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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***

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Abstract

Introduction and Scope

This study thoroughly investigates the Roman *nymphaeum*'s structure, origin, and evolution across different periods, focusing on four key examples in Jordan: Amman, Gerasa, Gadara, and Petra, as well as the coin-depicted *nymphaeum* of Pella. These structures transitioned from sacred fountains dedicated to *nymph* deities into monumental urban elements with more secular functions, reflecting broader architectural and cultural transformations in Roman cities of the East.

The research explores how *nymphaea* developed during the Roman period, reaching their zenith in the 2nd and 3rd centuries AD. Originally associated with natural grottos and sacred water sources, these structures evolved into wider, larger, and more architecturally elaborate urban features. The study argues that some *nymphaea* lacked religious purposes, serving instead as monumental fountains symbolizing civic wealth and urban planning. Despite this shift, inscriptions and coins—such as those from Pella and Gadara—indicate that some retained sacred functions.

Jordan's *nymphaea* exemplify both Roman architectural ingenuity and their integration into local cultural and urban contexts. These *nymphaea* highlight the cultural synthesis of East and West, demonstrating advanced water management techniques and the importance of water in urban life.

Key Research Questions

To address its aims, the thesis investigates the following questions:

- What are the origins, historical development, and typological characteristics of Roman *nymphaea* across the Roman Empire, and how are these reflected in Jordan's *nymphaea*?
- What cultural, religious, and practical roles did *nymphaea* serve in Roman cities, particularly in water management, urban planning, and societal dynamics?
- 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?

Justification

Despite their historical and architectural significance, *nymphaea* remain understudied. Their physical traces, often neglected, provide valuable insights into the socio-economic and cultural exchanges of ancient civilizations. Understanding these structures enhances our knowledge of Roman architectural ingenuity and their integration with local traditions. In Jordan, where water is scarce, these monuments underscore the critical role of water in shaping urban and social landscapes. Their preservation is vital for understanding intercultural interactions in the Roman Empire.

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.

Many *nymphaea* lack comprehensive excavation or documentation, resulting in limited understanding of their full historical and functional contexts. Conservation efforts, as seen in the Amman project, underscore the potential for integrating these monuments into modern urban landscapes as cultural and educational spaces.

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.

Methodology

This study employs two primary methodologies:

Literature Review: A comprehensive analysis of scholarly sources, archaeological reports, and historical texts to contextualize *nymphaea* within Roman architecture. Emphasis is placed in Amman, Gerasa, Gadara, Petra, and Pella, alongside regional comparisons.

Fieldwork and Documentation: Site visits, photography, and detailed observations to document architectural features and damage. Illustrations that reconstruct destroyed structures like those in Petra and Gadara, providing visual insights into their original grandeur.

The study integrates cultural resource management (CRM) principles to evaluate preservation challenges and propose sustainable conservation strategies.

State of the Art of the thesis in Jordan and Beyond

This literature review provides a detailed historical and scholarly exploration of Roman *nymphaea* structures, focusing on the Amman *nymphaeum* in Jordan and its counterparts in the region. This is the key themes of the previous studies:

- *Early Accounts and Identification*

Johann Ludwig Burckhardt (early 19th century): Identified the Amman *nymphaeum* as a public building. Claude Conder (late 19th century): Expanded its characterization, describing it as a bath. Howard Butler (early 20th century): Classified the structure as a *nymphaeum* mason.

- *Key Studies on the Jordan nymphaea*

Adnan Hadidi (1970s): Explored the Roman Forum of Amman, indirectly contributing to understanding the *nymphaeum*'s urban context. M.B. Kadhim (1993): Highlighted the neglect and need for revitalization of the Amman *nymphaeum*. Mohammad Waheeb (1990s): Conducted excavations and provided detailed documentation, revealing artefacts such as human statue heads. 2014–2018 Restoration Project: Funded by the U.S. Ambassadors Fund for Cultural Preservation, it utilized advanced techniques like 3D laser scanning and aerial photography, significantly improving the site's condition and accessibility. Fadi Khalfieh (2011): Studied the impact of air pollution on the *nymphaeum*'s limestone. Al-Bawab et al.: Published findings on conservation efforts, emphasizing cultural heritage management.

Gerasa (Jerash), Gadara (Umm Qais), Petra, and Pella: Studies have highlighted the regional significance of *nymphaea*, their architectural diversity, and their integration into urban water

systems. Researchers like David Boyer and Achim Lichtenberger explored these structures' water management and symbolic roles. Arthur Segal and Nur Banu Uğurlu: Focused on the architectural and urbanistic roles of *nymphaea* in the Roman East, examining their dual function as functional water systems and decorative urban landmarks. 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."

- *Broader Thematic Insights*

Cultural and Mythological Context: Jennifer Larson examined the mythological associations of *nymphaea* with *nymphs* and their evolution as urban fountains.

Functionality vs. Monumentality: Scholars such as Julian Richard critiqued the misclassification of monumental fountains as *nymphaea*, emphasizing their practical roles in Roman cities.

Architectural Typologies: Norman Neuerburg established a typology for *nymphaea*, aiding the analysis of their structural evolution.

Broader Roman context: Warwick Ball examined the history of the Roman empire in the east, and the architecture and key themes of the Roman empire from the archaeological perspective, which was essential while conducting this research.

Structure of the Research:

1. **Chapter One:** *Introduction*
 2. **Chapter Two:** *Historical background*
 3. **Chapter Three:** *Water, Myth, and Architecture: The Evolution of Nymphaea from Mythical Origins to Architectural Monuments*
 4. **Chapter Four:** *Beyond Jordan: Roman Nymphaea in the Southern Levant and other regions of the Roman Empire*
 5. **Chapter Five:** *Exploring Roman Nymphaea in Jordan: Heritage Assessment, Virtual Restoration, and Cultural Resource Management*
- *Conclusion*
 - *Bibliography*

- *Appendix*

The First Chapter provides a preface of the research, containing the main key points that research will dive into, and how it was structured and the methodologies behind its creation.

The Second Chapter dives into the historical background of the examined *nymphaea* locations in Jordan, it goes through the typography of each location and gives a comprehensive insight into the development of each city where the masons are constructed, which gives the reader a more thoughtful understanding of how these cities developed, reaching to the Roman period, which eventually provides the reader with the needed data to connect it to the evaluation of the architecture of these structure and the complexity of the influence that was poured and merged with the roman engineering expertise.

The Third Chapter of this thesis sheds light on the evaluation of the *nymphaeum* as a structure, and how it is connected to the mythological believes of the people who constructed it, it starts with its direct connection with the *nymph* creatures, and how these creatures according to ancient believes played an essential role in natural phenomena, and how the development of praising these creatures resulted in constructing this masons we find today in many different ancient archaeological sites. The chapter also discusses the different usage of the term “*nymphaeum*” and how it was interpreted within the scholarly sphere. The chapter also sheds light on the typology of the *nymphaeum*, mentioning the limitations that faced the author while conducting a typology due to the different and wide range of characteristics that the *nymphaea* structures hold throughout different areas, and different time periods.

The Fourth Chapter dives into the Roman *nymphaea* that are found outside of Jordan, the beyond *nymphaea* of the examined *nymphaea* of the thesis, this chapter attempts to structure a wider range of understanding to the *nymphaeum* structure in the Eastern Roman empire, by mentioning the characteristics of these *nymphaea*, and the historical development that the areas of construction had gone through, in order of giving a more thorough understanding of the *nymphaea* as a whole.

The Fifth and final chapter is the crown jewel of the thesis, it provides the research with its richness and the main discussion it intends to dive into; this conclusive chapter, is divided into three parts, the author examines the Roman *nymphaea* situated in the kingdom 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. This chapter 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.

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 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. **Then a conclusion** that sums up the findings and the main key themes of this thesis, followed by a bibliography list, and an appendix.

Main Research Results

The research traces the historical and cultural evolution of Roman *nymphaea*, originating as sacred Greek structures tied to water and *nymph* worship and transforming into monumental urban features during the Roman era. It highlights how Greek *nymphaea* were modest and functional, while Roman *nymphaea* became architecturally complex and integral to urban planning. The study

identifies unique regional adaptations in Jordan, particularly in Amman, Gerasa, Gadara, and Petra, where local topography and culture influenced their design. These structures served multiple roles, including providing water, hosting ceremonies, and symbolizing authority and affluence, often functioning as focal points of urban life. Interdisciplinary insights, such as connections to mythology, linguistics, and heritage management, enhance the understanding of their significance in Roman urbanization and cultural exchange.

Main Outcomes of the Thesis

The thesis establishes a typology for *nymphaea*, categorizing their architectural and functional characteristics across Greek, Hellenistic, and Roman periods. It underscores their cultural importance as symbols of the blending of Roman and local traditions, showcasing their dual roles as monumental fountains and civic landmarks. Conservation strategies, including the use of technologies like 3D modeling, are proposed to preserve these sites and promote public engagement. The research synthesizes existing literature and fieldwork, contributing a comprehensive study of Jordanian *nymphaea* while positioning itself as a foundation for future research. This work emphasizes the interdisciplinary approaches needed to deepen the understanding and preservation of these architectural marvels.