courtyard in front of the façade. These decorative elements include floral and geometrical designs, reels, and beads. Additionally, blocks with decorative moldings in shallow relief were used, and numerous marble fragments of varying colors were found, ranging from light grayish-white to reddish, light dark, blue, and green. From the available remains of capitals, architraves, and friezes, it can be imagined how the *nymphaeum* was elaborately modeled to be a place of rest and glory during the Roman Period.[555] These decorative elements share similarities with those observed in the *nymphaeum* constructions of other Decapolis cities, such as Gerasa in northern Jordan. Unfortunately, many of the decorative components are missing, possibly due to the collapse of columns, resulting in the stones either falling or being subject to looting over the past century.[556]

Two limestone human heads were discovered (Plate 23), and their genders were not detailed. Both heads were discovered to be broken and repurposed in the *nymphaeum*'s

[552] Merrill 1881: 400.

[553] Waheeb & AlGhazawi 2014: 137.

[554] Waheeb & Zu'bi 1995: 235.

[555] Al Adarbeh 2019: 17-19.

[556] Waheeb & AlGhazawi 2014: 136-137.

inner courtyard to construct new walls. The heads show a high level of artistry, especially in the carving of the eyes, hair, and nose, which were once decorated with precious materials (though these were not found). Their unique style suggests they were Roman but not originally part of the *nymphaeum's* statuary decor. It's believed they once adorned statues of citizens who had rendered distinguished services or contributed to the construction expenses.[557] The shape and appearance of the heads hint at their Roman character. but the original source of these heads still requires clarification to fully understand their importance to Roman Philadelphia.[558]

The Amman *nymphaeum (Figure 2)* is characterised by round and square apertures on its interior walls, predominantly in the lower sections of the three expansive apses and smaller niches. The apertures above were employed to affix bronze clamps, which were used to fasten the marble used for the interior casing; some clamps have been unearthed within the lower sections of the *nymphaeum* walls. The revetment was constructed using a mortar with a thickness of 0.5 cm composed of a standard grey cement mixture. The Department of Antiquities (DoA) excavation led by Waheeb produced a variety of marble fragments, which displayed a diverse array of visual characteristics such as light greyish-white, reddish, light dark, blue, and green.[559]

Only a limited number of decorative elements were discovered. Regrettably, a considerable number of the ornamental components are absent, presumably due to the structural failure of the columns and later decay of the stones or the act of plundering that has occurred in recent centuries. Identifying the original placement of the fragments within the structure poses a current challenge, considering the available evidence.[560] There are no known structures east or west of the *nymphaeum*. According to Philadelphia's municipal plan, the *nymphaeum* was built on the city's outskirts due to the stream's bed.[561]

[557] Waheeb & AlGhazawi 2014: 134.

[558] Ibid.

[559] Ibid: 139.

[560] Ibid: 139.

[561] Segal 1997: 164.

The city's aqueduct waters were distributed using specialised tanks. Based on Condor, who mentions an aqueduct that runs parallel to the stream on its north side, the aqueduct may have been built in ancient times to provide water for the presumed Roman baths east of the mosque. The aqueduct's current wall consists of small, irregular stones measuring approximately 38 and 23 cm. The channel has a width of approximately 60 cm and is supplied with water from the 'Ayn Philadelphia spring. To the south, two 91 cm-deep side channels guide water towards small water mills.[562]

According to Waheeb, archaeological findings can infer that the Philadelphia *nymphaeum* was supplied with water through a direct connection to a primary conduit originating from a reservoir or a secondary channel connected to an aqueduct. Previous construction activities in the vicinity of the *nymphaeum* revealed the existence of two additional water sources. One spring is positioned adjacent to the wing in the southwest direction, whereas the other is situated close to the wing in the northeast direction of the *nymphaeum* structure.[563]

The process of water collection and distribution necessitates the presence of a substantial reservoir. The aqueduct was designed to transport water from Ras al-'Ayn and various springs to the central city, primarily to supply the *nymphaeum* edifice, which featured a basin. The engineers implemented a hydraulic system in which water was directed along the slopes of Wadi Philadelphia, effectively dividing it into multiple conduits to reduce the overall pressure.[564]

It is worth shedding light on the fact that, down the Citadel, the lower part of Roman Amman is situated south of the water stream "Sīl" of Amman, where buildings and structures such as the forum, odeum, *nymphaeum*, and theatre are located. It is noticed that the water stream played an essential role in the location of the masons, as the building did benefit from it.[565] Natural or artificial causes, such as modern expansion,

[562] Conder 1889:39.

[563] Waheeb& AlGhazawi 2014: 139 See Also See Waheeb & Zu'bi 1995, and Waheeb 2006 (unpublished manuscript).

[564] Wheeler 1964: 149.

[565] Hadidi 1992: 296.

have destroyed many Roman buildings in Amman. This has made it difficult to understand the city's water system. In 2020, 12 antiquities from the Roman era were discovered during construction work. Experts believe the site may have been a Roman bath containing a heating system (plate 24); two statues with missing heads were also discovered. The author poses the question of whether the two statues are connected to previously discovered heads at the nymphaeum. However, due to limited research and restricted access, this inquiry will be the focus of future investigations. Nevertheles, these construction areas were only 300 m away from the Roman *nymphaeum* of Amman, but further investigation was conducted outside the area.[566] This observation indicates that a significant number of artefacts remain buried beneath the contemporary urban landscape of Amman. However, the densely populated nature of the city poses considerable challenges to the excavation of these artefacts. Nevertheless, it is a matter of discussion, as Amman had been inhabited long before the Roman invasion in 63 BC, and Christianity spread in the 4th century AD.[567] Giving the region a new culture.[568]

Unfortunately, the demolition was done for natural and artificial reasons, such as repurposing Roman structures to create new masons in the Byzantine, Islamic, and modern periods. Because of the *nymphaeum*'s location in downtown Amman, surrounded by modern commercial and residential buildings and asphalted streets, understanding the dynamism of Roman design is complicated. Excavation is almost impossible due to the busy area. The *nymphaeum* structure was constructed on a grand scale, and despite lacking a clearly defined purpose, it possessed the characteristics of a monumental edifice. The determination of the construction date of the *nymphaeum* is reliant solely on the analysis of stratigraphic evidence and stylistic criteria due to the lack of inscriptions or literary references.[569]

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[566] For further see: https://www.al-monitor.com/originals/2020/12/jordan-amman-roman-ruins-baths-archeology-excavation.html & www.royanews.com/news/232084 (Both entered in August 2023).

[567] Friedland & Tykot 2012: 52.

[568] Perry et al, 2009: 429-441.

[569] Waheeb& AlGhazawi 2014: 140.

The architectural design of the building does not inherently indicate a limited scope of purpose. Based on the initial evaluation, it is indicated that the remnants embody a distinctive and significant monumental edifice located in Philadelphia. The Philadelphia *nymphaeum* had a comparable counterpart at Philippopolis (Shahba) in Syria, which served as an imperial monument.[570]

The similarities between the two *nymphaea* include their semi-octagonal shape, the presence of apses, multiple niches, and a multi-tiered design aimed at achieving maximum aesthetic impact. Both structures also featured intricate water systems integrated into their design.[571]

The Amman *nymphaeum*, contrasts with the Philippopolis, in its specific architectural details and local adaptations. The Philippopolis *nymphaeum*, features a more consistent use of orthogonal planning and an emphasis on a rectilinear forum layout, while the Amman *nymphaeum* incorporates irregularities adapted to its local topography.[572]

The Amman *nymphaeum* is a prominent *nymphaeum* mason, which dates to the 2nd century AD indicates the city's significance during Roman times. Moreover, it shows the glamour of Roman architecture with its grandeur façade (Plate 25), presenting how what seems to have started as a sacred grotto for the *nymphae* developed architecture-wise and was modified to suit a new topography and geography, displaying how the Roman presence in the east influenced Roman architecture and how the Roman building evolved.

[570] Amer and Gawlikowski, 1985: 5.

[571] Ibid. See also Waheeb& AlGhazawi 2014: 141.

[572] Darrous & Jérôme 2004: 15-18.

Figure 2*: The Ruins of the nymphaeum of Amman. The lower part is the foundation built on barrel vaults. The second floor consisted of three large apses with two rows of niches designed to host statues. © Photo: Haupt & Binder Retrieved from: https://universes.art/.*

5.1.2. The *nymphaeum* of Jerash (Gerasa)

The city of Jerash has suffered significant losses to its historical artefacts and remnants due to a series of conflicts, neglect, and natural disasters over numerous centuries. Notwithstanding these challenges, Gerasa has demonstrated resilience and continues to provide many historical sites for exploration, including its temples, theatres, and *nymphaeum*.[573] The influence of Roman architecture can be seen in many contemporary structures and residences.[574]

The people of Gerasa were keen on water management investments beyond their municipal borders during the Roman era. The western and northwestern rock-cut canals

[573] Rostovtzeff, 1932: 73-90.

[574] Bany Yaseen, et al. 2013: 465-471.

indicated a complete water management system that delivered water to the city's upper west side.[575] Large bath complexes and other monumental buildings were constructed throughout the first three centuries AD, including a *nymphaeum*, and various cisterns to serve the city's inhabitants' water needs, including those related to hygienic purposes.[576]

The *nymphaeum* of Gerasa (Plate 26) was situated adjacent to the monumental entrance to the Temple of Artemis, with its facade overlooking the *cardo maximus (Plate 27)*.[577] In 1983, the Department of Antiquities (DoA) performed an anastylosis restoration of the façade of the monument.[578]

It is worth noting that the Temple of Artemis in Gerasa (Plate 28) stands out as a significant surviving monument to Artemis in the region. This impressive temple was completed around 180 AD, during Jerash's prosperous period, and represented one of the most notable sanctuaries in Syria-Palestinia. The veneration of Artemis experienced substantial growth in the eastern Mediterranean, possibly influenced by the Hellenized Roman communities, particularly in the urban hubs of the Eastern Empire.[579]

Although early visitors sketched and captured images of the monument, the jumbled masonry obscured its function and its original appearance. European visitors first observed the monument in the early 19th century.[580] Until Gottlieb Schumacher's description, the monument was not recognised as a *nymphaeum*.[581] Based on the building's architectural design, the structure appears to be of the usual Roman Severan exedra *nymphaeum* type of the 2nd century.[582]

The *nymphaeum* was built within a limited space, located adjacent to the *cardo,* bounded by a cathedral complex to the south and a street to the north. The monument's two-story

[575] Ibid.

[576] Lichtenberger and Raja (2016): 98-117.

[577] Segal 1988: 23.

[578] Boyer 2022: 407.

[579] Kampen 2003: 206, 217-18.

[580] Boyer 2022: 407.

[581] See Schumacher 1899: 4 & Schumacher 1902: 1410.

[582] Bol 1988: 11. See Also, Maxwell 1980: 123-125.

façade, which consists of two wings and a central semicircular exedra, has an omega-shaped plan.[583]

The *nymphaeum* of Gerasa has a façade length of 23.5 m and a width of 7.2 m. The maximum width of the façade is 9.8 m. It features one exedra with a diameter of 8.8 m and and a height of 10 m.[584] The entrance to the *nymphaeum* from the *cardo* is ornamented by two massive Corinthian columns that stand roughly 13 m tall; three columns and capitals are currently in good shape and are located 10 m from the front of the spreading wings of the façade.[585] The façade is divided into two storeys, each containing nine niches; seven, alternately square and round, adorn the recess, while the last two, both rounds, adorn the straight faces on either side.

Free-standing yellow limestone Corinthian columns surrounded each of the nine niches; they had an ornately carved entablature that protruded from the façade between each recess and separated the lower floor from the top floor. The second storey shares the same dimensions as the first, and has the same type of niches, columns, and entablature as the first, but the circular niches are now adorned with broken pediments.[586] The façade's depression was crowned with a semi-dome of scoriae rising from a line just above the broken pediments.[587]

The first storey of the *nymphaeum* was initially covered in a fine *cipollino* marble retaining wall, while the second storey was finished with plaster and paint. The semi-dome was possibly coloured or gilded; the statuary was once housed in niches but had long since vanished.[588] Water was supplied to the figures through apertures in the lower

[583] Parapetti 1983: pl 4.

[584] Based on measurements of the author. & Boyer 2022: 412.

[585] Boyer 2022: 414.

[586] Boyer 2022: 409-414.

[587] Kraeling 1938C: 21-23.

[588] Buckingham 1821: 380. See also; Friedland 2003: 417 & Hirt 2021: 7.

niches, from which it flowed in constant streams into the extensive basin that ran down the entire front of the façade (plate 29).[589]

A low, straight wall with ornate base and crown mouldings surrounds this basin on the street side. According to Kraeling's description, it is punctured by seven small tunnels that finish in lions' heads, through which the water exits the basin and becomes visible to bystanders; the water from the centre stream was directed into a red granite laver in the pavement of the sidewalk.[590] Outflowing water was directed underground and away from the site through step openings at the base of the enclosing wall.[591]

A large portico stretched from the *nymphaeum*'s façade to the very edge of the *cardo* walk. It is unclear exactly how it was contrived. The four massive columns positioned in pairs along the sidewalk's border are critical structural elements. Between them and the respective *antae* of the façade were four smaller columns.[592]

The four columns before the *nymphaeum*'s façade stood significantly taller than the *cardo maximus* colonnade. The space between the two central columns corresponded with the aperture of the central niche, and the four columns of the *nymphaeum*'s portico bore a Syrian pediment that matched the form of the front of the half-dome atop the niche.[593] The portico collapsed during later periods, and its ruins were removed from the *cardo* and reused in other structures.[594]

However, the portico appeared to have two wings protruding from the façade's straight faces; the roofing offered a large, shaded area above the basin and the sidewalk between the portico and the *nymphaeum*'s front wall. The *nymphaeum* of Gerasa is recognised for

[589] Buckingham 1821: 380.

[590] Ibid.

[591] Kraeling 1938C: 21-23.

[592] Ibid.

[593] Segal 1997: 160.

[594] Kraeling 1938C: 21-23.

its magnificent architectural embellishments and its style is highly akin to the *Baroque*[595] style.[596] The *nymphaeum* shares some features with *Baroque* architecture, such as its use of curves, ornate decorations, dramatic effects, the presence of niches adorned with statues, and the overall grandeur and complexity of the design.

The *nymphaeum* was a prominent feature of the urban environment of Gerasa due to its location facing the *cardo maximus* and its proximity to the Artemis complex and the cathedral sanctuary.[597] It is probable that the exedra of *Herodes Atticus* in the Altis of Olympia (Plate 30), Greece, which was far more extensive in scale, influenced the architecture of the *nymphaeum* at Gerasa in the 2nd century. The use of an exedra or apse-like structure in *nymphaea* became increasingly common in Roman towns and cities throughout the empire, as it provided a space for people to gather and socialise and served as a backdrop for statues and other artworks.[598]

The exedra of Herodes Atticus is dedicated to Zeus. This widely recognised exedra is a lavishly furnished terminal point of an aqueduct constructed to supply clean, potable water to individuals participating in the Olympic Games. It is situated near two storage basins, with a semicircular edifice adorned with several statues depicting individuals from the imperial and familial lineages of Herodes Atticus and his spouse. According to Avotins, it dates to 153 AD.[599]Although the structure was a fountain dedicated to Zeus, nevertheless, it shared similarities with Gerasa's *nymphaeum* in its semicircular exedra shape and the water flowing from the spouts.

An inscribed dedication on the lower storey architrave around the apse and fragments found in secondary contexts provide evidence that the *nymphaeum* was constructed during the reign of Commodus (180-192 AD). The dedication emphasises a *terminus post*

[595] It should be noted that this term should not be confused with the Baroque artistic trend that emerged in Rome in the 1600s. Researchers refer to the mixture and abundance of decorative elements in Eastern Roman architecture as a kind of 'Baroque' of the Roman period.

[596] Segal 1997: 162.

[597] Ibid.

[598] Richard 2012: 164 & Boyer 2022:409.

[599] For further See Avotins, 1975: 249. & Strazdins 2022 Chapter Nine.

quem of 190 AD. Therefore, it is likely that the *nymphaeum* was constructed in 190/191 AD.[600] The *nymphaeum* is later than the portico and propylaeum, because a bracket off-centre on the drum of the nearest *nymphaeum* column supports the last architrave of the portico. The columns before the *nymphaeum's* façade stood significantly taller than the *cardo maximus* colonnade (Plate 31) each being approximately 13 m high.[601]

The central piece of the propylaeum, which faces Artemis' court, was completed in approximately 150 AD.[602] The *nymphaeum* gained its final shape in 190/ 191 AD.[603] At the end of the second century AD, this *nymphaeum* served as the city's primary public fountain.[604]

Several things point to the idea that the *propylaeum*, which was the earlier building, was changed before it was finished to fit the *nymphaeum*. For example, some rooms north of the stairs are about 4.40 m wide, while others south of the stairs are about 5 m wide. This shows that space was limited north of the stairs. Most likely, the presence or building of the *nymphaeum* compelled the builders of the propylaeum to adopt the northern rooms to accommodate the available space.[605]

Crowfoot asserted that the absence of the northern pilaster proved that the *propylaeum's* builders knew that the *nymphaeum* was being constructed or planned.[606] The last *nymphaeum* portico column bears an off-centre bracket to support the last portion of the propylaeum portico architrave, revealing that the *nymphaeum* columns were cut considering the pre-existing construction.[607]

The *nymphaeum* formed a component of a water distribution system from the 2nd century that provided water to bathhouses and fountains in the northwestern section of the city.

[600] Jones, Journal of Roman Studies, Volume XVIII, 1928: 160-162 & See Welles 1938: 406. N.69.

[601] Kraeling 1938C: 21-23 & see also Boyer 2022: 414.

[602] Parapetti 1995: 177-81.

[603] For further see: Kraeling 1938C: 21-23 & Segal 1997: 161-62.

[604] Seigne 2008: 39.

[605] Kraeling 1938C: 21-23.

[606] Crowfoot 1931: 143 &: Kraeling 1938C: 202-205.

[607] Kraeling 1938C: 21-23.

The *nymphaeum*'s supply was directed to the lower-storey spouts through an internal distributor channel. The design is prevalent in the Empire, but the *nymphaeum* and other nearby fountains have a unique local architectural style characterised by spout blocks.[608]

The hydraulic system and the architectural layout of the *nymphaeum* underwent multiple modifications. The timeframe of the alterations is blurry. An early earthquake that might have struck the region in 363 or 418 AD necessitated the construction of at least one buttress wall to support the fragile façade. Initially constructed to enhance the basin's capacity, the wall was subsequently dismantled, facilitating convenient public access. The frontal spout flow was consolidated into a single outlet and discharged into a small draw basin. The precise date of the closure of the *nymphaeum* is uncertain. However, the building was severely damaged, filling the basin with debris. This destruction might have been due to the many earthquakes that occurred in the area between the 4th and 8th centuries AD.[609]

The water delivery system to the rear of the *nymphaeum* is unclear due to limited excavation in the area. It is uncertain whether the supplying aqueduct went directly into the building to a storage or distribution basin at the back of the *nymphaeum*. In contrast, the primary water source for the city's west side is believed to be the Birketein reservoir; however, its role in supplying the *nymphaeum* and other structures is disputed, although some scholars have suggested it.[610] The aqueduct from the southwest of the Sanctuary of Artemis could have been a source of water.[611] An open-channel aqueduct is thought to have provided the *nymphaeum* with its first water supply through distribution centres on elevated terrain to the west.[612]

An open masonry aqueduct was found during the excavation of a 5th-century building known as the *Quadriporticus*. This aqueduct was located west of the *Nymphaeum*, and

[608] Boyer 2022: 428.

[609] Boyer 2022: 422- 426 & See also Grigoratos et al 2020: 803-832.

[610] See Rostovtzeff 1932: 83; McCown 1938: 167; Browning 1982: 213 & Boyer 2014: 523.

[611] Seigne 2002: 16; 2004: 176–177.

[612] Seigne 2008: 39.

the excavators hypothesised that it served as the original supply line.[613] However, this is unlikely because of the use of spolia and its elevation, which is 2.7 m above the distributor conduit and niche spouts.[614]

Potential distribution centres include the lower terrace basin in the Artemis Temple complex, the *Placcus* basin near the *Placcus* Baths, and a distribution basin or *castellum divisorium* beside the lower terrace basin (Plate 32). In addition, an aqueduct possibly brings water from the southwest of the Sanctuary of Artemis.[615]

On the basis of his research, Lepaon suggests that the *Placcus* basin was initially constructed to serve as a public bath.[616] Before the *Placcus* Baths were constructed in 455 AD, water may have initially come from this basin and been piped to the *nymphaeum*.[617] On the other hand, the lower terrace basin could have been constructed to supply the *cardo* fountain network, which would have included the *nymphaeum*. It might have been operating the entire time that the *nymphaeum* was around.[618]

A conduit in the lower part of the façade was used to distribute water from the *nymphaeum* supply aqueduct to the niche fountain outlets (Plate 33-34). Similar arrangements of *nymphaea* were used at Tipasa and Alexandria Troas.[619] The original dimensions of the *Gerasene* conduit remain unknown, with only a limited section currently observable within a niche outlet.[620]

The hypothesis that the niches in Gerasa's *nymphaeum* monument once housed statues with water flowing through them in the lower storey niches is potentially supported by the presence of similar statues in niches found in other structures and *nymphaea*, such as

[613] Brenk 2009: 21–22; through Boyer 2022 :415.

[614] Boyer 2022: 415.

[615] See Boyer 2022: 300– 01.

[616] For further details see Lepaon 2012: 221-26 & 147,197.

[617] Lepaon 2015: 106.

[618] See Boyer 2022: 415.

[619] Macdonald 1986: 103 & Forschungen 1953: 27-32 See also Lamare 2019: 227-228, Also check Noureddine 2020: 101-104.

[620] Boyer 2022: 415

the Exedra of Herodes Atticus at Olympia and the Ephesus *nymphaeum*.[621] No evidence of statuary remains depicting the use of spouting statues has been found. The rear wall of each niche features a quadrangular opening measuring roughly 17 by 22 cm.[622]

Within the urban landscape of Roman Gerasa, the enhancement of public infrastructure through religious and monumental dedications by civic officials was a significant aspect of the city's development. A notable example is an inscription mentioning an *astynomos* who dedicated a statue of *Dionysos* to a fountain. This dedication underscores the vital role of the astynomos, a civic official responsible for the maintenance and repair of public buildings and roads. Such acts of dedication not only fulfilled religious obligations but also reinforced the social and cultural fabric of Gerasa.[623] This practice mirrors similar traditions observed in other cities of the Decapolis. The *nymphaeum* of Gerasa, with its intricate architectural elements and figural decorations, exemplifies the intertwining of civic pride, religious devotion, and social status. Contributions by officials like the astynomos were instrumental in shaping the urban identity and communal life of Gerasa during the late Roman period. Yet, it is worth mentioning that the architectural features of the Gerasa *nymphaeum* do not suggest it had a similar role to the Amman *nymphaeum*, which some scholars propose may have been used for public addresses, though no solid evidence supports such a usage for the Gerasa *nymphaeum*.

In the first part of the fifth century, Christians restored the land west of the Roman *nymphaeum* and Propylon. According to a Byzantine inscription, *Artemidorus* built the *nymphaeum*, which restored a building to look like the original builder; this was a typical act during Roman-Byzantine times.[624] It appears that the site was used until the eighth century. Seventh-century datable coins might prove this; a remarkably well-preserved glass flask and an early islamic coin from 706 AD were discovered in a canal beneath the *nymphaeum* wall, confirming the muslim presence at Gerasa.[625]

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[621] Avotins, 1975: 244-45 & Weiss 2010: 68-70.

[622] See Boyer 2022: 415& Bol 1988: 11-13.

[623] Gatier et. al 2017: 142.

[624] Segal 1997: 160.

[625] Brenk et. al 2009: 217.

5.1.3. The *nymphaeum* of Gadara (Umm Qais)

In the north of Jordan, approximately 110 km from the capital city of Jordan, the ancient city of Gadara is situated.[626] The city mentioned in the Bible[627] is located on a spur high above both rivers, Yarmouk and Jordan, with annual rain encouraging agriculture without irrigation.[628] Natural characteristics distinguish Gadara from other Decapolis cities.[629] Views from Gadara include the Sea of Galilee, the Jordan River, the Yarmouk River, and the Golan Heights, making it the Decapolis city with the most stunning scenery.[630]

The Roman city of Gadara contains two roadways that make up its ordered plan, one of which is the broad, east-to-west *decumanus* street. The north and south of the city are divided by this street; *cardo* street forms a right angle with the *decumanus*.[631] Gadara, similar to other Roman cities, had a public forum on the western tip of the acropolis that was repurposed for churches during the Byzantine era.[632]

The water supply development in Gadara (Figure 3) occurred during the Hellenistic development of the city by conserving rainwater in reservoirs. Due to the lower height, it was difficult to transport water into the city; therefore, the nearby springs were only used as a supplementary method. These springs were rendered inaccessible to the city's residents during a siege.[633]

This development in the water system and presence in the city started after the annexation of Gadara by the Roman Empire in 64 BC. As the city underwent a phase of extensive reconstruction; as a component of this procedure, a comprehensive aqueduct (Ain Turab) was erected. The aqueduct in the urban area underwent multiple modifications and

[626] Ababneh 2016: 52.

[627] Mathew 8:28-34.

[628] Kerner et al 1997: 265.

[629] Shiyab et al 2017:183.

[630] Ball 2002: 196.

[631] Weber, 1991:225.

[632] See Guinee and Mulder, 1992: 387-406.

[633] Keilholz 2017: 166–168.

extensions. Five recognised stages are closely associated with the spatial and temporal development of Gadara's urbanization.[634]

The initial stage occurred during the first century BC, when water was transported via an aqueduct tunnel to where the North Theatre was later built. The next stage entailed the relocation of the inner-city entrance of the tunnel, prompted by earthquake repercussions in either 31 BC or 33 AD. During the first century AD, the third phase emerged, and the North Theatre's construction forced the relocation of the tunnel's outflow, resulting in several metres shifting to the west.[635]

During the fourth stage of development, which occurred around the early second century AD, the outflow was redirected towards the western slope of the settlement hill. This alteration coincided with the city's growth towards the western region. During the fifth stage of modifications, a significant development occurred with the construction of a new aqueduct known as the Qanat Fir'aun. This aqueduct had an impressive capacity to supply approximately 100 L/s of water to the city.[636]

The considerable size of the city's water pipe indicates the massiveness of the monument. The aforementioned “Qanat Fir'aun” is an impressive hydraulic infrastructure that spanned a remarkable distance of 150 km, serving as an aqueduct that interconnected the prominent Decapolis cities of Adra'a, Abila, and Gadara (Plate 35). The tunnel spanned a considerable length of 92 km.[637]

It is worth noting that the specific segment connecting Ain Turab and Gadara remained unfinished, thereby rendering it incomplete. Water was channelled to the Qanat Turab aqueduct during the second century AD, leading to the development of a sophisticated water distribution system in Gadara to manage the increased water supply. Implementing two water distributors and a water distribution system in the city's western region enabled efficient management of water resources in response to the demands of urban water

[634] Keilholz 2017: 149–166.

[635] Ibid.

[636] Ibid.

[637] Keilholz 2017: 149–166.

consumers. The water system in the city of Gadara managed to distribute water in a way that everyone had enough water for basic things which was considered the priority and luxurious structures such as the *nymphaeum* came after that in terms of importance.[638] It is worth mentioning that the approximate 100 m difference in elevation helped transport water from Ain Turab to Gadara. The aqueduct was a tunnel that wound for 30 km along the mountain range. It was typically 1.6–1.8 m high and 0.6-1.0 m wide and was cut into the rock a few metres below the surface. The aqueduct kept the water cool, preserving its quality, and concealed it from enemies, providing a secure water supply for the city.[639]

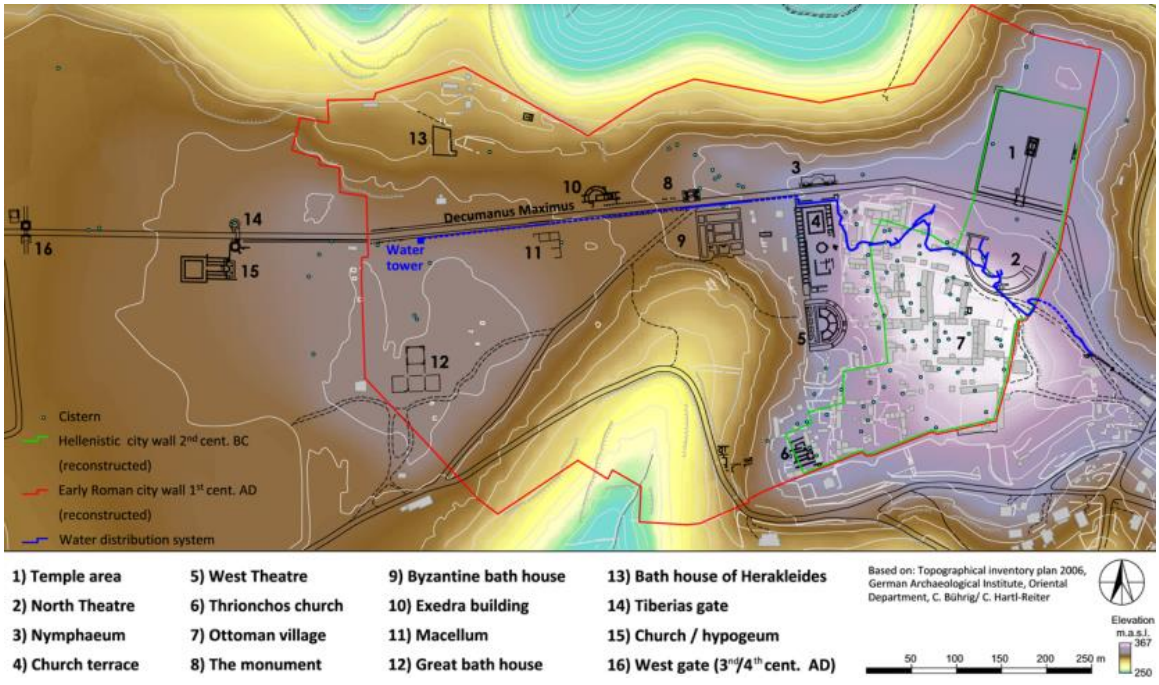

Figure 3: Topographical plan of Gadara (Umm Qais) City map of Gadara with the Hellenistic and early Roman extensions as well as the locations of the cisterns (source: vector data based on Buhrig and Hartl-Reiter 2006)

The ruins of the Gadara *Nymphaeum* (Plate 36) are situated at the current Y-junction in the middle of the ancient region, to the northern sidewalk of the Roman-era paved road, the *decumanus maximus*, northwest of the Acropolis.[640] During the Roman era, the city's

[638] Keilholz 2017: 149–166 & See Zenz 2006: 409-414.

[639] Keilholz 2017: 150.

[640] Weber 1988: 349.

expansion across a small ridge towards the western plateau began at this place, which is significant to the city's history.[641] The *nymphaeum* is a massive s*everan* fountain *nymphaeum,* based on its architectural characteristics and the period it was built, and is considered massive due to its 40 m length, and dates to the late 2nd century AD.[642] The type of the nymphaeum is considered to be exedra *nymphaeum*.

The *nymphaeum* can be described as a substantial, rectangular edifice featuring a centrally located pool. The structure is adorned with architectural elements such as Corinthian columns, pilasters, and friezes. The original structure of the *nymphaeum* consisted of two levels; however, presently, only the lower level has endured. It is believed that the upper level of the structure was designed as a colonnade, featuring a roof with a gable design.

According to Bol, based on its architectural style, the building appears to be a typical *nymphaeum* from the late Roman period.[643] The well-preserved remains of the building reveal an omega-shaped ground plan. The plan comprises central exedra, a semicircular recess framed by two smaller niches. The lateral wings of the building project longitudinally, and each is provided with a semicircular exedra.[644]

The water feature being discussed is considered among the most sizable fountains in the Levant area, showcasing a breadth of 40 m compared to its contemporaries, Gerasa and Petra, which are 20 m long on average. Significantly, it showcased a pair of substantial storage areas positioned towards the back of its exterior (Plate 37).[645]

A rectangular, east-to-west-oriented layout can be seen in the building's western portion, which is thought to be a massive fountain pool.[646] Water was pumped into the pool by

[641] Savage et al. 2005:529.

[642] Richard 2012: 79.

[643] Bol 1988: 11.

[644] See Richard: Cat no. 39.

[645] Richard 2012: 79.

[646] Segal 1997: 154.

conduits hidden in its façade from a neighbouring reservoir, hidden behind the *nymphaeum*, and covered by a barrel vault cistern used until recently.[647]

The potential connection between the fountain and the aqueduct is established through the presence of a castellum divisorium and terracotta pipes. The Gadara *nymphaeum* employs a systematic arrangement of 8-cm-diameter clay pipes and conduits.[648] Keilholz explains that the water distribution system's primary flow was used to provide water to the western city, while its uppermost segment was allocated for water supply to the opulent *nymphaeum*; the water distribution system functions based on the principles of the "*castellum aquae*," albeit with deviations from the Vitruvius' theoretical framework.[649]

According to Keilholz, the water flowing from the water distributor's lower portion served the water needs of the western city, while its upper segment was allocated for supplying the extravagant *nymphaeum*. Although the water distributor functions based on castellum aquae principles, in practice, the water distributor offers a more pragmatic solution compared to the castellum aquae. Thus, the water distributor presents a more practical alternative to the "*castellum aquae*" regarding water management.[650]

It is worth noting that according to Vitruvius's theoretical description in his book, the way water was divided in the *castellum aquae* depended on who needed it the most. The basic water supply was intended for public wells. If there were more water available, it would go to bathhouses. Only when there was excessive water could it be used for private homes. This approach distributes water based on its importance to different users.[651]

The structure is a facade-*nymphaeum* with a central exedra and two flanking *aediculae*; it is 39/40 m long by 13 m wide and stands about 16/17 m tall. It is the second-largest

[647] Ibid.

[648] Richard 2012: 102-103 & Keilholz 2017: 159.

[649] For further See Vitruvius Book VIII.

[650] Keilholz 2017: 149–166.

[651] See For further Vitruvius Book VIII & Richard 2012: 102-103 & Keilholz 2017: 159.

nymphaeum found in the Decapolis cities so far.[652] The multiple construction phases of the *nymphaeum*, dated between the second and seventh centuries AD, demonstrate the structure's significance to the city's infrastructure over time.[653]

The *nymphaeum*'s focal point is a rectangular niche of 6 by 6 m, with a secondary, semicircular niche beyond it that is topped with a partial dome. On either side of the more significant central niche in the *nymphaeum*'s façade are a pair of smaller, semicircular niches that appear to have been used to display sculptures.[654]

The façade of Gadara's *nymphaeum* faces the main street, similar to most of the *nymphaea* in the Levant.[655] The fountain basin at Gadara was partitioned into three distinct sections and featured eleven frontal spouts.[656] The *nymphaeum* of Gadara operated through a system in which a basin was solely supplied and emptied through spouts (Plate 38); this likely indicated a relatively sluggish flow rate and required significant time for the basin to fill.[657]

A marble sculpture, initially placed in the *nymphaeum*'s niches, dates back to the Roman Imperial period, maybe the middle of the second century, and was discovered among the mason's ruins.[658] Weber mentions a well-preserved sculpture representing a standing maiden draped in a long garment; the displayed statues were made of shiny white marble, which did not contrast with the dark blue basalt masonry initially covered by marble slabs.[659] Many statues made of different types of stone, including limestone, basalt, and marble, were unearthed or found in Gadara, due to the presence of basalt in Gadara, which the people often used in sculpturing despite its black-to-dark blue colour; meanwhile, the local white limestone was also used despite its low resistance to erosion

[652] Savage et al. 2005:530 & Segal 1997: 154.

[653] Segal 1997: 154.

[654] Segal 1997: 154-155.

[655] Segal 1997: 155.

[656] Richard 2012: 124.

[657] Ibid: 164.

[658] Segal 1997: 155.

[659] See Weber 1988: 349-50 & Segal 1997: 154-55.

and weathering. It is worth noting that in the Museum of Umm Qais, a statue is displayed that matches the description mentioned above by Weber (Plate 39). However, the web page of "Umm Qais Heritage" describes that it was found on the eastern façade of the Podium; it seems that this is the statue meant by Weber and mentioned in Segal.[660]

Nevertheless, another fragment found near the *nymphaeum* of Gadara is worth mentioning; it is a fragment of a togate man (Plate 40). Only a preserved torso is found, which, according to Weber, carried the head of a private man.[661] Based on scholary examination, it seems that the original statue was the size of a man; however, only 81 cm of the fragment is found. According to Friedland, the piece dates to the Flavian or early Trajanic periods.[662]

In 1990, across from the *nymphaeum*, a marble statue of a Satyr (Plate 41) was discovered with animal skin, standing at a height of 80 cm. It portrays a youthful Satyr or Silenus, a renowned figure from Roman antiquity, draped in an animal skin—a symbol of his identity.[663] The Satyr's head, lower legs, and arms are absent, but his posture against a tree trunk, supported by his elbow, is discernible. Notably, a break on the right chest suggests the presence of a musical instrument, possibly a flute or syrinx, once held in his hand. The depiction of the animal skin, which envelops his body and extends over his left flank, is marked by two jagged-edged stripes carved from fine-grained white marble; the statue, now displaying a yellowish patina, is attributed by Weber to the high imperial period, dating to the 2nd century AD or later.[664]

Recently, the bottom part of an upright female figure (torso) and an arm remnant, both made of marble, were discovered (Plate 42) at Gadara. The goddess Aphrodite is mentioned explicitly in the pedestal's donation inscription. Palaeography of the Greek characters suggests an approximate date around the end of the 2nd or beginning of the

[660] See Weber 1988: 349-50 & Segal 1997: 154-55.

[661] Weber 2002: 408-9.

[662] Friedland & Tykot 2010: 181-82.

[663] Bol, 1983:186 & Al-Bashaireh 2022: 2.

[664] Weber, 2002:405 & Al-Bashaireh 2022B: 2-3.

3rd century AD. The inscription on the plinth indicates that it was the partial donation of a Gadara resident.[665]

In Gadara, an incomplete statue, specifically the torso, bearing a resemblance to the iconic "Artemis of Ephesos", was found (Plate 43). It is worth noting that this representation of the goddess Artemis is presumed to have been sculpted from Aphrodisian marble, sourced from Aphrodisias, Turkey. This observation underscores the potential for cross regional artistic exchanges and material trade in antiquity, shedding light on the interconnectedness of people from the different regions of the Roman Empire. The left side of the artefact exhibit signs of fracture, resulting in an interruption of the flow of the inscription. This interruption slightly compromises the ease of deciphering the initial portion of the upper line. These observations lead to the distinct inference that the original possessor of the statue obtained in a state of pre-existing damage. Subsequently, the inscription was added during the chiselling process. This unequivocally underscores the notion that the statue underwent secondary repurposing, in addition to its initial purpose.[666] The epigraphic content is as follows:

"ΜΑΡ(ΚΟC) ΑΛΕΞΑΝΔΡΟC ΤΗΝ ΑΦΡΟΔΕΙΤΗΝ ΤΗ ΚΥΡΙΑ ΠΑΤΡΙΔΙ

Μάρ(κος) Αλέξανδρος τὴν Ἀφροδείτην τῇ κυρίᾳ πατρίδι.

Mar(cus) Alexandros (dedicavit statuam)

Aphro | d(e)iti domus patriae."

The inscription translates to "Marcus Alexandros dedicated (a statue of) Aphrodite to the revered homeland." This dedication by Marcus Alexandros signifies his devotion to both the goddess Aphrodite and his homeland.

According to the inscription, the public *nymphaeum* at the *decumanus maximus*, further to the east, would serve as a potential "aquatic" monument for its display, whose figural ornamentation was ordered by the district deputy *Aurelius Diophantus* for the welfare of

[665] Al-Bashaireh et al. 2019: 354-355

[666] Al-Bashaireh et al. 2019: 355-56

his hometown in the second half of the second century AD.[667] The deciphered Greek epigraph unveils the following content: "Αὐρήλιος Διόφαντος Διονυσίου Ἀντιοχεῖς ἀστύνομος Γαδάρων διὰ βίου τὸ νυμφαῖον τοῦτο καὶ τὰς εἰκόνας ἐκ τῶν ἰδίων ὠκοδόμησε καὶ ἀνέθηκε τῇ Τύχῃ Γαδάρων καὶ πᾶσι τοῖς θεοῖς" (*Aurelios Diophantos, offspring of Dionysios, hailing from the Antiochos clan, bearing the office of astynomos within Gadara for the duration of his existence, undertook the construction of this nymphaeum and enriched it with sculptural effigies, all at personal expense. He consecrated this edifice to the entity of Tyche specific to Gadara, as well as to the entire pantheon of deities*). [668]

As an astynomos, *diophantos* was responsible for the maintenance and repair of public buildings and infrastructure, reflecting his civic duty and status. His dedication of the nymphaeum, both a religious and civic gesture, underscores the interplay between public service and personal piety in Roman society.[669] Dvorjetski's analysis asserts that this inscription propounds the following propositions: Aurelios Diophantos bore a Greek appellation and was affiliated with a Greek tribe, while having committed the *nymphaeum* as an offering to the indigenous goddess Tyche in conjunction with the entire assemblage of deities. This collective assemblage could potentially encompass both the Roman and alternate divinities venerated within Gadara. This proposition serves as a testament to the intricate cultural identity and theological contrast intrinsic to Gadara and its populace. These observations can be interpreted as a manifestation of the region's distinctive identity and the multiplicity of faith traditions, which endured with a notable degree of self-governance and Hellenistic cultural influence within the broader context of Roman dominion.[670] Nevertheless, a theory described by Al-Bashaireh et al. has surfaced, suggesting that the newly found marble is for Aphrodite and was displayed in one of the semicircular niches along the curved back wall of the *nymphaeum*.[671]

[667] Weber 2002: 266. & savage et al: 529-31.

[668] Dvorjetski & Last 1991: 157-161 & savage et al 2005: 527-555.

[669] Gatier et. al 2017: 341.

[670] Dvorjetski & Last 1991: 157-161 & savage et al 2005: 527-555.

[671] For further reading. Al-Bashaireh et al. 2019: 354-357.

Several buildings, including the *nymphaeum*, make impressive use of white marble or polychrome stones in conjunction with the native limestone and basalt; columns of Cipollino marble (*marmor carystium*) were also used in the decoration of the *nymphaeum*.[672] Although it does not directly identify where these marble fragments were used, a comparison with similar structures suggests their placement on the column shafts (Plate 44). In Gadara, other constructions, such as the Late Roman Baths featured capitals and bases crafted from Prokonnesian marble, potentially combined with monolithic shafts made of Troad granite.[673] A parallel application of materials can be observed in the five-aisled basilica from the 4th century AD, where some columns were also hewn from Troad granite. The responsibility for funding public amenities such as sanctuaries and *nymphaea*, often shouldered by affluent residents and military officials, underscores their significant role in the development of these structures. According to Hirt, marble of various colours was brought in from beyond Syria's borders.[674]

A piece of marble block was found at the archaeological site of the Roman *nymphaeum* in Gadara. The artefact provides a valuable demonstration of the decorative elements and floral motifs that adorned the notable sacred and public monuments of Gadara, especially the *nymphaeum* (Plate 45). The block exhibits distinct curvature and detailed carvings on two perpendicular sides, suggesting its likely function as a component of the outer edge of the semi-dome that once covered the central pool of the *nymphaeum*. It dates back to the late 2nd century AD, and this marble segment serves as a tangible representation of the period's artistic and architectural sophistication. It is currently located on the *decumanus maximus*, positioned in front of the *nymphaeum*.[675]

Al Bashaireh notes that a total of 16 marbles of white colour and two marbles of green colour were retrieved from the *nymphaeum* archaeological site; two marbles of white colour were unearthed and successfully traced back to the western baths (Al-Qasr) during

[672] Al-Bashaireh 2022: 1- 15.

[673] Dodge 1988, 223. See also: Al-Bashaireh& Lazzarini 2015: 9.

[674] See Dodge 1988, 223, 229 & Hirt 2021: 15; for further; Packer 1967:129.

[675] See https://www.ummqaisheritage.com/ (entered August 2023).

the excavation process.[676] This indicates that there is a chance that not all the findings necessarily belong to the site they were found at, as due to the different vandalism acts and damage that occurred from human or natural causes, dramatic movements of materials were performed at the archaeological site. However, it strongly suggests that the use of marble was indeed occurring at the site, and the size and delivery of water to the *nymphaeum* indicates the importance it had to the people. In addition, the presence of marble, imported from outside the region, indicates the richness of the city, and indicates that the inhibitors of the city were eager to display their economic status.

The lower channel, which serves as the city's primary water supply, leaves the western terrace of the Acropolis hill directly across from the *nymphaeum*. The two water routes for the city pass through the Acropolis hill on the northern slope at various levels. The lower channel follows a more even course with some side channels, whereas the upper channel travels through an irregular path that passes through five cisterns. The bottom canal, which may be modern with the *nymphaeum*, exhibits smooth levelling and substantial lime deposits, but the upper channel was never used.[677]

Determining the water supply pressure height from these lime deposits in the *nymphaeum* is difficult. This proof demonstrates that the water tanks on the back of the *nymphaeum* were marginally filled above the lower order and most definitely did not supply the top order with water; the city's location on top of a plateau ridge and the associated challenges with water delivery can readily be used to explain this. The *nymphaeum* of Gadara exhibits no water outlets in the upper order.[678]

In addition to a second fountain structure to the west and a second water basin directly across from the *nymphaeum*, excavations have also unearthed several water conduits, cisterns, and basins hewn into the bedrock that partially belong to the Hellenistic Age. The *nymphaeum* has undergone several construction phases ranging from the second to

[676] Al-Bashaireh, 2011: 317 & for further see Al-Bashaireh 2003.

[677] Savage et al. 2005:529-30.

[678] Savage et al 2005: 530.

the seventh century AD. It provides insight into the significance of the building for the development of the city's infrastructure over time.[679]

It is suggested that since the deposits covering most of the remains appear to date primarily to the sixth and seventh centuries, the building may have been destroyed at some point in the late Byzantine period or the early Umayyad period.[680] Many pieces of pottery date back to the 6th and 7th centuries AD, and possibly some from the 8th century, as mentioned by the excavators' early date.[681] Complete distraction or partial destruction might have occurred on the *nymphaeum* structure, as it might have been among the buildings damaged by an earthquake in the middle or early seventh century.[682]

The *nymphaeum* of Gadara, located in the ancient city of Umm Qais in northern Jordan, serves as a noteworthy testament to the architectural and historical heritage of this metropolis from the Roman era. The water supply system of Gadara underwent a series of developmental stages, including the construction of the Qanat Fir'aun aqueduct. The *nymphaeum*, characterised by its elaborate design, architectural adornments, and strategic positioning along the *decumanus maximus*, affirms the city’s magnificence in the late 2nd century AD. Furthermore, unearthing diverse sculptures and artefacts in close proximity to the *nymphaeum* enhances our understanding of the cultural heterogeneity of Gadara and the interdependence among cities during the Roman era. However, it is essential to note that additional scholarly inquiry and archaeological excavations are needed to yield further revelations regarding this ancient urban centre and its grand edifices, thereby enhancing our understanding of the intricate historical fabric of Gadara. The *nymphaeum* is a substantial rectangular edifice with a centrally positioned reservoir. The structure is adorned with Corinthian columns, pilasters, and friezes. The original structure of the *nymphaeum* consisted of two levels; however, only the lower level has endured. The structure's upper level was designed as a colonnade with a gabled roof. However, no objective evidence can directly prove this theory.

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[679] Ibid.

[680] Bol 1988: 11-12.

[681] Ibid.

[682] Maxwell 1980: 210.

5.1.4. The nymphaeum of Petra

Petra, referred to as the Rose City is located south of the Dead Sea, 100 km north of the Aqaba Gulf, and about 200 km south of Amman. It is thus positioned in a transitional zone between the Mediterranean basin and the desert. *Petra* is the Greek term for rock.[683]

The Nabataeans made Petra the capital of their kingdom and transformed it into a metropolis city and a trade hub for the area. The Nabataeans reached their zenith point during the first century BC. until the end of the first century AD. [684]

Bowersock mentions that Petra was designated as the metropolis of Roman Arabia by Trajan, who did not intend to do so, as he moved the capital of the province to Bostra, which indicates that he wanted to diminish the role of Petra as the centre of the southern part of the Arabia territory.[685]

According to an inscription found near the colonnaded street, after the annexation of Petra to the Roman Empire, the Romanization of Petra started making it more comparable to the other Roman cities in the east. During the early stage of the second century AD, a significant embellishment of the city centre comprised the construction or reconstruction of the new temenos gate, the *nymphaeum*, the Odeion, and the Paradeisos.[686] Pliny mentions that the most esteemed Sweet Rush of his time "comes from Nabataea, known also as teuchitis; the next best is the Babylonian"[687]

[683] Al-Weshah & El-Khoury 1999: 170 And, Shqiarat 2019: 2.

[684] Abbas 1987: 9 & Athamneh 2017: 58.

[685] Bowersock 1983: 85.

[686] See Starcky (1968): 60 & Fiema (2008): 165.

[687] Pliny the Elder, Natural History 21.72.120.

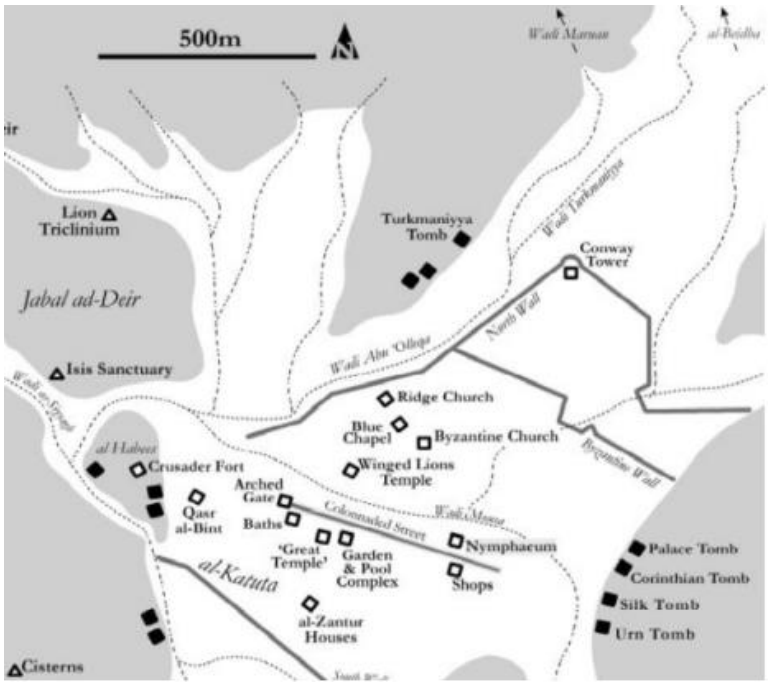

Figure 4: Map of Petra city centre (Web, http://petranationaltrust.org/ui/Photos) retrieved from Cummins: 2014.

The *nymphaeum* of Petra was among the first structures one would have seen upon entering the Roman city centre; it was situated along the colonnaded street. The *nymphaeum* was built on the south bank of Wadi Musa, on the city's eastern outskirts, with its front looking south towards the colonnaded street. When the land was examined and explored around the turn of the 20th-century, the *nymphaeum* foundation substantially survived, and its architectural elements were still visible.[688]

On the basis of similarities found in comparable locations within the Roman East, the *nymphaeum* of Petra was likely reconstructed in the form of an exedra; this exedra would have been embellished with elaborate carvings portraying water *nymphae*, serving as a tribute to the gods to whom the monument was devoted.[689] However, no direct evidence supports this suggestion that the *nymphaeum* has been embellished with carving, only a reconstruction based on a depiction found in Brownining (Plate 46). According to Kanellopoulos, the base of the *nymphaeum* and the location of it at the colonnaded street

[688] See Bachmann et al., 1921: 34-35.

[689] For further see: Browning 1973: 135-36. Segal 1997: 164 & Shqiarat 2019: 6.

are the same as the arrangement, with a *nymphaeum* at the beginning, which resembles the colonnaded street along the river bank at Lepcis Magna.[690]

The *nymphaeum* occupies a strategically important position at the commencement of the colonnaded street. The structure in question is designed in an Omega shape. It features a curved seating area at its centre, surrounded by two extending sections containing three recesses. The exedra contains a superficial seating arrangement divided into three sections, which are potentially intended to display sculptures. A single-storey structure encompasses the entire assemblage. The central exedra exhibits a notable distinction from its immediate surroundings as a result of the presence of a protective barrier. Various structural components influence the distinct arrangement and aesthetic of the water feature in Petra.[691] According to Browninig, the structure had a triangle-shaped design, which was essential due to the role it played as an intersection of two Wadis streams; he also suggests that the *nymphaeum* was constructed sometime after the colannaded street was constructed, which is the early 2nd century AD.[692]

The *nymphaeum* was constructed with the length of the principal façade measuring approximately 20-21 m as a straight wall with a semicircular niche (opening 6.50 m). In contrast, the width of the same façade is approximately 12.50 m. Inside the niche, flat, engaged piers create beautiful foregrounds and backdrops. Opposite the smooth walls on either side of the central niche stood three columns organised in a symmetrical configuration, with two columns close to where the smooth wall meets the niche and a third column near the end of the wall. Perhaps a half-dome covered the centre niche.[693] Inside the exedra was a shallow bench with three protruding areas; these areas may have been used to display statues. For the lower basin, the length extends to 19.40 m, while the width spans 3.70 m.[694]

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[690] Kanellopoulos 1998: 3.

[691] Bachmann et al. 1921: 34-35. Weber & Wenning 1997: 60 & Segal 1997: 165-66. And Richard 2012.

[692] Browning 1971: 136.

[693] Segal 1997: 165. & Richard 2012: 276.

[694] Richard 2012: 276.

Almost the entire length of the *nymphaeum* facade is occupied by 5 m by 19 m rectangular basin enclosed by a stone parapet. One ascended to the basin from street level through steps that ringed the basin on its facade and two short sides.[695] Being situated on the bank of Wadi Musa, near its confluence with Wadi Mataha, the rear wall of the *nymphaeum* was reinforced by a substantial, triangular building block whose apex penetrated the Wadi Musa riverbed. This sturdy structure prevented the *nymphaeum* from being damaged by seasonal flash floods.[696]

Petra's *nymphaeum* (Plate 47 A, B) was smaller in dimension than Gerasa's and Bosra's *nymphaea*. Nonetheless, the structural design of the monuments was similar to that of an omega-shaped exedra fountain.[697] Therefore, it is fair to believe that it was constructed during the second century AD. Also, it is considered, according to Browning, a modest affair compared to the Severan *nymphaeum* at Lepcis Magna.[698] Unfortunately, due to the absence of datable epigraphic material that specifies the time of construction of the monument, it is hard to determine its exact date of structure; nevertheless, it can be assumed based on similarities with other *nymphaea* in the region, such as the location of the *nymphaeum* at the colonnaded street and the omega-shaped base, which indicates an exedra, and also the site of its construction on a water streaming area. Therefore, on the basis of these similarities, it dates to the 2nd century AD.[699]

The *nymphaeum* exhibited a substructure characterised by a basin measuring approximately 19.40 by 3.70 m, which is indicative of its considerable scale. Moreover, noteworthy is the lower section of the Severan fountain in Petra, highlighting a shared architectural feature among the *nymphaea* in the region. This architectural complex featured essential components, including a central inlet, a spacious primary basin, an overflow system, and a secondary basin. The water flow rate within the *nymphaeum*

[695] Ibid

[696] Ibid.

[697] See Richard 2012: 79

[698] Browning 1971: 135-6

[699] Segal 1997: 157-166

appears to have been moderate, suggesting a commensurate water supply volume.[700] However, owing to the absence of extant architectural remnants, the precise details of the water distribution system remain elusive. Nevertheless, it is posited that the hydrological infrastructure associated with this architectural edifice comprised an intricate network of interrelated elements, encompassing a primary ingress point, a substantial reservoir, a mechanism for managing surplus water, and an auxiliary reservoir. The convergence of these constituent elements collectively contributed to the functional and structural configuration of the Roman *nymphaeum*.[701]

Although it is considered to have been built at the entrance of the city, Richard argues that the *nymphaeum* of Petra was not at the very entrance of the city, as it was structured at the entry point of the inner monumental centre, prior to the beginning of the colonnaded street.[702] It is imperative to mention that the *nymphaeum* was not the first water encounter for travellers and passersby. Multiple potable basins and terminations were observed along the trajectory of the aqueducts traversing the conduit of the Siq ravine, as expounded by Bellwald.[703]

The *nymphaeum* monument was a hospitable structure for travellers arriving at Petra, providing a convenient space for rest and socialisation. It offers the opportunity to quench thirst and rejuvenate by partaking in water and the refreshing sprays emitted by the fountains. The *nymphaeum* served as a communal space for residents and non-residents, symbolising the volume of water flowing into Petra and thus being a prominent marker of the city's social standing. The *nymphaeum* was a significant emblem of prestige and social standing within the city.[704]

Petra is an arid area; thus, erecting this water monument can undoubtedly give an impressive and assertive representation.[705] According to Leigh-Ann Bedal, the concept of

[700] Richard 2012: 164.

[701] Ibid.

[702] Richard 2012: 203.

[703] Bellwald 2003: 66-67.

[704] Bedal 2003: 101.

[705] Segal 1997: 166.

water display can be perceived as a lavish commodity, representing affluence and social standing. Hence, incorporating decorative water features such as the *nymphaeum*, cascades, and the Petra Pool within the Garden Complex would serve as a subtle yet potent reminder to visitors and inhabitants of the city regarding the magnanimity and authority of the governing figures.[706] The Nabataeans placed great importance on their city of Petra, situated along crucial trade routes known for their active trade. This highlights their strong desire to accomplish significant goals. Given the significant dependence of the city on trade and commerce, it is plausible to suggest that the Nabataeans strongly desired to attract and make a lasting impact on the distinguished visitors to their urban hub. Undoubtedly, the motivation behind such aspirations stemmed from the potential to enhance business negotiations and transactions, thereby bolstering the economic strength of Petra. Hence, the importance of water-presenting structures such as the *nymphaeum*.

The structure's primary feature is water, which reaches the basin in front of the façade through aqueducts, canals, or the natural flow of water due to the geography of the *nymphaeum*'s site.[707] However, a great deal of destruction has faced the monument, and no thorough inspection was conducted on the premises. The absence of the facade makes it difficult to determine how the monument functioned. Nevertheless, the *nymphaeum* in Petra, an architecture amidst Jordan's rugged terrain, unlike grand aqueduct terminations, this structure's water flow seems deliberately restricted, possibly due to gravity-driven systems standard in the Levant. The context of the Siq's aqueduct end and the addition of a water fountain across the street, which is not fully receiving the water, suggest controlled water distribution. Comparable fountains in Sweida, Byblos, and Berytus reinforce the notion of restricted water discharge for monumental fountains.[708]

The *nymphaeum* of Petra reveals that not all fountains supplied by clay pipes in the area had a significant water flow. Gravity-based systems, which naturally restricted water flow via the pipes, were frequently used. Further analysis of the Petra *nymphaeum* reveals

[706] Bedal 2003: 105 & Cummins 2014:31.

[707] Bachmann et al. 1921: 34-35. Weber & Wenning 1997: 60 & Segal 1997: 165-66.

[708] See Richard 2012: 71-72.

corroborating data favouring this assertion. The height difference between the presumed water structure and the fountain across the road indicates that the water flow was insignificant, as the restricted height difference would not provide sufficient gravitational force to support a substantial outflow. Additionally, it is important to mention that the water received by the fountain was only a fraction of the released water, which was integrated into the setup during a later phase. These observations challenge the idea of a substantial water discharge from the *nymphaeum*.[709]

Based on the author's observation of examining the site the water entered by aqueduct pipelines into the monument (Plate 48) and circulated into the *nymphaeum*. However, due to the lack of investigation at the site and the demolished façade and whole structure, it is not accessible to determine the precise movement of water within the monument. Yet, according to Browning, based on its location at the intersection of Wadi Mousa and Wadi Mahata (Plate 49), the *nymphaeum* was designed as a very flattened triangle to assist the confluence of the two streams and might have been one of the terminals of the water system that went through the Siq.[710]

The *nymphaeum* of Petra exhibited diverse water supply sources, showcasing remarkable organisation and foresight. The system exhibits the capacity to extract water from diverse origins, including the Wadi Mataha Formation, a conduit or channel originating from Ain Bebdbeh, a channel running along the western perimeter of Jebel el Khubtha, and a pipeline situated in the northern region of Siq. Repetition of water provision played a crucial role in managing fluctuations in water availability.[711]

A theory suggests that a significant flood occurred in Petra during the 4th and 5th centuries AD, and the flood speed might have varied from 0.5 m/s to an astonishing 1.1 m/s. With great strength, the rushing water surged beyond the meeting point at the *nymphaeum*, aiming to reunite with the waters in Wadi Musa. The result was an awe-inspiring view—an impressive deluge wave reaching measurements of 5 to 8 m, moving

[709] Richard 2012: 102.

[710] Browning 1971: 136.

[711] For additional information concerning the water distribution in Petra See: Ortloff 2005: 93-109.

ahead with extraordinary force. As the immense rush continued, it gained momentum, achieving a remarkable speed of 3.3 m/s along the colonnaded road.[712]

Thus, it seems that the flood had significant effects, resulting in huge damage to the city of Petra, as the floodwaters during the history of Petra might have had the potential to cause various forms of harm to archaeological sites and features.[713] This might be the reason why no facade was found for the *nymphaeum* and no structural remains are still in situ at the *nymphaeum*.

The complex configuration ensured that in the event of a singular supply malfunction, alternative sources would seamlessly assume control to sustain an uninterrupted water supply to the central region of the city throughout the entire year. The implementation of this ingenious technique allowed the urban centre to effectively preserve its commercial and religious areas despite the challenging climatic conditions characterised by high temperatures and scarce rainfall. The water management techniques employed by the Nabataeans and their remarkable architectural accomplishments garnered significant admiration, which led to the influx of merchants from distant locations who spread the city's reputation for affluence and expertise in water management to far-flung corners of the world.[714]

The *nymphaeum* was built using local resources, functioning as a fountain, resting area, and public monument. Its design aimed to provide comfort, rest, and water to passersby while promoting the city's wealth and prestige to visitors and residents. The building's facade was adorned with limestone, tiles, and columns, while the ceiling was covered with wood and various places were embellished with colored marble. Serving as a meeting spot for locals and tourists alike, the nymphaeum symbolised the plentiful water streaming into Petra, making it a highly regarded symbol of the city's standing.[715]

[712] For further See Paradise 2012: 143-150.

[713] Comer 2015: 231-244.

[714] Ibid.

[715] For further See Shqiarat 2019: 6-10.

It is important to note that while the water features in Petra mostly date back to the Nabataean period, the *nymphaeum* is a unique structure that could be credited to Roman influence. According to Schmidt, Roman influence is clearly evident in Nabatean heritage, particularly in their coinage and the architecture of specific buildings, such as the facade of the Monastery in Petra. This differentiation emphasizes the individuality and historical significance of the *nymphaeum* amidst Petra's diverse array of architectural treasures.[716] The author discovered what seems to be some Roman-period pottery sherds (Plate 50) in situ, further supporting the idea that this *nymphaeum* is related to the Roman period.

[716] Schmid 2001: 407-419.

5.1.5 The coin of the nymphaeum of Pella (Plate 51)[717]

The archaeological site of Pella, showcases extensive city walls from the Bronze Age, dwellings reminiscent of the Egyptian architectural style, and imposing temple complexes constructed with large stones on the primary mound. These structures compete for attention alongside remnants from the subsequent classical period, resulting in a site that offers something of interest to a wide range of individuals. A leisurely walk amidst the expansive remnants of Pella offers numerous distinct glimpses that bear significance to pivotal events in the history of Jordan.[718]

According to Trell, the Roman *nymphaea* exhibited a unique characteristic whereby, even when in a state of decay, they had the potential to be erroneously identified as completely distinct architectural forms, including gates, triumphal arches, freestanding exedra, scene-walls, or even harbour buildings. Roman architecture incorporated and modified various architectural elements from earlier styles as a derivative style. These elements included apses, exedra, arches, niches, pediments, and projecting *aedicular* columns.[719]

Examining the *nymphaea* coins, the focal point of Neuerburg's discourse was a well-documented Roman coin historically linked to the Esquiline Hill for an extended period. To categorise the fountains of Italy according to their types, a comprehensive collection of archaeological artefacts, literary references, and instances of *nymphaea* found beyond the borders of Italy was assembled. These coins added only a brief description of Pella *nymphaeum*.[720] No real evidence or materials can be found concerning the *nymphaeum* of Pella, which makes it more difficult to construct a well-organized methodology concerning examining it and its presence.

[717] The main source of this sub-chapter concerning the *nymphaeum* of Pella, is Trell 1978: 147-61, Also See Smith & McNicoll et al 1992:120-140. And Seyrig 1959: 68-70.

[718] Bourke 2013: 1.

[719] Trell 1978: 147-61.

[720] For further See Neuerburg 1960 & Trell 1978: 147-61.

Two distinct types of coins originate in Pella, specifically from the periods of Commodus and Elagabalus. These coins prominently display a clear abbreviation for the fundamental structure of the building, accompanied by supplementary elements.[721]

The numismatic artefacts from Pella, dating back to the early third century AD, feature depictions of a *nymphaeum*. Unfortunately, the depiction on the coins cannot be compared to corresponding architectural remains and only provides us with a *terminus ante quem* for the so-called *nymphaeum* of Pella.[722]

Fortunately, the two types of coins in Pella bear the inscription "NYMΦ(αίφ)", which is a noteworthy rarity among coins that represent a specific type of structure, such as the *nymphaea*. Trell suggests that the diemakers of the coin in Pella might have assumed that their work was not very clear and might have needed some indication for the intended structure, the *nymphaeum*. Using a determinative is rare within the spectrum of architectural coin types. During ancient times, the identification of a particular architectural structure or the deity or emperor to whom a monument was dedicated was not considered necessary. It is suggested that the individuals using the coins knew of the architectural structures portrayed on them, encompassing both the buildings of Rome and those of their respective urban centres if they did not reside in the capital city. In response to the inaccurate identification of the depicted image, its creators' inclusion of a helpful The legend on the Pella coin can be seen as whimsical but deserves consideration.[723] Both coins exhibit complete similarity, featuring identical round-headed niches on their respective facades. The coin depicting Elagabalus displays a heightened level of precision. The Commodus coin clearly shows that the end *aedicula* is curvilinear, not rectangular.[724] An actual architectural structure corresponding to the twin-arched representation depicted on the coins has not yet been unearthed.

[721] Trell 1978: 147-61.

[722] Smith & McNicoll: 1992: 122.

[723] Seyrig 1959: 68-70 Trell 1978: 147-61.

[724] Trell 1978: 147-61.

Smith, et al, uncovered a notable U-shaped wall, about 1 m thick, during their 1981 excavation beneath a Byzantine street, potentially part of Pella's civic complex. The structure's location near the city's primary spring, alongside a large staircase leading to Wadi Jirm, has led to suggestions that it might be linked to the *nymphaeum* depicted on ancient coins from Pella. Given its proximity to the water source and its distinctive U-shaped design, the researchers proposed that the structure could have functioned as a *nymphaeum*, a public water feature common in Roman and Byzantine cities. Despite the architectural and locational hints supporting this idea, further evidence is still required to definitively confirm its purpose.[725] Moreover, no concrete evidence of the *nymphaeum's* presence or location has been found to date, aside from the coin depictions.

The abovementioned coins provide definitive evidence of the existence of a *nymphaeum* at Pella, leaving no doubt about its identity or overall architectural composition. However, our knowledge of the Roman architecture at Pella is limited due to the lack of surviving structures, and the Roman *nymphaeum* is one of these structures. According to Waheeb, Roman structures such as the Roman *nymphaeum* at Pella were demolished and reused for Byzantine structures in following periods. Thus, most of the Roman architecture from this period is no longer extant.[726]

Based on the coins (Figures 5, 6), the architectural design of the *nymphaeum*'s facade is characterised by a hemi-cyclical arrangement, wherein multiple tiers are stacked vertically to create a sequence of storeys. Two pairs of columns support each level. Notably, the *aediculae* at the edges of the facade have curved designs, which differ from the typical rectangular form. The *aediculae* possess roofs that extend into the attic space and are characterised by a distinctive frieze embellished with circular decorations. The upper section of the attic ceases before reaching the *aediculae*, whereas the semicircular basin within the apse does not extend towards the adjacent *aediculae*. The straight line depicted below serves as more than a mere representation of the front wall of the basin. It

[725] Smith et al. 1981: 68

[726] Prof Mohammed Waheeb 6/Sep/2023 Personal communication.

is a symbolic representation of a rectangular foundation, crucial in providing structural stability for the entire *nymphaeum*.[727]

The concise depiction of the coins also uniquely presents a distinct figure within the *nymphaeum*, as illustrated in Figure 5. When we analyse the image portrayed on the Elagabalus coin with greater scrutiny, it becomes evident that the engraver skillfully manipulated the design to create a more spacious and prominent portrayal of a standing male figure elegantly adorned in intricate garments. This figure is notable for its outstretched hand, drawing attention to its significance in the overall composition.[728] The diemaker's ability to condense and refine the image enhances the coin's aesthetic appeal. It emphasises the importance of this central figure within the context of the *nymphaeum*'s design.

Figure 5: Coin of Pella, minted in Pella the back displays the nymphaeum, the obverse draped and cuirassed bust of Elagabalus (AD 218-222). Source: https://rpc.ashmus.ox.ac.uk/coins/6/9292 (August 2023)

In terms of similarities, it can be observed that both coins exhibit round-headed niches on their facades, with two niches present on the first coin and an equal number on the second coin. The Elagabalus coin offers a more precise depiction of the central unit, featuring

[727] Trell 1978: 147-61.

[728] Ibid.

two *aediculae* instead of one. Furthermore, the coin provides evidence that the two primary aediculae exhibit a rectangular configuration, featuring straight lintels and stairs that conform to the curvature of the semicircular facade.[729] Nevertheless, it is important to acknowledge that the architectural elements portrayed on the coins may not accurately correspond to the specific features observed in actual structures. The presence of paired columns depicted on the Pella coins is not supported by definitive evidence.

Both coins (Figures 5 and 6) provide valuable insights into the architectural features of the *nymphaeum*, including the hemi-cyclical facade, multi-tiered structure supported by columns, curvilinear aediculae, and rectangular foundation. The ongoing discourse surrounding the interpretation of the markings on the back wall and the inherent limitations associated with relying exclusively on statues for identification purposes enhance our understanding of these numismatic representations.[730]

Nevertheless, the absence of tangible evidence of the *nymphaeum* presents an archaeological dilemma. The two coins function as symbolic depictions of the *nymphaeum*; however, the lack of a physical frame of reference adds complexity to determining its actual presence in the physical world. If the decision is made to place it at the Pella site, it is crucial to undertake a more comprehensive, extensive excavation and research programme actions. It is necessary to gain a better understanding of the exact characteristics and historical significance of this monument.

[729] Trell 1978: 156-7.

[730] Ibid.

Figure 6: ***Nymphaeum of Pella in Decapolis, as displayed on Commodus era coin. Paris. Courtesy of the Cabinet des Médailles, Bibliothèque Nationale. Retrieved from Trell 1978.***

5.2. Roman *nymphaea* ruins in Jordan: Theoretical explorations and virtual reconstruction [731]

5.2.1 Theoretical explorations

In this sub-chapter, the author embarks on a theoretical exploration, drawing insights from the research findings to examine Roman *nymphaea*'s significance and cultural impact. In addition, the author reconstructed the dismantled facade of the *nymphaea* in Gadara and Petra, employing the facade of Gerasa's *nymphaeum* as a foundational reference. Compared with many other *nymphaea* structures in the area, Gerasa's *nymphaeum* is in relatively better condition despite the structural damage sustained. In this chapter, we elucidate the distinctive features and components of these *nymphaea*, as discussed in this thesis. Finally, we conclude this subsection with a concise summary of the data presented in the preceding sections.

In Jordan, four main *nymphaea* structures are still in situ; two are still in what can be described as accepted status, which are the *nymphaeum* of Amman (Philadelphia) and the *nymphaeum* of Gerasa (Jerash), while the *nymphaeum* of Gadara (Umm Qais) and the *nymphaeum* in Petra are mostly demolished. Nevertheless, the base of the structures is still visible.

The Roman *nymphaea* had an essential role in Roman urban planning, as it served religious and secular functions. The *nymphaeum* monument acted as a shrine for the *nymphae*; however, it also played a role in providing water, leisure, and comfort for city dwellers. Their strategic placement along main roads indicated their role as prominent displays of city pride and prosperity, symbolising power and affluence. The Pella *nymphaeum*'s appearance on a coin underscores the significance of the *nymphaeum* structure during that period as being placed on a coin, possibly attributed to the area's hot climate and limited water supply, as well as the people’s pride in the great architectural design of the *nymphaeum* structure.

[731] This subchapter presents the results of the author’s work.

Situated within the Decapolis cities and along the Nova Trajan, these *nymphaea* displayed the economic growth of the cities in which they were situated and served as symbols of status among the Roman Empire's urban centres. This trend emerged from the economic success of these politically and commercially strategic cities, prompting elites to construct these monuments to reinforce their influence. The Roman *nymphaea* in the East exhibited a distinctive design that combined Roman architectural principles with Eastern influences. A prominent Eastern decorative element observed in the ornamentation of *nymphaea* is the 'Syrian niche'[732], a notable characteristic observed in the decorative elements of *nymphaea* and various Roman structures in the Levant. The 'Syrian niche' is an eastern distinctive architectural element that Warwick Ball has recognised as one of the prominent features of the Roman baroque. Its decorative nature characterises it. Typically, the Syrian niche features a recessed niche embedded within a wall, primarily intended to house a statue. This niche is typically surrounded by a pair of engaged colonnettes that serve as supporting elements for a miniature pediment. The decorative element was employed with a high level of complexity to enhance large building exteriors. Despite being widespread, the origins and purpose of the Syrian niche remain enigmatic, it is not yet determined the factors underlying its incorporation into Roman architectural design.[733]

Although identified as such based on water channels and archaeological discoveries, the Amman *nymphaeum* appears to embody a synthesis of a *nymphaeum* and kalybe architectural elements. This fusion reflects the convergence of Eastern and Western cultural influences. Notably, the Amman *nymphaeum* stands out due to its distinctive features, such as the presence of an internal staircase, a feature uncommon in Roman *nymphaea*. Its strategic topographical location, combined with the influence of Eastern kalybe architecture, likely contributed to the construction of its imposing façade, which is

[732] Throughout this thesis, the author avoids the term "Syrian niche", as scholars do not widely use it, and it was used in this paragraph to emphasise the mentioned argument. However, this does not preclude the possibility that their environment influenced the *nymphaeum* niches during construction.

[733] Ball 2002: 286, 291, 326-28, 383-394.

characterised by three exedrae positioned at the intersection of the *decumanus* and *cardo*.[734]

When examining the population estimates for the cities of Amman, Gerasa, Gadara, and Petra during the period from the 1st to the 3rd centuries AD, it becomes apparent that these cities had similar population scales. The estimated population ranges for Amman were between 8,000 and 10,000 individuals, for Gerasa between 10,000 and 25,000 individuals, for Gadara between 7,000 and 9,000 individuals, and for Petra between 10,000 and 30,000 individuals. When ratios are employed to analyse the population of Rome, which was approximately 1 million.[735] Considering the seating capacities of notable Roman architectural structures such as the Colosseum (40,000-50,000 seats)[736] and the Amman Theatre (6,000 seats), it becomes evident that these figures pertaining to residents and urban populations are consistent with Walker's theory, which argues that the establishment of a *nymphaeum* in a city necessitates the attainment of a specific threshold in terms of population size and urban advancement.[737] The Amman *nymphaeum* is used as a case study to illustrate this theory, which applies to all Roman *nymphaea* in Jordan.[738] Therefore, this analysis highlights the architectural significance of the Amman *nymphaeum* as a monument that symbolises the wealth and importance of the city within the Jordanian region during the Roman period.

Another aspect that requires further investigation is the fountains in traditional old Syrian houses (Damascene houses). The Syrian traditional houses have unique architectural forms and are designed to be both private and public. These houses are considered to be a unique and important part of Syrian culture and history.[739] Some are still in use in Syria today, and people still use and enjoy them, reflecting their value to the local community. The author hypothesises that Roman *nymphaea* initially influenced the fountains of traditional old Syrian houses (Damascene houses), proposing that the concept of water

[734] See Chapter Three & Five of this thesis. And Ball 2002: 292-93.

[735] Hopkins 1978a: 96–98.

[736] Tzaferis 1990: 66.

[737] Walker 1987: 61.

[738] Ibid, See also Chapter Three of this thesis.

[739] For further See Eilouti & Al Shaar 2012: 415-425.

fountains for leisure and comfort evolved from Roman fountains (*nymphaeum*), which served as the base structure. Over time, local people incorporated elements from Byzantine, Islamic, and Ottoman cultures, resulting in the Syrian traditional house fountains that can still be seen today. It is mentioned that the Islamic world assimilated and perpetuated the water traditions inherited from the Mediterranean and Iranian regions of late antiquity, previously under the dominion of the Roman, Byzantine, and Sasanian empires.[740]

Traditional Syrian houses frequently feature an ornate interior courtyard with a fountain in the centre and ornate facades surrounding it (Plate 52). Their facades are decorated with intricate patterns. The Iwan, an open, covered area, is a significant feature of these courtyards. The Iwan is a raised platform with a charming outdoor reception and seating area, accessible by a few steps. The Iwan is ideally situated to catch cooling summer breezes and is a hub for cultural events and evening gatherings. The Iwan, which consists of two identical rooms facing one another, has an elaborate stone arch that leads to the courtyard. The transition from the courtyard to the Iwan is marked by an elaborate floor with a mosaic made of multicoloured marble that is reminiscent of designs found in oriental carpets. The inner basins of the fountains are always shaped like an octagon or a hexadecagon and are square. The fountain serves as the heart of the house and provides many benefits, such as privacy, ventilation, natural light, sound masking, and aesthetic appeal. The fountain is also a symbol of wealth, status, and hospitality, as it shows the generosity and refinement of the host.[741]

The Roman *nymphaea*'s religious significance appears to have diminished, even during its own time. In contrast, the Syrian fountains held no religious role; instead, they were exclusively functional, serving diverse purposes, as stated earlier. This observation aligns with historical indications that the *nymphaea*'s religious role faded. Such context underscores that the theory does not assert a direct lineage but proposes that the Roman influence introduced the concept of water fountains, which evolved through the dynamic interplay of Eastern and Western cultures. The notion of an adorned fountain, designed

[740] For further see Bloom & Blair 2009.

[741] See Al Abidin 2005: 63-70; Ajaj & Fausto 2014: 286-288.

for comfort, leisure, and displaying affluence, might trace its origins to the Roman *nymphaea*. The evolution is evident; where the Roman *nymphaea* played a broader civic role, the concept matured into private fountains with ornamental facades tailored for personal enjoyment and wealth displays.[742]

The potential correlation between the fountains found in Syrian residences and the Roman *nymphaea* – structures devoted to *nymphae*, particularly those associated with springs – prompts consideration. These Roman *nymphaea*, often buildings or grottoes adorned with sculptures, plants, fountains, and paintings, served as sanctuaries and reservoirs, enhancing urban aesthetics. Although separated by a substantial temporal gap between the Roman period and Syrian modern homes, one could contend that the foundational concept of these fountains might be traced back to Roman *nymphaea*. This perspective derives from the shared attributes between *nymphaea* and traditional Syrian house fountains.

The essence of the *nymphaea*, persistent in Eastern cultures, is manifested in modern Syrian homes. This endurance through cultural shifts, including the Islamic period in the Levant and North Africa, followed by the Ottoman period's architectural transformations and improvements, highlights architectural motifs' innate adaptability and assimilation. The parallels between the Roman *nymphaea* and Syrian house fountains underscore a continuum of influence across time and space. This architectural evolution, from public monuments to private residential expressions, is a testament to the fluidity of cultural and aesthetic concepts.

The practice of incorporating fountains endures in contemporary residences, with discernible influences stemming from historical monumental fountains. Notably, the integration of fountains in adherence to Islamic stylistic canons is found in Islamic states. especially the Moroccan Islamic- style fountain (Plate 53).[743]. It is worth noting that a Roman *nymphaeum* was found in today's Morocco.[744] Thus, It is plausible to conjecture that Moroccan Islamic-style fountains might have undergone cultural adaptations that can

[742] See Al Abidin 2005: 63-70. & Ajaj & Fausto 2014: 286-288 and Chapter Five of this thesis.

[743] Taskourth 2020: 565.

[744] See Belhaj et al 2016: 531-535 See also Benharbit et al 2021: 125.

be traced back to Roman *nymphaeum* fountains. Islamic cultural heritage adeptly assimilated and reinterpreted this Roman-Greco legacy, thereby bestowing it with distinctive characteristics emblematic of Islamic architectural tradition.[745]

The author's argument resides in the enduring legacy of Roman heritage, specifically containing the functional essence fundamental to the *nymphaeum*, or Roman monumental fountain. This legacy has transcended temporal boundaries, resonating across diverse spheres of contemporary existence. An illustrative manifestation of this continuum is evident in the architectural idiom characterising house water fountains, which distinctly echo the influences of Islamic Moroccan design. Notably, this architectural expression establishes a link to the Roman *nymphaea*, discernible through shared elements, including façades, foundational structures, and water distribution mechanisms.

The culminating inference sought by the author underscores the imprint of Roman culture in the East, entrenched within the profound cultural substratum of the region.

5.2.2 Virtual reconstruction using the Gerasa *nymphaeum*

The existing condition of Gerasa's *nymphaeum* allows for the discernment of the predominant architectural style that served as the foundation for the initial structure. Hence, we can extract the main basic architectural plan of the second-century AD *nymphaea* in Jordan. *Nymphaea's* presence in ancient Roman cities in Jordan manifests its significance to the Roman civilisation and underscores its importance.

In order to gain a comprehensive understanding, the author draws upon the data gathered from the *nymphaeum* of Gerasa (Plate 54) and endeavours to reimagine the basic layout of two demolished *nymphaea* structures in Jordan: the *nymphaeum* of Gadara (Plate 55 A, B, C, and D) located in northern Jordan, and the *nymphaeum* of Petra (Plate 56 A, B, C, and D) in southern Jordan. These two *nymphaea* (Gadara and Petra) were chosen due to their resemblance to the *nymphaeum* of Gerasa, as the *nymphaea* shares the characteristic of being a *severian* semicircular exedra type, constructed during the same period.[746]

[745] Taskourth 2020: 565.

[746] See subchapters (3,4,5) in chapter 5 of this research.

No superstructure has been discovered for the *nymphaea* of Gadara and Petra; however, the bases of these structures remain in situ. The measurements of Gadara's *nymphaeum* are as follows: length: 40.0m; width: 11.0 m (with a maximum width of 13.5m). Interestingly, the diameter of the exedra is 14.0m, indicating a larger size than Gerasa's *nymphaeum*, which has a façade length of 23.5 m and a width of 7.2 m and maximum façade width is 9.8 m. However, both monuments exhibit similar proportions when considering the ratio between length and width. The ratio for Gadara is approximately 3.6 (40/11), whereas Gerasa's is 3.26 (23.5/7.2).

Petra's *nymphaeum* appears to have dimensions similar to Gerasa's *nymphaeum*. Petra's *nymphaeum* is 21 m long with a 6.50 m wide semicircular niche. Parallel measurements highlight similarities in the *nymphaea* structures of both Petra and Gerasa. Thus, the façade of the Gerasa *nymphaeum* could serve as a foundational reference for Gadara and Petra's main architectural elements.

The methodology employed in recreating the sketch design of *nymphaea* structures involved several steps. Initially, the existing facade of Gerasa's *nymphaeum* was outlined on a basic plan, serving as the foundation for the replication process, given that these *nymphaea* were contemporaneously constructed and shared a common cultural and political context. Thus, it might be postulated that the core architectural elements defining Gerasa's *nymphaeum* could have influenced the design approach employed in creating the *nymphaea* observed in Gadara and Petra.

Additionally, observing the depiction of the *nymphaeum* of Pella[747] on the two coin types displays, despite its unclarity, an exedra *nymphaeum* of three storeys. However, it is imperative to recognise that this proposition remains speculative, awaiting substantiation through concrete evidence. Subsequently, a sketch plan was developed for the remaining sections of the *nymphaea* at Gadara and Petra, and these individual plans were then integrated.

[747] See chapter 5 subchapter: Pella.

Great attention was devoted to maintaining the unadorned nature of the illustrations, with deliberate omission of the distinctive characteristics of Gerasa's *nymphaeum*. Consequently, the adornment and architectural elements of the two *nymphaea* were excluded due to insufficient available information on these aspects.[748]

Figure 7[749] explains the process of recreating a basic plan for the facade of Gadara's *nymphaeum*. This involved sketching the basic outline of the structure and referencing the structural elements observed in the still-standing *nymphaeum* of Gerasa. Notably, the *nymphaeum* of Gadara was characterised by masonry constructed of basalt stone.

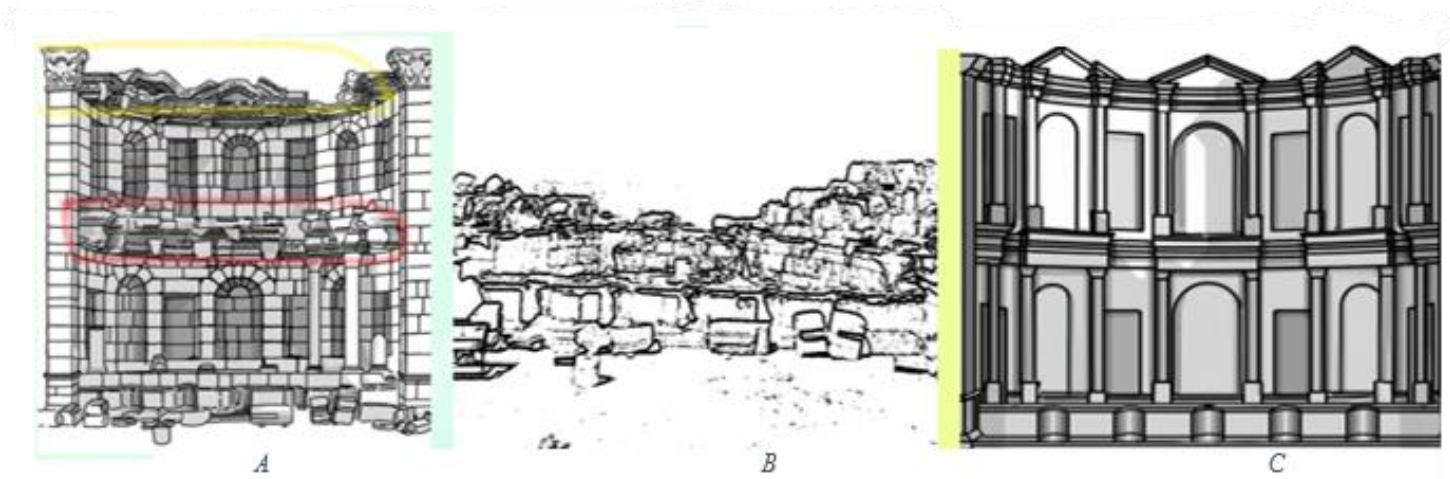

Figure 7: (A) Sketch of the facade of the nymphaeum of Gerasa, with the frieze and decoration band; (B) A sketch of the nymphaeum of Gadara in its current status; (C) The facade of both the nymphaea of Gadara and Gerasa combined into a basic nymphaeum facade structure constructed from the base of the nymphaeum of Gadara, with the basic outline of the nymphaeum of Gerasa for the upper stories and a simple designed frieze. (The image is a sketch by artist Lamara Dagistani, created in 2023, based on the author's guidance).

Despite the destructive condition of the Roman *nymphaeum* in Petra, the author has developed a conceptual reconstruction of the core architectural design of the

[748] See (Plates 67 A and B) For restoration with statues in the niches generally based on the Statues of Plate 39 the statues found in Gadara.

[749] See (Plates 68 A, B and C.) in the appendix for better resolution for the same reconstruction image.

nymphaeum's facade. This reconstruction is comprehensively depicted in Figure 8.[750] The methodology employed in this study involved generating a rudimentary schematic design, drawing inspiration from the discernible structural attributes identified within the Gerasa *nymphaeum*.

The main goal of this study is to determine whether it is possible to use the blueprint for the architecture of the Gerasa *nymphaeum* as a starting point for reconstructing an approximate plan of the *nymphaea* at Gadara and Petra. This endeavour is underpinned by the potential existence of shared architectural traits among the *nymphaea* discussed in this study. This is supported by their distinctive characteristics, construction chronology, and geographic proximity to the cities where these *nymphaea* once stood.[751]

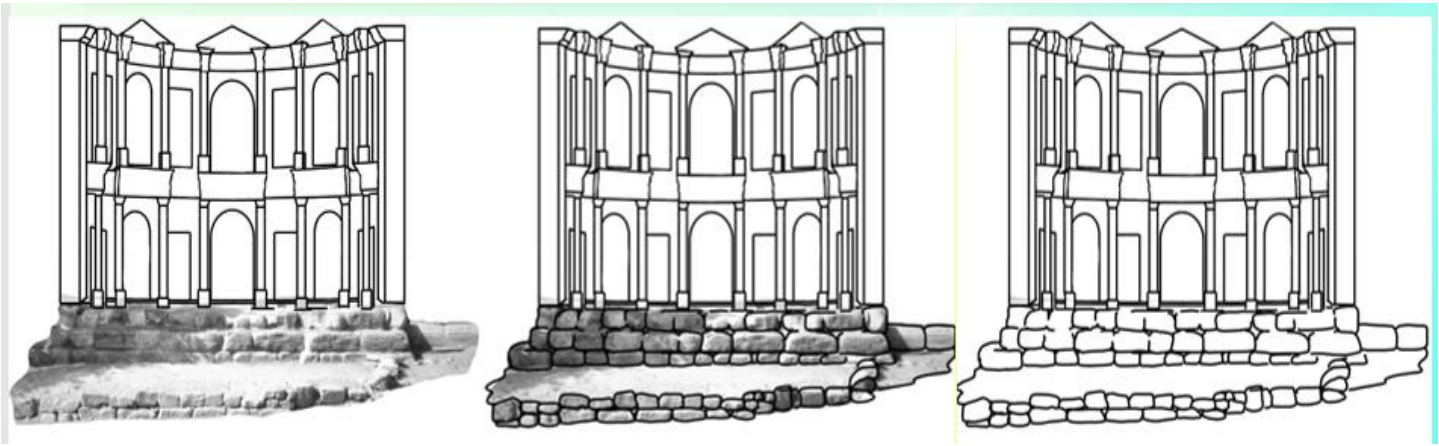

Figure 8: Sketches of the process of making a basic sketch for the nymphaeum of Petra by combining the basic nymphaeum structure of Gerasa with the base of the nymphaeum of Petra. (The image was sketched by artist Lamara Dagistani, based on direction provided by the author, 2023)

The absence of conclusive evidence shrouds the superstructures of Gadara and Petra's *nymphaea* in uncertainty regarding whether they featured a straightforward apse design or embraced the intricate multiplicity of niches akin to the Gerasa *nymphaeum*.

[750] See (Plates 69 A, B, C) in appendix for better resolution for the same sketches.

[751] See tables 2,3,4.

In navigating these complex historical reconstructions, whether the structures in Gadara and Petra exhibited a streamlined apse design or encompassed the complexity of multiple niches, as observed in Gerasa, remains an enigma yet to be resolved. The meticulous sketches presented in this study should be recognised as the author's earnest endeavour, meticulously crafted using available tools and thoroughly researched data.

A profound understanding of the methodological limitations inherent in historical reconstruction will enrich this effort. Considering these considerations, the author acknowledges the open nature of their work—an invitation to scholarly critique, refinement, and advancement within academic discourse.

The Gerasa *nymphaeum* is a valuable historical and architectural resource that helps understand and reconstruct other monuments in Jordan that might have shared the same function as the *nymphaeum* of Gerasa. Cross-referencing architectural designs and analyzing the Gerasa *nymphaeum*'s arrangement revitalizes these old structures to reveal their past and enhance our knowledge of Jordan's architectural heritage.

Nymphaeum	Type	Location	Date of Construction	Water Source	Similar structures
Amman	complex monumental façade/ unique polygonal shape	intersection of *cardo* and *decumanus*	Latter part of 2nd century AD.	Surrounding highlands and water stream (Sil)	Shahba/ Sagalassos *nymphaeum*
Gerasa	Semicircular winged exedra/ omega-shaped	*cardo maximus*	190/191 AD	Water reservoir? Berktein reservoir?	exedra of herodes atticus, located in Olympia, Greece
Gadara	Semicircular winged exedra/ omega-shaped	*decumanus maximus*	Latter part of 2nd century AD.	Reservoir behind the mason	Scythopolis *nymphaeum*
Petra	Semicircular exedra/ omega-shaped	*decumanus maximus*	Early 2nd century AD.	various sources.	Bosra *nymphaeum*
Pella	hemi-cyclical façade?	?	1st -3rd century AD?	?	?

Table 2. Main elements of the *nymphaea* of Jordan.

Nymphaeum	Exedra diameter	Number of exedras	Spouts	Inlets
Amman	8.4 & 5.5 m	3	14?	?
Gerasa	8.8 m	1	7	7
Gadara	14.0 m	1	11	3
Petra	6 m	1	?	1

Table 3. Exedra dimensions and water elements of the *nymphaea* of Jordan.

Nymphaeum	Length	width	heigh	Stories
Amman	68.0 m	12.6 m	around 12 m (app.)	3
Gerasa	23.5 m	7.2 m	10 m (app)	2
Gadara	40.0 m	13.5 m	25 m (est)?	2(?)
Petra	20.0 m	6 m	12 m (est)?	2(?)

Table 4. Main dimensions of the *nymphaea* of Jordan.

The author contrasts two instances of Roman nymphaea: the nymphaeum at Gerasa and that at Lepcis Magna. The comparison seeks to elucidate the distinct and analogous aspects of these masons, including their architectural characteristics, conditions of preservation, and cultural importance. The nymphaeum at Gerasa is regarded as well-preserved, while the nymphaeum at Lepcis Magna is deemed to be in good condition despite certain demolished sections, and it continues to offer significant insights into the historical and cultural aspects of the Roman Empire.

Location within the City:

Gerasa *nymphaeum*: This structure was built into the urban matrix by occupying a central position along the cardo maximus and from there it radiated towards the other regions of the city. The location of the *nymphaeum* addresses its dual roles not only as an ornamental feature but also as a public water cellar being a focal point that is intended to catch the attention of the people who pass by and also serve some civic use.

Lepcis Magna *nymphaeum*: The structure is located in North Africa, at the beginning of a colonnaded avenue that establishes a connection between the port and the forum. It serves as a transitional element between the civic and commercial sectors of the city. A significant amount of significance is attached to the *nymphaeum* of Lepcis Magna. The proximity of the temple to the Temple of Septimius Severus highlights the significance of the temple in terms of the functions it plays in imperial ceremonies and other rituals.

Architectural Features:

Gerasa *nymphaeum* measures 23.5 m in façade length, 7.2 m in width, and has a maximum width of 9.8 m. Its height reaches 10 m, with a two-story design, featuring niches for statues, adorned with Corinthian columns approximately 13 m tall exhibits an exedra-shaped design with Corinthian columns and a richly decorated frieze. It shows the use of marble and limestone to create an imposing and highly decorative structure, serving both utilitarian and aesthetic functions. The presence of acanthus leaves in the decoration and the use of multiple niches for statues reflect the Roman emphasis on luxury and display.

Lepcis Magna *nymphaeum*: With an imposing width of 48 m, the nymphaeum includes a 7.7-meter radius central semicircular exedra behind a trapezoidal area. The surviving structure reaches a height of 16 m, showcasing a façade adorned with stacked Corinthian columns and marble cladding.[752]

Current Condition and Preservation:

The Gerasa *nymphaeum* remains in a relatively good state of preservation, with its façade, columns, and decorative elements still largely intact. Although some elements, such as statues and portions of the upper stories, have been lost over time, the monument continues to offer significant insights into Roman architectural practices and urban design.[753] Its current state allows for the continued appreciation of its grandeur and importance within the urban fabric of Gerasa.

The Severan Nymphaeum at Lepcis Magna has suffered extensive damage over the centuries. While portions of the structure, such as the northern segment and parts of its ashlar facade, remain intact, much of the southern semicircular section has collapsed. Despite this, the concrete core and rear stairways offer glimpses into its original grandeur. Some of its key features, including niches once likely adorned with imperial statues, remain speculative due to the absence of definitive archaeological evidence.

[752] Chapter 4.8.

[753] Chapter 5.1.2.

Furthermore, the structure's deterioration has left it partially buried under debris, limiting access and study.[754]

Cultural and functional significance:

Gerasa *nymphaeum* functioned both as a monumental fountain and a symbol of the city's prosperity, reflecting the civic pride and the importance of water management in Roman urbanism.[755] Its prominence along the cardo maximus emphasizes its dual role as a public utility and an ornament of the cityscape.

The *nymphaeum* of Lepcis Magna demonstrates the blending of cultural, religious, and practical elements in Roman urban design. Architecturally, it reflects the Eastern Roman Empire's stylistic influences, with its semicircular design and elaborate facade. Culturally, the *nymphaeum* served as both a civic amenity and a symbol of Roman authority, demonstrating the empire's capacity for urban plann ing and water management. Functionally, it was a hub for communal interaction, offering a space for leisure while celebrating the achievements of Roman engineering. Its strategic location in the city's heart underscores its role as both a landmark and a focal point for social and ceremonial gatherings.[756]

To sum it, while both *nymphaea* served similar purposes within their respective cities, the *nymphaeum* of Gerasa is distinguished by its superior preservation and architectural grandeur, offering invaluable insights into Roman urbanism in the East. In contrast, the *nymphaeum* of Lepcis Magna, though significantly deteriorated over the centuries, remains a testament to the grandeur of Roman architecture and provides a broader understanding of social and cultural life in the Roman Empire. Both *nymphaea* share many similar features, such as the exedra-shaped design that was prominent in Eastern Roman cities, and utilized comparable water systems that integrated aesthetic and functional elements, yet their differences in condition and context highlight the varied expressions of Roman architectural ambition across the empire.

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[754] See Chapter 4.8.

[755] Chapter 5.1.2.

[756] Chapter 4.8.

5.3. An Evaluation of Cultural Resource Management (CRM) Practices at Roman *nymphaea* of Jordan: Identifying and Addressing Challenges on Site

On a global scale, a correlation exists between tourism, heritage, and cultural elements. Specifically, tourism plays a noteworthy role as an economic catalyst in safeguarding and maintaining cultural and heritage assets.[757] Those motivated by the value of heritage preservation and conservation are archaeologists historians, institutions, organisations or societies interested in or engaged with heritage as well as visitors to the heritage tourism site.[758]

Cultural resources, such as archaeological sites, are precious yet finite. Therefore, land usage must be managed and improved to lessen the risk of destroying cultural artefacts.[759] Archaeological sites face growing threats from development, climate change, tourism, poor management, looting, conflict, and limited government resources.[760] Several developing nations placed a high value on the tourist industry in the latter three decades of the twentieth century.[761] Nevertheless, sustainable development has highlighted the need to protect tourist sites from harmful consequences. Resource-based attractions require effective management and planning.[762] This subchapter will illuminate some of the main threats facing the *nymphaea* of Jordan.

To achieve sustainable tourist development, tourism should be a framework component tied to other socio-economic activities while benefiting local inhabitants, protecting the ecological and cultural heritage, and achieving political objectives. This aim demands complex planning for sustainability; there are inherent pressures and limits on the

[757] For further See Chik & Tahir 2000.

[758] Ahmad et al 2008: 401-413 Also see Azua et al 1989: 2-13.

[759] Elia,1993: 97-104.

[760] Williams 2018: 5-9.

[761] Oppermann & Chon, 1997: 178-191.

[762] Helmy & Cooper 2002: 515-16.

sustainable growth process in developing nations due to deficiencies in development planning and the urge for short-term economic advantages.[763]

The upcoming subchapters that are based on the cities of the examined *nymphaea* will deal with common issues that face archaeological sites in general, such as vegetation cover and graffiti drawing. Followed by a SWOT analysis for each of the intended *nymphaeum* structures in Jordan mentioned in this research. To commence, it is imperative to provide an initial comprehensive overview of the main issues encountered at each *nymphaeum*.

Vegetation surrounds the site, and plants grow through the site's rocks; this might be a disadvantage for the long-term preservation of the site. Plants can quickly overwhelm a historical building or landscape if not adequately managed. In tropical areas, for instance, trees and plant growth can quickly overtake historic buildings and places, necessitating regular maintenance.[764] According to Reuben Rainey, vegetation is a fluid and dynamic environmental element, and this factor can readily cover a historic resource.[765]

To thrive, plants that can endure poor conditions need deep-developed roots. Thus, plant roots lengthen and expand. Successful plants grow deeply into the gaps or spaces between stones used to build historical structures, causing chemical and physical damage. The roots hydraulically squeeze the stones, deepening water infiltration and extending fractures. As the water freezes, the deformation expands—plant root development and radial thickness strain buildings, leading them to degrade. Over time, roots can expand gaps and joints, allowing more moisture into plant colonies such as rhizomes, which can cause mechanical ruptures and substrate constraints.[766] Moreover, decomposing roots, stumps, and moss residues weaken structures by creating low-density areas and promoting seed germination and growth of other plant species.[767]

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[763] Ibid.

[764] Feilden, 2007: 131.

[765] Rainey, 1983:68-89.

[766] Ibid & Aksoy et al. 2000:1152-1161. For further see also: Elgohary et al. 2022: 6.

[767] Benharbit 2021: 136.

Another issue caused by vegetation found at an archaeological site is that plants increase the probability of a fire breaking out, making them a potentially hazardous element.[768] Wildfire impacts can jeopardise the archaeological interpretation of the site or the artefacts within it and the ability to capture and record human history in ancient times.[769] Wildfires can change the essential material properties that help to study artefacts, making archaeological resources vulnerable.[770]

Graffiti: Heritage sites, such as rock art, monuments, and historical sites, are particularly vulnerable to graffiti, described as "the unlawful act of painting, writing, scratching, and etching into public or private property."[771] Graffiti expresses someone's desire to say something to remark, enlighten, entertain, convince, insult, or validate their existence in life.[772] Graffiti is primarily seen as a criminal crime since its execution is frequently associated with public and private infractions, such as distorting buildings or monuments.[773]

Conservation, preservation, and cleaning of a site that has faced graffiti vandalism are not easy, as challenges increase due to the delicate status found at historical sites. The cleaning process relies on the material utilised and the damaged material. Graffiti removal is more difficult when the vandalism is on a surface to be protected, such as historical wall paintings or modern street art.[774]

[768] Korkanç & Savran 2015: 293. See also Benharbit 2021: 136-37.

[769] Friggens et al. 2021: 2.

[770] For further See: Romme et al. 1993: 28-30. & Buenger 2003: 207,303. Also, Davis 2018: 209-219 & Caneva et al 2006: 163-170.

[771] Keats 2008: 24 & see also Merrill 2011: 59-75.

[772] Ellis 1985: 1.

[773] For further See Baglioni et al, 2018: 218-26. & Young 2012: 297–298.

[774] For further See Giorgi et al. 2017: 3707-12.

5.3.1 Amman *nymphaeum*

The *nymphaeum* of Amman is a significant cultural source and gives much insight into the Roman design; nonetheless, examining the archaeological site is necessary to throw light on the site's status from a cultural management perspective. Thus, a strategic analysis of heritage management at the *nymphaeum* of Amman based on a SWOT analysis that was conducted on the Amman *nymphaeum*.

The Restoration and Rehabilitation Project of the Roman *Nymphaeum* in Amman protected the site's internal environment by removing non-site-related constructions and eyesores, cleaning the front area of garbage, landscaping, and installing winter-friendly terraces.[775]

Amman *nymphaeum* SWOT A**nalysi**s

The researcher will add a brief (SWOT) analysis concerning the information that was gathered during the conduct of this research. SWOT analysis (Strengths, Weaknesses, Opportunities, Threats)[776] The importance of SWOT analysis is crucial in archaeological sites, as it helps preserve the location for the future, which, by doing so, might shed light on discoveries using better futuristic technologies and enhanced methodologies.

In the SWOT analysis conducted by the author, the abovementioned restoration and rehabilitation projects positively impacted the results and increased the strengths. However, if we make a new assessment of the site based on the late visits by the researcher:

Strength:

The archaeological projects conducted at the *nymphaeum* site are still subject to intensive preservation work. The *nymphaeum* site has been declared an archaeological park. This status affords protection to the site and establishes the power of control for the relevant regulatory authority. The last project on the site increased awareness among key

[775] For further Concerning the situation of Amman *nymphaeum* see: Al-Adarbeh et al 2018.

[776] Dalton 2019: 249-252.

stakeholders and the local community regarding the importance of the site of the *nymphaeum*. It should have the highest priority and shed light on the issues related to the site on different media platforms.

Weakness and Threats:

The *nymphaeum* of Amman is located at the centre of downtown Amman; commercial buildings, markets, and housing residents surround it. This crowdedness and high traffic cause pollution and slow destruction to the site, the number of vehicles, and the humidity that the site faces. Hence, dampness causes foundation weakening, salt crystallization, corrosion, and microorganism growth.

The monument's current location in Amman's modern urban environment generates air pollution, vibration, and essential urban infrastructural upgrades, such as installing a sewage system under the structure and critical roadways around it. The *nymphaeum* has weathered, rising moisture, efflorescence, sub-florescence, erosion, staining, crumbling, chipping, cracking, separation, and flaking.[777]

Located in a crowded area also increases the odds of vandalism in the area, although the area is considered secure; nevertheless, some minor vandalism experiences have been witnessed, as well as littering in the site and surrounding areas.

However, it must be noted that the Department of antiquities and Amman municipality managed to keep the location in good condition. However, the problem is raising awareness among the people, especially the younger generation, of the importance of preserving the site and how crucial it is to protect and keep it in good condition.

Opportunities:

The 2014-2018 project improved the site in several sectors, highlighted it, and showed what a professional management plan could achieve. More projects and campaigns should be conducted to raise awareness, especially in schools and universities, to increase their pride in archaeology and its amount of history.

[777] For more details about damage assessment at Amman *nymphaeum* See: El Khalili 2016: 477-492.

It is also worth noting that the necessity for conservation efforts – mentioned earlier- arose due to both the deteriorated state of the monument and the unfavourable condition of the surrounding vicinity, wherein 70% of the resident's expressed dissatisfaction with their quality of life. The primary objective of this restoration project was to enhance the park and its surrounding area to facilitate viable tourism activities, thereby generating benefits for the local community.[778]

The author's field visit to the *nymphaeum* revealed that it is well maintained; it is worth noting that the site's location poses a significant challenge due to the site's proximity to a major thoroughfare, which results in significant pollution, as well as a large number of pedestrians and vendors operating in the area, all of which contribute to littering and, potentially, vandalism.[779]

[778] Al Haddad et al, 2022 2847-57.

[779] For further see Khalfieh 2011 & Al Haddad et al, 2022 2847-57.

5.3.2. Nymphaeum of Gerasa

The Gerasa *nymphaeum's* issues, such as rubbish and stone degradation, were evident during the author's field survey. The situation is reasonable, and limited conservation and preservation work was done on-site. However, some factors at the site may harm the mason and should be monitored.

Vegetation cover at the *nymphaeum* site in Gerasa

Due to Gerasa's warm summers, dried grass and people smoking may cause wildfires. According to the Hillingdon government website, cigarettes thrown on dry grass, while not improperly put out, might start grass fires.[780]

The Gerasa *nymphaeum* is encompassed by vegetation (plate 57) that transitions into arid foliage. It is recommended that site management implement additional protective measures. During the spring season, the herbaceous plants that grow near and within Gerasa's *nymphaeum* have a detrimental impact on the environmental tolerance of the structure. Therefore, ensuring the cultural relics are well-maintained is imperative to prevent damage.

Graffiti at the *nymphaeum* site in Gerasa

At the site of the *nymphaeum* in Gerasa, the author found minor vandalism during the field visits (plate 58) the graffiti is found on the outer wall of the basin, and is wording in Arabic. Although it is not a massive act of graffiti, this might be because the site is an archaeological park supervised by the DOA; however, this act is visible and indicates a lack of awareness among some of the site's visitors, and might lure more acts of such vandalism in the area. Visitors to a destination may want to do more than see and experience the sights and sounds of the area; of these interaction methods, some, like graffiti, which is judged morally as unpleasant.[781]

[780] https://www.hillingdon.gov.uk/article/3085/Grass-fires (visited 21/04/2023).

[781] Thirumaran 2013: 580.

Hence, it is highly recommended that strict laws should be issued to lower this kind of act in archaeological sites. Also, procedures to spread awareness and heritage respect culture among site visitors and increase the local people's fondness for the sites on their land. The historical value it presents to the whole world. More workshops and projects to solve and decrease the frequency of these vandalism acts should be conducted in the future.

Littering and scattered relics at the *nymphaeum* site in Gerasa

Not much littering was discovered throughout the area; nevertheless, some types of rubbish were apparent, each in its distinct clutter (Plate 59). Littering occurs throughout the *nymphaeum*, particularly in the water tank. Littering in different forms conveys the sensation and picture of a dirty, unclean environment; thus, littering may influence visitors' experiences.[782] The site should be cleaned more frequntly, and more supervision should be given regarding its cleanliness.

At the site of the Gerasa *nymphaeum*, the remnants of Roman columns are few and have not been maintained in accordance with historical preservation standards (see Plate 60). The site requires a conservation strategy to preserve its substantial cultural heritage, especially against natural deterioration. Additionally, climbing on the Gerasa *nymphaeum* is a common activity for visitors pausing to take photographs, which poses a potential risk of long-term damage to the stone structure.[783]

Addressing these behaviours is crucial. Distributing written laws and guidelines on-site is essential to prevent further harm and potential structural damage.

SWOT Analysis for the *nymphaeum* site in Gerasa

Based on the information above, the author can conduct a SWOT analysis evalution of the site of the *nymphaeum* of Gerasa:

Strength: The Gerasa *nymphaeum* complex remains intact and undamaged, exhibiting a commendable state of preservation. Its well-preserved condition renders it a valuable

[782] AlMasri & Ababneh 2021: 2457-8.

[783] See Qaddhat et al 2021: 248-61.

resource for scholarly investigation into Roman *nymphaea* in the region, offering a stable foundation for research.

Weakness: One of the primary challenges confronting the site is its limited visibility, as the site's cultural significance necessitates increased attention and awareness. From a physical perspective, it is imperative to prioritise the maintenance and preservation of the site by implementing enhanced protective measures. Additionally, meticulous attention should be given to cleaning and removing vegetation and effectively managing scattered nearby relics.

Opportunities: With an appropriate management plan and a focus on sustainability, the *Nymphaeum* site in Gerasa holds significant potential for future development. Given its well-preserved facade and location within a major archaeological site, the *Nymphaeum* of Gerasa can serve as a valuable platform for showcasing Roman culture and attracting tourists.

Threats: The primary challenges confronting the Gearasa *nymphaeum* site encompass those previously delineated in the preceding sections, along with the potential ramifications of neglect, which could potentially harm the site.

5.3.3. Nymphaeum of Gadara

Within the same matter conducted earlier in Gerasa, this sub-chapter examines the challenges encountered by the *nymphaeum* of Gadara and discusses the significance of sustainable tourism development. Integrating tourism with socio-economic activities, preserving local traditions, and safeguarding ecological and cultural heritage allows for the harmonious preservation of the past while shaping the future.

The primary objective is to identify and suggest strategies to address areas that need improvement. Implementing proactive measures to safeguard the *Nymphaeum* of Gadara is crucial for preserving its aesthetic appeal and historical importance for future generations.

Vegetation cover at *nymphaeum* of Gadara

Vegetation surrounds the *nymphaeum*, and plants grow through the rocks. This might be a disadvantage for the long-term preservation of the site. Plants can quickly overwhelm a historical building or landscape if not adequately managed. In tropical areas, for instance, trees and plant growth can quickly overtake historic buildings and places, necessitating regular maintenance.[784]

One additional concern engendered by vegetation within an archaeological site is the heightened likelihood of fire ignition, thereby rendering them a potentially perilous constituent. The potential consequences of wildfires on the interpretation and preservation of archaeological record, particularly on the documentation of human history in ancient eras, are of significant concern.[785]

A variety of vegetation surrounds the *nymphaeum* at Gadara (Plate 61), which gradually changes from lush vegetation to more arid and dry foliage. It is strongly advised that the site administration implement supplementary protective measures. During the vernal period, the herbaceous flora close to and encompassing Gadara's *nymphaeum* exerts an adverse influence on its structural resilience to environmental conditions. Consequently, safeguarding cultural artefacts' integrity necessitates meticulous preservation to avert potential harm or degradation.

Littering and scattered relics at the *nymphaeum* of Gadara

A certain degree of littering has been observed upon examination of the vicinity. The phenomenon of littering is observed to manifest ubiquitously within the confines of the monument, with a notable concentration of such occurrences being discernible in the vicinity of bores (Plate 62). In its various manifestations, littering is a visual and sensory representation of an unsanitary and polluted milieu. Consequently, littering can be posited as a factor that potentially impacts the perceptions and encounters of individuals

[784] Feilden, 2007: 131.

[785] This was mentioned earlier in the research.

visiting said environment;[786] the site's current state necessitates a comprehensive assessment of its cleaning practices and an increasement of oversight mechanisms to ensure optimal cleanliness standards are upheld.

The *nymphaeum* of Gadara exhibits a dearth of archaeological artefacts, which regrettably lack proper organisation and maintenance in accordance with established historical management protocols (Plate 63). In order to safeguard the substantial cultural and historical worth of the property against the deleterious effects of natural phenomena, it is imperative to devise and implement a comprehensive conservation strategy that protects the relics of the site of future looting for personal construction and to benefit from the data that can be extracted from examining and studying these artifices.

Engaging in ascending the *nymphaeum* structure is an additional endeavour that individuals contemplate undertaking during their visit to the designated location, often pausing momentarily to capture photographic mementoes. However, it is imperative to acknowledge that such conduct possesses the inherent capacity to induce gradual degradation of the stone material over an extended temporal trajectory.[787]

Acknowledging and duly address these behaviours, as their disregard may have adverse consequences; mitigating the potential escalation of such behaviours and ensuring the efficient distribution of written statutes and guidelines within the relevant vicinity is crucial.

Fortunately, the *nymphaeum* of Gadara exhibited an absence of discernible acts of vandalism in its architectural integrity. This phenomenon can plausibly be attributed to its strategic placement within a locale that experiences a substantial influx of transient visitors. Nevertheless, it is imperative to acknowledge that a comprehensive investigation has been conducted on the site of Gadara, encompassing the examination of the *nymphaeum* and focusing on assessing air pollution. Additionally, the climatological aspect of the site's orientation has been thoroughly analysed, elucidating its manifold repercussions on the architectural edifices erected and discovered within its confines.

[786] AlMasri & Ababneh 2021: 2457-8.

[787] See Qaddhat et al 2021: 248-61.

The geographical region of Gadara exhibits a semi-arid climate characterised by hot and dry summers and mild winters, accompanied by sporadic precipitation patterns. The meteorological data reveals a mean air temperature of 26.4 °C, exhibiting diurnal fluctuations with a nocturnal nadir of 16.5 °C and a zenith of 36.2 °C. The range of relative humidity spans from 44.7% to 87.5%. It is observed that higher levels of humidity, coupled with moderate annual precipitation, contribute to an increased occurrence of wet deposition of pollutants. Consequently, this phenomenon may result in raindroplets with a higher degree of acidity.[788]

The meteorological parameters' measurements at Gadara reveal that the detected air pollutants generally remained within the prescribed national limits established by the Jordanian Ministry of Environment. Nevertheless, it is worth noting that the concentrations of ground-level ozone exceeded the established thresholds stipulated by the World Health Organisation (WHO); these observations elicit apprehension regarding the plausible amplification of erosion and deterioration velocities of geological formations at the site of Gadara. Thus, the imperative lies in implementing a stringent mitigation strategy to safeguard the invaluable cultural artefacts of Gadara, alongside other significant archaeological sites in the northern region of Jordan.[789]

In conclusion, the *nymphaeum* of Gadara, with its intricate architectural elements and embodiment of Roman urban planning principles, emphasises its multifaceted importance within the city's urban fabric. It is imperative to undertake additional endeavours to perpetuate and enhance cognisance of this prodigious aqueous structure among indigenous inhabitants and visiting sojourners. Furthermore, resolute conservation initiatives are indispensable to shield the locale from potential harm or decline. Undoubtedly, the Gadara *nymphaeum* is a poignant embodiment of Jordan's rich cultural and architectural heritage, necessitating the utmost reverence and safeguarding.

SWOT Analysis for the *nymphaeum* of Gadara

[788] Abu-Allaban & El-Khalili 2014: 5-8.

[789] For further See AlGhazawi et al 2015:366 & Ibid.

Based on the above, it is possible to evaluate the SWOT of the site of the *nymphaeum* of Gadara;

Strength: The Gadara *nymphaeum* possesses distinctive characteristics, as it is constructed using black basalt and situated in a prominent area within the Roman city of Gadara. This location offers a captivating atmosphere for those who visit. From an archaeological standpoint, the site holds significant value as a noteworthy monument, containing a wealth of information that scholars can study in the future.

Weakness: One of the site's main obstacles is its limited visibility to visitors, who often pass by without noticing or engaging with it. Consequently, the site's cultural significance calls for heightened attention and awareness. From a physical standpoint, the site's exterior exhibits signs of deterioration. However, the foundational structure of the *nymphaeum* remains intact, and various other archaeological artefacts are discovered in their original positions.

Opportunities: with a wider effort in awareness, the *nymphaeum* site in Gadara can be more of interest. Given its rich history and exciting location within a major archaeological site, the *nymphaeum* of Gerasa can serve as a valuable platform for showcasing Roman culture and attracting tourists.

Threats: The Gadara *nymphaeum* site faces several significant challenges, as discussed in the preceding sections. Additionally, there is a concern regarding the potential consequences of neglect resulting from a lack of awareness, which could potentially cause harm to the site.

5.3.4. Nymphaeum of Petra

Regrettably, the current condition of the *Nymphaeum* of Petra does not align with its former state of grandeur. Thus, The feasibility of conducting an extensive cultural heritage evaluation on the monument is limited due to its demolition, resulting in only inadequate remnants that fail to meet the criteria of a comprehensive structural site. Nevertheless, it is worth noting that the existence of the *nymphaeum*'s foundational

structure and the dispersed arrangement of rocks in the vicinity provide compelling indications that a formerly esteemed architectural edifice occupied this site.

An empirical survey of the premises yielded evidence of littering and identification tools indicative of previous bonfires (Plate 64). There are also scattered archaeological objects made of rocks and stones that might have been used within the structure of the *nymphaeum*; these objects are scattered around the *nymphaeum* site in Petra.

Fortunately, graffiti in the area under consideration is minimal, with only a minor occurrence where the letter "E" was displayed on the posterior aspect of the *nymphaeum* (plate 65).

The presence of vegetation is notably limited because of inclement weather conditions, which are inherently unfavourable for the optimal growth of grass. Nevertheless, it is worth noting that it is close to the *nymphaeum*, a substantial arboreal specimen that commands considerable attention due to its conspicuous presence. As previously expounded upon in the extant scholarly investigation, it is imperative to acknowledge that the subterranean structures of plants can engender harmful effects on the designated location.

Thus, it is imperative that the governing bodies meticulously deliberate the ramifications resulting from this arboreal entity's presence. An additional matter of perturbation pertains to the insufficiency of attentiveness and the dearth of informative markers at the *Nymphaeum* locale within the archaeological site of Petra. In the absence of conspicuous signifiers, except for a weathered informational placard, discernible manifestations denoting this structure as a *nymphaeum* are notably absent. It is advisable to allocate increased cognizance and scrutiny to this monument to ensure its appropriate acknowledgement and safeguarding.

Adjacent to the *nymphaeum* (Plate 66), a nearby local small shop showcased merchandise to visiting tourists. However, there were no valid concerns regarding the potential adverse effects on the site from doing so. Nevertheless, implementing measures to preserve the

integrity of the *nymphaeum* while also addressing the requirements of local businesses warrants careful consideration.

SWOT Analysis for the *nymphaeum* of Petra

Strength: The *nymphaeum* of Petra holds considerable significance because of its placement within the city of Petra, an archaeological site of immense global importance. The *nymphaeum*'s architectural design, situated in a warm climate, showcases impressive water management techniques, making it a subject worthy of further scholarly investigation.

Weakness: Regrettably, the outward appearance of the site is in a state of deterioration, with no definitive documentation regarding its original form. Furthermore, the site lacks attention because its available information and awareness are indistinct. The signage, rendered illegible by the sun's intense heat, must provide visitors with clear guidance.[790] The harsh sunlight and absence of shading further impede the observation of the site, consequently diminishing the significance of the *nymphaeum* monument in Petra.

Opportunities: By implementing a comprehensive awareness campaign, the level of interest in the *nymphaeum* site in Petra can be significantly enhanced. The *nymphaeum* of Petra, situated within a prominent archaeological site, possesses a significant historical background and an intriguing geographical position. This site encapsulates the heritage of two prominent civilizations, the Roman and Nabataean cultures. Consequently, the *nymphaeum* of Petra presents an invaluable opportunity to exhibit and explore these two civilisations' distinct characteristics and contributions.

Threats: Several obstacles must be overcome before the Petra *nymphaeum* can be fully appreciated. Concerns have also been raised about the potential dangers to the site due to ignorance and neglect.

[790] The author discussed this issue directly with the head of the Petra archaeological site during the time of the visit Dr Suleiman Farajat, who explained that the summer heat, and sunlight causes distraction to the information sites and assured that further actions will be taken to prevent this issue.

Conclusion:

The *nymphaeum* structures erected in today's Jordan resulted from a stretch of *nymphaea* attached to ideologies connected to *nymphae* that preceded their construction; these origins date back to the early ancient Greek period. The *nymphaeum* structure held significant religious and sacred importance in the people's collective consciousness during ancient eras. The belief in the divine nature of the *nymphae*, particularly their association with water and its control, significantly influenced the design and decoration of these structures. The *nymphae* were revered as creatures capable of regulating water flow, mitigating floods, and ensuring favourable circumstances for humans.

Water, a vital resource that shaped human settlement, growth, and development, played a central role in conceptualising the *nymphaeum*; initially, the construction of the *nymphaea* was rooted in sacred rituals aimed at appeasing the *nymph* deities. The *nymphaeum* underwent architectural development during the Hellenistic period, although in minor aspects, as outlined in Chapter Three of this research. During the Roman era, the *nymphaeum* made a remarkable leap in masonry and architectural complexity; at the same time, its sanctity as a monument to the *nymphae* persisted, and the Romans expanded the architectural characteristics of the *nymphaea* and incorporated them into their urban planning. Departing from the notion that a *nymphaeum* must be built within a grotto or near a natural water source, the Romans used these structures as central features in their cities, usually *nymphaea* were centrally placed at intersections or along main streets.

This evolution in *nymphaeum* design aligned with the Romans' advancement in water management systems, enabling them to transport water from distant sources to cities lacking sufficient natural water sources. Consequently, the *nymphaeum* symbolised both religious significance and urban progress. Throughout this research, an exploration of the *nymphaeum*'s origin within *nymph* mythologies was undertaken, highlighting its connection to these structures. Additionally, examples of mythologies and terms surrounding the *nymphae* and the *nymphaea* and their adaptation throughout ancient and contemporary periods were examined, including the linguistic associations the *nymph* term had in different aspects of science, such as the relevance it may have with the term

"*nymph*omaniac," which is thought to be based on the ancient belief that the *nymph* creature was a highly sensual divine.

The research also contributes to delineating a typology for the *nymphaeum* structure by examining prior research and literature. Although these typologies might have been based on different elements, they demonstrate these edifices' notable architectural progression and cultural importance during the ancient Greek, Hellenistic, and Roman eras. The Greek *nymphaea*, characterised by its modest and functional design, and the Roman *nymphaea*, known for its exquisite and ornate features, both testify to the ingenuity and creativity displayed by architects during their respective eras. The categorisation of *nymphaea* structures poses a significant difficulty owing to their wide range of attributes. However, this research tried to thoroughly examine, emphasising essential features and instances of each category. Regardless, future discoveries and enhanced research methods might pave the academia concerning the *nymphaea* typology, thus manifesting a more legible typological system.

Through studying *nymphaea*, valuable understandings can be obtained regarding ancient civilisations' social and cultural customs. These architectural features fulfilled various roles, including providing access to potable water, serving as venues for ceremonial activities, and functioning as representations of authority and affluence. The evolutionary and diverse nature of *nymphaea* serves as evidence of the lasting impact of Roman architecture and its contributions to the field throughout history.

During their military campaigns, the Romans undertook a process of territorial expansion, thereby disseminating their sophisticated technological advancements and architectural methodologies to the regions they subjugated and colonised. The situation was analogous in the context of the *nymphaeum* structures, which underwent a period of significant growth during the 2nd century in the urban centres of present-day Jordan. An example can be observed in the urban centre of Philadelphia, presently recognised as Amman, where a remarkable *nymphaeum* of facade classification is prominently featured—the ongoing scholarly discourse regarding the potential designation of the structure in question as a *kalybe*. However, the predominant consensus among experts leans towards its classification as a *nymphaeum*, primarily based on its overall

architectural composition and distinctive characteristics. The significant water features, such as the *nymphaea*um in a specific historical urban centre, are evidence of the significant advancements that have been made in the field of civil engineering. The architectural design of *nymphaea* reflects a blend of Hellenistic and Roman Eastern styles.

The elements of these structures that were mentioned in the previous chapters, four and five of this research, and the presence of the *kalybe* mason, which is a structure only found in the Eastern Roman Empire and had an encounter with the architectural design of the *nymphaea* structures of the East by impacting on the design of these religious monuments, and adding a secularist element and a temporal role to the establishment, as some *nymphaea* structures (Amman, Bosra) might have been a *kalybe* structure that was merged architecturally into a *nymphaeum*, though currently supported by limited archaeological evidence. However, the discovery of staircase remains in certain *nymphaea* ruins might be considered a support for this theory. The mega masons that are displayed today, these monuments, and their unique design set the Eastern Roman monumental fountains (*nymphaea*) apart from the fountains of the Western Roman Empire and demonstrated that the Roman presence in the East had left behind an architectural legacy that was uniquely its own. Thus, we can better understand the regions and cultures that comprised the Roman Empire if we have a firm grasp on what sets these magnificent water structures apart from others and where they originated.

The architectural design of the Amman *nymphaeum* demonstrates adaptations to the city's challenging topography. The aforementioned adaptations can be attributed to the objective of integrating the *nymphaeum* harmoniously with its environment and mitigating the challenges posed by the region's topographical limitations. Despite the limited scope of excavations conducted in the vicinity of the *nymphaeum*, future investigations are expected to provide valuable knowledge regarding the construction techniques employed and the contextual importance of this monument.

In addition to Amman, the *nymphaea* discovered in Gerasa, Gadara, and Petra, exhibited comparable architectural designs and were erected within the same temporal framework. The presence of these *nymphaea* was instrumental in increasing the urban design of their

respective cities and serving as vital water sources for the residents. The architectural features of the Petra and Gadara *nymphaea* are not well documented. The *nymphaea* located in Gerasa, Petra, and Gadara seem to be of the Exedra type and can be traced back to the Severan period.

During this study, the researcher conducted field excursions on locations of the *nymphaea* in Jordan, examining the status and contextual environments associated with these exceptional architectural features. The research emphasises the *nymphaea* found in Gerasa, Gadara, and Petra, as these locations provide noteworthy examples of *nymphaeum* architecture in Jordan. The *nymphaeum* of Amman, located centrally in the capital city, is of notable importance because of its current endeavours in research and enhancement initiatives focused on preserving and exploring its historical and architectural significance.

This study adopts a cultural management approach to secure these impressive monuments' long-term existence and safeguarding for future generations, providing insights into crucial aspects that necessitate attention and conservation endeavours. Furthermore, conducting a thorough SWOT analysis of the *nymphaea* in Jordan yields significant insights that can be of great value to future researchers and stakeholders engaged in examining and advancing such architectural features. Investigating *nymphaea* in Jordan encompasses scholarly efforts to unravel the ancient Romans' architectural accomplishments and cultural influences in this historically significant area. It is also suggested that further research is required concerning the heritage management of the *nymphaea* sites in Jordan to display to the local people and tourists the magnificence of these sites and their importance.

The Roman *nymphaea* in Jordan can be considered a great example of the merging of different cultures, as seen through the exhibits of the grandeur of Roman architecture and urban planning. Yet, it indicates how the area's culture at that time affected the construction of these monuments and how the Romans managed to benefit from the domestic cultures of the places they conquered and to develop based on the geographical and cultural features of the sites they settled within. The investigation posits that Roman culture laid the foundation for fountain architecture, influencing subsequent

developments in later historical periods. The study underscores the enduring significance of fountains in Levantine heritage, elucidating their sustained presence in contemporary dwellings. The Roman *nymphaea* in Jordan are richly documented in scholarly literature. The Roman *nymphaeum* emerges as an aethereal testament that interweaves the East's mystique and the West's splendour. Within its structure lies splendid evidence of the grandeur of Roman civilisation, whose influence transcended vast reaches across the globe. This architectural marvel is a fluent witness, immortalising the harmonious symbiosis between the Roman ethos and the myriad cultures encountered on their journey. It is an enduring testament to the profound tapestry of human advancement.

This study highlights the architectural and cultural significance of Roman *nymphaea* in Jordan, emphasizing their dual role as monumental fountains and symbols of civic identity in Roman urban planning. By situating these structures within the broader context of Roman imperialism and their adaptation in the Levant, the research explores the interaction between local traditions and Roman architectural forms.

It also examines how these structures integrated into the social fabric of the cities where they were built, serving political, social, and cultural functions. For instance; the *nymphaeum* of Amman is thought to have been used for speeches and political purposes, showcasing the city's power, particularly that of the upper-class residents. These structures often acted as tools for asserting political and social status. A good example is *Artemidorus*, who restored a *nymphaeum* in 5th century AD, to resemble the work of its original builder, a common practice in Roman-Byzantine times to gain respect and private recognition. Additionally, the multi-functional use of *nymphaea* underscores their importance. The inclusion of heritage conservation strategies, such as 3D modeling and virtual restoration, offers practical solutions for preserving these monuments and provides a framework for future research. These findings highlight the need of interdisciplinary approaches to preserve Roman nymphaea as enduring symbols of cultural exchange and historical legacy.

This thesis does not signify a terminus to research concerning nymphaea of Jordan, but a threshold for continued scholarly inquiry. The author's efforts in examining and exploring these *nymphaea* structures remain resolute and dedicated to increasing and recalibrating

existing findings. As the trajectory towards attaining a doctoral degree unfolds, the intention is to leverage enhanced resources and heightened expertise in constructing more nuanced and accurate renderings of these architectural remnants. Post-graduation endeavours encompass disseminating these findings through scholarly publications, contributing to the academic dialogue surrounding Roman *nymphaea* architecture and its contextual significance within Jordan's cultural heritage. The aspiration is for these pursuits to deepen understanding and underscore the ongoing commitment to academic accuracy in advancing our understanding of historical constructs.

In summary, this research contributes significantly to the academic understanding of *nymphaea* structures in Jordan by collecting and analyzing a wide range of data. It highlights the cultural and architectural evolution of *nymphaea* from Greek to Roman times, emphasizing their religious, social, and urban significance. The study also explores the socio-political implications of *nymphaea* as symbols of imperial power and public benefaction, and the merging of Roman and local cultures in their design and function. By integrating interdisciplinary approaches, including mythology, linguistics, and heritage management, this thesis broadens the scope of *nymphaea* studies and offers practical recommendations for their preservation and public engagement. This research underscores the enduring legacy of Roman nymphaea as a bridge between ancient engineering ingenuity and modern cultural heritage.

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Appendix

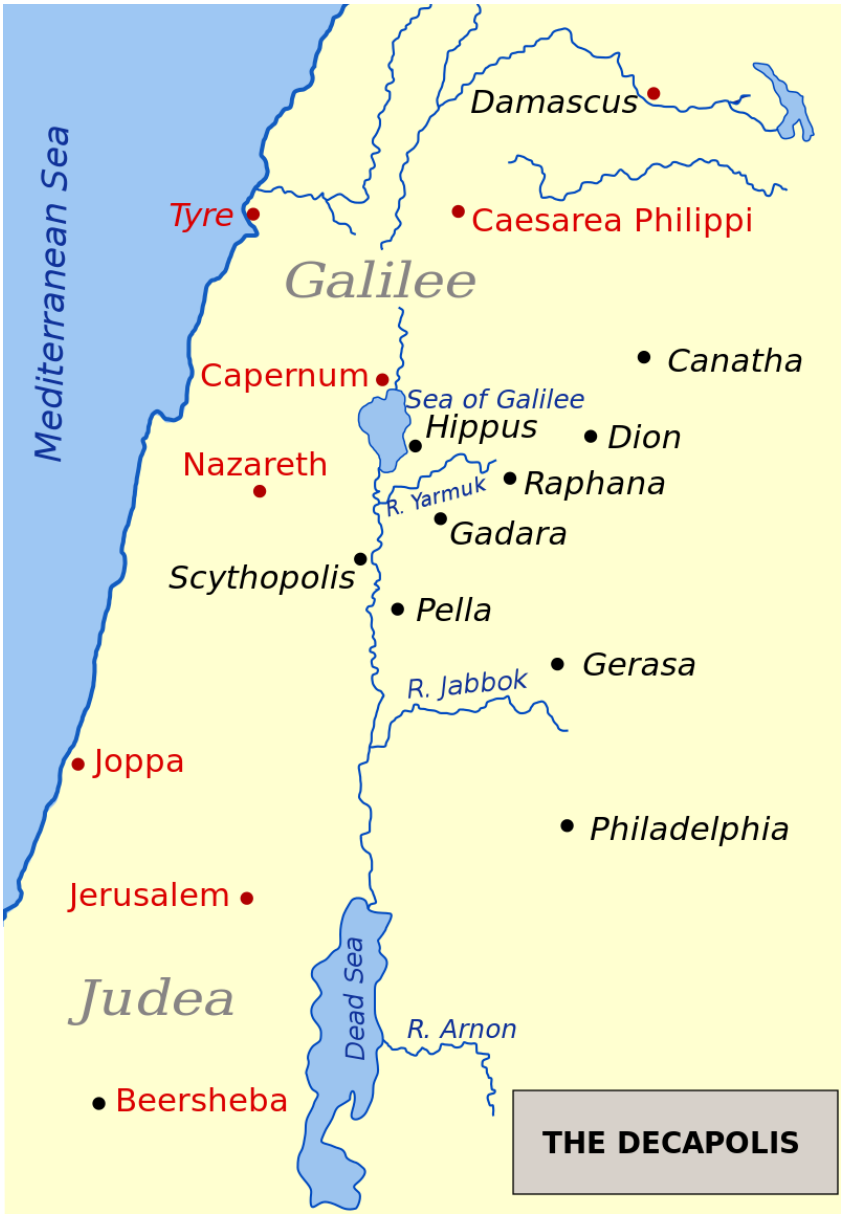

Plate 1: Decapolis Cities; By Nichalp - Own work, CC BY-SA 2.5, https://commons.wikimedia.org/w/index.php?curid=460339

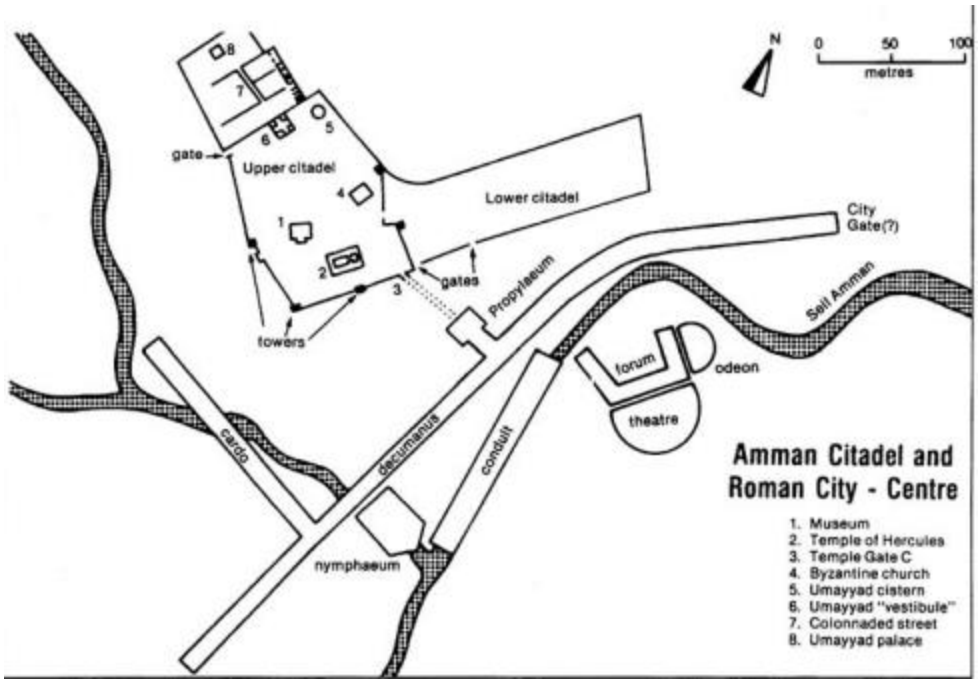

Plate 2 Roman Amman Philadelphia Map (Source: Ball 2002: 192)

Plate 3: Statue of a *nymph* taking their ease near a pool of water.; London, British Museum inv. 145689

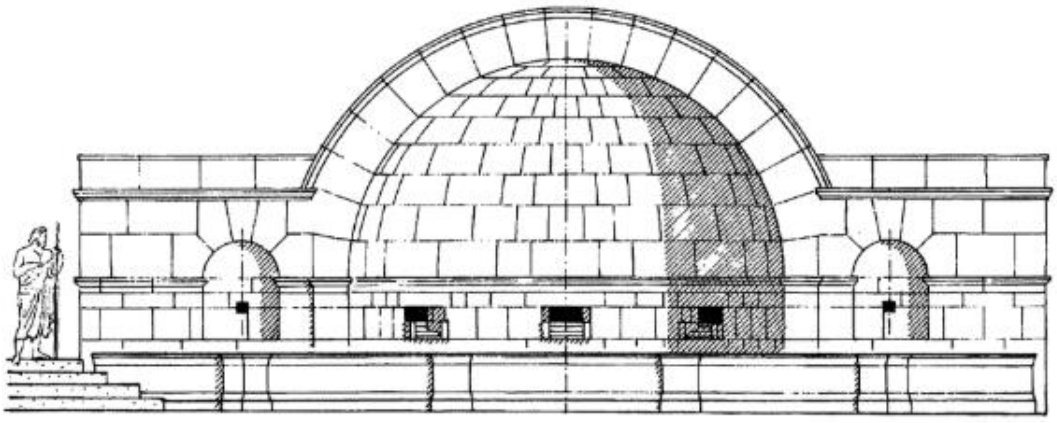

Plate 4: Curved *nymphaeum* Pergamon, fountain in the Demeter Sanctuary: variant with lateral wings, early 1'1 c. AD (Richard 2012: 42)

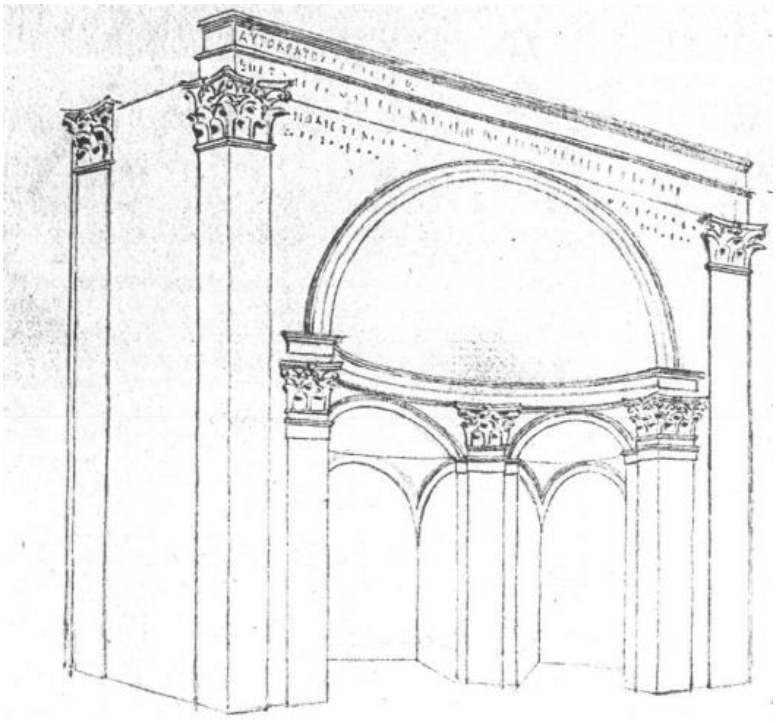

Plate 5: The *nymphaeum* of Suweida. Elevation sketch by Bankes 1816 or 1818. it is extracted from Sarte 2013.

Plate 6: Map of the Hauran Warwick Ball 239

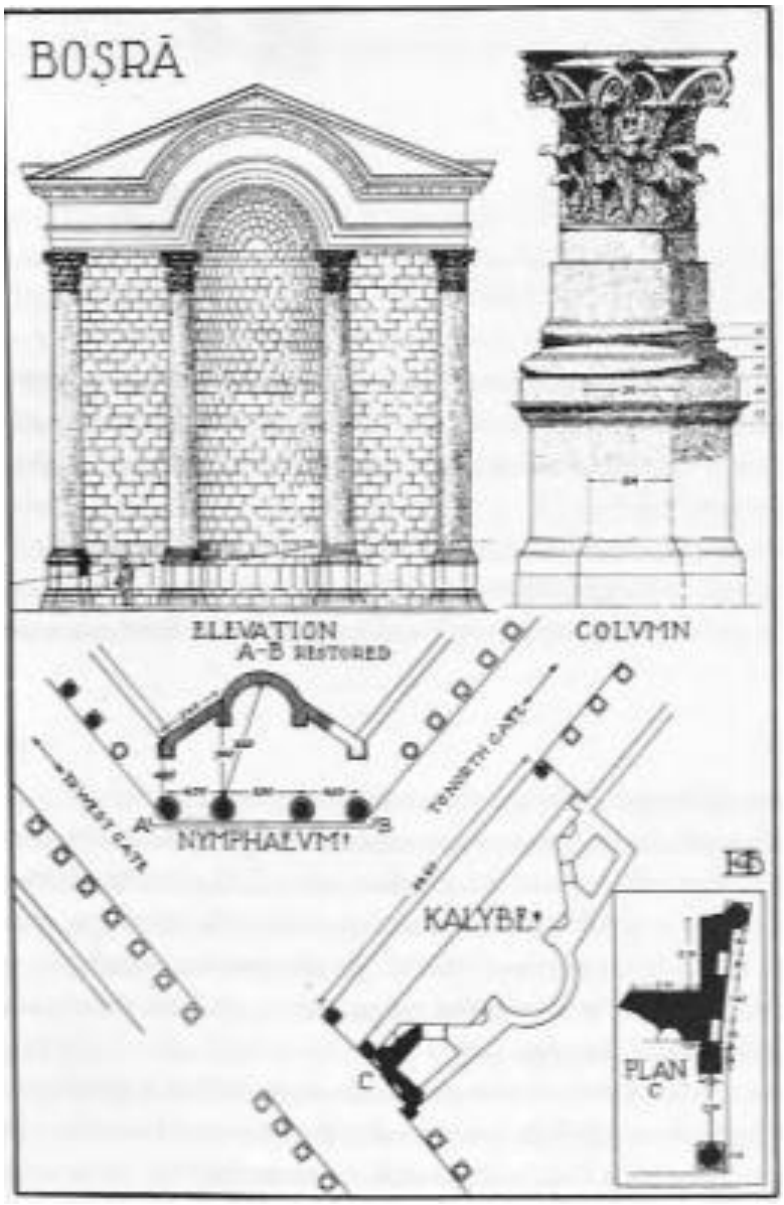

Plate 7: Bosra, the *nymphaeum*, plan and elevation suggested reconstruction. Extracted from: Segal 1997.

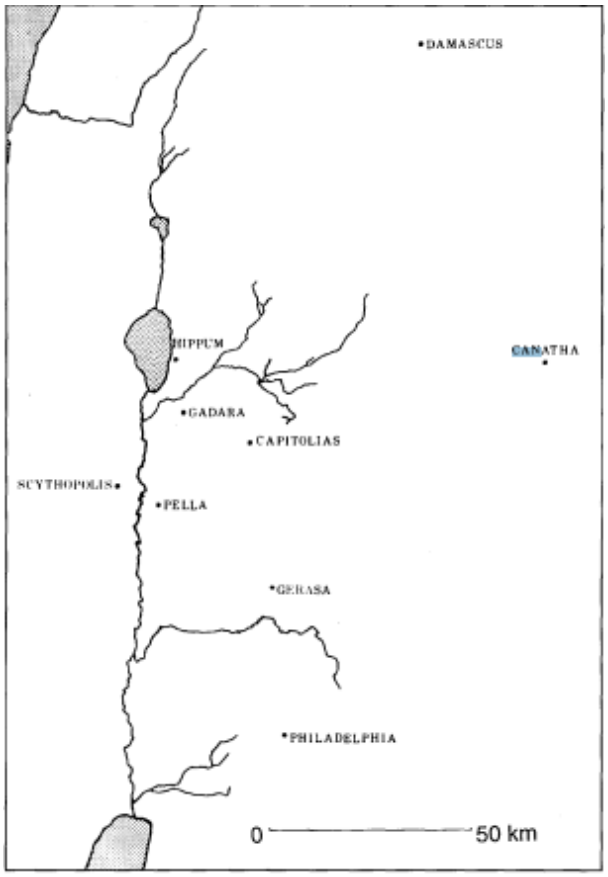

Plate 8: Decapolis cities, Canatha on right side of the map Extracted from: Bowsher 1997

Plate 9: Qanata (Kanawat) *nymphaeum*. *Extracted from:* SANA news agency

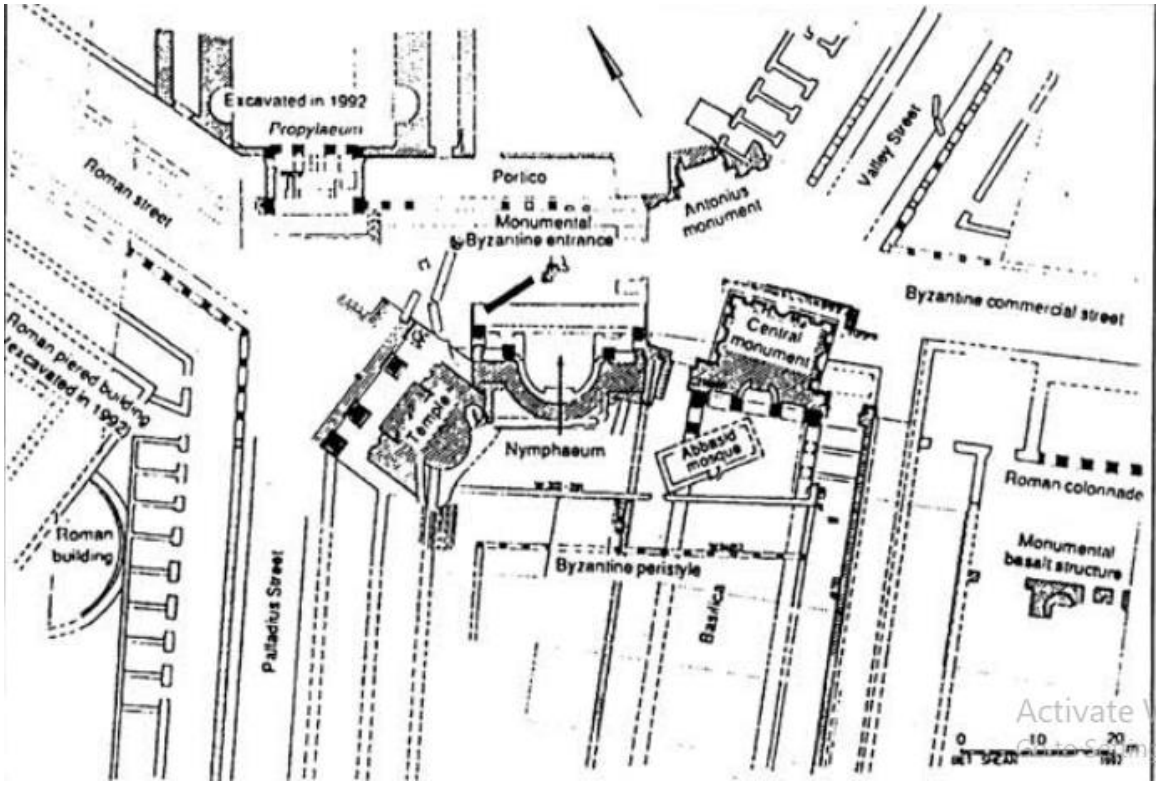

Plate 10: Plan of Beth Shean, with the monumental centre inset. (After Foerster and Tsafrir. Retrieved: Warwick ball 2002)

Plate 11: Limestone items from the Scythopolis *Nymphaeum* (Hebrew University excavation, 1992)

Plate 12: *nymphaeum* of Scythopolis Bet Shean Both one is an illustration at the site for tourists source (https://vici.org/vici/25139/ retrieved august 2023)

Plate 13: The antonine *nymphaeum* at Sagalassos Source Madain Project (https://madainproject.com/sagalassos entered august 2023)

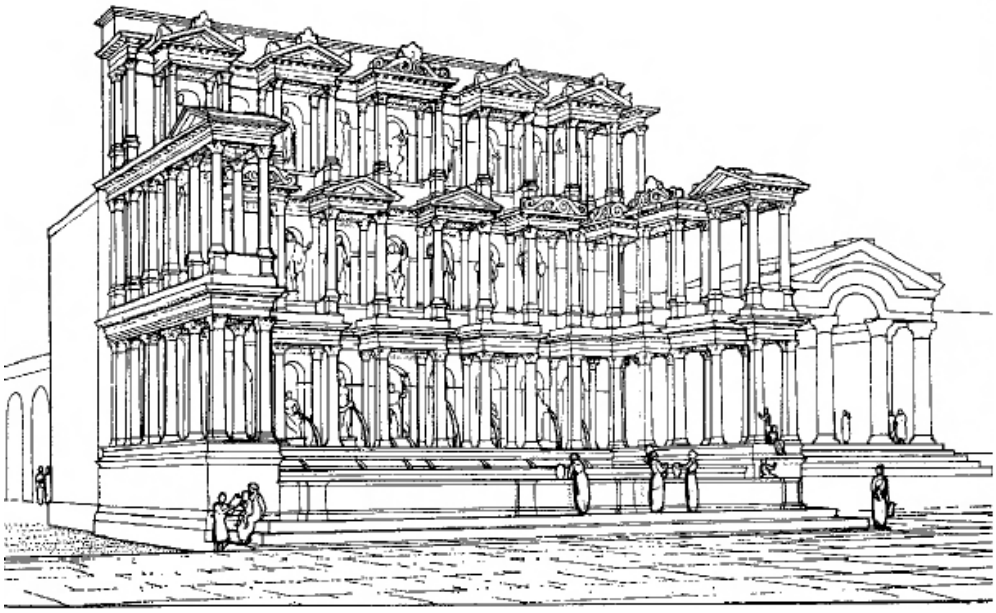

Plate 14: Miletus: Reconstruction of the *nymphaeum*. Source: UĞURLU 2004

Plate 15: The Severan *nymphaeum* at Lepcis magna in Lybia (Snap picture from a YouTube video August 2023 Url: https://youtu.be/601k7v-o5o4)

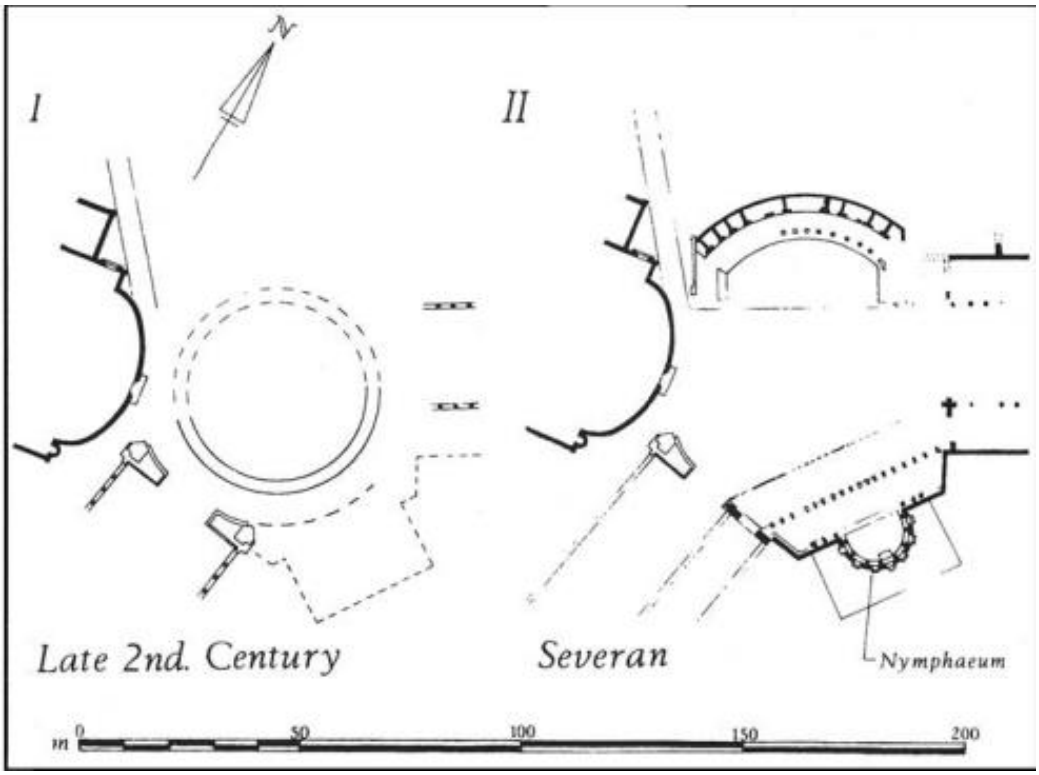

Plate 16: The circular plaza and *nymphaeum* at Lepcis Magna (After Ward-Perkins) Source: Ball 2002

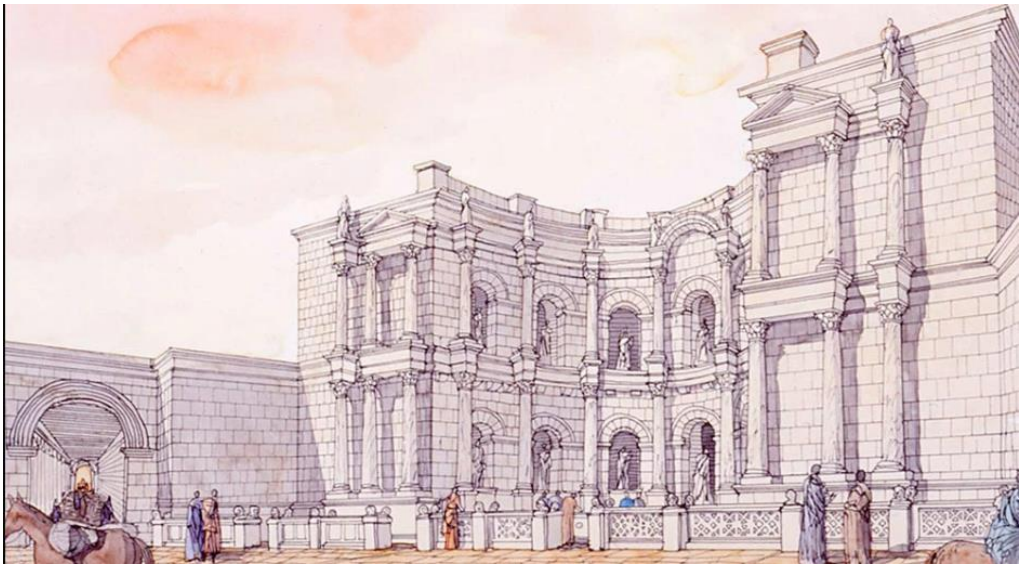

Plate 17 Reconstruction of the Lepcis Magna nymphaeum, Source: eanclaudegolvin.com (entered august 2023)

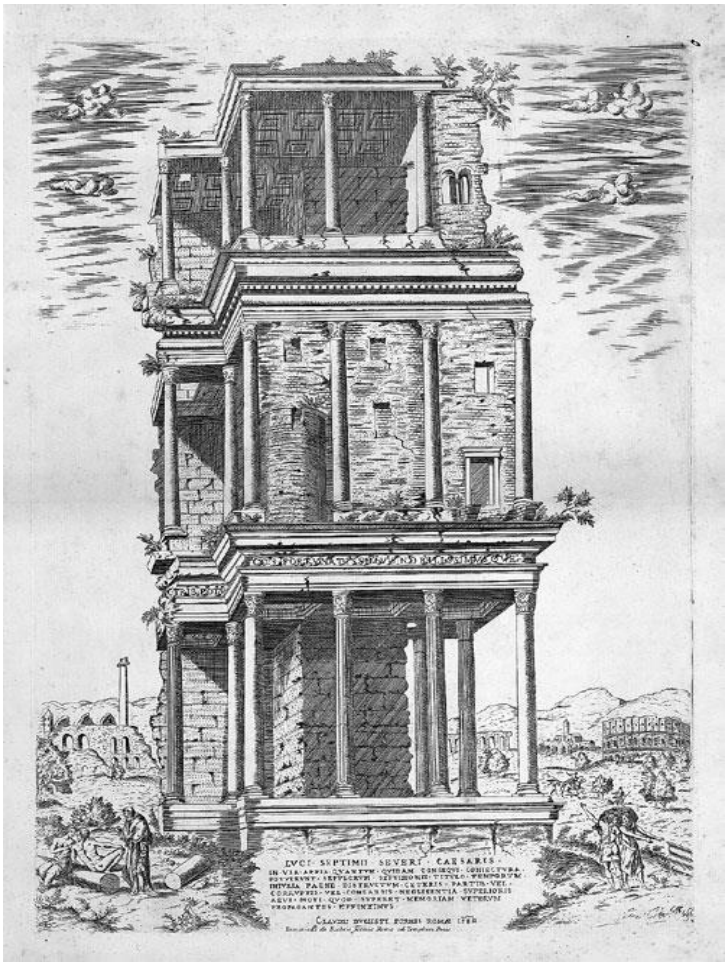

Plate 18: A fragment of the Septizodium is shown in this engraving dating to 1582. Public Domain, https://commons.wikimedia.org/w/index.php?curid=579347

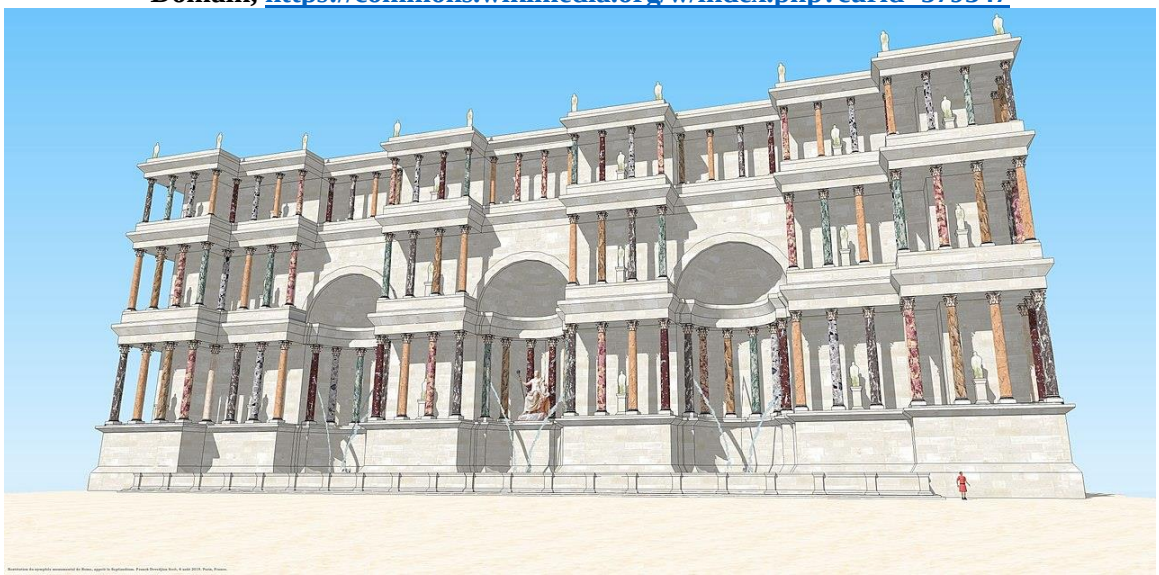

Plate 19: SEPTIZODIUM in Rome By Franck devedjian - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=81086605

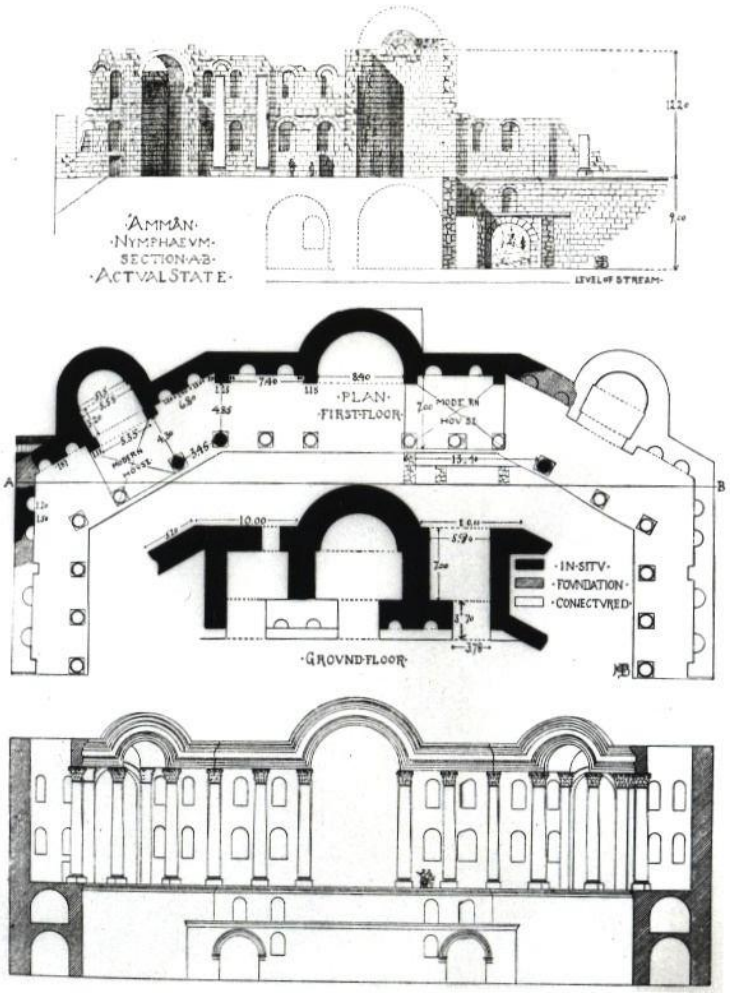

Plate 20: Plan of the ground and first floor of Amman *nymphaeum*. They are drawn by Butler's expedition (Butler 1909).

Plate 21: Aerial Photography of Amman *Nymphaeum*, displaying the crowded vicinity surrounding it. (Source: Aladarbeh et al 2019)

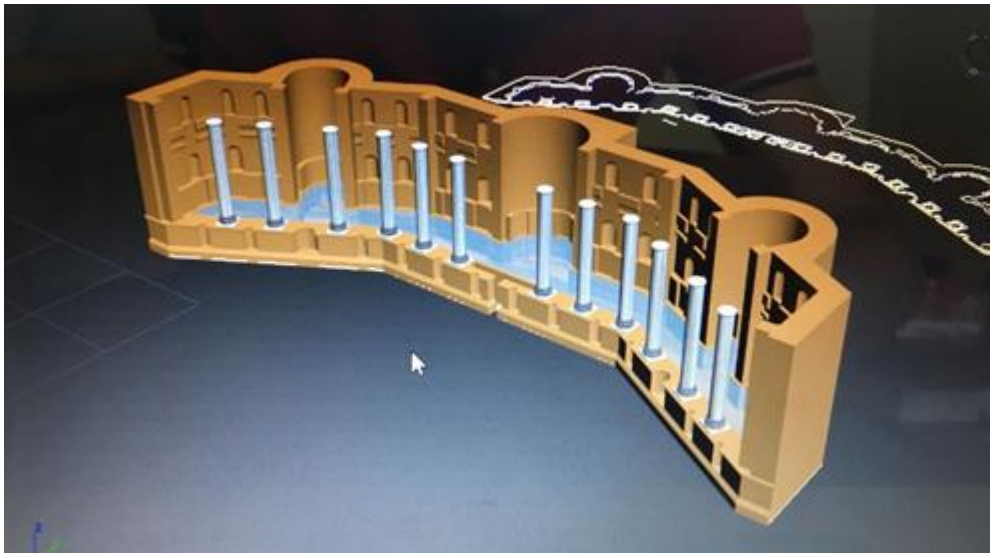

Plate 22: 3D documentation visualized module Source (Al ADarbeh et al 2019)

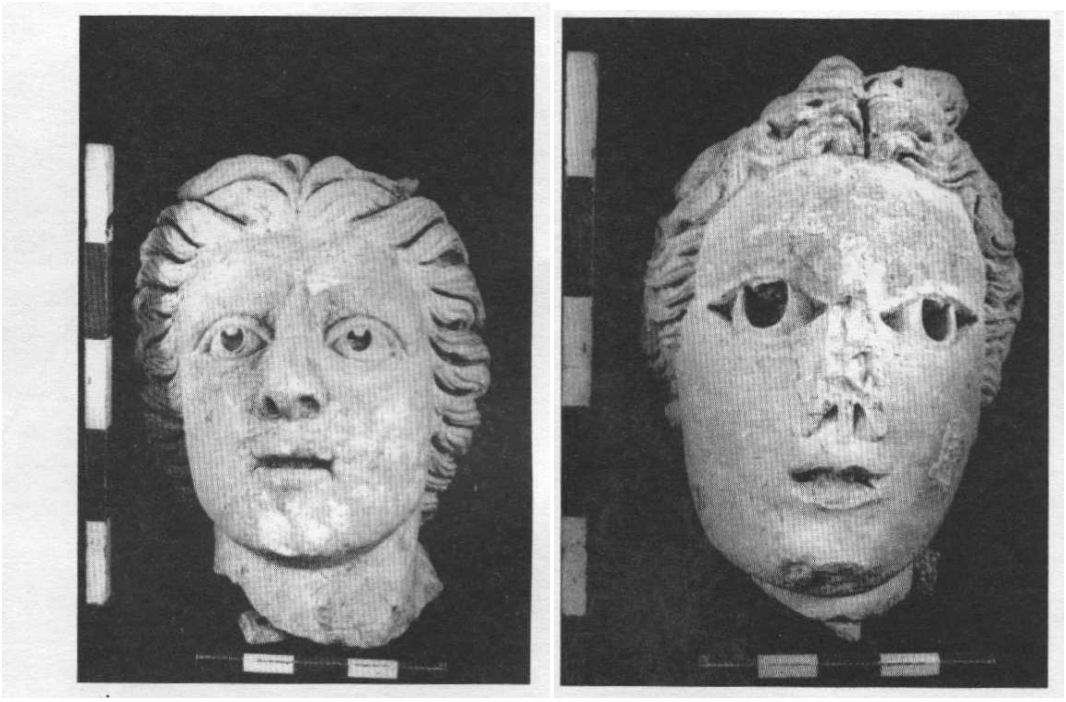

Plate 23: Two heads of human statues discovered during the excavation. (Waheeb & AlGhazawi 2014)

plate 24: Construction work at the so-called Roman bath were uncovered in 2020 an area with shops and local restaurants. Amy McConaghy / The National (Accessed Aug 2023)

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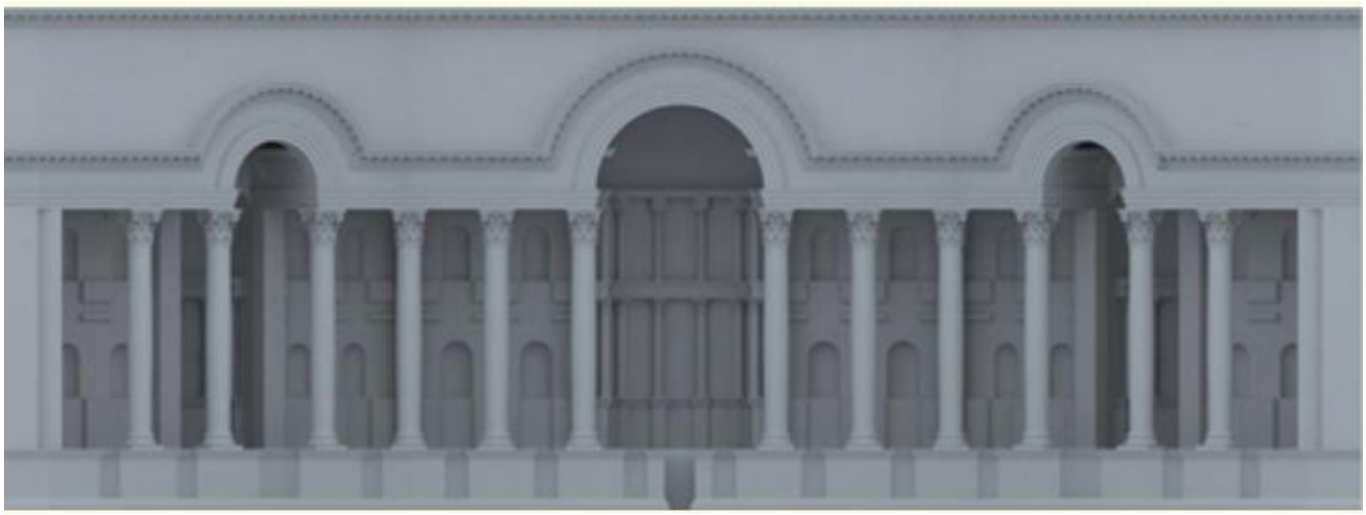

Plate 25: 3D rendered model of the *Nymphaeum*, showing the main façade (rendering by Adel Mutawi) Retrieved from PETER M M G AKKERMANS. 2018, Archaeology in Jordan Newsletter: 2016 and 2017 Seasons ACOR, AMMAN.

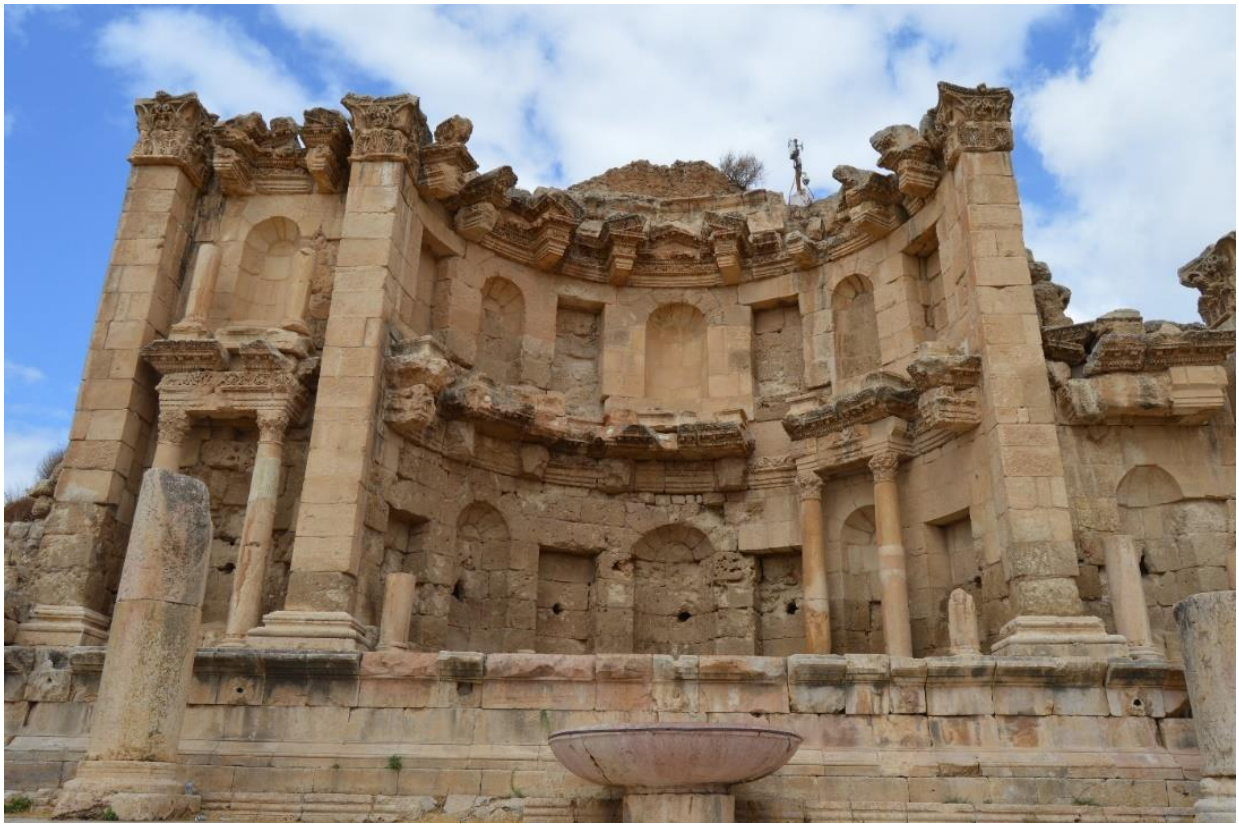

Plate 26: The *nymphaeum* of Gerasa. (Photo taken by the author in 2022)

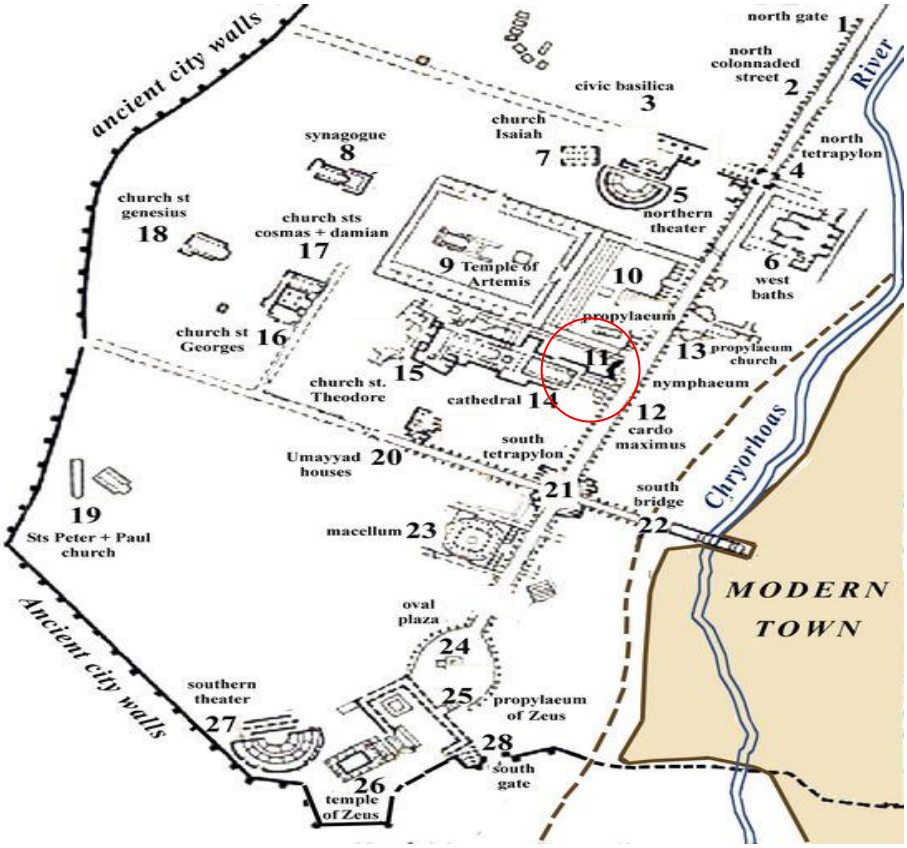

Plate 27: The city plan of Roman Gerasa, The *nymphaeum* number 11. Source: Aubin, Melissa M. in The Oxford Encyclopedia of Archaeology in the Near East (1997), vol.3: 215-219 retrived from (https://www.athenapuB.Com/ August 2023)

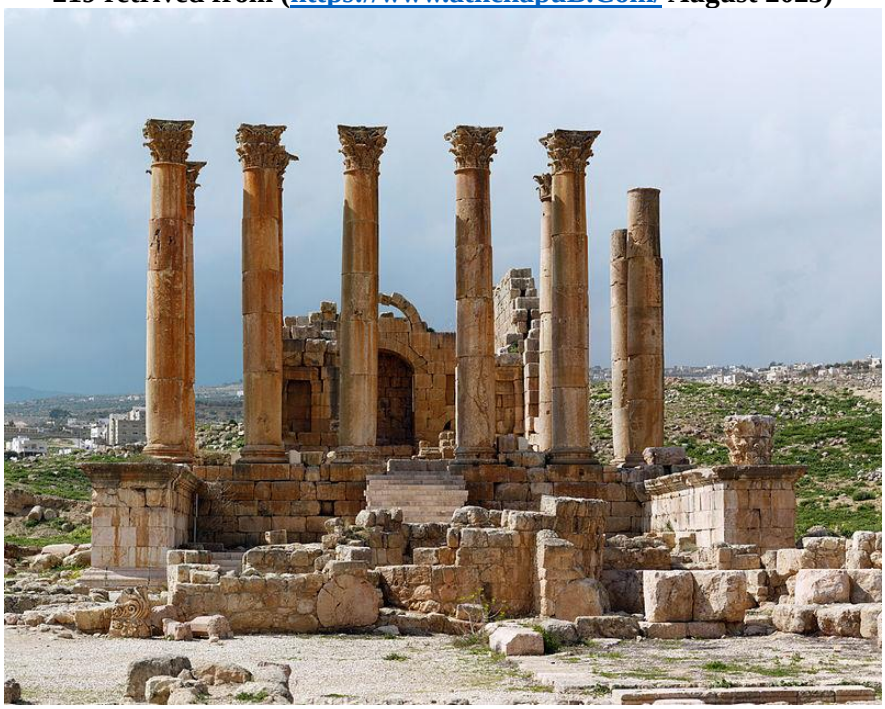

Plate 28: The Jerash Temple of Artemis of Jordan https://commons.wikimedia.org/w/index.php?curid=6492725

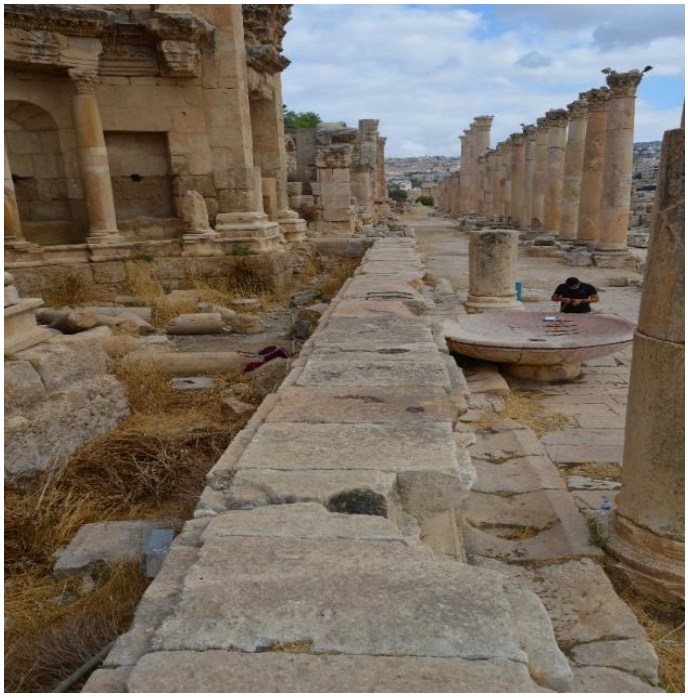

Plate 29: The basin and the water where the water streams. On the left side of the picture, behind the basin, is the water tank of the *nymphaeum*. (Photo taken by the author in 2022)

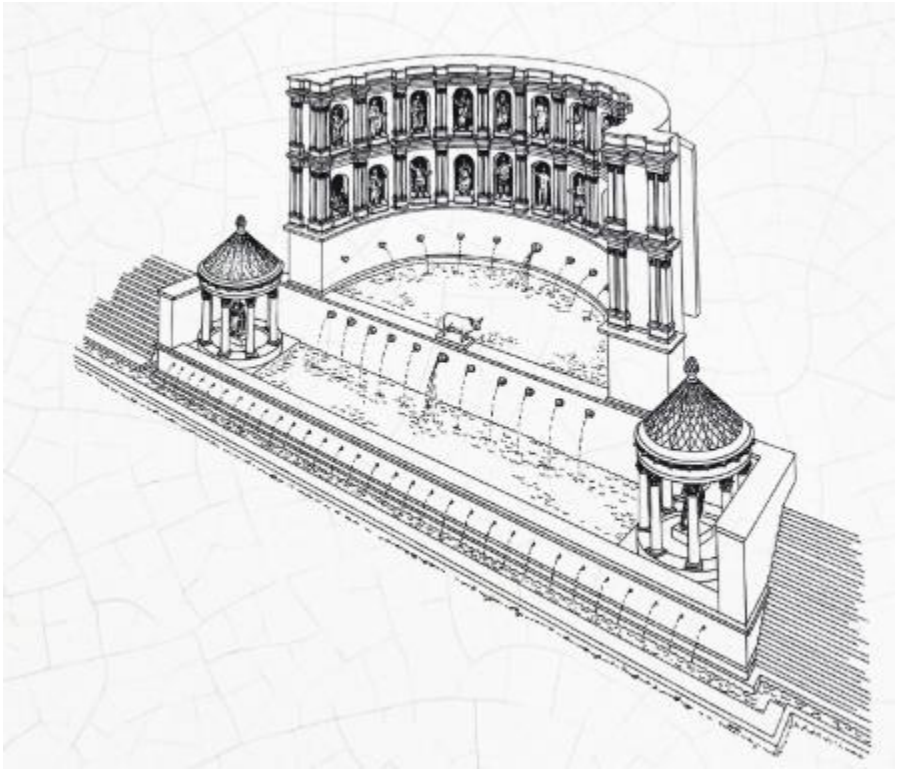

Plate 30: Exedra of Herodos, Olympia, Greece reconstruction 3D source By Davide Mauro - Own work, CC BY-SA 4.0.

Plate 31: A wide shot of the *nymphaeum* structure displaying the columns of the *nymphaeum* and the difference in length. (Photo taken by the author in 2022)

Plate 32: Spolia water channel exposed in excavations at the rear of the *Nymphaeum* (Jerash Water Project). Retrieved from Boyer 2022.

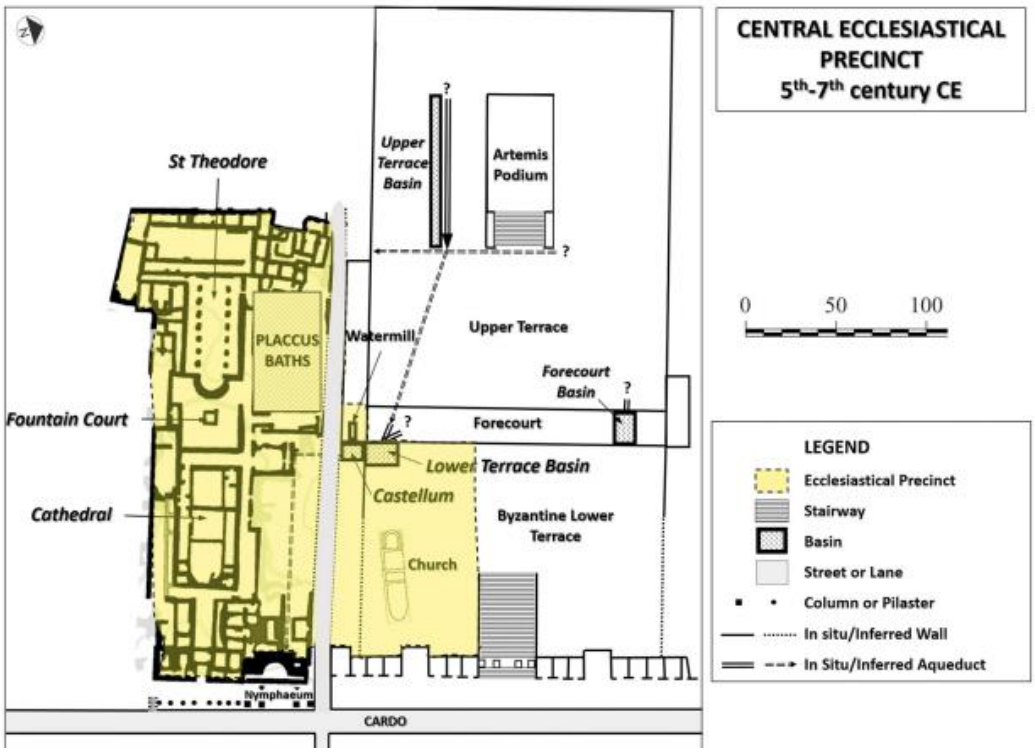

Plate 33: Plan of the central ecclesiastical precinct established between the 5th and 7th centuries AD in Gerasa (Cathedral-St Theodore outline after Lichtenberger et al. 2019: map 2). Retrieved from Boyer 2022.

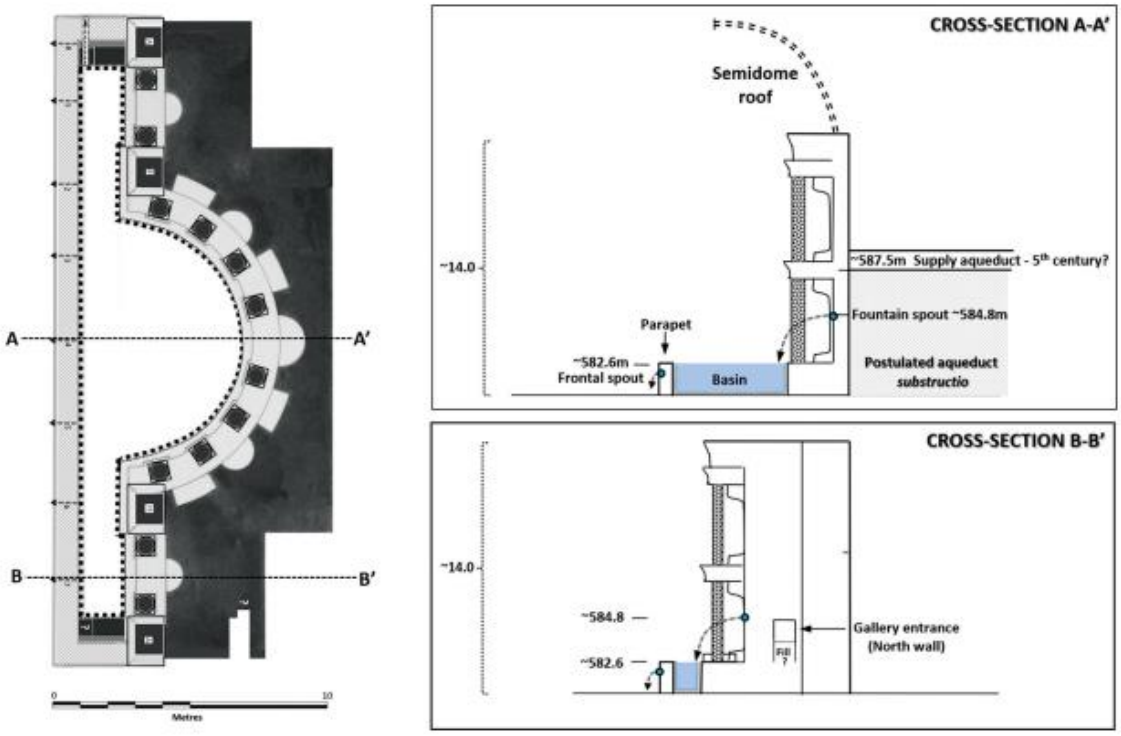

Plate 34: Cross-sections showing water flow through the *Nymphaeum in Gerasa* (Jerash Water Project). Retrieved from Boyer 2022.

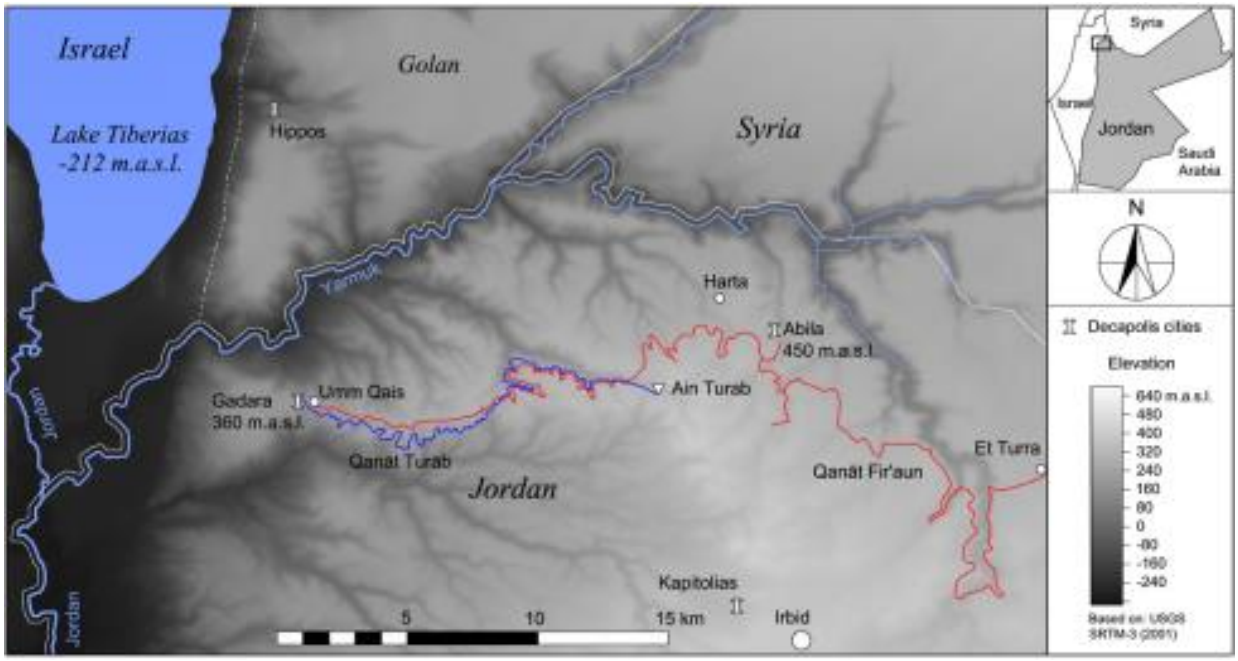

Plate 35: Location of Gadara with its neighbouring northern Jordan Decapolis cities and the Qana¯t Tura¯b and Qana¯t Fir'aun aqueducts (aqueduct courses based on Do¨ring 2016) retrevied from Keilholz.

Plate 36: A wide upper shot of Gadara's *nymphaeum*, displaying the type of black basalt rocks and the white stones found in ruins. (Photo taken by the author in 2022)

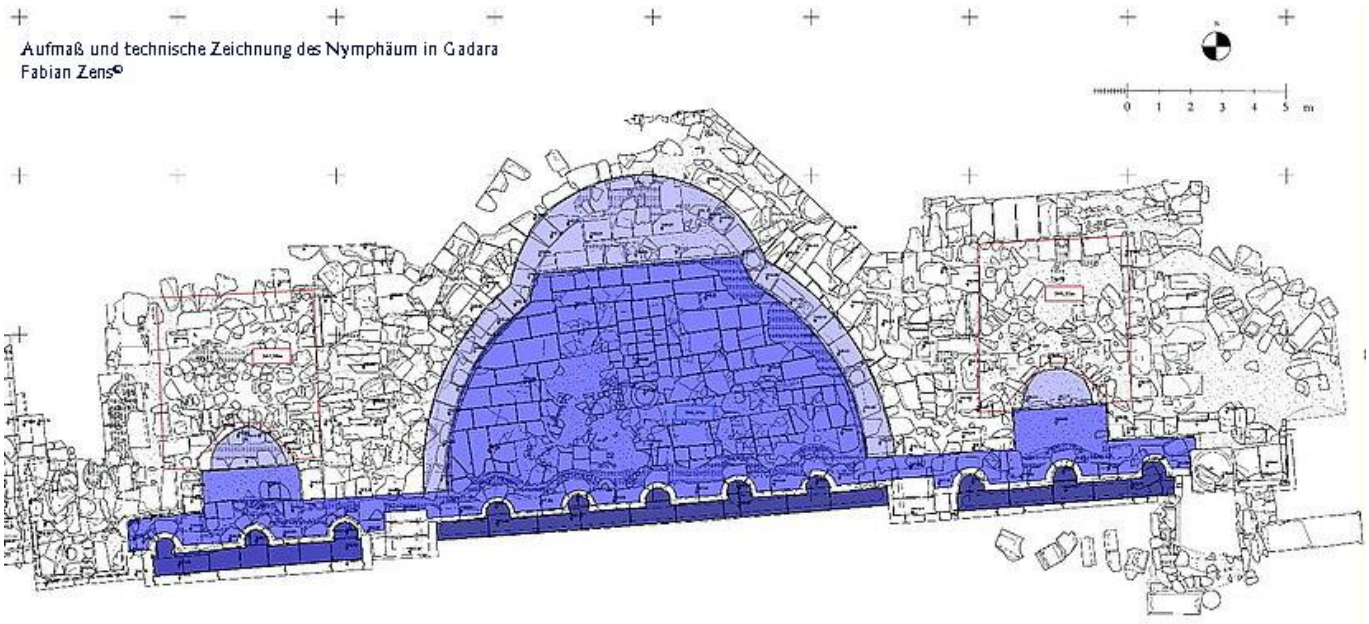

Plate 37: measurment and technique of water distribution within the *nymphaeum* of Gadara source, wetted areas of the *nymphaeum* dark blue lowest heigh of street level, light blow highest of street level. Source (http://www.qanat-firaun.de entered August 2023)

Plate 38: Waterspouts of the *nymphaeum* at Gadara. (Photo taken by the author in 2022)

Plate 39: Sculpture of a Menead Carved white marble statue of a female. Source: ©UmmQaisHeritage https://www.ummqaisheritage.com/

Plate 40: The statues of a Togate man found in Gadara Source: DOA Archive (http://publication.doa.gov.jo/Publications/ViewChapterPublic/93)

Plate 41: Sculpture of a Satyr. Young Satyr or Silenus in animal skin which is one of the most popular figures of Roman antiquity. Source: https://www.ummqaisheritage.com/

Plate 42: left: the new Aphrodite statue fragment (height 83 cm); and right: the upper and lower arm (41 cm) with drapery remains (Retrieved from: Al-Bashaireh et al. 2019)

Plate 43: Gadara *nymphaeum*: Artemis of Ephesus Umm Qays, Museum of Gadara Source: (https://www.ummqaisheritage.com/ / entered august 2023)

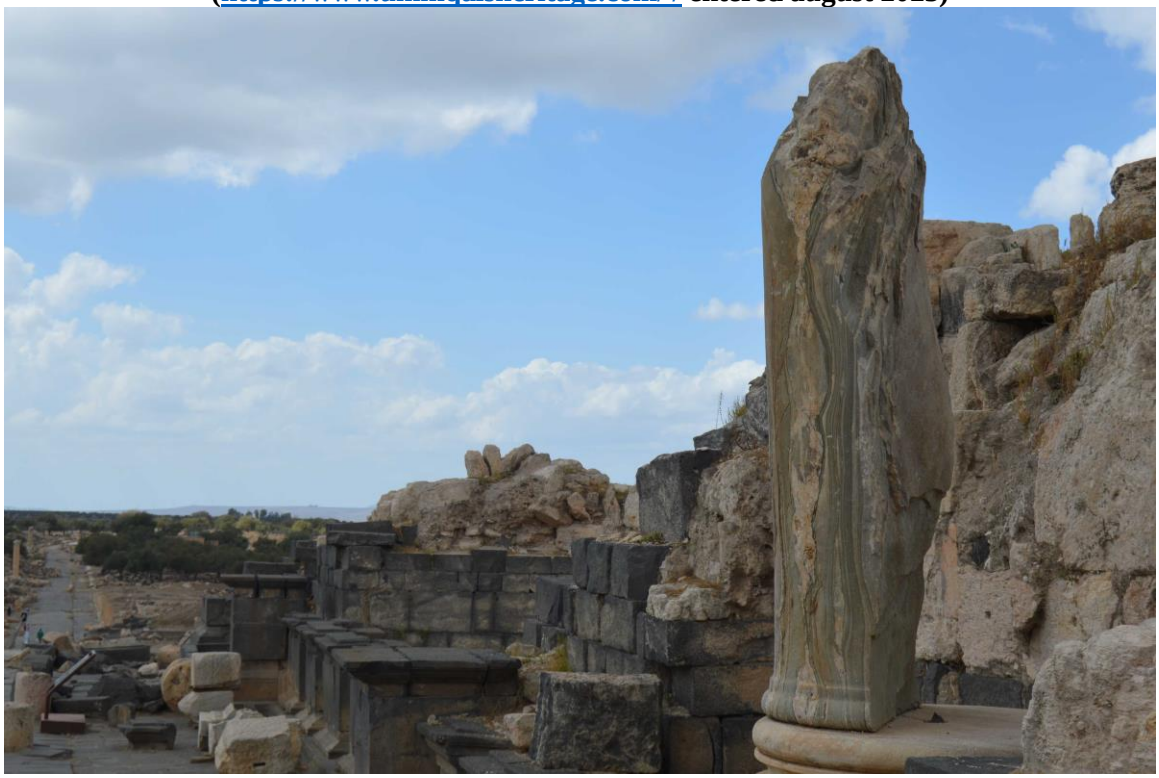

Plate 44: Cipollino marble on a shaft at the ruins of the *nymphaeum of Gadara,* source. (Photo taken by the author in 2022)

Plate 45: Marble decoration from the *nymphaeum* of Gadara Source: URL: UmmQaisHeritage.com Accessed august 2023.

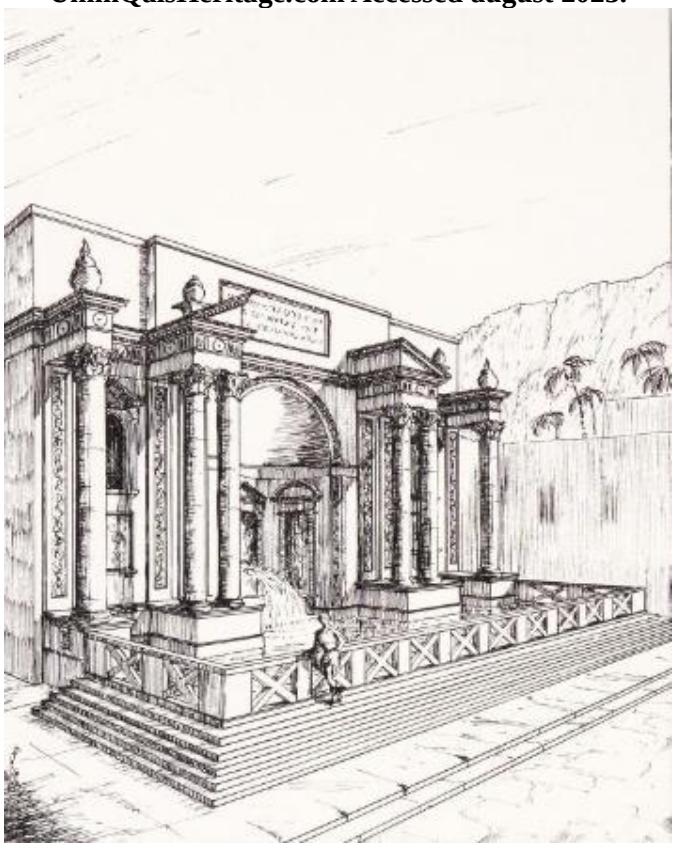

Plate 46: Petra *nymphaeum* Reconstruction based on Bachmann plan. Retrevied from Browining 1971.

Plate 47 A Front view to the *nymphaeum* of Petra. (Photo taken by the author in 2022)

Plate 47 B: side view of the *nymphaeum* of Petra. (Photo taken by the author in 2022)

Plate 48: Water aqueduct channel into the *nymphaeum*. (Photo taken by the author in 2022)

Plate 49: The location of the *nymphaeum*; R stand for the *nymphaeum* monument the Wadi Mataha and the *nymphaeum* intersecting Source: Kanellopoulos 2002: 253.

Plate 50: Roman Pottery shreds found at the site of the *nymphaeum*. (Photo taken by the author in 2022)

Plate 51: *Nymphaeum*: male figure, holding globe and scepter standing left within central distyle structure flanked by arched alcoves in space between; below, semicircular retaining wall with spouts for upper pool; all within distyle façade set on retaining wall with spouts for lower pool Source: https://www.cngcoins.com/Coin.aspx?CoinID=222876

Plate 52: The fountain in Achik Bash House in Aleppo. Photo source Al Abidin & Zein; the Courtyard Houses of Syria 2005.

Plate 53: Fountain at the Hassan II Mosque in Casablanca, Morocco. Source: Istock/ KogenHansen.

Plate 54: 3D module for the *nymphaeum* of Gerasa Source: Youtube channel antonio4887 Accessed August 2023.

Plate 55 A: 3D capture of the *nymphaeum* of Gadara (Source: Living Museum of Umm Qais Project sketchfaB.Com) Accessed August 2023.

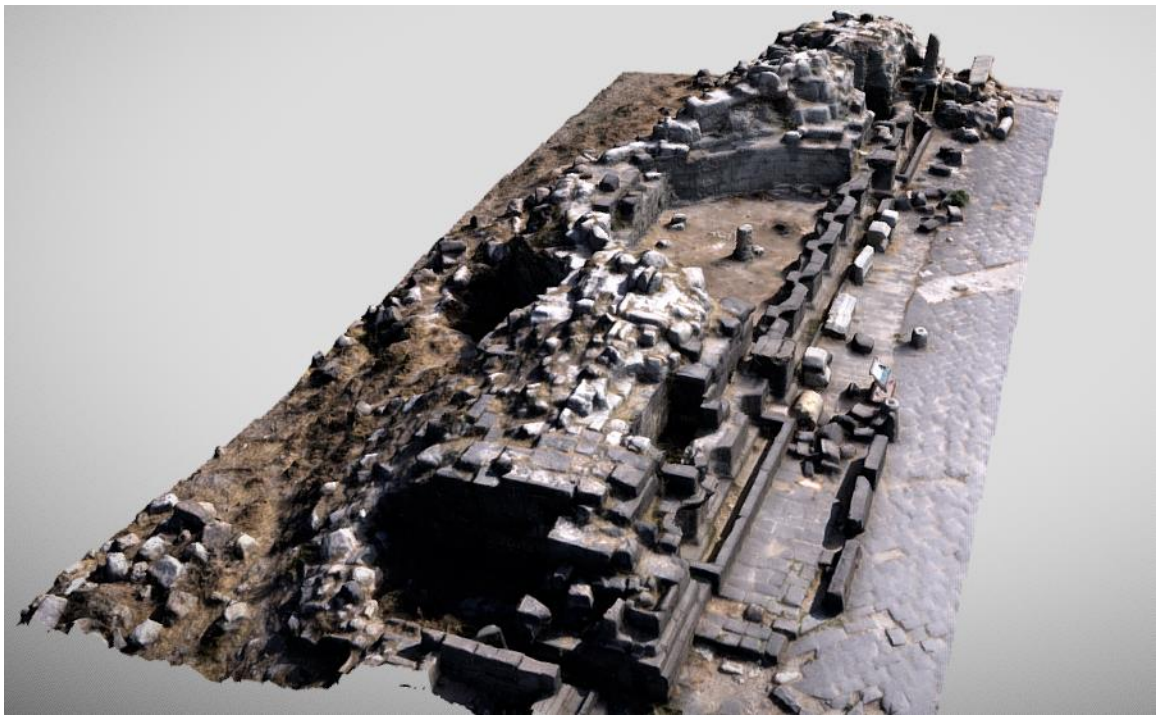

Plate 55 B: 3D capture of the *nymphaeum* of Gadara (Source: Living Museum of Umm Qais Project sketchfaB.Com) Accessed August 2023.

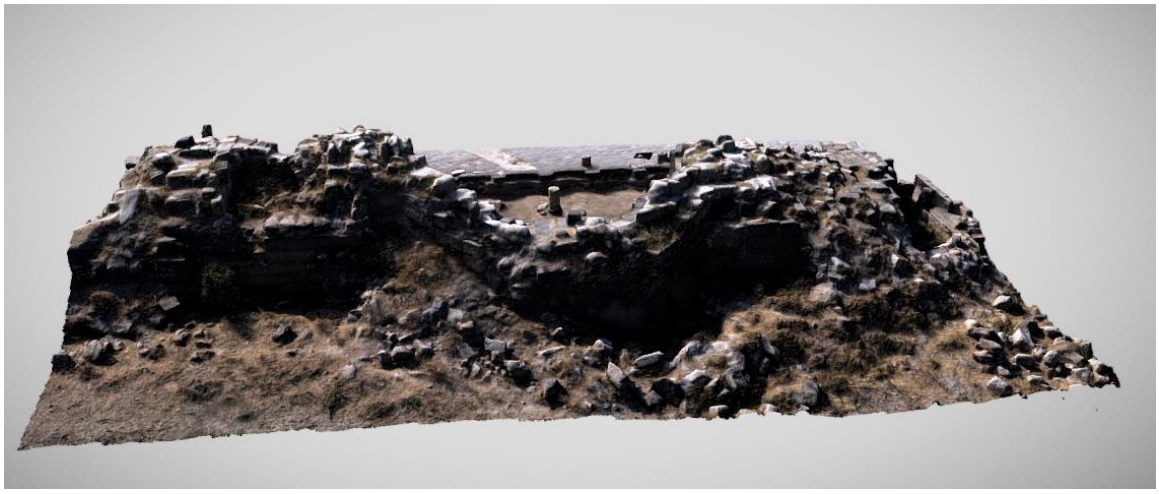

Plate 55 C: 3D capture of the *nymphaeum* of Gadara (Source: Living Museum of Umm Qais Project sketchfaB.Com) Accessed August 2023.

Plate 55 D: 3D capture of the *nymphaeum* of Gadara (Source: Living Museum of Umm Qais Project sketchfaB.Com) Accessed August 2023.

Plate 56 A: 3D capture of the *nymphaeum* of Petra. (Created by the Author in 2022)

Plate 56 B: 3D capture of the *nymphaeum* of Petra. (Created by the Author in 2022)

Plate 56 C: 3D capture of the *nymphaeum* of Petra. (Created by the Author in 2022)

Plate 56 D: 3D capture of the *nymphaeum* of Petra. (Created by the Author in 2022)

Plate 57: vegetation presence at the *nymphaeum* of Gerasa. (Photo taken by the author in 2022)

Plate 58: Acts of vandalism graffiti on the stones of the *nymphaeum* of Gerasa. (Photo taken by the author in 2022)

Plate 59: Rubbish found in the area facing the *nymphaeum's* facade. (Photo taken by the author in 2022)

Plate 60: **Relics of Roman columns are found scattered at the *nymphaeum* site. (Photo Taken by the Author 2022)**

Plate 61: Vegatiation cover at the site of *nymphaeum* in Gadara. (Photo Taken by the Author 2022)

Plate 62: Littering inside the basin of the *nymphaeum*. (Photo Taken by the Author 2022)

Plate 63: Archaeological artefacts belonging to the *nymphaeum* of Gadara scattered randomly around and within the *nymphaeum*. (Photo Taken by the Author 2022)

Plate 64: Littering at the site of *nymphaeum* in Petra, and indication of bonfire traces. (Photo Taken by the Author 2022)

Plate 65: A minor act of Graffiti vandalism at the site. (Photo Taken by the Author 2022)

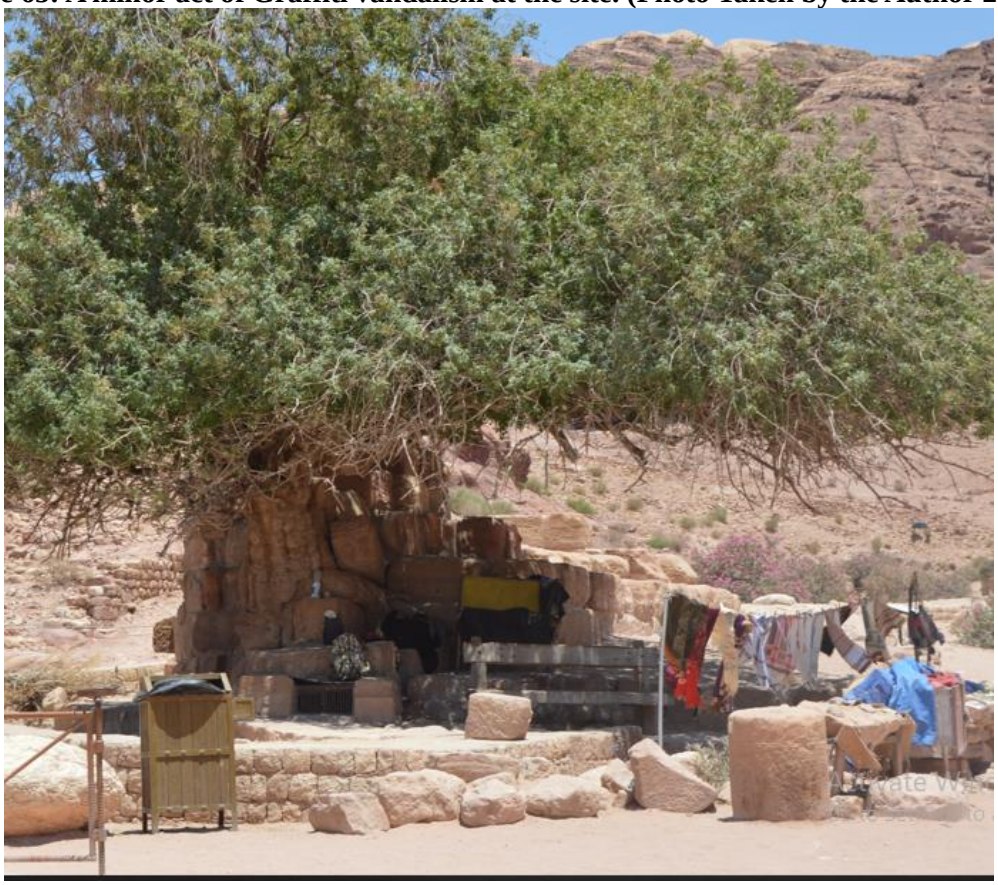

Plate 66: A small local shop using the *nymphaeum* to display its products. (Photo Taken by the Author 2022)

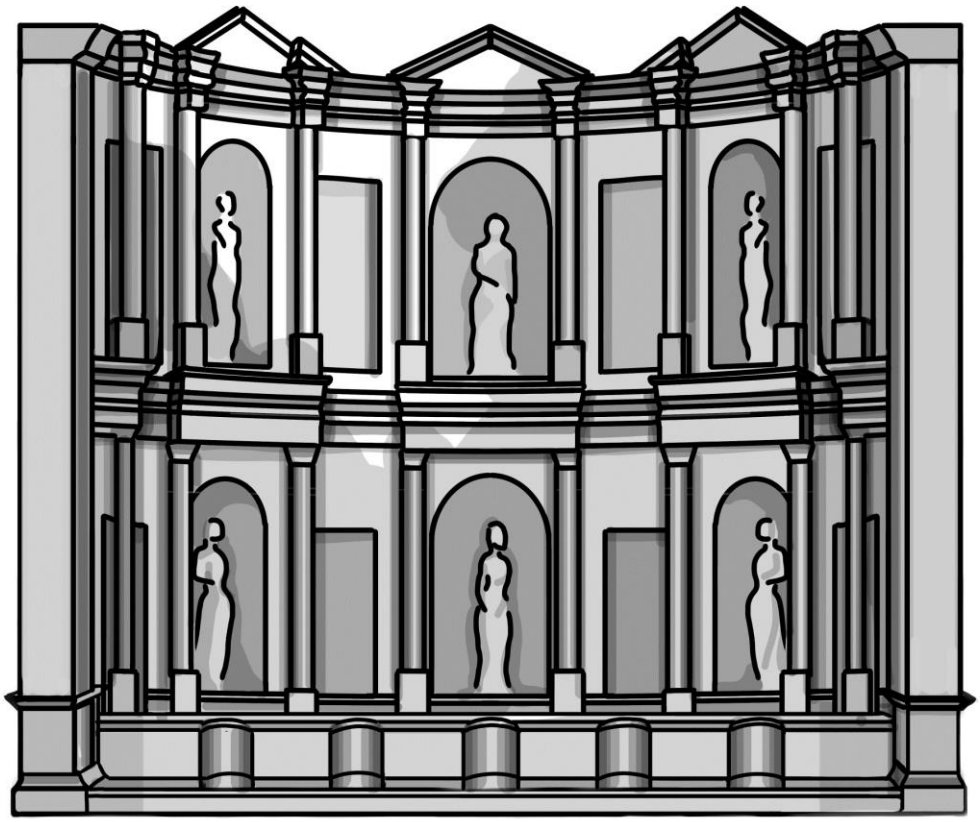

Plate 67A: Reconstruction sketches of the façade of the *nymphaeum* of Gadara with statues visible filling the niches, visualized by artist Lamara Dagistani (2023).

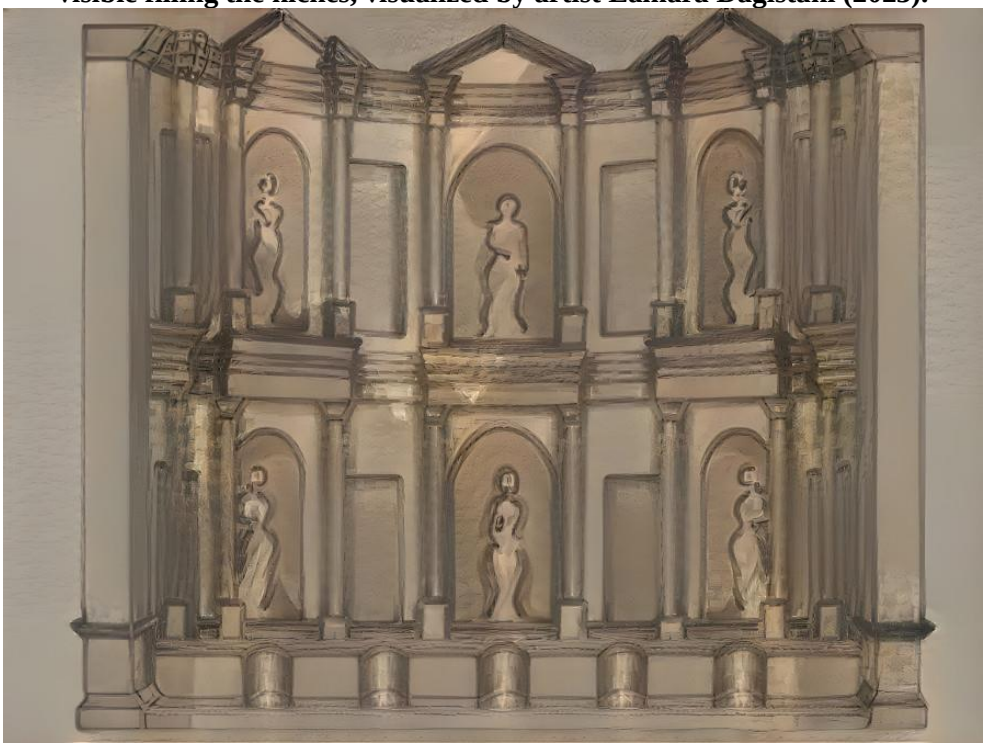

Plate 67 B: Sketch displaying Reconstruction of the façade of the *nymphaeum* of Gadara with statues filling the niches, visualized by artist Lamara Dagistani (2023).

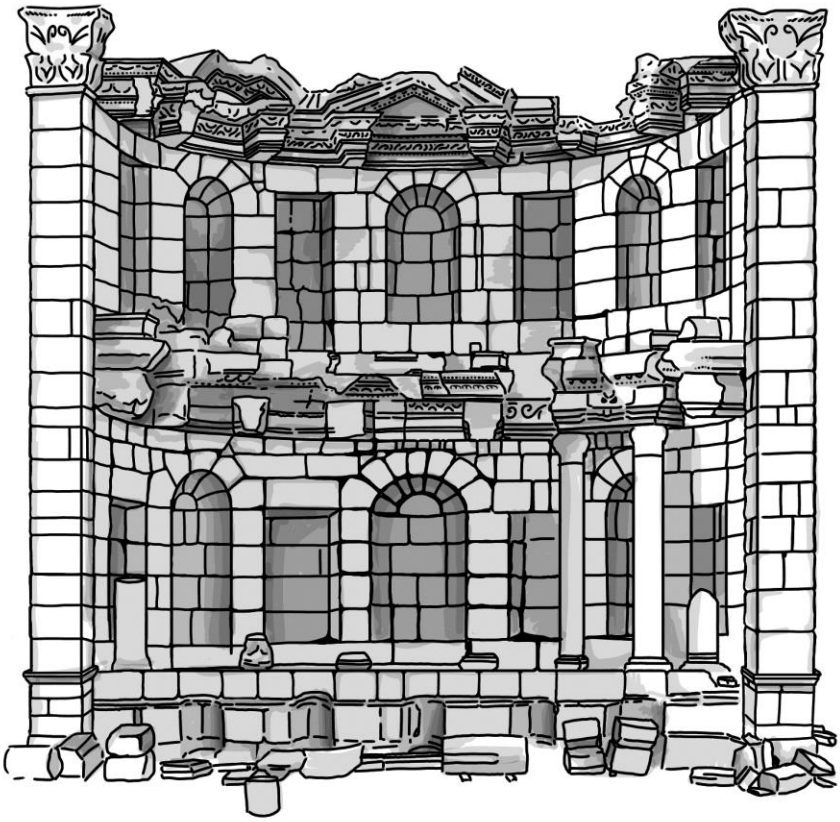

Plate 68 A

Plate 68 B

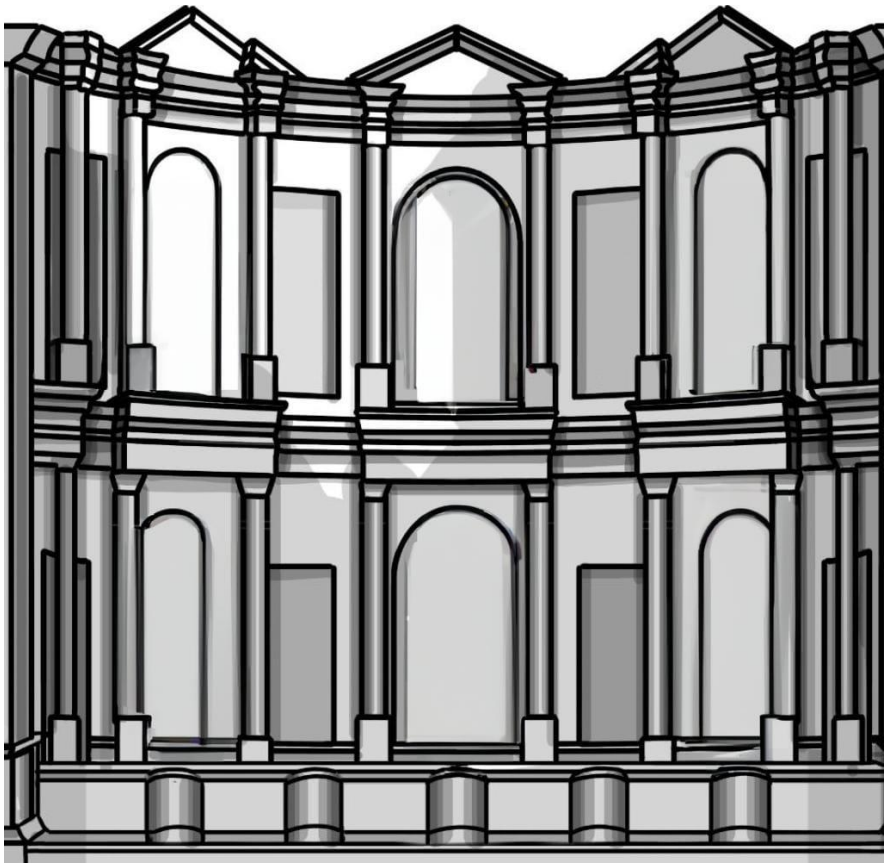

Plate 68 C

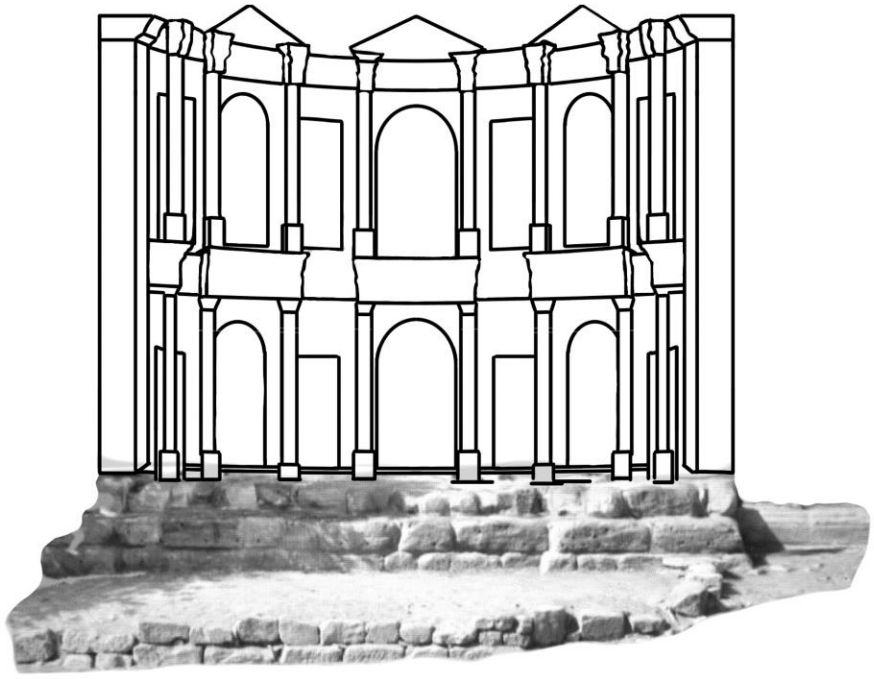

Plate 69 A

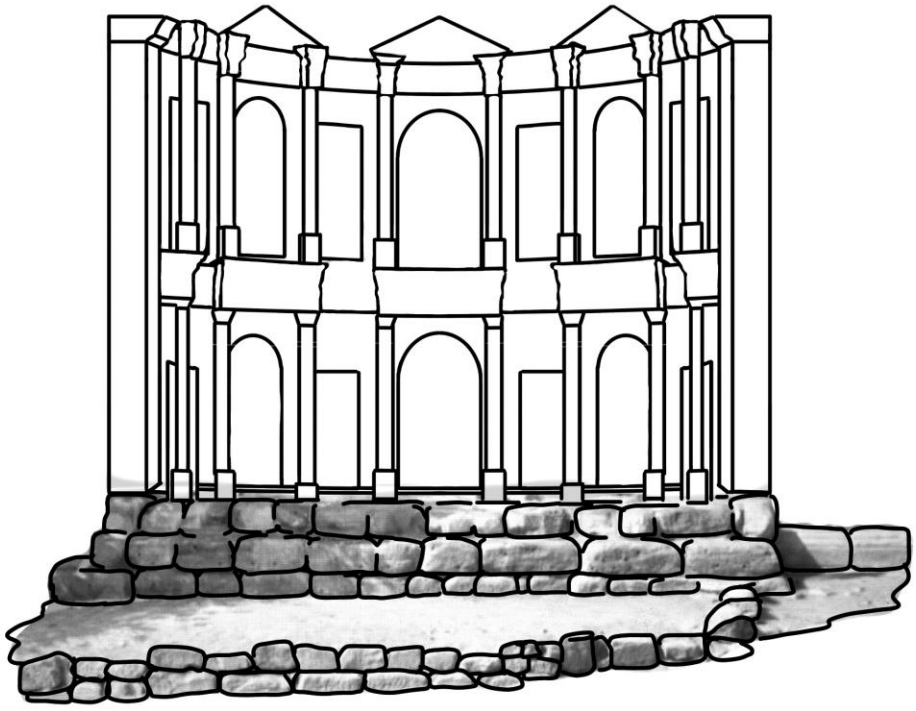

Plate 69 B

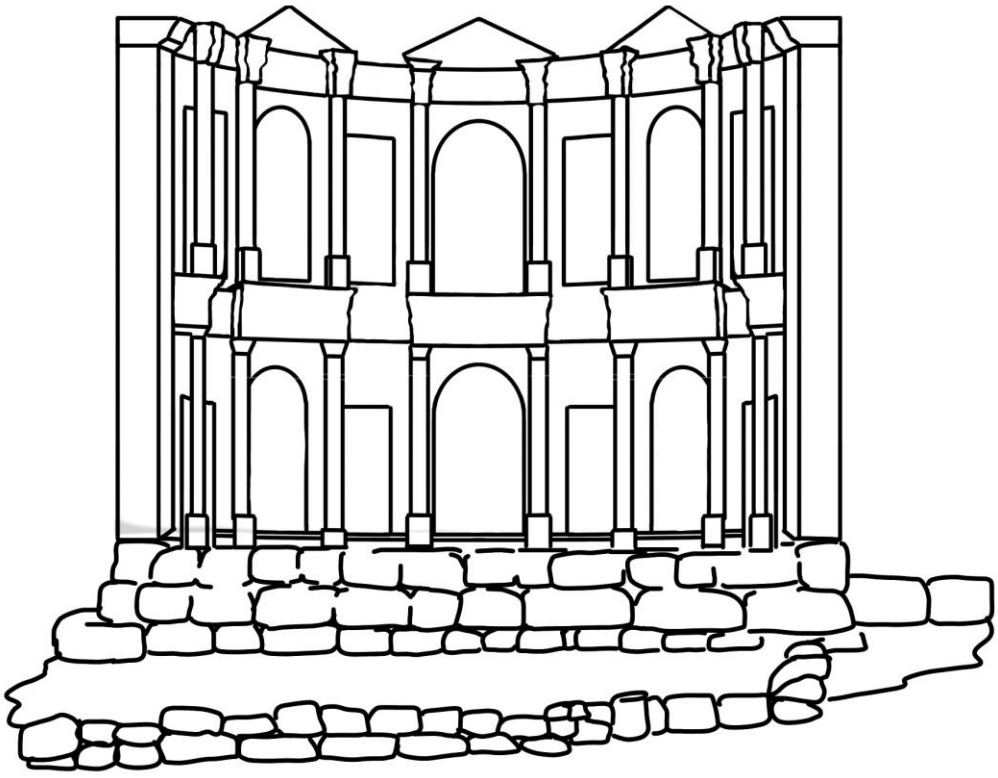

Plate 69 C