

Harbours of Byzantium

The Archaeology of Coastal Infrastructures

Edited by

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Cover: Southwestern harbour of Byzantine Kassandreia in Chalkidiki, Greece (A. Ginalis)

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Editor's Preface

Christianity, Roman tradition and ideology, as well as Greek cultural heritage, have been labelled as the pillars of the Byzantine Empire. In fact, the real crux and enabler of power in an empire that combined the Occident with the Orient was its control over the seas. As such, seafaring constituted the formula of success for dominance of the Mediterranean, playing a key role in communication, military activities, and, especially, economic exchange. But how does one get from land to water? The linking gates are coastal installations, i.e. ports, harbours, and other infrastructures. These function as economic hubs, cultural and social meeting points, as well as gateways for communication and connection.

Even though the study of harbour sites and port networks of the Byzantine Empire constitutes a relatively new research field, it has nevertheless received significant attention over the last few years, as we can see from the instigation of various projects and the staging of conferences. However, attention is rarely paid to analyses of physical harbour remains and their impact on the general development of Late Antique and Medieval architecture, economy, or trade networks.

As such, in 2018, an international conference on the *Harbours of Byzantium* was organised at the Institute for Advanced Study of the Hanse-Wissenschaftskolleg in Delmenhorst, Germany. This event was intended to focus particularly on the archaeology of Byzantine coastal sites, including both harbour infrastructures *per se*, as well as associated facilities and affected landscapes. Leading scholars in the field from twelve different countries presented new material and data with which to understand the development of harbour architecture and coastal activities from Late Antiquity to the Middle Ages. The papers set out to cover sites from all provinces of the Byzantine Empire, stretching from Italy in the West to the Levantine coast in the East, and the Black Sea in the North to Egypt in the South. This allowed a general overview for comparative analyses and discussions on various aspects of Byzantine harbour networks and maritime connectivity.

Accordingly, the current volume provides a series of scientific papers deriving from presentations given at the conference. Beyond general approaches to the study of Byzantine harbour archaeology, the contributions offer a representative picture of harbour activities across the historical and geographical boundaries of the Byzantine Empire. Although it is impossible to reflect a comprehensive picture of the entire sweep of coastal landscapes, this work hopefully provides a basis for future comparative research in Byzantine harbour studies – on a local, regional, and supra-regional level.

The conference programme is included in the Appendices. The differences between the conference programme and the final version of this volume are explained by the fact that some scholars who submitted abstracts were ultimately unable to attend, and some who did attend and gave their papers did not submit them for publication. Fortunately, other colleagues agreed to contribute to this volume and I am most grateful to them for so doing.

I would like to express my deepest gratitude to all participants in the Delmenhorst Conference for presenting papers that provided unique insights, not just into ongoing excavations and investigations related to harbour installations, but also into hitherto understudied aspects of coastal infrastructures. It has been a considerable challenge to assemble this volume, and I am therefore particularly indebted to all authors who contributed and enriched this publication. Bearing in mind the time-consuming work of editing and unifying the papers, etc., as well as the difficulties brought on by the COVID pandemic, I have done my best to ensure as prompt a publication as possible.

Thanks must go here to Dr Susanne Fuchs and her team from the Institute for Advanced Study of the Hanse-Wissenschaftskolleg for their support in organising the conference in Delmenhorst. I am also sincerely grateful to David Davison and Mike Schurer from Archaeopress for agreeing to publish this volume and for guiding this work through to publication, their technical help, and the quick production of the printed version.

Alkiviadis Ginalis

4. The Late Antique and Byzantine Port of Thessalian Thebes – The Archaeology of its Coastal Infrastructures

Alkiviadis Ginalis and Anna Gialouri

The Late Antique and Byzantine port city of Thessalian Thebes is situated beneath what is nowadays the modern municipality of Nea Anchialos in central Greece (Fig. 4.1). As a result of the area's re-occupation during the Roman Imperial period, Thessalian Thebes was founded probably around the 1st century AD (Stählin 1924: 113). In fact, the site succeeded the ancient coastal site of Pyrassos, which had functioned as *Epineion* of the Classical inland city of Phthiotic Thebes (Gialouri, forthcoming; Nikolaou and Kravaritou 2012: 241-243; Soteriou 1931: 2).¹ Both Phthiotic Thebes and Pyrassos were destroyed by the Macedonian king Philip V in 217 BC, who favoured the port city of Demetrias (located c. 17km further north at modern Volos) and freed it from any competitors in its vicinity (Lazarides 1987: 312-315). Hence, only with the period of the *Pax Romana*, which started a time of economic and social prosperity, and consequently growing urban as well as commercial activities, did the former coastal site of Pyrassos recover and gain in importance. Due to heightened coastal activities during Late Antiquity, it finally underwent a phase of resettlement, replacing Phthiotic Thebes as the new urban centre and maritime gateway to the Thessalian hinterland. The gradual movement of inhabitants to the coast led to the decline and shrinkage of the inland city. However, it nevertheless continued to be inhabited and even fortified until the 5th century AD (Gialouri 2022: 50-51; Nikolaou and Kravaritou 2012: 241-243). Free of any pagan tradition, and under the influence of Christianity, the port city not only functioned as a commercial hub but also gained in importance as a cultural and ecclesiastical centre between the 1st and the 4th centuries AD. This eventually resulted in the development of Late Antique and Byzantine Thessalian Thebes (Karagiorgou 2001a: 184-185; 2001b: 53-4; Koulouras 1997: 281-292; Koder and Hild 1976: 271-272; Avramea 1974: 150-156; Soteriou 1931: 4). Being connected to the same agricultural and industrial wealthy hinterland as Demetrias, Thessalian Thebes reached a similar level of maritime activity. However, the city's era of prosperity did not last long. After a time of considerable stability, wealth and growth during the 4th, the 5th and the first half of the 6th centuries AD, the episcopal port city particularly

suffered from the troublesome events of the late 6th and the 7th century AD. Earthquakes, plagues and fire, as well as the Gothic and Hunnic raids, and especially the Avaro-Slavic 'invasion', caused not only an economic regression but also an urban decline and cultural stagnation. Accordingly, facing fundamental urban changes, particularly due to the permanent Slavic settlement (Avamea 1974: 155), Thebes entered a time of transformation during the Middle Byzantine period. However, despite the complete loss of its former splendour, the port city seems to have made a gradual recovery after the second half of the 7th century AD. This is indicated by the account of the *Vita et Miracula Sancti Demetrii*,² describing trade relations between the Byzantines and the Velegezetes Slavs during the 7th century AD (Karagiorgou 2001b: 22-29).

Although the entire site is located beneath modern Nea Anchialos, excavations have been able to unearth large parts of the ancient city of the Roman Pyrassos and Byzantine Thebes. Apart from numerous public buildings, including secular, domestic, and ecclesiastical facilities, as well as amenities and other urban infrastructures (Karagiorgou 2013; Ntina 1994; 2008; 2009; Karagiorgou 2001a: 185-197; 2001b: 53-63; Ntina 1994; Lazarides 1987; Soteriou 1931: 11ff; Arvanitopoulos 1908a: 161-163), several buildings relating to the city's harbour have been revealed. This includes not only port-related structures belonging to the so-called *Emporion*³ surrounding the harbour area, but also various types of harbour installations *per se* with their different mooring facilities.

Thebes' *Emporion* consisted of both commercial and monumental buildings, such as the large complex of the forum area and the later marketplace with storerooms and pottery workshops. The most commercially active area of the *Emporion* was, without question, the city's pulsing main street, passing directly by the harbour in a northeast-southwest direction. The colonnaded commercial street was flanked by baths, workshops, warehouses or storerooms, shops, and other multi-storeyed houses (Lazarides 1973: 33, Figs 28b-30;

¹ Researchers are often confused by the toponym of Thebes, relating Hellenistic Phthiotic Thebes with the later Byzantine port city of Thessalian Thebes. For the etymological complexity of the ancient city name, see Soteriou 1931: 4-5, 29.

² Lemerle 1979-1981: Vol. I, 214 (§254): 'σταλήναι εἰς τὰ τῶν Θεβῶν καὶ Δημητριάδος μέρη πρὸς τοὺς τοῦ ἔθνους τῶν Βελεγηζιτῶν, ὀφείλοντας ἐξ' αὐτῶν ξηροὺς καρποὺς ἐξωνήσασθαι'.

³ For *Emporion*, see Ginalis 2014: 14-15; further see Liddell and Scott 1843: 548; Mundell Mango 2000: 189-207, Figs 4, 22, 27.



Figure 4.1: Archaeological remains of Thessalian Thebes at Nea Anchialos, Greece (A. Ginalis after Karagiorgou 2013: 158, Fig. 138).

Soteriou 1961: 111; 1960: 132-134).⁴ Excavations as well as recent rescue investigations revealed parts of these building complexes (Figs 4.2-4.3). These indicate building phases dating up to the mid to late 7th century AD (Ntina 2006: 427; Karagiorgou 2001b: 54-55, 60-61; Ntina 1994: 363, 365).

⁴ For further information on the marketplace and the street, see: Gialouri, forthcoming; Karagiorgou 2013: 161-162; Ntina 2009: 423-425; Karagiorgou 2001a: 192-193, 196; Lazarides 1975: 33.

The Inner Harbour

As for the harbour and its various installations, Thessalian Thebes possessed one central harbour basin, around which the city's *Emporion* was orientated. Although the harbour is still in use today, a number of structures or sections are fairly well preserved. However, apart from a short report on the harbour's physical layout by Soteriou in 1929, the archaeological information is limited to a brief mention of the existence of breakwaters and the discovery of a boundary stone (see below) in the course of dredging works in the



Figure 4.2: Part of the paved colonnaded street (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.3: Warehouses or workshops along the paved colonnaded street (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

harbour basin (Karagiorgou 2001b: 54; Soteriou 1931: 12). Indeed, the best preserved and most striking feature is certainly its massive south-eastern breakwater, which still defines the extent of the modern harbour basin (Fig. 4.4). The breakwater has a bow-shape, leading from the north-eastern coastline towards the southwest. Its current dimension shows a total length of c. 150 m, which is more or less consistent with the Late Antique harbour area. Based on the topography of the coast, the original length of breakwater may have been twice as long (see discussion below). Recent aerial photographs and satellite pictures even allow a rough determination of its original width of c. 13 m – 20 m. Beyond its main purpose of simply protecting the harbour basin against the open sea, with its prevailing strong waves, currents, and tides, it also fulfilled other purposes, i.e. featuring different superstructures.⁵ Accordingly, excavations revealed that the breakwater supported sea walls as an extension of the city's circuit walls; hence, the harbour was incorporated into Thebes' fortification system (Gialouri, forthcoming; 2022: 51-57; Ntina 1994: 357; Soteriou 1931: 12).

⁵ For the function of breakwaters, see Ginalis 2014: 26-30.

The sea wall consists of two parallel walls, which enclose a core section of mortar with rubble stones, resembling a frame-walling technique (Fig. 4.5a-b). While the two wall layers possess a width of c. 0.40 m each, the compact filling shows a width of up to 1.90 m, giving the feature a maximum total width of c. 2.70 m (Gialouri, forthcoming; Karagiorgou 2013: 159; Ntina 1990: 89).⁶ This corresponds exactly to the sea wall along the south-western breakwater (see below).

Although the early phases of the city walls are yet unknown, based on written accounts, e.g. Procopius of Caesarea and Zosimus (Haury 1913: 112-113 (IV.3.5); Mendelssohn 1887: 31, I.43), as well as the construction method (*opus isodomum*) of the lower part of the land walls, the city must have been fortified at the latest by the mid 3rd century AD. Based on archaeological data, the earliest traceable fortification measures of the city are the sea walls along the inner side of the harbour basin, which seem to correspond with the

⁶ Sections with staircases, i.e. at the sea wall along the south-western breakwater; the wall reaches a width of up to 3.30 m (Gialouri, forthcoming).

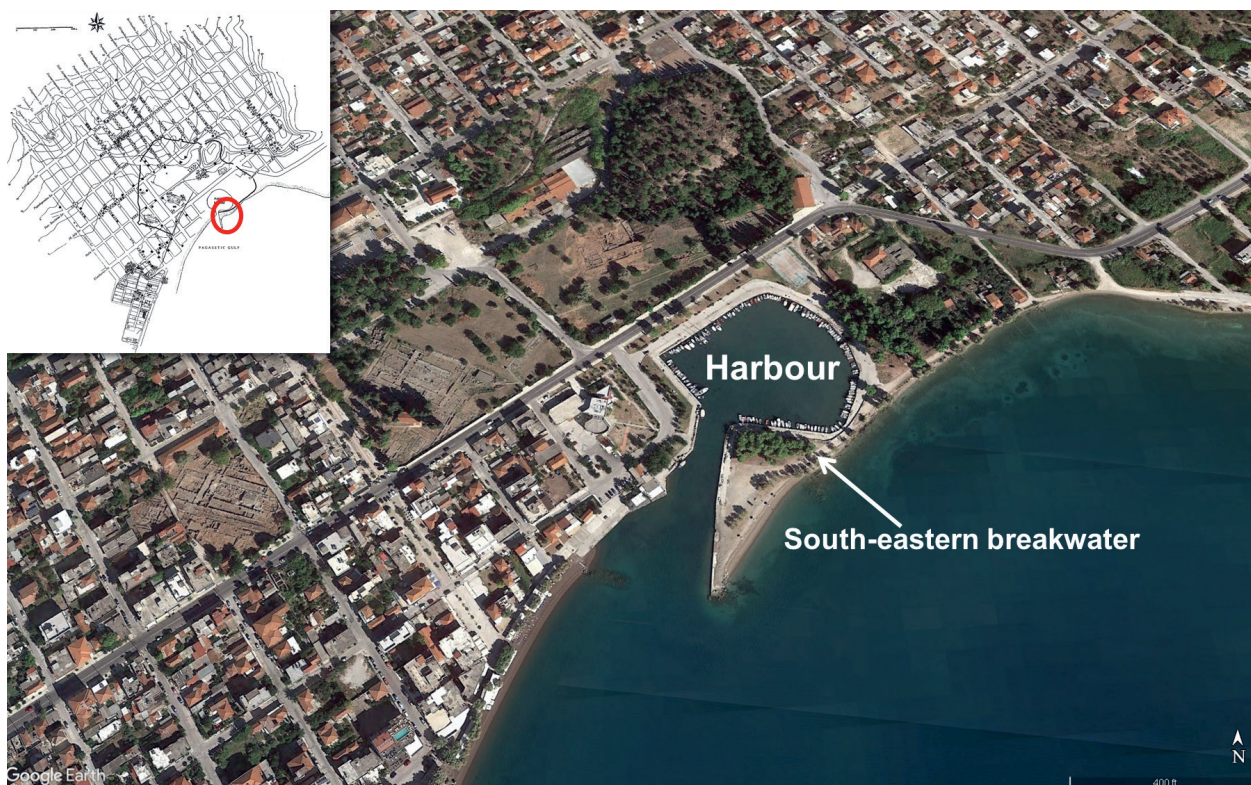


Figure 4.4: South-eastern breakwater (based on Google Earth).

date indicated by the written sources. As such, the city (incorporating also the harbour) must definitely have been fully fortified by the 3rd century AD, with repairs/adjustments or shifts, and possible extension works, during the 4th and 5th centuries, and as late as the reign of Justinian I (Gialouri, forthcoming; Karagiorgou 2013: 159; Ntina 1994: 357; Avramea 1974: 151).

Beyond fortification measures, the breakwater was also used to increase the mooring space within the harbour basin and fulfil commercial and traffic related functions. This had been achieved by constructing moles along the inner side of the breakwater as extensions of the quay line. Unfortunately, no mole construction has been documented so far along the inner side of the south-eastern breakwater due to modern harbour building activities; nevertheless, its existence can be strongly assumed. In contrast to its modern equivalent, however, it is unlikely to have extended over the entire length of the breakwater but rather over a maximum length of c. 100 m.

Soteriou rightly assumed that the harbour basin must have been enclosed not by a single, but by two breakwaters, with mole superstructures protruding from the quay lines into the sea (Soteriou 1931: 12, Plan 1), one protecting the harbour area from the east and southeast, and one supposedly from the south and southwest. Unfortunately, there has long been

no information concerning the exact location and dimension of the second, south-western, breakwater. As such, it was initially believed that the ancient and Late Antique harbour was of the same size as its modern equivalent. Only recently have archaeological rescue investigations by the Greek Ephorate of Antiquities of Magnesia unearthed a small section of what seems to belong to some superstructure of the south-western breakwater (Fig. 4.6). Situated c. 280 m southwest of the modern harbour, it shows that the port of Thebes was of much bigger extent than expected (Fig. 4.7).

Based on the exposed structural remains on the south-western breakwater, the feature shows a northwest-southeast orientation, leading towards the shoreline and the south-eastern breakwater. How close the south-western breakwater originally approached the south-eastern one is unknown; hence, the size of the harbour entrance cannot be determined with certainty. Based on the coastal topography and an estimated length of the south-western breakwater of c. 160 m, which corresponds to the length of its south-eastern counterpart, the harbour entrance may have been up to 50 m wide.

The south-western breakwater has been completely overbuilt by modern urban development. Only a very limited part of its superstructure could temporarily be unearthed during roadworks by the Greek Ephorate



Figure 4.5a: Part of the sea wall along the south-eastern breakwater excavated in 1986 (Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.5b: Part of the sea wall today (A. Ginalis).



Figure 4.6: Superstructure on the south-western breakwater (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

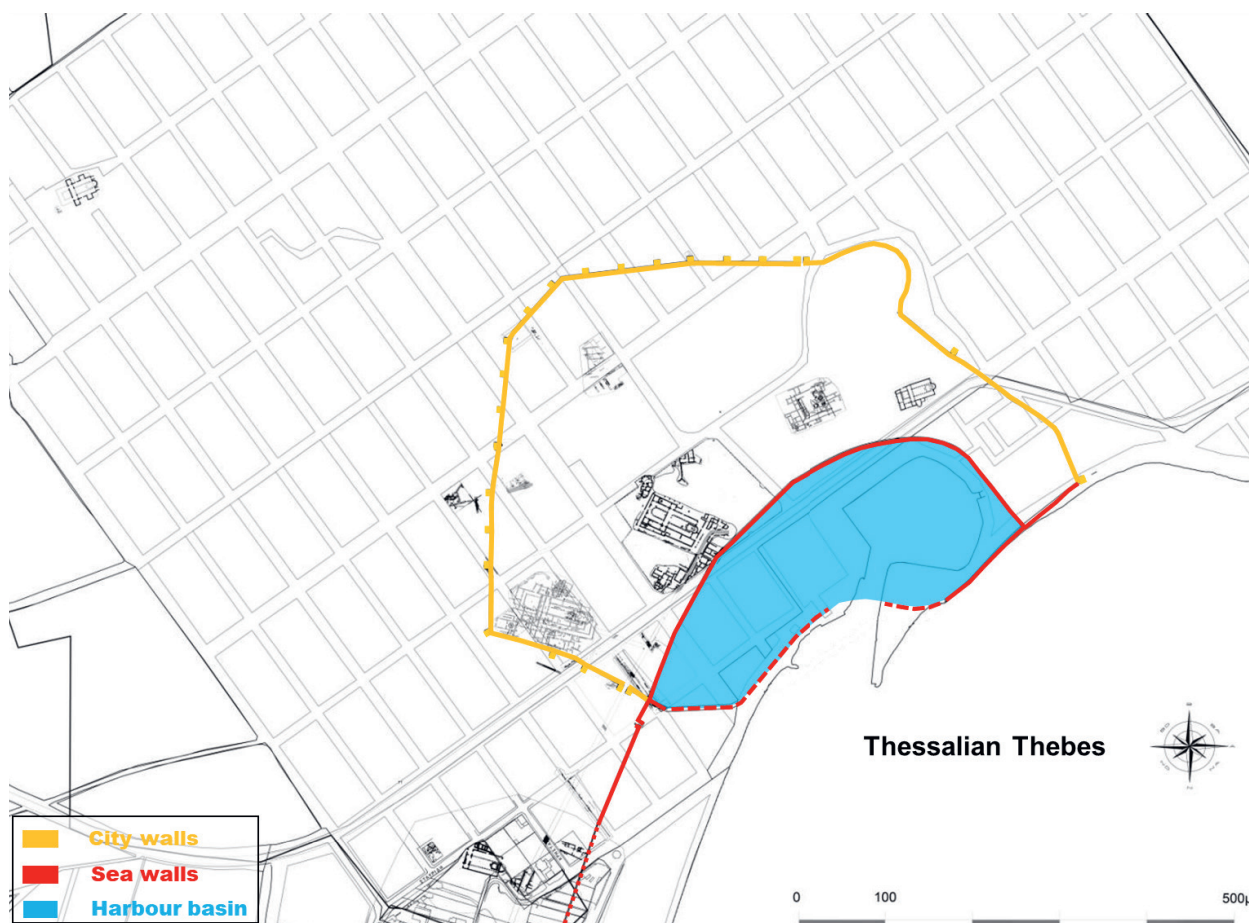


Figure 4.7: Estimated extent of the harbour basin (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

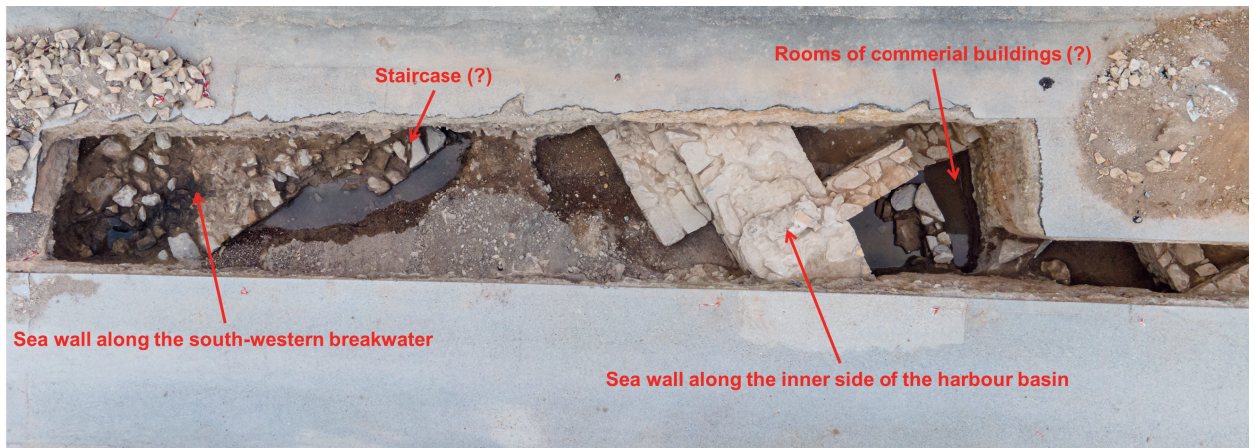


Figure 4.8: Unearthed intersection of the sea walls (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.9: Wall superstructure on the south-western breakwater (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

of Antiquities of Magnesia (Fig. 4.8). Fortunately, that unveiled crucial details about the nature and architecture of the entire installation. The exposed remains show a large wall construction, consisting of a mixture of rock boulders, regular ashlar blocks, and large stone slabs. In fact, what at first seems to be one single feature 2.70 m wide (with an extension of up to 5.20 m towards the inner side) proved to be two separate wall lines belonging to two different building phases: an

earlier western outer wall that was eventually widened by an eastern inner wall and subsequently covered by large stone slabs (Fig. 4.9). The outer wall has a linear, nicely worked, outer profile. Its lower part is composed of regular stones and ashlar blocks, followed by smaller irregular stone blocks in the form of rubble masonry. Resembling the lower part of the city's circuit walls, it may be identified as a section of the sea wall that runs along the breakwater, thus enclosing the harbour basin.



Figure 4.10: Spoilation of Sarcophagi for mole construction (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

As such, a date to the Early Byzantine period, with later repairs and alterations (adjustments), can be suggested.

While the outer sea wall is largely composed of regular stones and ashlar blocks, the inner wall comprises mostly natural rock boulders, irregular stones, and stone slabs. The outer feature sits on top of a series of sarcophagi, of which three could be documented (see below) (Fig. 4.10).⁷ The latter seem to rest on an artificial substructure in the form of wooden formworks that serve as solid foundations. The Roman architect and engineer Vitruvius Pollio, as well as later the Byzantine scholar and historian Procopius of Caesarea, refer to the use of rectangular wooden formworks or chests (κιβωτούς as Procopius refers to them) for the construction of harbour installations protruding into the water like jetties or moles (Vitruvius, *De Architectura* V. 12. 3; Procopius, *De Aedificiis* I. 11. 18-20). Such wooden formworks or *caissons* were prepared on land and subsequently sunk into the water in order to be placed on the surface of the breakwater. The *caissons* were eventually filled with a compact composition of mortar mixed with rubble stones and ceramics, resembling the construction method of *opus caementicium* (Brandon *et al.* 2014: 189-222). Although preserved wooden posts (0.10 m - 0.14 m thick) belonging to vertical pillars of one of the *caissons* were unearthed and extracted during the roadworks (Fig. 4.11a-b), unfortunately neither the presumed wooden formwork nor its mortar filling could be further documented. Nonetheless, the installation may be identified as a mole construction on top of the south-western breakwater.

As for the mortar filling, the brief examination of the substructure by the Greek Ephorate of Antiquities



Figure 4.11a: Wooden post of a *caisson* (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.11b: In situ wooden posts of a *caisson* (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

revealed no remains of mortar, merely a rubble stone filling. However, the unique conditions of marine environment obviously required a certain type of hydraulic mortar.⁸ By mixing quicklime, seawater, and an aggregate as a mortar-binding material, this would have provided the necessary stability to withstand the impact of the sea. Whether the aggregate used for the mortar composition consisted of pozzolan ash, the so-called *puteolanus pulvis* (a volcanic sand from the Gulf of Naples near Puteoli), frequently used for harbour sites of the Roman Imperial period, i.e. Caesarea Maritima and Pompeiopolis in Cilicia (Brandon *et al.* 2014: 73-81, 94-101, 136; Oleson 1988; Raban 1989: 64ff), or any other additive, cannot be answered without archaeometric analysis of some potential future finds of mortar remains. Therefore, its identification as 'Roman marine concrete' must remain uncertain.

⁷ The sarcophagi most likely originate from the Roman Necropolis at the northeastern end of the city. For further information, see Lazarides 1967: 22, Figs 21b-22a; Soteriou 1931: 16, Fig. 13.

⁸ For the technology and character of hydraulic concrete, see Blezard 2004; Brandon *et al.* 2014: 1-4, 141-187; Gotti *et al.* 2008.

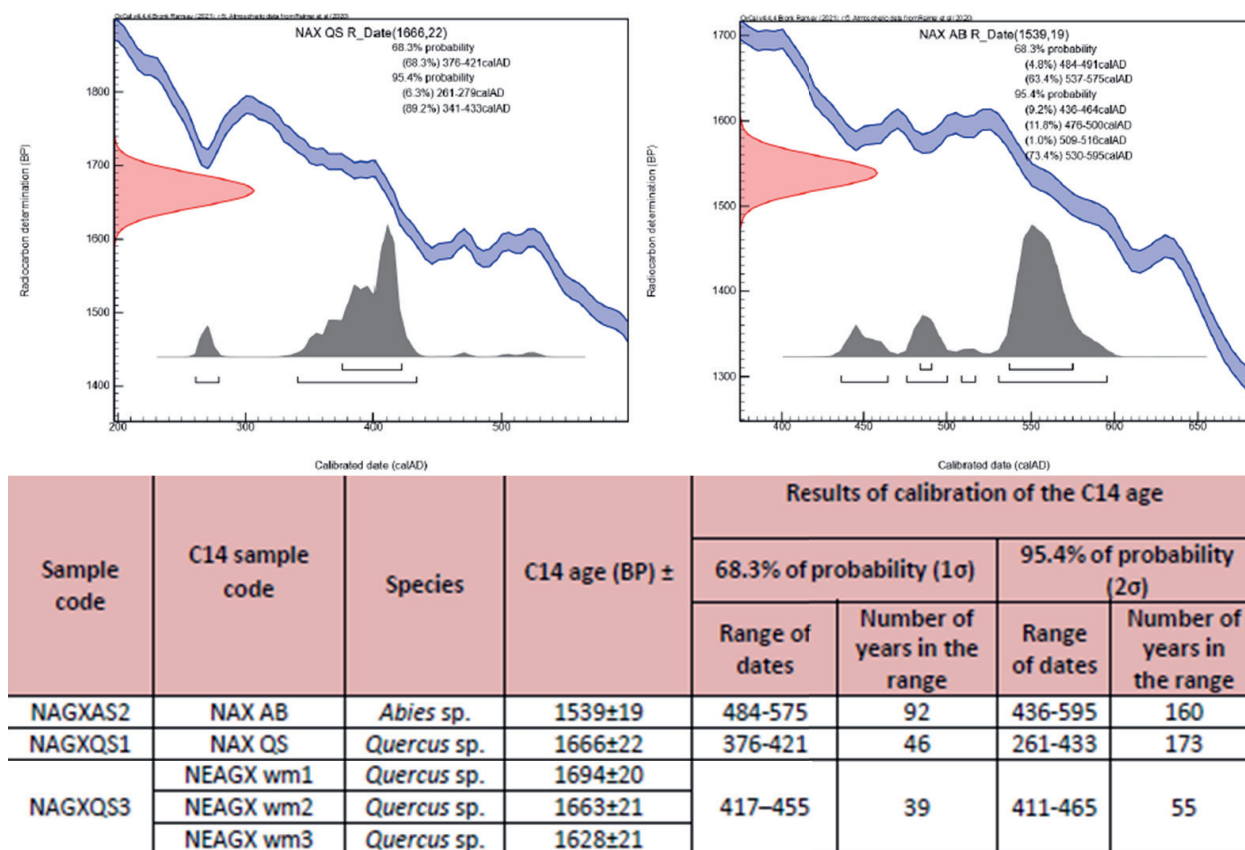


Figure 4.12: C14 dates of the wooden posts (after a report by A. Christopoulou *et al.* 2023, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

Concerning the dating of the installation, and whether or not it was erected contemporaneously with the outer wall, the re-used stone sarcophagi, at least two of which can be identified as Roman Imperial monuments of the ‘garland sarcophagus with tabula’ and ‘sarcophagus with *tabula ansata*’ types, provide a *terminus post quem* of the 2nd-3rd century AD (Katakes 1999-2001: 190; Koch 1993: 27-29, 172-173).⁹ It can therefore be assumed that at least the mole construction (if not the sea wall too) can be roughly dated between the 4th and the 6th century AD, which corresponds to the building phase of the harbour, as well as the development of the episcopal port city of Late Antique and Byzantine Thessalian Thebes, with some possible repair or extension works as part of Justinian’s building programme. In fact, recent dendrochronological and ¹⁴C analyses of the wooden posts reveal a date for the mole’s wooden formwork in

the 5th century AD,¹⁰ supporting the assumption based on the sarcophagi (Fig. 4.12).

Beyond the two afore-mentioned mole structures, the space alignment provided two large quay areas along the north-western and north-eastern coastlines. With the south-western breakwater being situated as far southwest as 280 m from the modern harbour basin, the spatial layout of the Late Antique harbour basin seems to have had a more irregularly elongated oval shape, taking advantage of the coastal environment by stretching from northeast to southwest (Fig. 4.8). This provided the harbour basin with an up to 400 m-long north-western and a roughly 150 m-long north-eastern shoreline. While it remains unclear to what extent the north-western coastline was equipped with any quay installation for loading and unloading or embarking and disembarking operations, the existence

⁹ Both types of sarcophagi have been documented at numerous other sites, both *intra muros* and *extra muros*, e.g. below the Acropolis in Athens: Soteriou 1931: 16, Fig. 13. While the sarcophagus with *tabula ansata* seems to be of local Thessalian stone, the garland sarcophagus with *tabula* shows high similarities with garland sarcophagi originating from Assos (Arslan 2018: Figs 9-11, 21-22). Shipments of sarcophagi from Assos to the Greek mainland and beyond are well indicated by the cargo of the Methone 7 shipwreck.

¹⁰ Based on the report by A. Christopoulou, A. Elzanowska and T. Wazny (2023), the three samples provide a rough date range between the 4th and 6th centuries AD. However, the most accurate analysis indicates a date range of between AD 411 and 465. Further details on the dendrochronology and results of the ¹⁴C dating will be published by the above authors and the Greek Ephorate of Antiquities of Magnesia. We would like to take this opportunity to particularly thank A. Ntina for her pioneering research and efforts and congratulate her on her highly important work on Thessalian Thebes.

of a quay along the entire length of the north-eastern coastline can be considered with confidence, thanks to a preserved 5m-long quay section (Ginalis 2014: 183-184; Ntina 1990: 89, Fig. 85a). The preserved quay section was first identified by Soteriou in the 1920s, together with further structures supposedly belonging to harbour facilities along the north-eastern coastline of the harbour basin (Soteriou 1931: 11-12). However, by simply reporting that the wall section consisted of a row of large, well-worked stone blocks, Soteriou unfortunately omits more precise information. Subsequent cleaning work undertaken by the Greek Ephorate of Antiquities of Magnesia (formerly the 7th Ephorate of Byzantine Antiquities) has revealed a width of 2.20 m - 2.30 m (Ntina 1990: 89). The visible part, with a northwest-southeast orientation, consists of a single row of ashlar blocks measuring a total length of c. 10 m and a width of 0.35 m - 0.40 m (Fig. 4.13). Some of the blocks show small notches of mostly rectangular shape (Fig. 4.14), which provide a recast for a mortar bonding or metal clamps, enabling greater stability and resistance for longer. This is further shown on the re-used ashlar blocks of the later outer quay structure (see below). The stone wall forms a frontal harbour façade, followed by a compact conglomerate of rubble stones and mortar. Unfortunately, the construction technique of the quay line cannot be determined due to its limitation and overbuilding by modern harbour works. It therefore remains unclear whether, as at the harbours of Larymna and Anthedon, as well as the Boukoleon and Theodosius harbours at Constantinople, a chamber system with a filling of rubble stones and mortar was applied, or whether the compact rubble stone and mortar conglomerate rather formed a levee with an embankment, as can be seen, e.g., at the entrance channel to the harbour at Ephesus (Ginalis 2022; 2014: 184-185; Ginalis and Ercan-Kydonakis 2021: 34; Zabehlicky 1999: 480). In any event, a remaining series flattened blocks and slabs of stone indicate that the conglomerate was covered with a final layer of dressed stones that constituted the walking level of the quay area (Figs 4.13, 4.15). As for the width of the quay line, Soteriou reports a distance of 10 m from the sea walls to the shoreline of the harbour basin. Although Soteriou refers to the width of the potential south-eastern mole, a similar width can also be assumed for the quay, as it again corresponds precisely with the width of the quay at Ephesus, as well as at other harbours, e.g. Anthedon (Ginalis 2022: 98; Soteriou 1931: 12; Zabehlicky 1999: 480).

Apart from the remains of the quay line itself, a further preserved structure can be identified that projects from the quay westwards into the harbour basin (Fig. 4.16). Unfortunately, neither Soteriou, nor other reports from harbour works or archaeological investigations, provide any indication concerning the visible remains. Similar



Figure 4.13: Frontal facade and walking level of the eastern quay-line, consisting of a single row of ashlar blocks and dressed stones (A. Ginalis).



Figure 4.14: Small rectangular notches on ashlar blocks (A. Ginalis).

to the quay structure, it consists of a single row of stone blocks forming a frontal harbour façade, followed by a compact conglomerate of rubble stones and mortar. Although the structure follows the same architectural method used for the quay, it seems that it constitutes a separate feature, being attached to the quay line



Figure 4.15: A series of flattened blocks and slabs form the walking level of the quay area (A. Ginalis).



Figure 4.16: Projecting platform from the quay in the harbour basin (A. Ginalis).

and built of smaller stone blocks. Unfortunately, the purpose and function of the structure remains unknown due to its limitation by the modern harbour superstructure. However, since it extends c. 3m into the harbour basin, before turning parallel to the quay line and leading beneath the modern superstructure again, it may be identified as a jetty or platform-like extension of the quay area. This was planned, most likely, to increase mooring space to cope with heightened levels of maritime traffic, and possibly improve the effective operation of other harbour facilities, e.g. cranes.

Dredging works in the modern harbour basin at the beginning of the 20th century revealed a boundary stone originally belonging to the harbour's mooring facilities (Fig. 4.17); unfortunately, its original location is unknown. As such, it remains unclear to which side of the harbour the boundary stone belonged, and whether

it was situated along the potential south-eastern mole or one of the quay areas. Based on the brief description by Soteriou, the boundary stone has the shape of a small column or pillar, with a height of 0.74 m and a diameter of 0.14 m (Soteriou 1931: 12, Fig. 9). At its upper end the following letters can still be read:

Δ'
KATA

According to Soteriou, in the 1920s a further line depicting the lettering 'ΠΛΟΥΣ' was also recognisable, consequently giving the reading:

Δ'
KATA
ΠΛΟΥΣ

Understanding Δ' as the Greek numeral 4, and ΚΑΤΑΠΛΟΥΣ as 'putting ashore' or 'sailing to land' (Liddel and Scott 1843: 906), the epigraphy can be interpreted and translated as the '4th mooring space'. Therefore, similar to modern comparative examples and measures, the boundary stone marked a specific mooring area for incoming ships. Despite the discovery of just one boundary stone, based on Thebes' flourishing trading activities and the intensive life pulsing through that part of the port city, it can be assumed that there must have existed numerous such features. However, so far it forms an unparalleled discovery for the study of harbour infrastructures, providing us with an important and unique insight

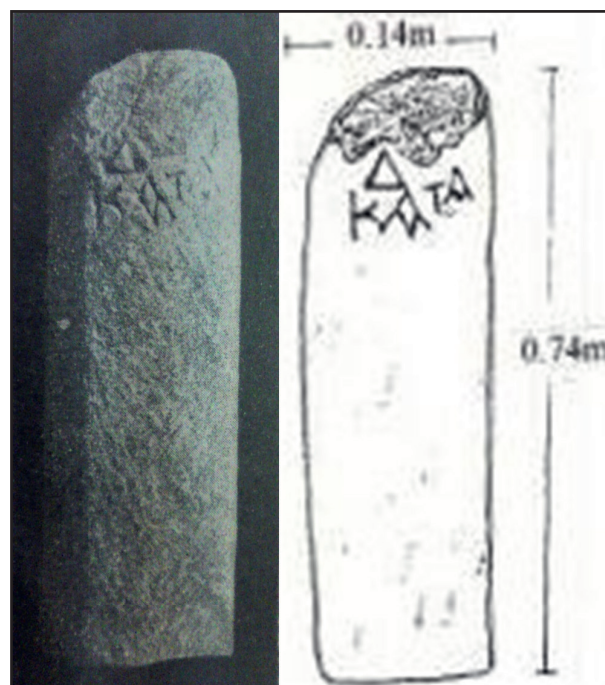


Figure 4.17: Mooring stone (after Soteriou 1931: 12, Fig. 9).

into Byzantine harbour administration. The single boundary stone demonstrates the precise arrangement of the harbour basin, helping our understanding of how trade was facilitated and administered, not just within the harbour area itself but also in the area of the *Emporion* adjacent to the harbour. In this respect, as far as the positioning of incoming boats is concerned, although the exact location of the mooring stone can no longer be allocated, the appearance of a 4th mooring space in the modern harbour area indicates that the approach to the 1st mooring zone must have been the north-eastern section of the basin, immediately after entering the harbour.

As for the dating, based on the characteristics of the letters the boundary stone has been attributed again to the 5th century AD (Ginalis 2014: 186; Karagiorgou 2001a: 213). As such, it is most likely that this date also applies to the construction of the harbour's quay line. Similar to the south-western mole, the construction of the quay line can therefore again be assigned to the building phase that included the development of the episcopal port city of Late Antique and Byzantine Thessalian Thebes. As for the jetty/platform, the fact that it constitutes an annexe to the quay indicates that it was probably not constructed contemporaneously with the quay area. Consequently, the structure most likely represents a later addition, possibly belonging to a 6th-century construction phase, as part of some extension or repair works during Justinian's reign.

In summary, although the physical remains of the inner harbour are very limited, due to modern urban development, they allow enough information for a hypothetical reconstruction. In contrast to the circular-shaped harbour basin of modern Nea Anchialos, occupying a mere 1.4 ha, by the 5th century AD at the latest, the spatial layout of the harbour basin seems to have had a more elongated oval shape and a calculated size of c. 5 ha (Fig. 4.8; Fig 4.18b).

As already indicated, based on the topography of the coast, as well as the total extent of the south-eastern sea wall, it can be suggested that the breakwater may originally have reached as far east as the eastern end of the city walls, hence possessing a length of up to 300 m. The course of the south-eastern sea wall must therefore initially (before the 5th century AD) have run not just partially but fully on top of the breakwater. Accordingly, a larger harbour basin stretching towards the east can be assumed (Fig. 4.18a). This corresponds with the course of the sea wall along the inner side of the harbour basin. On the basis of the archaeological remains to date, to the west of the harbour basin the sea wall can be traced much further south than its intersection with the city walls (Fig. 4.8). This indicates that prior to the construction of the 5th-century

harbour (with the erection of the above-mentioned south-western breakwater/mole), its basin may have extended also further to the south. Since the sea wall is dating as early as to the mid 3rd century AD (based on current archaeological investigations, see Gialouri 2022: 57), this presumably earliest phase of the harbour predates the city walls of Early Byzantine Thessalian Thebes. As such, it possibly matches the potentially much wider running city wall of the 3rd century AD. How far south the harbour may have extended remains to be investigated. Calculating a symmetrical enclosure with a centrally located harbour entrance, as was common in the Roman era,¹¹ one can therefore again estimate a length of up to 300 m for a potentially earlier south-western breakwater, resulting in a harbour area of up to 8 ha (Fig. 4.18a). This is supported by the recent discovery and documentation of a gate just south-west (hence outside) of the 5th-century dated harbour (Gialouri, forthcoming; 2022: 54). However, without any further archaeological basis, this remains a hypothetical reconstruction and has yet to be confirmed.

What is certain, though, is that by the time of the foundation of Early Byzantine Thessalian Thebes the harbour basin was rebuilt within a more limited, but probably better organised, space (Fig. 4.18b). Whether this is the result of a natural siltation process, or an artificial filling for a reorganisation of the harbour zone and its associated *Emporion*, remains unknown. Regardless of this, with the theoretical reduction of the basin, the Late Antique harbour seemingly possessed one main breakwater (c. 200 m long and encircling the harbour basin from the southwest), and a shorter one, stretching from the northeast over a length of c. 150 m. The harbour layout of Thessalian Thebes in the Byzantine period was not an isolated case, but rather followed a possible centralised construction plan. With a number of comparative examples, i.e. the harbours of Constantinople, Thessaloniki, and Anthedon (Ginalis 2022: 80; Ginalis and Ercan-Kydonakis 2021: 41-42; Leivadioti 2009: Plan 2), the use of an architectural blueprint throughout the empire during the Early Byzantine period has to be considered. With a width of up to 150 m and a length of c. 400 m, as well as given the orientation of the colonnaded commercial street with the marketplace of the *Emporion*, in the 5th-6th century AD the harbour basin of Thessalian Thebes possessed a calculated size of up to 5 ha (Fig. 4.18b). Due to the steady siltation process, eventually the south-western part of the basin further (?) gradually filled up, so that by the Middle Byzantine period only a very limited north-eastern section (perhaps c. 2.6 ha) must have been accessible (Fig. 4.18c). Over time, the harbour basin silted up entirely – until it was dredged to its

¹¹ The most well-known example is the Roman Imperial harbour of Portus. For the most recent bibliography on Portus, see the *Portus Limen Project* (<https://portuslimen.eu/>, last visited 6 Sept. 2023).

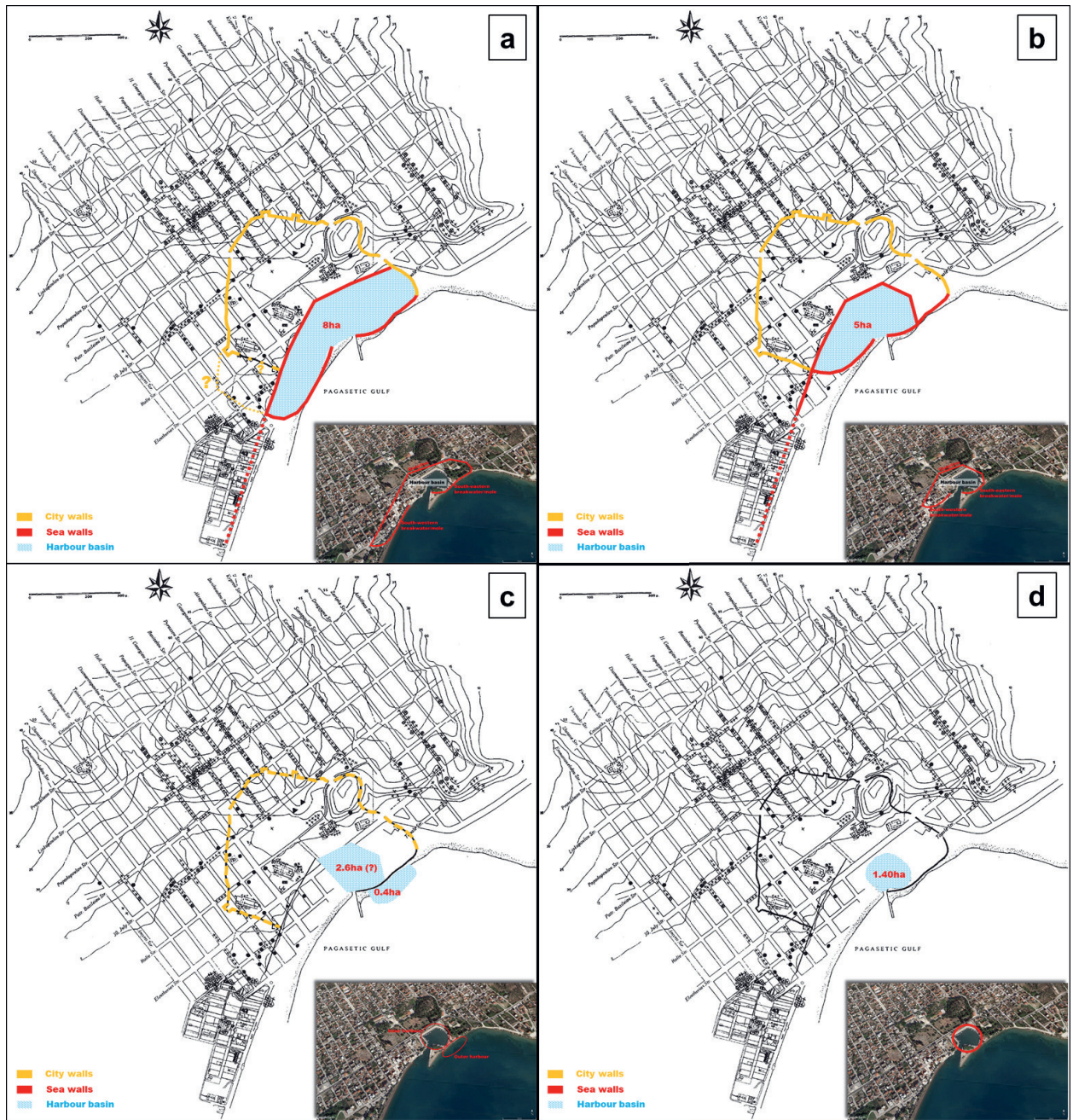


Figure 4.18: The estimated development of the harbour basin. a) until 4th c. AD; b) 5th-7th c. AD; c) 7th-8th c. AD; d) modern (A. Ginalis after Karagiorgou 2013: 158, Fig. 138).

modern shape at the beginning of the 20th century (Fig. 4.18d).

The architectural characteristics of the various features, the archaeological results of the surrounding area of the *Emporion*, as well as the urban history of Late Antique and Byzantine Thessalian Thebes, tend to suggest a mainly commercially orientated port. However, the harbour basin may also have accommodated an area dedicated to the construction and maintenance of ships, or the architecture and administration associated with

naval warfare, e.g. by housing shipsheds and slipways, respectively. Accordingly, Soteriou even argues for an interpretation as *Neorion* (Soteriou 1931: 10, 12, Fig. 10). A similar phenomenon can, in fact, be observed for the Theodosian Harbour at Constantinople, where a series of war ships indicates that military and commercial sections were no longer separated, and related activities were eventually conducted within the same ports (Kocabaş 2015: 26; Pulak *et al.* 2015: 62). Whether the harbours of the predecessor sites of ancient or Roman Pyrrasos functioned exclusively as *Neoria*, and were



Figure 4.19: Widely scattered ashlar blocks and irregularly shaped worked stones along the outer side of the SE breakwater (A. Ginalis).

only transformed and reorganised with the foundation of Late Antique Thessalian Thebes, remains unknown.

Concerning the general dating of the inner harbour, Stählin (1924: 113) believed that the present harbour basin and its preserved remains do not belong to the Roman or Byzantine port city but rather to the ancient harbour of Pyrassos. While the initial elongated shape of the harbour, with the erection of the two breakwaters, may indeed go back to the role of Pyrassos as *Epineion* of the Classical inland city of Phthiotic Thebes,¹² none of the preserved harbour infrastructures date prior to the Roman Imperial and Early Byzantine periods. This includes the remains of the sea walls, the south-western mole construction, and the north-eastern quay line with the jetty. As a result, three (of which two are archaeologically tangible) construction phases can be proposed for the harbour basin of Thebes (Fig. 4.18a-c):

The first phase possibly goes back to the foundation of the site as *Epineion* of Phthiotic Thebes during Classical Antiquity, which may be evident only through the existence and original extent of the south-eastern breakwaters. It is likely that the early shape was maintained up to the Roman Imperial period, eventually by encircling it with sea walls at the latest by the 4th century AD. The next harbour-related construction phase, which possibly implied a first major modification of the preceding ancient harbour, can today only be envisaged by the incorporation of the harbour into the city's fortification system, i.e. extending the circuit walls along the breakwaters. Based on the physical remains of the mole and quay structures, and with the discovery of the boundary stone, the main transformation and reorganisation of the harbour came

with the foundation of Late Antique Thessalian Thebes and the need to adapt to the new political, urban, and primarily economic circumstances in the 5th century AD. Finally, various harbour infrastructures, e.g. the sea walls and the north-eastern quay area, undergo a last phase of repairs and extension during the 6th century AD. Based on the account of Procopius of Caesarea and the frame-walling technique of the sea wall on the south-eastern breakwater (Haury 1913: 112-13 (IV.3.5)), the building measure may be attributed to the Justinian reign and his extensive building programme.

The Outer Harbour

As well as the inner harbour basin, Soteriou also reports on harbour structures along the exterior side of the south-eastern breakwater, running parallel to the sea wall (1931: 12). However, apart from referring to visible quay remains in the water, he again provides no further information on the feature's architecture. Various preserved wall sections, as well as large ashlar blocks and irregularly shaped worked stones, can be determined, scattered widely along the outer side of the breakwater (Fig. 4.19). By incorporating the sea wall, the stone blocks can be seen as representing a huge, rectangular, platform-like feature of some probably re-used material from the sea wall itself, as well as remains from various facilities along the inner harbour basin as well. As such, Soteriou's interpretation of a quay installation can be supported. Unfortunately, without archaeological investigation the exact extent and dimension of the quay remains, again, hypothetical. Aerial and satellite images, however, indicate a total length of c. 95 m and a maximum width of 21 m (Fig. 4.20). A series of longitudinal and lateral wall sections is discernible. Showing an intersecting arrangement, with an interval of c. 4 m, these resemble the chambers of the construction system identified at the harbours

¹² A similar scenario occurs in the harbour at Anthedon (Ginalis 2022: 104).



Figure 4.20: The extent of the outer harbour (A. Ginalis, based on Google Earth).

of Anthedon, Larymna, Theologos, Aegina, the outer harbour of Lechaion, and the Theodosian Harbour at Constantinople (Ginalis 2022: 98, 105; 2021: 34). As such, it can be assumed that the chambers were initially filled with a conglomerate of rubble stones, mortar, and coarse ceramic.

Approximately 70 m northeast of the quay, a jetty (c. 45 m long, 1.70 m wide) projects from the coastline in a northwest-southeast direction into the sea (Figs 4.20, 4.21). The structure again shows a frame-walling technique. Its two parallel wall foundations, which enclose a core section of mortar with rubble stones, consist of large rectangular limestone ashlar blocks. These are mainly set in courses of stretchers that gradually descend in steps towards the sea (Fig. 4.22). Although some headers are visible in the water, no consistent system of stretchers and headers can be discerned, even less the formation of chambers (Fig. 4.21). However, apart from its land section, the underwater surface material of the jetty is quite poorly preserved.¹³ The ashlar wall foundation seems to have been further built up with the core section of rubble stones and mortar. It is likely that the ashlar blocks of the wall foundations are again re-used stone material from the sea walls along the south-eastern breakwater. As

such, together with the quay further to the southwest, the jetty must have been erected when the sea wall was no longer in use and in a state of collapse. Therefore, a post-6th century AD date must be considered.

Just next to the jetty, a large circular kiln was recently unearthed by the Greek Ephorate of Antiquities of Magnesia (Fig. 4.23); this was identified as a lime kiln, based on the extensive production unit of at least 19 kilns that operated at the beginning of the 4th century AD in the harbour area of the castle of Platamonas (Gialouri, forthcoming; 2022: 53-54; Loverdou-Tsigarida 2004: 99-102). Unfortunately, the kiln has suffered from the impact of the sea, constantly washing out material and thus slowly destroying it. Consequently, only the 0.70 m-thick outline of the combustion chamber, with the furnace or stoking chamber, as well as the back part of the kiln's firing chamber, are preserved.¹⁴ While the lower part of the firing chamber is built of stone mixed with brick and mortar (Fig. 4.24), parts of collapsed vaults indicate that the dome consisted exclusively of brick (Fig. 4.25). The kiln has a diameter of c. 2.80 m. At the back, the arrangement of mortared stones provides a row of vent holes, leading to a seemingly posterior chamber or a further building section (Fig. 4.23b).

¹³ A proper recording would require a more detailed archaeological investigation.

¹⁴ Further archaeological investigations need to be carried out to verify the state of preservation, as well as for further documentation.



Figure 4.21: Jetty of the outer harbour (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

The fact that no remains of archaeological material (including firing residues, pottery remains, or some sort of waste material, e.g. slag), or any other architectural elements could be documented so far makes a functional identification of the kiln difficult. However, some remains of lime within the combustion chamber point to its use as a lime kiln. A further lime kiln has been unearthed at the western end of the harbour basin (west of the south-western breakwater), which, again, was in operation after the collapse of the sea wall (Gialouri, forthcoming). Nevertheless, dating the kiln remains difficult.

The operation of kilns along the shoreline, and even more so next to the mooring facility, suggests the installation of some kind of production unit to facilitate the movement of industrial products, together with other goods, as is the case at the harbour of the castle of Platamonas (Loverdou-Tsigarida 2004: 99-102). Situated along (and partly using) the sea walls, the kiln site must have been established when the sea wall was no longer in use and in a state of collapse. Consequently, the production site can be put in historical context with the attached jetty, which suggests a post-6th century AD date.

Approximately 70 m further to the northeast, the single-aisled, chapel-like church (or small basilica),



Figure 4.22: Stepped inclination and composition of the jetty (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

referred to as the '10th basilica' or 'Church/Basilica J', is located next to the sea (Fig. 4.26). Situated just outside the city wall at its north-eastern bend, and stretching in a northeast-southwest orientation, it indicates a close connection to the outer harbour installations. Although the church has been the object of small-scale excavations (Karagiorgou 2013: 162; Ntina 2008: 422-423; Karagiorgou 2001b: 59; Ntina 1990: 89; Soteriou 1931: 16, Fig. 12), it has not received significant attention so far. According to brief reports, annexe



Figure 4.23: Circular lime kiln next to the jetty (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.24: Composition of the lower part of the firing chamber (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).



Figure 4.25: Part of the collapsed vault (A. Gialouri, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

buildings or associated structures can be identified in the surrounding area, which, together with the church, show at least two yet undefined construction phases (Karagiorgou 2001a: 193; Varalis 2001: 228 (549)). Whether the structures are in any way connected to the jetty, and thus to the harbour complex, remains to be further studied and clarified. In any case, the proximity of the church to the landing stage alone strongly indicates its close involvement with the coastal activities going on along Thebes' outer shore.

Although the various facilities are located within a short distance, and in even intervals, which gives the impression that they all belong to one bigger coastal infrastructure, it cannot be ascertained whether these formed a functionally and operationally consistent harbour complex. However, an interactive relationship, particularly between the quay and the jetty as an extension for the increase of mooring space, can be assumed; forming different architectural units, both obviously fulfilled different functional purposes. While the quay area along the exterior of the south-eastern

breakwater forms a direct connection to the inner harbour and the adjacent *Emporion*, the jetty, located at the edge of the commercial area, may well have served as a platform for specific industrial activities – possibly under the influence of the church.

As far as the dating of the harbour installations along Thebes' outer shore is concerned, without further investigations it remains unclear whether the various structures belong to a single, or at least chronologically close, construction phase. Nevertheless, both the jetty and the quay line incorporate the sea wall along the south-eastern breakwater, as well as re-use its building material, which indicates a post-Justinianic date. Apart from a general *terminus post quem* of the 6th century AD, an exact historical classification is, unfortunately, rather difficult to determine. However, the construction technique applied at the quay provides an important indication for a date into the Middle Byzantine period. The adoption of a chamber system finds parallels in port-construction activities at a number of sites, i.e. Anthedon, and the Theodosian



Figure 4.26: Basilica J north of the jetty (A. Ginalis, Greek Ministry of Culture, Ephorate of Antiquities of Magnesia).

and Boukoleon harbours of Constantinople. These show the erection of facilities with an identical architecture, at the turn of the 7th/8th century AD, as a response to the consequences of the Arab conquest of Egypt and the immediate necessity for the reconfirmation of Byzantine authority over the Greek peninsula (Ginalis 2022: 105; 2021: 34-35, 44-45; Karagiorgou 2001b: 31, 168ff). As such, the construction of the outer quay line, and possibly even the entire harbour complex, may be associated with the growing importance of central Greece, and particularly that of Thessaly, as a major producer and supplier of agricultural produce from the second half of the 7th century AD onwards. As stated above, this is supported by the 7th-century account of the *Vita et Miracula Sancti Demetrii*, which indicates trade relations between the Byzantines and the Velegezetes Slavs, who settled mainly around Thebes (Karagiorgou 2001b: 28-29). Under additional consideration of the creation of the theme of Hellas c. AD 695, a date to the end of the 7th century AD, or even slightly later, therefore appears most likely for the implementation of port-construction works on such a scale.¹⁵

Conclusions

In conclusion, in contrast to the written sources and mainly archaeological evidence on land, which suggest that Thessalian Thebes flourished throughout Late Antiquity until it had almost completely disappeared by the mid 7th century AD (Avramea 1974: 155-166; Karagiorgou 2001a: 214), the study of its coastal infrastructures, including the various harbour installations, provides a slightly different picture. The increase of commercial activities and the heightened volume of sea traffic during the Roman Imperial period undoubtedly had an impact on the port infrastructure of Thebes, which may be reflected in a first modification of the ancient harbour. However, the thriving era of maritime activities that went along with a redefinition of the harbour area started with the foundation of Late Antique Thessalian Thebes. Accordingly, a peak of maritime trade during the Early Byzantine period is reflected by the erection of new harbour facilities along the inner harbour basin during the 5th century AD. After a last phase of repairs and extension works during

¹⁵ Accordingly, a date of as late as AD 750 for the Byzantine reconstruction phase of the harbour of Aegina was suggested

(Knoblauch 1973: 83).

the 6th century AD, fundamental urban changes caused a decline in commercial activities, which seems also to have resulted in the gradual siltation of the harbour basin during the late 6th and early 7th centuries AD. Despite the different fate of Thebes' urban history, the outer harbour complex (particularly the quay area with the jetty) attests a continuation of economic and social developments through agricultural and industrial activities during the Middle Byzantine period. Even though alterations of the harbour area confirm the general point of view that by the Middle Byzantine period Thebes had lost its role as a major port city (Koder and Hild 1976: 271; Reinders and Prummel 2003: 20), the harbour installations along its outer shore reveal that it remained commercially active and even underwent a gradual economic recovery after the second half of the 7th century AD. However, no longer as a major urban centre, but rather as an active trans-shipment hub for agricultural and mainly industrial exploitation of the coast and its hinterland. After a last revival of Imperial harbour activities as a response to consequences following the Arab conquest of Egypt and the necessity for the reconfirmation of Byzantine authority over the Greek peninsula, which led to the creation of the theme of Hellas c. AD 695, Thessalian Thebes declined to a mere staple-market economy before becoming entirely impoverished, and eventually disappearing from the pages of economic history by the end of the Middle Byzantine period. Thebes' gradual decline, however, did not mean that economic activities came to a complete standstill. Due to the permanent settlement of Slavs in Thebes' agricultural hinterland, together with the lack of Imperial control and thus the rise of private business as the prevailing economic system, by this time Thebes mainly functioned as a staple market for private or ecclesiastic commercial activities. Similar to other locations, at Thebes the church probably played not only a social but also an important economic role, influencing and controlling the commercial landscape. This is not only indicated by the numerous basilicas and church infrastructures around the harbour area and the *Emporion* during the Early Byzantine period, but also supported by the '10th basilica' at the later outer harbour.

Probably influenced by western traders, new coastal centres, e.g. Almyros and Pteleos in the central and southern Pagasetic Gulf, emerge and eventually take over Thebes' commercial dominance from c. the 9th century AD onwards. This is supported by a final mention of Thebes in the *Codex Parisinus Graecus 1555A*, dated between the ends of the 8th/9th centuries AD (Karagiorgou 2013: 166).

Finally, it has to be stressed that Thessalian Thebes constitutes a highly complicated site with a very complex urban history. As such, the above reconstruction of

the city's harbour area remains hypothetical and an up-to-date suggestion by the authors. We hope that future archaeological investigations will reveal more information that will help clarify the many remaining questions – and prove us either right or wrong. In any event, such research presents an excellent example of how the study of harbours and their facilities can be key to the understanding of urban history. We look forward to learning more and more about Thebes' fascinating existence during Late Antiquity.

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