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Reassessing the Harbour of Anthedon

Before starting with my analysis of Anthedon's harbour facilities, it must be mentioned that this paper is dedicated to my mentor David Blackman. His admirable work on the harbour of Anthedon together with Helmut Schläger and Jörg Schäfer not only forms the starting point of harbour studies as a scientific discipline within the field of archaeology but more so it still constitutes one of the best examples of its kind. As such, exactly 50 years after they investigated the harbour in 1966, I visited the site myself, which led me to the decision to honour Anthedon and their researchers with a re-examination of the data 50 years after they publicised »Der Hafen von Anthedon mit Beiträgen zur Topographie und Geschichte der Stadt« in 1968.

The coastal site of Anthedon is situated approximately 14 km north-west of Chalcis (Byzantine Euripus) along the Greek mainland coast (**fig. 1**). In contrast to its modern administrative affiliation to the island of Euboea, during Antiquity and the Middle Ages, it belonged to the province of Boeotia and later Hellas, respectively. This is attested by written accounts, such as Homer's Iliad (II, 508), Herakleides Criticus' Descriptio Graeciae (I, 23), the Periplus of Scymnus, Plutarch's Naturalis Historiae (IV, 7), Strabo's Geographica (IX, 2, 2; 13), Stephanus of Byzantium or Hierocles' Synekdemos (644, 12), as well as a series of inscriptions, referring to Anthedon as the most southern Boeotian harbour and member of the Boeotian League[1]. Located on the southern coast of the northern Euboean gulf, Anthedon consequently played an important role as a strategic coastal site of Boeotia as early as the Homeric Age.

The site's significance as a harbour station for the coastal network of central Greece has mainly been attributed to its proximity to Chalcis, as well as its function as one of the only three maritime connections of Boeotia with the Euboean Gulf besides Larymna and Halae (Byzantine Theologos) or Atalante, respectively. The key role of Anthedon, however, is not only based on its function as a strategic intermediate station within the Euboean Gulf and especially between the Boeotian inland city of Thebes and the Euboean capital. Moreover, lying next to the so-called River *Drestilia* (ancient *Schinous*), which divides the homonymous plain between Mount *Chtypas* (ancient *Messapion*) in the east and Mount *Ptoion* or *Ptoo* in the west (**fig. 2**), Anthedon served as a fundamental transshipment centre for the entire fertile coastal area and its wider hinterland. Even though Boeotia's harbours probably served mainly local trade, the precedence of its harbour sites becomes apparent from the fact that Anthedon was preferred to the likewise easily accessible coastal land route[2], which passes by *Loukissia* around 2.5 km further inland. Of particular importance would have been therefore its role as a so-called *epineion* for Thebes itself as well as the rural sites around the lake and later plain of *Copais* and its channel system via Lake *Ylike* and Lake *Paralimne*[3].

Beyond literary and epigraphic testimonies, mainly the rich material remains of Anthedon and its harbour area confirm the important role of the site from the Bronze Age until the Byzantine era. However, despite numerous studies by scholars such as Leake (1805), Ross (1844), Ulrichs (1846), Frazer (1895), Georgiades (1907), Lehmann-Hartleben (1923) or Orlandos (1937)[4], unfortunately, only a single season of excavation by Rolfe has so far ever been carried out, dating back to 1889. Undertaking merely four test trenches, the latter nevertheless revealed parts of the Acropolis, the city walls and other building complexes of the around 25.5 ha large area. Alongside some archaeological data of the Classical period, the documentation of an early Christian basilica next to the harbour and a large Byzantine graveyard southeast of the city point not only to a constant occupation from the Classical to Byzantine times but also to a peak of urban life and maritime connectivity throughout the late antique and early medieval periods[5]. Nonetheless, although Anthedon was subject to further investigations, such as the architectural survey by Georgiades[6], the site and above all its most prominent and important feature – the harbour area – did not receive much attention until the 1960s. Only in 1966/67 did Schläger, Blackman and Schäfer conduct a systematic examination of

1 Buck / Tarbell, Anthedon. – Hierokles, Synekdemos 17. – Keil, Sylloge 15. – Koder / Hild, Hellas and Thessalia 123. – Müller, Geographi Graeci I, 216. – Strabon, Geographika 32-33. 42-43. – Heraclides Criticus, Descriptio Graeciae 82-83. – Schläger / Blackman / Schäfer, Anthedon 25-28. 98-102.

2 Strabon, Geographika 54-55.

3 Blackman, Plautus 16.

4 Frazer, Pausanias 92-95. – Georgiades, Ports 7 pl. IV. – Leake, Travels II, 272-275. – Lehmann-Hartleben, Hafenanlagen 77-78. – Rolfe, Anthedon. – Ross, Wanderungen II, 126-132. – Ulrichs, Forschungen 36-37.

5 Leake, Travels II, 272-275. – Orlandos, Anthedon 172-174. – Schläger / Blackman / Schäfer, Anthedon 23-24. 30.

6 Georgiades, Ports 7.

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Fig. 1 Anthedon in its geographical setting. – (Photo A. Ginalis, 2018).

Fig. 2 Anthedon and its immediate hinterland. – (Photo A. Ginalis, 2018).

Fig. 3 Plan of the harbour of Anthedon. – (From Schläger/Blackman/Schäfer, Anthedon).

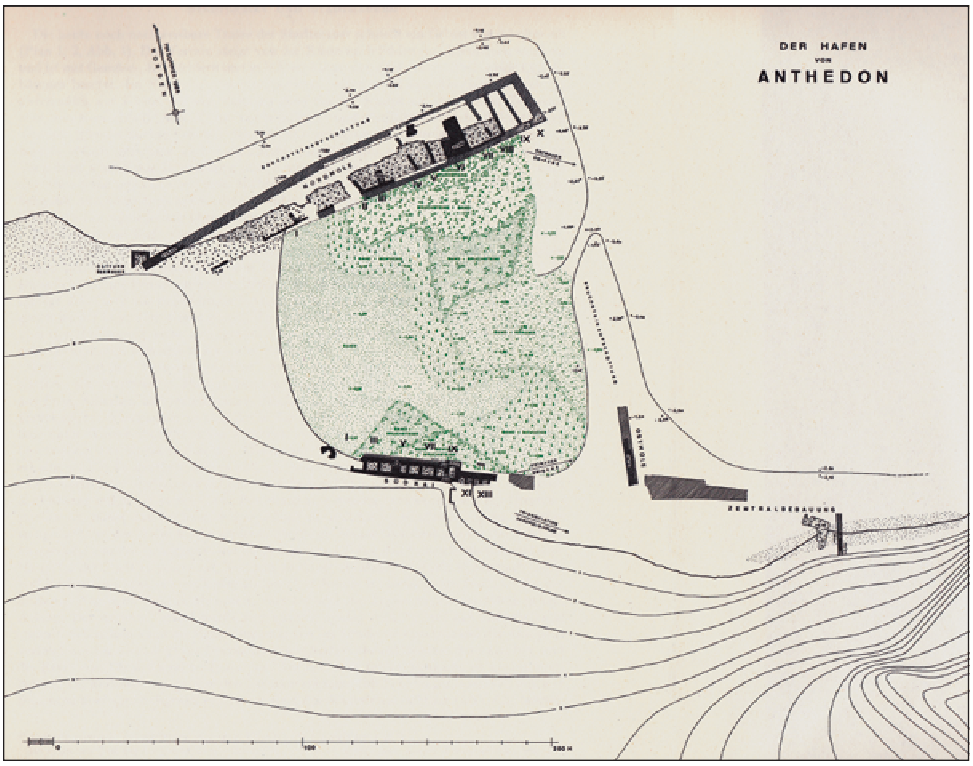
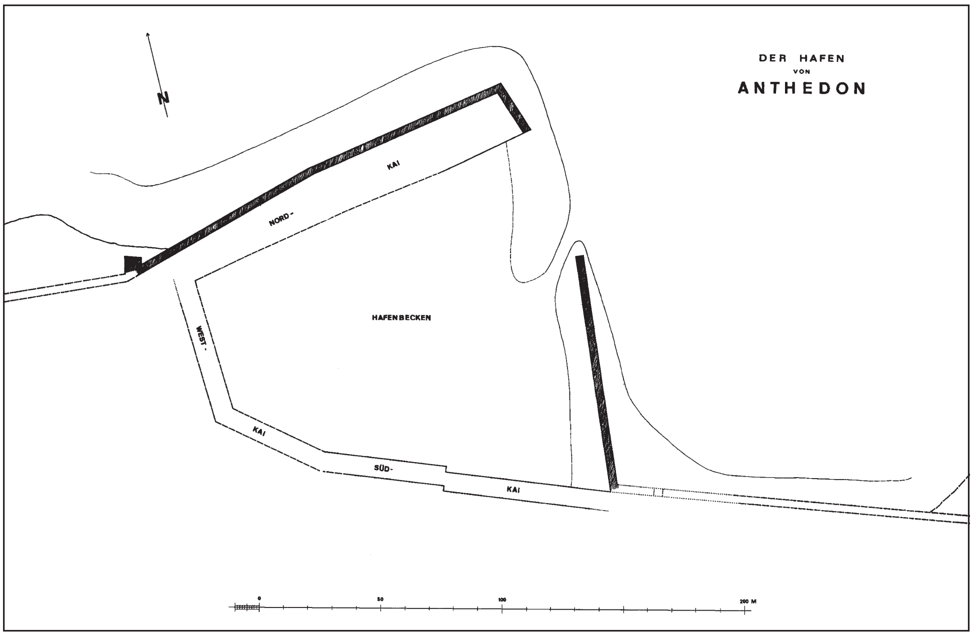


Fig. 4 Plan of the harbour basin of Anthedon. – (From Schläger/Blackman/Schäfer, Anthedon).



the still well-preserved harbour area with an architectural and topographic study of its material remains[7]. The investigation and reconstruction of the harbour installation and its associated coastal facilities include the northern and eastern breakwater with their mole superstructures and sea walls, the southern and western quayside, as well as a peculiar structure east of the harbour basin towards the western slope of the Acropolis (fig. 3-4). This is followed by a study of sea-level change, ceramic material, and petrographic samples.

Due to the influencing environment such as the geographical and physical conditions[8], the position and morphology of the harbour site did not change through time. This usually

7 Schläger/Blackman/Schäfer, Anthedon.

8 See Karmon, Components.

Fig. 5 Breakwaters of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

results in a rich and complex stratigraphy. However, based on the visible remains of the various harbour installations and their associated structures, the authors concluded that today's visible features most likely belong to one only building phase, for which a dating to the 6th century AD and most probably to the reign of Emperor Justinian I has been suggested[9]. Given the fact that according to Plutarch Anthedon and particularly the harbour area was destroyed by the Roman general Sulla in 86 BC, this appears to be convincing. 50 years after Schläger, Blackman and Schäfer's investigation, I visited the site in 2016 as a part of my research on Byzantine ports of central Greece. However, based on the 1966 data and photographic material, as well as my personal observations, I propose a slightly different or modified assessment, which is discussed separately for each harbour feature in the following sections:

Breakwaters

The most striking feature of Anthedon is certainly its massive breakwaters, which have the largest extent of all the structures (**fig. 5**). The harbour possesses two breakwaters: a larger northern and a smaller eastern one. The around 300 m long and 35 m wide northern breakwater shows a nearly east-west orientation, before turning south after 190 m to form a hook at its eastern end. In contrast, the eastern breakwater has a clear north-south orientation and stretches in a straight line from the southern shoreline to the north for a length of about 125 m. They overlap slightly and enclose the harbour, forming a harbour basin of about 1.50 ha.

Based on the documentation in 1966, the breakwaters consist of a steep-angled and carefully constructed tight rubble mound, which starts from the seabed and reaches up to a protruding crest. Slightly offset towards the internal part, this is followed by a shallow-angled and loosely constructed slope (**fig. 6**). Optically, the construction reminds therefore of a so-called *Composite breakwater*[10]. This type of breakwater with two levels of elevation was preferred in regions with a wide tidal range and where the depth of the water restricted the construction of the classical *Mound breakwater* for architectural or economic reasons. In this case, the rubble mound formed only a kind of foundation for vertical walls built on top of it. In the Euboean gulf, a strong tidal phenomenon can indeed be observed, which is caused by the eastern and southern tides of the Aegean Sea. Changing the direction of the water within the Euboean gulf every 6 hours, these tides cause a constant change in sea-level of up to 40-50 cm[11]. Consequently, the construction was interpreted as a uniform feature, which belongs to one construction phase. However,

9 Schläger/Blackman/Schäfer, Anthedon 91-95. 98.
10 Cornick, Engineering II, 116. 118 ff. – Ginalis, Byzantine Ports 27-31.
11 Schläger/Blackman/Schäfer, Anthedon 40. 76. – See also: http://antonios-antoniou.gr/evripos#.WobScucxnIU (08.03.2018).

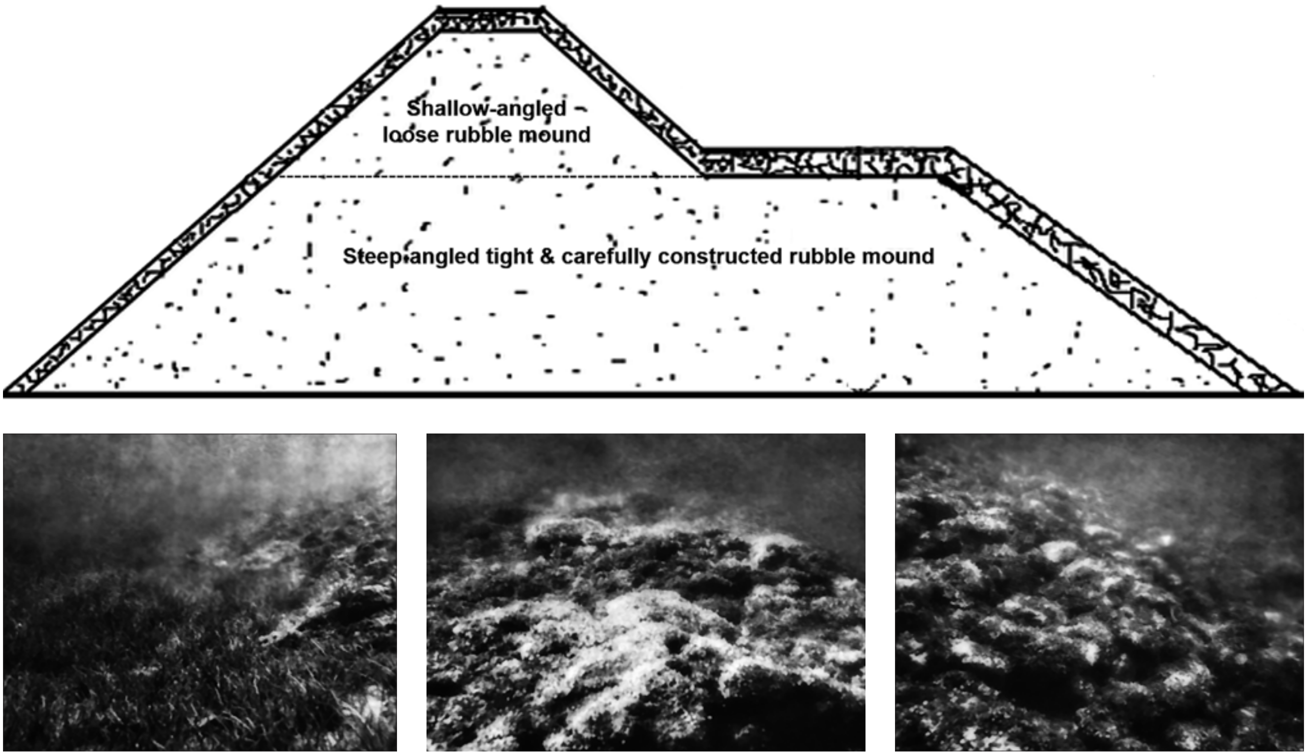
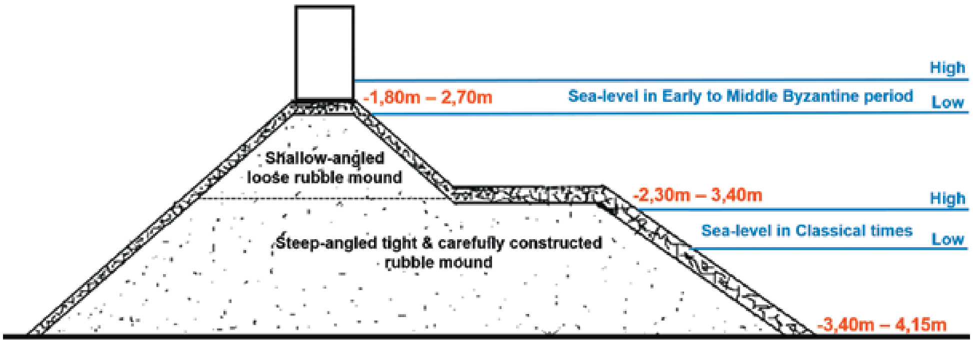


Fig. 6 Images and construction of the breakwaters of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 7 Measures of the breakwaters of the harbour of Anthedon. – (A. Ginalis, 2018).



Tab. 1 Measures of moles in Anthedon.

	Depth at the sea floor (m)	Depth at the crest (m)	Depth at the mole foundation (m)
Northern mole: north-western end	3.40	2.30	1.88
Northern mole: centre	3.90-4.15	3.20	2.40
Northern mole: north-eastern end	4.15	3.25-3.40	2.75
Northern mole: east end	3.55-3.75	2.25-2.60	1.85-2.55
Eastern mole: northern end	3.80	1.95	-
Eastern mole: centre	3.05	2.30	-
Eastern mole: southern end	2.50	2.05	1.20

the lower and upper parts of the breakwaters show entirely different characteristics. As such, it may also be suggested that the lower steep-angled and tightly constructed part and the upper shallow-angled and loosely constructed part in fact represent two different construction phases. This allows the interpretation of an earlier mound breakwater construction, which was subsequently heightened due to the rising sea-level at a later date. Accordingly, given the maximum depth of the breakwaters of 4.15 m measured in 1966 (fig. 7; Tab. 1) compared to the estimated sea-level in antiquity, the height would not be insurmountable for the construction of a simple mound breakwater. Even though the measurements may not

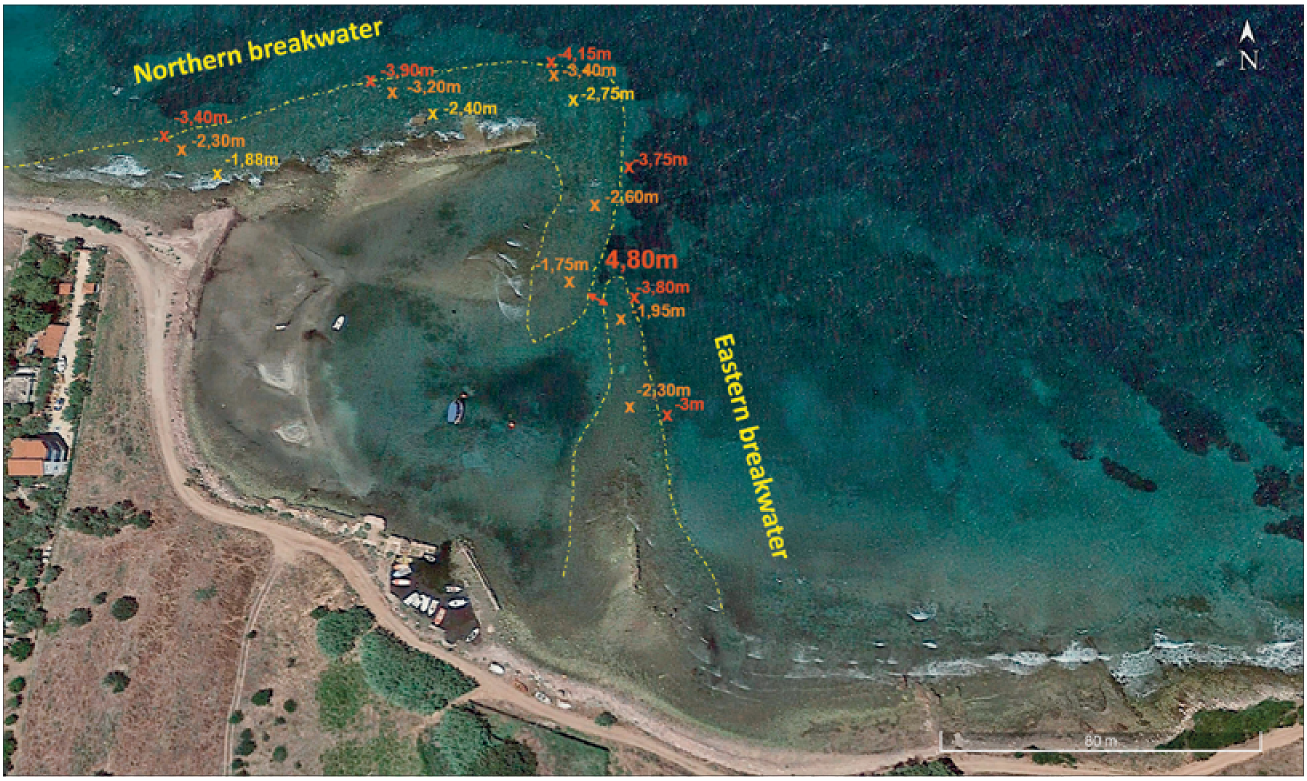


Fig. 8 Measurements of the breakwaters and of the entrance of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

represent the actual depths of the breakwaters due to the siltation of the harbour, further examples throughout central Greece such as the harbour of Skiathos attest that heights of 5 m were absolutely feasible.

But if the breakwaters truly show more than one construction phase, into which period are the two parts to be dated?

An answer to this question could be provided by the measurement of the harbour entrance in relation to the change in sea-level[12]. In the survey of the harbour entrance in 1966, a distance of 4.80 m was measured between the northern and eastern breakwaters at a depth of 2.40 m (**fig. 8**). Both, the given depth and the rather narrow passage, correspond with the Classical to Hellenistic periods and find their comparison in the port city of Pagasai, for which an equally narrow entrance of just 4.50 m was documented[13]. Even if 4.50 m seems too narrow and a more realistic width of 6-7 m may be assumed for the Classical to Hellenistic harbour entrance[14], the dimensions still clearly differ from those of later centuries. Accordingly, at a depth of 1.50 m, the entrance widens suddenly to approximately 19 m (**fig. 9**). As just mentioned, in contrast to the Classical to Hellenistic harbour entrance this is more reminiscent of harbours of a much later era, such as the central Greek sites of Thessalian Thebes, Polydendri, Koutsoupia or Stomio. Dating to the Roman Imperial to Early Byzantine periods and most probably to the era of Emperor Justinian I (6th century AD), these harbours all show a harbour entrance with a width between 20 m and 23 m[15]. As such, it can be suggested that the lower rubble mound was constructed as early as the Classical period, whereas the upper part indicates the resumption of harbour activities at Anthedon in the 6th century AD, after its destruction by the Roman general Sulla in 86 BC, as proposed by Schläger, Blackman and Schäfer[16].

This conclusion is further supported by the superstructures of the breakwaters. During the investigation in 1966, longitudinal wall structures were documented along both breakwaters[17]. While the course of the 32 m long preserved wall on the eastern breakwater follows the straight north-south orientation of its substructure, its counterpart along the northern breakwater leads 78.50 m towards the north-east, before turning east and running for another 86 m to reach a total length of 164.50 m (**fig. 4**). Even though the today largely submerged wall remains are only partly preserved, it is still clearly visible that they consist of rows of limestones constructed in a system of three headers with a total width of 3.40 m (**fig. 10**). The wall remains along the northern breakwater seem to be connected to the city wall, extending from a tower west of the harbour to the east (**figs 3-4**). As such, it had been suggested to identify both wall sections as the harbour's sea walls erected as a part of Justinian's building

12 Blackman, Sea level 123-125.
13 Ginalis, Byzantine Ports 172. – Schläger/Blackman/Schäfer, Anthedon 170 fn. 4.
14 Ginalis, Byzantine Ports 173.
15 Ginalis, Byzantine Ports 183. 231.
16 Schläger/Blackman/Schäfer, Anthedon 26. 91.
17 Schläger/Blackman/Schäfer, Anthedon 34-35. 50. 70-71.

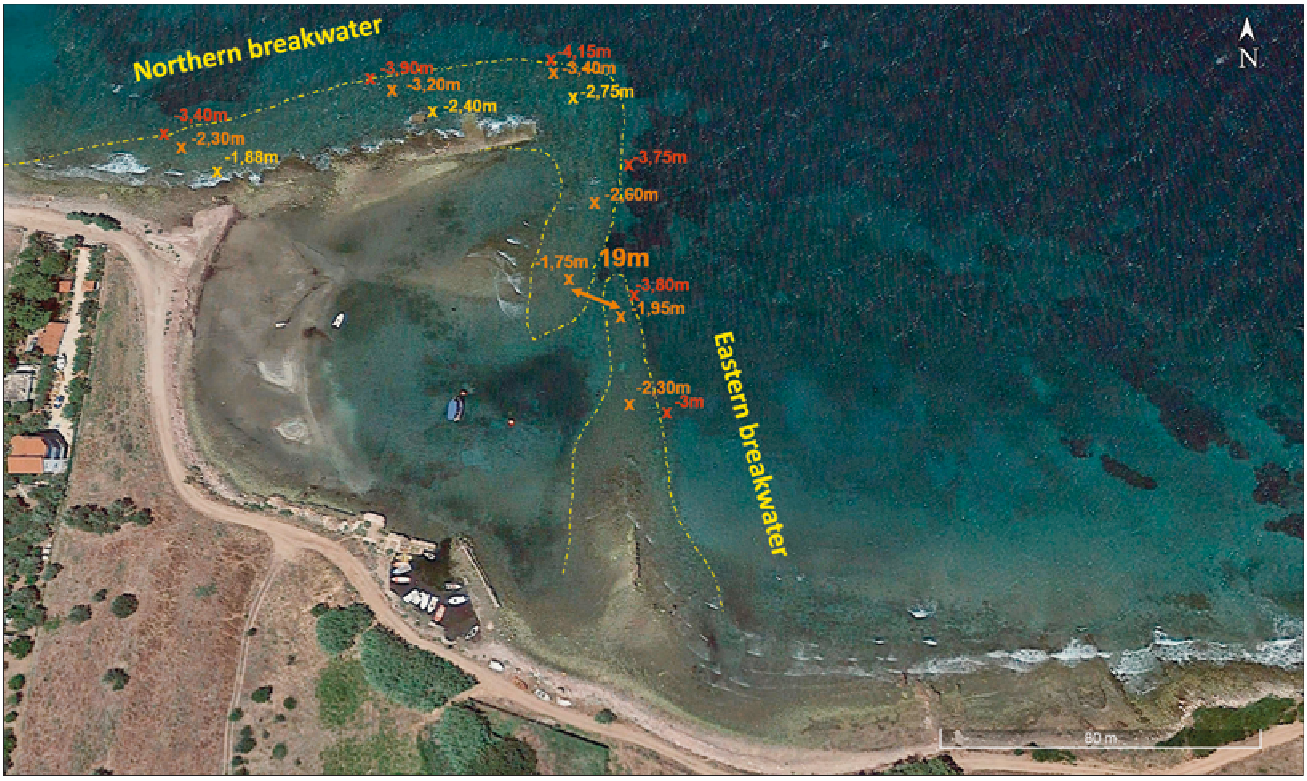


Fig. 9 Measures of the breakwaters and of the entrance of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

programme during the 6th century AD[18]. Some of the still visible stone heads of these supposed sea walls are documented under water up to a depth of 2.55 m. This corresponds precisely with the top of the breakwaters' upper part, which was used as groundwork, partly embedding the wall foundation. Despite the change in sea-level and the strong tidal phenomenon, the walls must have been at least partially under water already at the time of their construction. Consequently, this not only confirms that the walls and the upper part of the breakwaters belong to one construction phase, but also the above-described characteristics and identification of the entire structure as a composite breakwater. Since underwater artificial structures such as walls did not exist prior to the Roman period and the invention of hydraulic concrete[19], I believe that the 6th century AD date suggested by Schläger, Blackman and Schäfer can be supported but must be seen as a later addition to the existence of an earlier mound breakwater.

A point of discussion, however, appears to me more the function of the wall construction itself. The question is whether it constituted a sea wall or part of a free-standing mole. While Schläger, Blackman and Schäfer propose a reconstruction as sea walls, which integrate the harbour into the city's defensive system, Lehmann-Hartleben doubts the existence of a harbour fortification[20]. And indeed, there seem to be some discrepancies. The most substantial argument to interpret the structures as sea walls is given by its remains along the northern breakwater. The longitudinal wall with a width of 3.10-3.40 m is not only directly connected to a tower of the city wall west of the harbour but also continues smoothly in accordance with the width of the city walls for which on the Acropolis a width of 4.50 m was measured. On the contrary, the tower shows a clear east-west orientation, resulting in a rather strange angle to the south-west – north-east running wall along the breakwater. Furthermore, the walls of the tower possess a width of merely 1.20-1.40 m, which strangely enough corresponds to almost only 1/3 of the strength of the supposed sea walls. Additionally, for the effectiveness of defence, the walls should have featured also towers at their end to protect the harbour entrance. Besides the fact that these are entirely missing, the wall along the eastern breakwater should have possessed a total length of at least 90 m in order to leave a still reasonable gap of 55 m as suggested by Schläger, Blackman and Schäfer. Both, the investigation in 1966 and my own observations in 2016 could verify only a maximum length of around 40 m though.

The most serious argument against an interpretation as sea walls, however, is provided by a 15 m² large platform (**fig. 11**), which belongs to the northern mole construction

18 Schläger/Blackman/Schäfer, Anthedon 75.

19 Blackman, Ancient harbours I, fig. 1F. – Blackman, Ancient harbours II, 198. – Cornick, Engineering II, 116. 118. – Ginalis, Byzantine Ports 27-31.

20 Lehmann-Hartleben, Hafenanlagen 77-78.

Fig. 10 Superstructures on the breakwaters of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

(see next section »Northern Mole«). Situated approximately 50 m west of the mole head, this platform rests half on the remains of the longitudinal wall (**fig. 3**). Consequently, the latter constitutes a lower layer, which means that the supposed wall could not have been erected simultaneously with the mole superstructure with which the platform is associated. So, either it belongs to a different construction phase, or no sea wall ever existed. But even though the mole indeed most likely belongs to a later date, as argued in the following section, the supposed sea wall would have had to be dismantled to be able to construct the overlapping mole. But this seems rather unlikely. Finally, on the inner side, facing the harbour basin, a stone layer was documented forming remains of another longitudinal wall (**fig. 12**). It has been suggested that this wall constitutes the inner wall of the mole superstructure. On closer examination, however, a different alignment between the longitudinal wall and the mole construction can be observed. As such, it may be assumed that the inner wall belongs to the same lower stone layer as the seaward longitudinal wall onto which the mole is resting. A connection between the two parallel running walls is further supported by almost identical constructional characteristics, such as equally wide rows of three blocks built in a system of header-stretcher-header. As a result, it can be suggested that the two wall sections belong to a uniform construction of earlier date than the mole superstructure discussed in the following section. In terms of their function, the identical width of the inner longitudinal wall further discards the idea of a sea wall in favour of a preceding mole construction to the protruding remains of the northern mole superstructure.

Fig. 11 Platform on the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

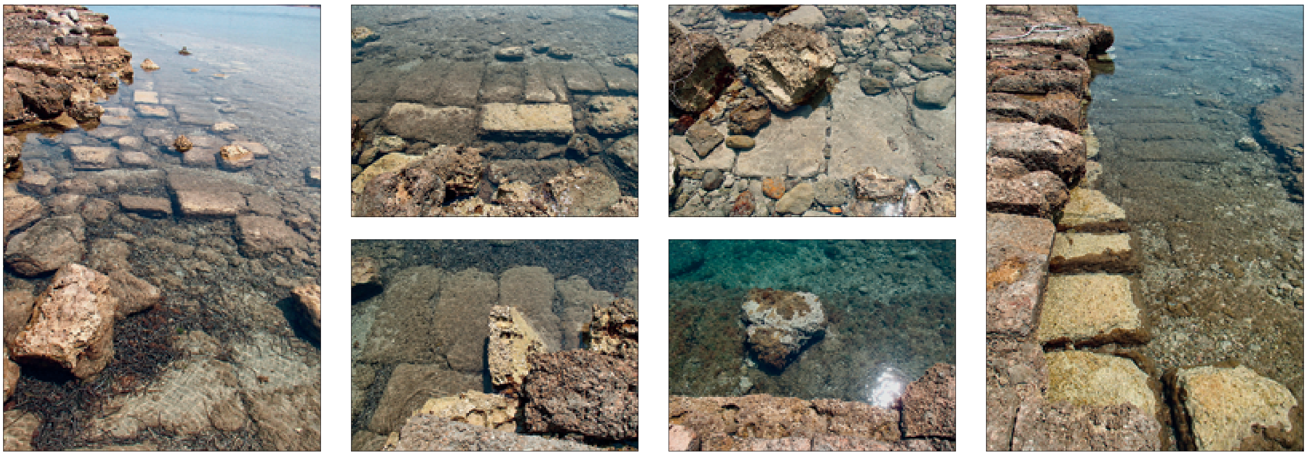


Fig. 12 Stone layer at the inner side of the breakwaters of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 13 Northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 14 Chamber system of the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Northern Mole

Apart from the two previously discussed longitudinally running wall lines, the northern breakwater also features a massive mole structure (referred to as the northern mole superstructure). Even though above the sea, the mole is only preserved for a length of 140-150 m, extending over the entire length of the two wall lines (**fig. 3** and **13**). Due to its exposure to heavy sea action, the outer part is heavily eroded. Therefore, its longitudinal walls have survived only partially along the inner side of the mole, for which the width can only be estimated at approximately 19-21 m. Nevertheless, it can be assumed that the mole adopted the shape and orientation of its preceding structure.

The mole has predominantly been constructed with a chamber system (**fig. 14**), which has erroneously been interpreted as Vitruvius' so-called »emplecton«-technique but was nevertheless correctly and impressively reconstructed by Schläger, Blackman, and Schäfer[21]. These chambers are defined by a series of lateral walls of limestone ashlar blocks, which cross the longitudinally running walls. Probably for static reasons, the lateral walls are not aligned parallel to each other, but form a rotating trapezoidal shape (**fig. 3**). These divided the mole into irregular sections filled with a conglomerate of rubble, mortar, and coarse ceramic (**fig. 15**). In contrast to the reconstruction of 1966, based on the nine still traceable sections, I noticed that they do not continuously run between the outer and inner wall of the mole but are rather divided into two chambers by another centrally located longitudinal wall (**fig. 16**). Whether the latter forms one continuous wall or multiple individual wall sections remains unclear. However, with an identical distance of approximately 9.50 m to both sides, it gives the impression of a continuous wall running lengthwise through the centre of the installation. This most probably aimed to strengthen the construction against the pressure of the filling. It is striking, however, that the use of this double chamber system was only applied to the eastern part of the mole, whereas for the entire western part no chamber could be verified at all. Only on today's shoreline, around 57 m east of the tower, the first and only lateral wall (identified by Schläger, Blackman and Schäfer as the »I. Quermauer«) can be verified[22].

In contrast to the lower longitudinally running wall lines, both the longitudinal and lateral walls of the mole's superstructure show an average width of only 1.20 m. A 10.71 m wide, platform-like part (by Schläger, Blackman and Schäfer identified as the »VI. Quermauer«) reveals that the conglomerate of rubble stones, mortar and coarse ceramic must have been covered with limestone ashlar blocks (**fig. 17**)[23]. The ashlar blocks of both the ceiling and the walls were neither clamped nor pegged. Their bonding was rather achieved by some sort of hydraulic concrete which was probably poured into their joints[24]. But since the blocks are set very tightly, no double mortar filling was applied such as at the supposed eastern mole (see next section »Eastern Mole«). Another architectural detail entirely missing from the lower wall layers

21 Schläger/Blackman/Schäfer, Anthedon 44-49. 94-95 Plan 2.
22 Schläger/Blackman/Schäfer, Anthedon 44 Plan 2.
23 Schläger/Blackman/Schäfer, Anthedon 47.
24 Schläger/Blackman/Schäfer, Anthedon 35. 38. 43. – Like other harbour sites in Greece, however, the hydraulic concrete mixture at Anthedon differs from the Roman pozzolana concrete: Brandon et al., Building for Eternity 39. 135-136.

Fig. 15 Detail views of the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 16 Detail views of the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

are the so-called »bedding channels« on the surface of the ashlars. These bedding channels, which are visible at the platform and some parts of the mole's inner side, seem to have run along the lateral walls (**fig. 18**). However, due to the heavy erosion of the mole's outer part, it cannot be clarified whether the bedding channels originally ran continuously from one side to the other. As such, its exact function remains uncertain, although it certainly must have had a structural reason (see section »Southern Quay«).

Fig. 17 Superstructures on the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 18 Superstructures on the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Finally, at the turning point of the mole structure 86 m west of the mole head, the mole is breached today over a distance of 3.50 m (**fig. 3** and **19**). It was thought that this breakthrough is caused by the natural erosion of the mole due to its exposure to the open sea. As such, it has received no further attention in the study of the harbour in 1966. However, the trigger and amplifier for the erosion at this part of the mole could have been a different one. In 2016 I noticed a peculiar architectural feature, which may shed a slightly different light on this part. The structure consists of two parallel running rows of ashlars, leading from the mole into the harbour basin (**fig. 20**). Based on its formation, the two stone layers certainly do not belong to the randomly scattered ashlars and rubble stones along the inner side of the mole, but rather form an architectural unit. With a visible length of around 13 m and following the lateral wall east of the breakthrough (II. Quermauer), it reminds of a channel. Similar harbour sites with a single entrance like that of Caesarea Maritima used such channels to install underwater ashlar-lined tunnels through the moles of the harbour, so-called »sluice channels« or flushing channels, to achieve the prevention of siltation by flushing the silt out of the harbour basin[25]. Perpendicular to the mole, the channel first leads towards the harbour basin before turning southwest towards

25 Blackman, Ancient harbours II, 202 fig. 9. – Boyce et al., Caesarea Maritima 124 fig. 2.

Fig. 19 Breach of the northern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 20 Structure leading from the northern mole into the harbour basin. – (Photo A. Ginalis, 2018).

the western quay area, which today forms an entirely silted up shoreline constantly spreading to the east. But if such a sophisticated feature for desilting was indeed attempted, the location of the supposed flushing channel as far east as the bend of the mole makes little sense for counteracting efficiently the siltation process deriving from the harbour's western coastline. Since siltation becomes a serious problem only after a certain time, such a structural component would have been completely unnecessary for a supposed newly built harbour in the 6th century AD. As such, the only explanation can be found in the fact that this building measure belongs to the later construction phase when siltation had become a serious threat, namely at the time of the (re)construction of the northern mole.

Regarding the latter, Schläger, Blackman and Schäfer suggest a link between the mole visible today and the above mentioned longitudinal lower wall lines dating to the reign of Emperor Justinian I. But as I have shown earlier, their different alignment, as well as the fact that parts of the mole rest half on the remains of the lower seaward wall remains, suggest a later date for the mole superstructure. Consequently, it can be assumed that the visible remains belong to a second mole, which represents a reconstruction of a potential preceding 6th-century building. This is further supported by the incomplete architectural implementation of the chamber system. While the eastern part of the mole is built using a double chamber system, the same is missing for the entire western part, where no chamber could be verified at all (**fig. 3**). If one considers the siltation process progressing from the west, at the time of the revival of the harbour in form of a reconstruction or repair, the shoreline already seems to have reached the western part of the breakwater, almost at the point where the very first lateral wall (»I. Quermauer«) was installed. Since this western part of the mole was apparently supported by the progressing shoreline, the implementation of a chamber system probably was not necessary in contrast to the exposed eastern part. Although this indicates the construction of a new mole after the 6th century AD, only a partial new construction was realized due to the reuse of the remains of the predecessor installation in the west. Anyhow, a chronologically different successor phase is further shown by architectural details, such as the bedding channels visible at the mole's lateral walls. In contrast to the mole superstructure, these bedding channels are again entirely missing, both at the submerged lower longitudinal walls and the western onshore part of the 6th century AD.

Finally, under this assumption, suddenly also the location of the supposed flushing channel at the bend of the mole clearly makes sense. With an estimated distance of 33 m to the western shoreline, aerial photographs still clearly show its impact, however, exclusively as a measure against the danger of siltation of the reconstructed successor mole (**fig. 20** above).

Fig. 21 Detail views of the eastern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Eastern Mole

In contrast to the northern mole, the superstructure along the eastern breakwater is very badly preserved. While a maximum length of around 40 m can still be observed under water, above sea-level the remains have only a length of 19 m, which follow the straight north-south orientation of its substructure (**fig. 3** and **5**). It seems quite strange that in comparison to the northern breakwater, apparently, no mole structures existed on the eastern one, but it allegedly supported sea walls. This assumption by Schläger, Blackman and Schäfer derives both from the identical construction method with the longitudinally running lower wall lines on the northern breakwater by using three headers, as well as the corresponding width of their wall remains of 3.40 m (**fig. 4** and **21**). However, despite the poor state of preservation, my investigation in 2016, as well as aerial photographs, reveal that the structure must have possessed a greater width of at least an estimated 4.50-7 m and even up to 11 m (**fig. 22**). Even though the minimum width of 4.50 m can be compared with the width of the city walls on the Acropolis (see above), an identification as such can again be challenged. This results from the connection of its remains with the use of the southern shoreline between the southern quay and the Acropolis.

In this regard, some remains of a 10 m long and 5.30 m wide submerged wall structure (**figs 3-4** and **33**), which most probably forms the extension of the quay towards the eastern breakwater[26], seems to be precisely aligned with the southern end of the structure along the breakwater. Based on the remains of a peculiar platform, which was documented by Schläger, Blackman and Schäfer just east of the breakwater's superstructure[27], a continuation of the submerged coastal structure beyond the breakwater can be

26 Kingsley, Barbarian Seas 150. – Schläger/Blackman/Schäfer, Anthedon 64.

27 Schläger/Blackman/Schäfer, Anthedon 71-73.

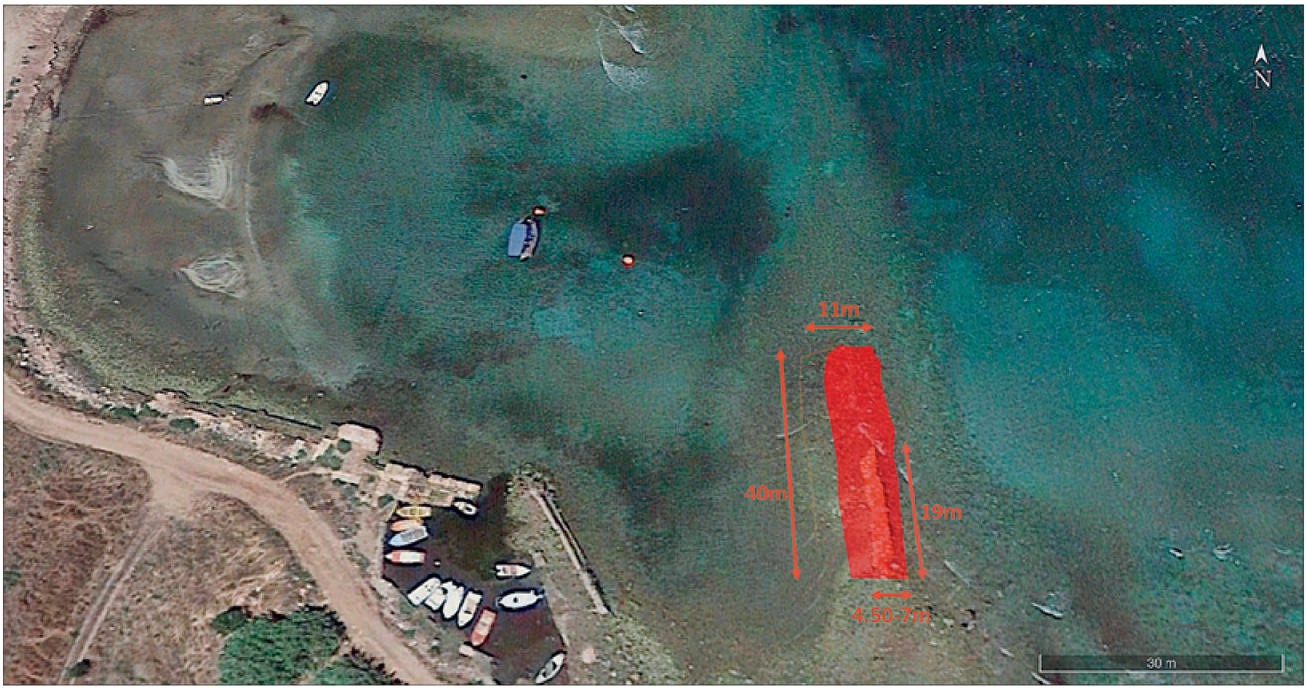


Fig. 22 Measures of the eastern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

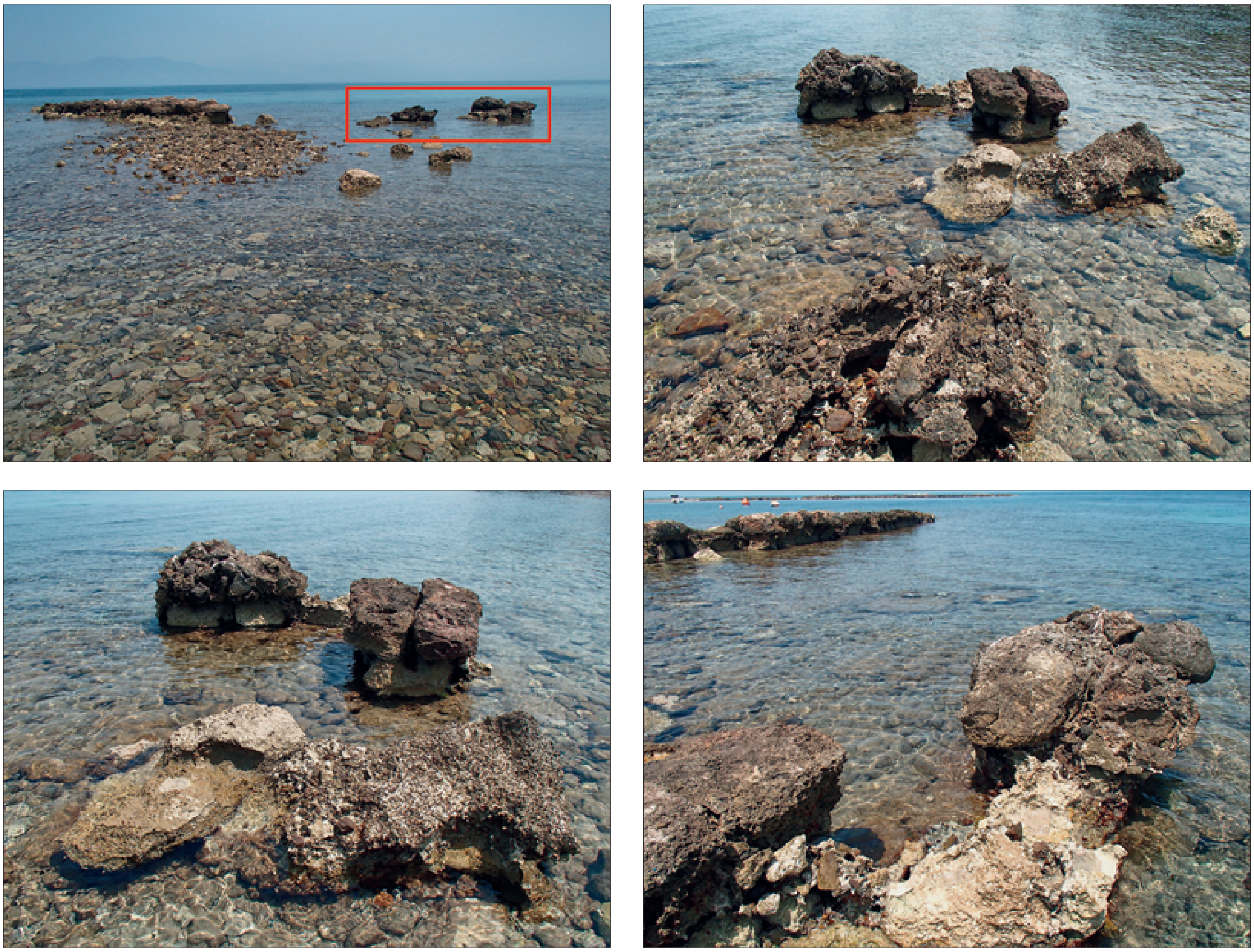


Fig. 23 Platform extending from the breakwater towards the eastern end of the shoreline of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

Fig. 24 Coastal features at the eastern end of the coastline of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

suggested. The 42 m long and up to 9.50 m wide platform extends from the breakwater towards the eastern end of the shoreline (**figs 3**, **23**, **33b**). Based on its alignment a connection to two further coastal features at the eastern end of the coastline can be observed (**figs 24** and **33b-c**), which were generally summarized as a so-called »Zentralbebauung« in 1966[28]. The easternmost structure consists of a 16.50 m long row of limestones constructed in a system of headers (**fig. 25**). Even though only a width of 1.90 m can be secured, scattered ashlar blocks next to the feature may again indicate a width of around 3.50 m, showing similarities with the submerged longitudinally running wall on the northern breakwater. Nevertheless, both its original extent and its function, unfortunately, remains hypothetical. Therefore, I agree with Schläger, Blackman and Schäfer regarding its indeterminable function and problematic identification. The western of the two structures forms a hook-shaped compound of rubble stones and mortar (**fig. 24a-c**). At only 3.50 m from the previous structure, it heads parallel into the sea. After 11-14 m from the shore towards the north, the feature turns to the west at an almost right angle to continue for another 11 m. It has been argued that the hook-shaped compound is not to be associated with the aforementioned platform[29]. Yet, its alignment fits perfectly with the southern end of the structure on the breakwater and the quay line west of it (**fig. 33**). As such, an association between the remains of the various coastal structures along the southern shoreline may well be determined, with a suggested function as a mooring area. This is supported by a roughly 290 m² large area south of the breakwater's superstructure. The latter consists of a conglomerate of compact sedimentation, gravel, pebbles, and small rubble stones and is literally strewn with ceramic fragments, confirming a rather commercial function (**fig. 26**).

As a result, unlike the conclusions of 1966, the remains rather point to the existence of a commercially orientated installation other than a sea wall. If the remains indeed do represent a structure other than a sea wall, similar to the

28 Schläger/Blackman/Schäfer, Anthedon Plan 2.

29 Schläger/Blackman/Schäfer, Anthedon 72.

Fig. 25 Structure at the eastern end of the coastline of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

	Length (m)	Width (m)
Philoxenite	120 107 (?) 38 (?)	4-5 (?) 5 (?) 5.50 (?)
Lechaion	50 (?) 50 (?) 45	17 (?) 7 (?) 12-18
Amaliapolis	42	5
Anthedon	40	4.50-7 (11)
Thessalian Thebes – Outer harbour	37 25	1.70 (3.40) 4
Larymna – Outer harbour	30 30	7 1.95 (4.50) (?)
Demetrias – Southern harbour Alykes	30	3.40
Skiathos	30 14	12-15 7
Afyssos	20	5

Tab. 2 Measures of jetties in various harbour sites.

northern mole only some kind of mooring facility is conceivable. But since an interpretation as eastern mole structure is to be excluded, an identification as jetty seems not just possible but in fact appears to be the most convincing alternative. And indeed, its dimension can be compared with jetties at other harbour sites in central Greece, such as Larymna, Demetrias, Thessalian Thebes, Skiathos, Amaliapolis, Afyssos or Corinth's Lechaion[30], showing an average width of 7 m (**Tab. 2**).

Moreover, great similarities are also shown by harbour sites outside the Aegean, such as the harbour of Philoxenite on the lake of Mareotis[31], dating to the 6th century AD. The latter seems not only to present similar dimensions but also identical structural characteristics (**fig. 27**). The jetty at the harbour of Philoxenite is built out of limestone ashlar blocks with very spacious jointing, filled with a double layer of mortar. These remind of the quite big jointing between the blocks of the jetty along Anthedon's eastern breakwater. Thus, the

30 Ginalis, Byzantine Ports 101. 126. 175. 191. 211. 224. – Rothaus, Lechaion 295-296. – Schäfer, Larymna 541. – For more information on the jetties at Lechaion see: https://www.theguardian.com/science/2017/dec/14/new-underwater-discoveries-in-greece-reveal-ancient-roman-engineering (23.04.2018).

31 Khalil, Alexandria. – Kingsley, Barbarian Seas 152-154.

Fig. 26 Superstructure on the eastern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

use of a double mortar filling between the blocks can also be assumed here, which is indicated by the remains of embedded ceramic fragments (**fig. 28**). As for its historical context, the use of three headers instead of the implementation of any chamber system, together with the apparent width of the wall remains of 3.40 m, point to an identical construction method with the longitudinally running lower wall lines on the northern breakwater. An affiliation is also visible through their common architectural characteristics, such as the complete absence of bedding channels. In contrast to this techni-

Fig. 27 Harbour of Philoxenite on the lake of Mareotis. – (From Kingsley, Barbarian Seas).

Fig. 28 Detail views of the eastern mole construction of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

cal detail applied at the northern mole superstructure and the southern quay (see sections »Northern Mole« and »Southern Quay«), the jetty uses another technique for its static strength. Like the harbour of Philoxenite, this is achieved by applying a double mortar filling. Hence, I support the conclusion drawn by Schläger, Blackman and Schäfer of dating the infrastructure along the eastern breakwater to the reign of Emperor Justinian I. Other than the function of the eastern breakwater and its potential superstructure during classical antiquity, for which a mole structure with a potential sea wall should not be excluded, during the 6th century AD the breakwater seems to have been redeployed as a suitable basis for a distinctive jetty as a part of Anthedon's commercial activities along its southern shoreline. Unlike the northern mole, however, it does not appear to have been included in the repairs of the harbour at a later date (see »Conclusions«).

Western Quay

Beyond the two breakwaters with their superstructures, the harbour of Anthedon also comprised quaysides along its western and southern shores (**fig. 4**). In contrast to the distinctive physical remains of the southern quay line (see next section »Southern Quay«), today its western equivalent hardly exists anymore. But while the quay is barely recognizable these days, in the 1960s Schläger, Blackman and Schäfer were still able to document some remains of its supposed masonry. Accordingly, the latter allegedly follows the curved shoreline from the southern quay to the northern mole, certainly showing at least one bend. Based on the observation of the terrain in 1966, the quay subsequently meets the northern mole presumably at the tower west of the harbour or at least slightly east of it. But how can the

Fig. 29 Western quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

almost complete absence of the western quay be explained, while the southern one is so remarkably well preserved? The only explanation may be seen in the aforementioned strong siltation process, which derives from the harbour's western coastline and progresses towards the east due to poor measures against the problem of siltation at the time of the revival of the harbour[32]. Hence, it can be assumed that the harbour basin was penetrating much further west. A roughly 5 m long wall section in between the tower west of the harbour and the shoreline (**fig. 3**), which Schläger, Blackman and Schäfer correctly consider as a part of the inner longitudinal wall of the 6th-century northern mole, indeed indicate how far west this harbour facility (and so does the basin) must have extended[33]. This supports the observation of the terrain in 1966, concluding that the western quay line apparently also ran further west. Consequently, its remains may be covered by the deposit layer and be found under the ground. This is at least suggested by satellite images, which indicate a roughly 17 m long and around 2.40 m wide wall line leading from the northern breakwater towards the western break-off of the southern quay (**fig. 29**). However, despite the progress of siltation in this area, the absence of a prominent structure corresponding to that along the southern shore is quite strange. If the two quay lines had been built at the same time, there would be no such a discrepancy between the complete disappearance of the one and the perfect preservation of the other – unless they belong to a different time-period.

As a result, in terms of its architectural affiliation and subsequently its dating, the western quay line may not be associated with the southern quay (see next section »Southern Quay«) but rather with the first construction phase of the northern mole. Accordingly, since the quay and the northern mole presumably meet close by the tower west of the harbour (where the mole does not show any signs of a chamber system), the western quay most likely belongs to the mole construction dating to the reign of Emperor Justinian I. Ultimately, the area along the western quay line seems to be greatly suffering from heavy siltation. Reaching as far east as the first lateral wall (mentioned earlier), a repair and reuse eventually appears to have been futile at a later date.

Southern Quay

Together with Anthedon's northern mole construction, the southern quay line forms today's most distinctive physical harbour feature (**figs 3-4** and **30**). Similar to the northern mole, the quay has been constructed with a chamber system defined by thirteen lateral walls of limestone ashlar blocks[34]. Here, however, the chambers do not show a trapezoidal shape but possess strictly parallel aligned lateral walls, which are again filled with an identical conglomerate of rubble stones, mortar, and coarse ceramic (**fig. 31**). The remains of the chambers stretch over a distance of around 53 m. After

32 Schläger / Blackman / Schäfer, Anthedon 52 fn. 77.
33 Schläger / Blackman / Schäfer, Anthedon 43-44.
34 Schläger / Blackman / Schäfer, Anthedon 54-59.

Fig. 30 Southern quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

approximately 30 m from its western break-off, however, the visible remains of the quay project around 2 m further into the harbour basin (by Schläger, Blackman and Schäfer identified as »IX. Quermauer«)[35]. But already after 8 m towards the east the quay falls back by 4 m again to form a jetty-like platform (**fig. 32**). With this false visual impression of a jetty, the platform indicates a structural change. According to this structural change, the well-preserved chambers provide different width dimensions. With an average width of 4 m, the chambers at the western part are much larger than those at the eastern part, which are only about half the width (**fig. 33a**). As such, the eight western chambers show a square shape, whereas the five eastern ones show a rectangular shape. Due to heavy erosion, similar to the northern mole, the full extent of the quay's total width can, however, only be estimated. Only at the platform-like part (chamber eight) as well as at chamber ten (between the lateral walls X and XI) both longitudinal walls are still visible and seem to be reasonably preserved. The latter consist of two rows of headers with a width of 2.40 m. These define the chambers with a length of 4.40 m. As such, a total width of the quay line of around 9.20 m can be suggested. Corresponding exactly to one parcel of the northern mole, an architectural ratio of 2:1 between the chambers of the northern mole and

35 Schläger / Blackman / Schäfer, Anthedon 58.

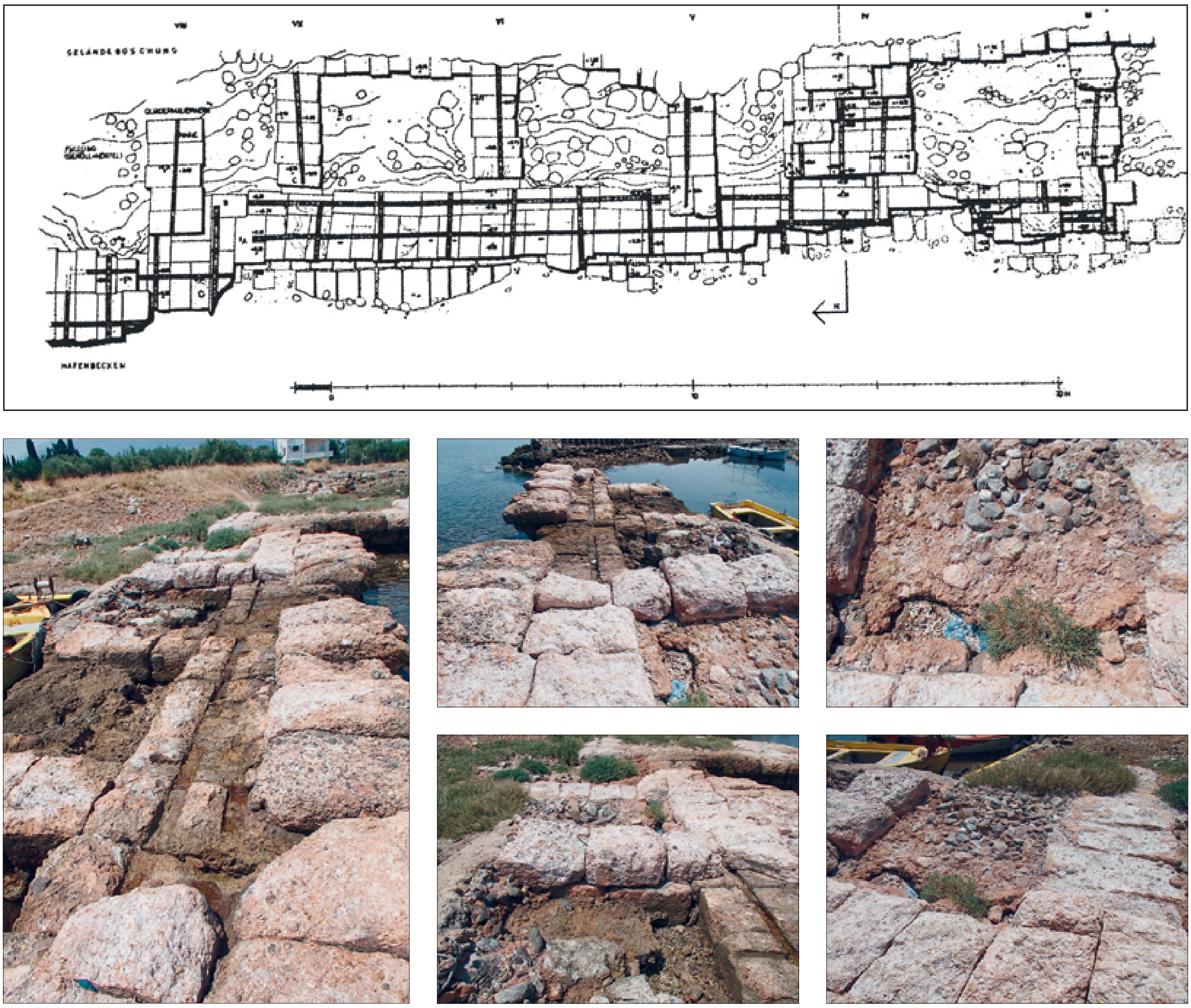


Fig. 31 Plan and views of the southern quay of the harbour of Anthedon. – (From Schläger / Blackman / Schäfer, Anthedon, and A. Ginalis, 2018).

those of the southern quay can be observed. Even though the larger dimension of the northern mole may be due to its orientation to the predecessor installation of the 6th century AD, a strong connection may be seen between both installations based on the need for robustness and stability of the structure. It has been suggested that the necessity for a resistant quay structure may be attributed to the sudden rising terrain south of the quay line. Accordingly, similar to the harbour of Leptis Magna and Rome's river quay on the Tiber, Schläger, Blackman and Schäfer propose a stepped construction also for Anthedon's southern quay[36].

A further similarity to the northern mole is given by the average width of the lateral walls of only 1.18 m, as well as the fact that the conglomerate of rubble stones, mortar and coarse ceramic is covered with limestone ashlar blocks (**fig. 34**). These blocks show again bedding channels on their surfaces. Unlike the northern mole, however, here the bedding channels are spreading over the entire structural remains of the southern quay to form a dense network. In fact, most of these channels still show the remains of a concrete filling up to the surface (**fig. 35**), consisting of a mixture of mortar, rubble stones and ceramic fragments[37]. Consequently, I agree with Schläger, Blackman and Schäfer to doubt the theories by Georgiades, Lehmann-Hartleben or Rolfe, who suggest a wooden bracing or drainage and ventilation system, respectively[38]. On the contrary, an assumption of a static-constructive function implied by the bedding channels on the northern mole may indeed be assumed instead[39].

36 Blackman, Ancient harbours I, fig. 2, 4. – Blackman, Ancient harbours II 203 fig. 11. – Blackman, Sea level fig. 8.3. – Schläger / Blackman / Schäfer, Anthedon Plan 3. – Williams, Roman harbours 75.

37 Schläger / Blackman / Schäfer, Anthedon 64. 67.

38 Georgiades, Ports 7 pl. IV. – Lehmann-Hartleben, Hafenanlagen 77 fn. 2; 105. – Rolfe, Anthedon 102.

39 Schläger / Blackman / Schäfer, Anthedon 67-68.

Fig. 32 Jetty-like platform in the southern quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

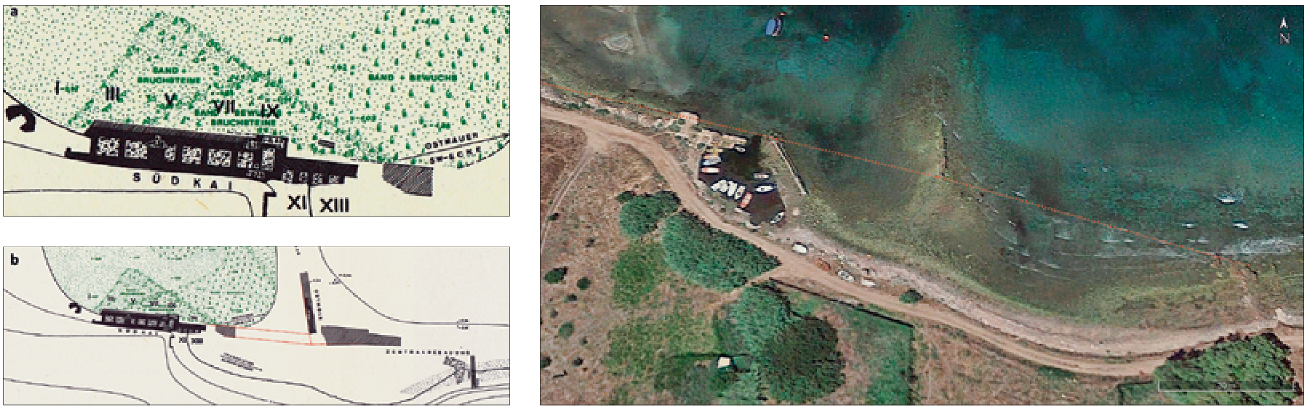


Fig. 33 Submerged wall structures in the harbour of Anthedon. – (From Schläger/Blackman/Schäfer, Anthedon, and A. Ginalis, 2018).

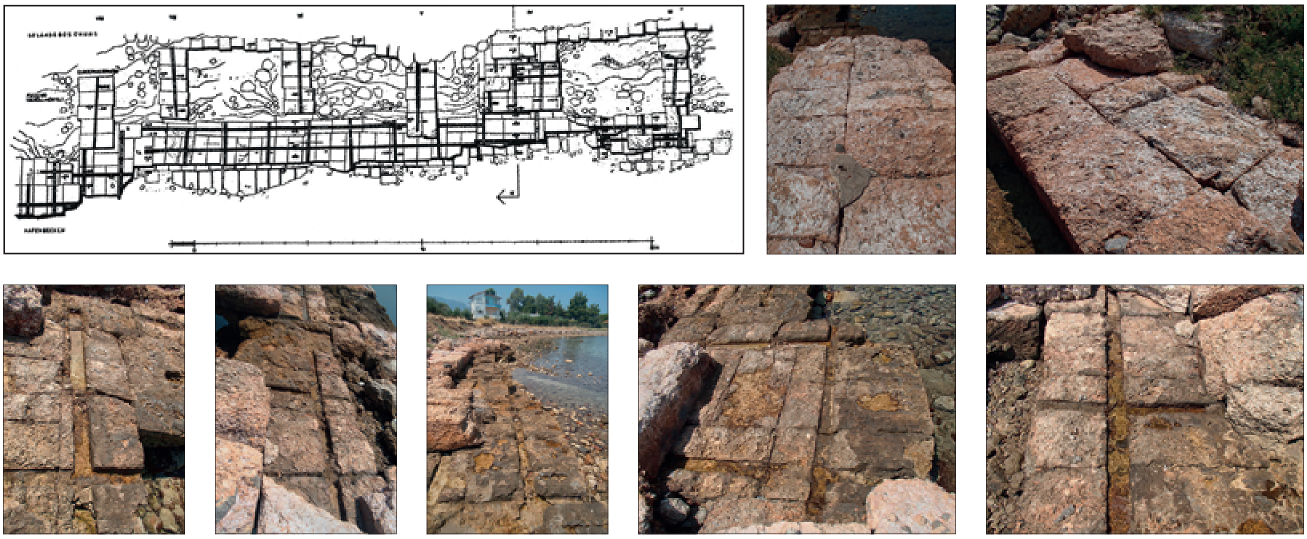


Fig. 34 Plan and views of the southern quay of the harbour of Anthedon. – (From Schläger / Blackman / Schäfer, Anthedon, and A. Ginalis, 2018).

Fig. 35 Detail views of the southern quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

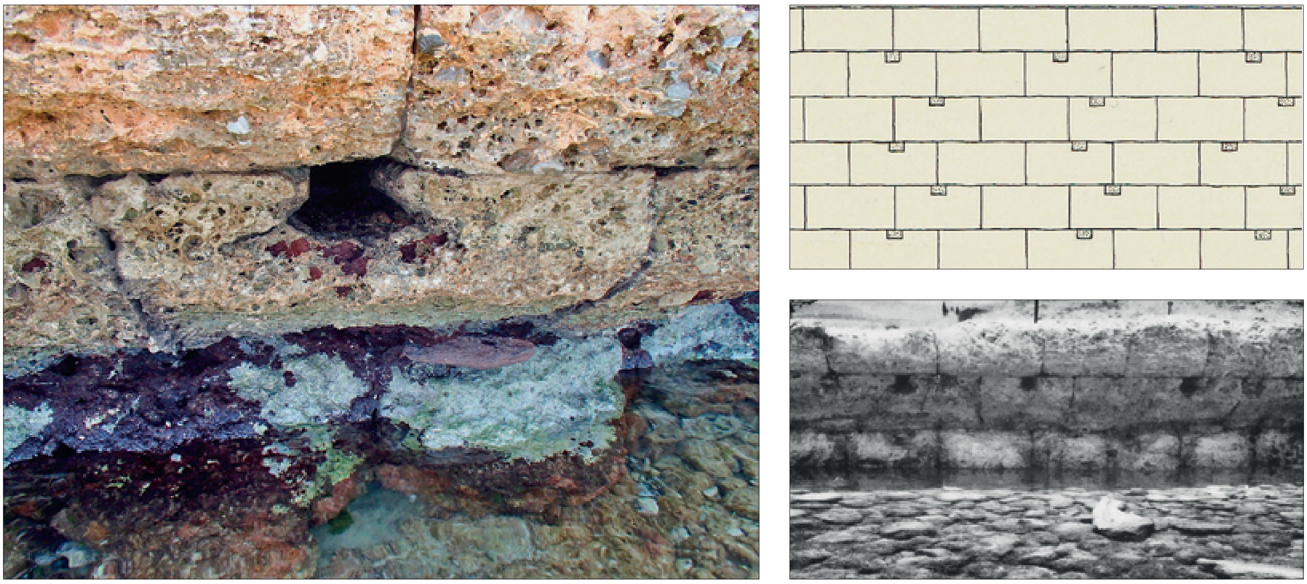


Fig. 36 Vertical view of the southern quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

This is further supported by the arrangement of the bedding channels. A vertical view of the quay line shows that the bedding channels lie beneath every other jointing of the following block row (fig. 36). Displaced from one layer to the next by one block, a consistent architectural principle can be observed. As such, despite a low use of mortar binding for rapid implementation, an effective construction method is achieved. However, at the same time this calls into question the existence of a supposed stepped construction.

As far as the chronology of the southern quay is concerned, a close connection to the northern mole superstructure can be determined. Even though Schläger, Blackman and Schäfer initially considered a different architectural approach and therefore a different dating based on their unequal density of bedding channels, a detailed study of their building techniques finally confirms a simultaneous construction. As a result, a date after the 6th century AD may be proposed for the southern quay line as well. This is further supported by the jetty along the breakwater east of the southern quay line. In contrast to the use of double mortar layers applied at the jetty, which emerges during Late Antiquity and seems to find its most frequent implementation during the 6th century AD, the chamber system together with the dense network of channels constitutes an equally robust but more sophisticated and advanced building technique avoiding an intensive use of both mortar and stonemasonry[40]. Eventually, a later date also goes along with the absence of a likewise prominent quay structure along the western shore, for which an association with the initial northern mole construction from the reign of Emperor Justinian I has been suggested (see previous section »Western Quay«). Consequently, a later repair for reuse of a certain quay section would eventually explain why only one part has been so well preserved.

Since both, the western quay and the eastern jetty show an earlier date belonging to a preceding harbour foundation, the question arises whether any predecessor structure also existed along the southern quay line. As a matter of fact, the quay's lowest visible block layer shows different characteristics to the upper layer, which in my opinion points to a different construction phase. Although the barely submerged layer is facing the problem of siltation, the ashlars are still clearly visible (fig. 37). So at least two rows are discernible, and according to the 1966 drawing, a third row of ashlars could even be determined[41]. The differentiation of the lowest block row from the upper layers is made evident mainly by two perceptions: the most striking one is again the complete absence of bedding channels. The same applies to the 10 m long and 5.30 m wide submerged extension of the quay towards the eastern breakwater. Even though the ashlar blocks show a high level of deterioration, signs of remains of some kind should have been existent somewhere – especially since the embedded ceramic fragments used as inclusions for the double mortar filling between the ashlar blocks are also still in place (fig. 38).

Secondly, the single ashlar blocks of the visible uppermost layer show a different orientation. While the latter, together with the bedding channel system, are set obliquely to the orientation of the quay, the submerged lowest layer shows a straight block setting[42]. As such, despite following the same alignment, it can be suggested that similar to the northern mole, the quay superstructure was erected on a preceding facility. Consequently, irrespective of the supposed stepped

40 Schläger / Blackman / Schäfer, Anthedon 37-38. 68.
41 Schläger / Blackman / Schäfer, Anthedon Plan 3.
42 Schläger / Blackman / Schäfer, Anthedon Plan 3.

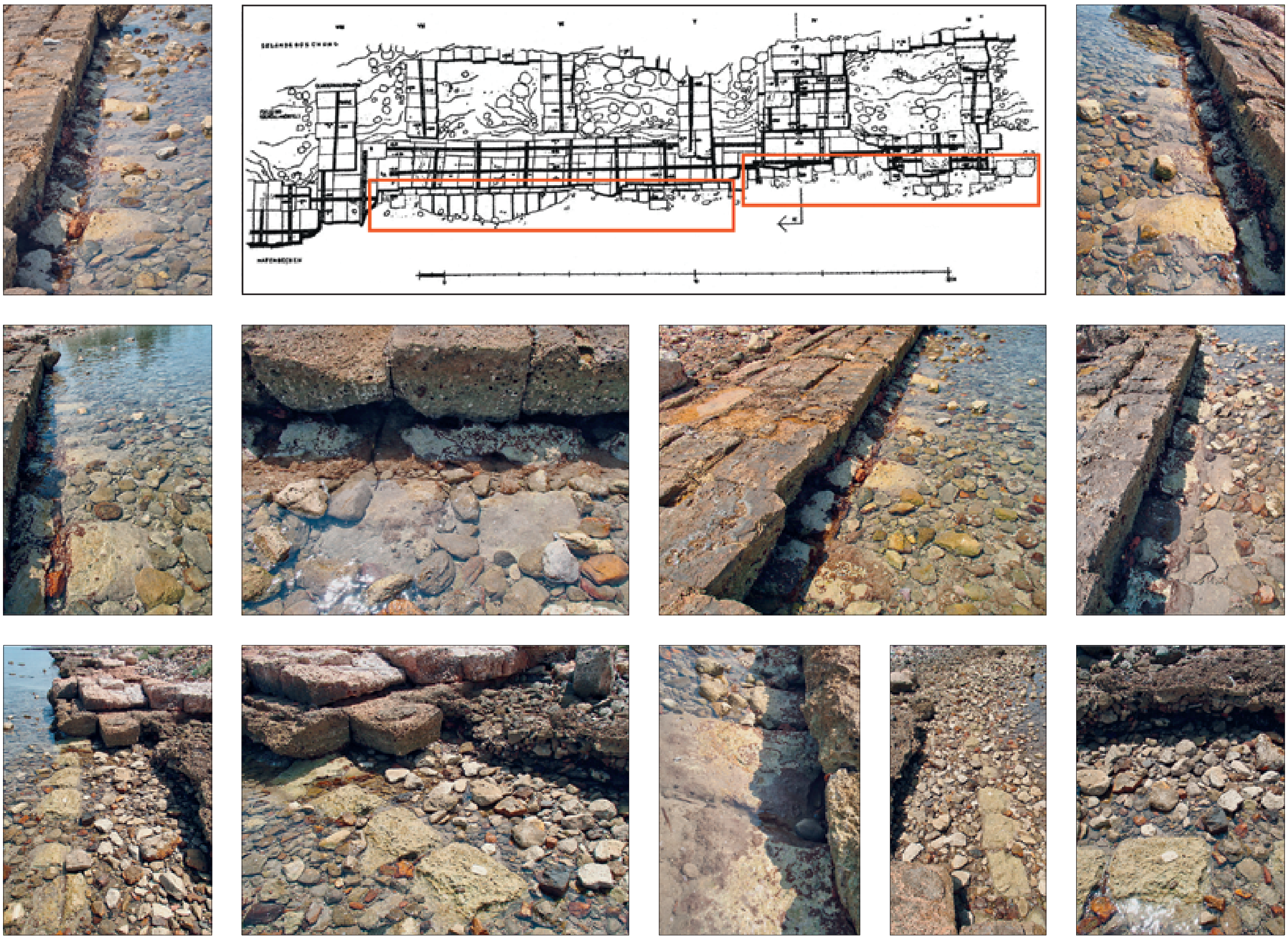


Fig. 37 Plan and views of the southern quay of the harbour of Anthedon. – (From Schläger/Blackman/Schäfer, Anthedon, and A. Ginalis, 2018).

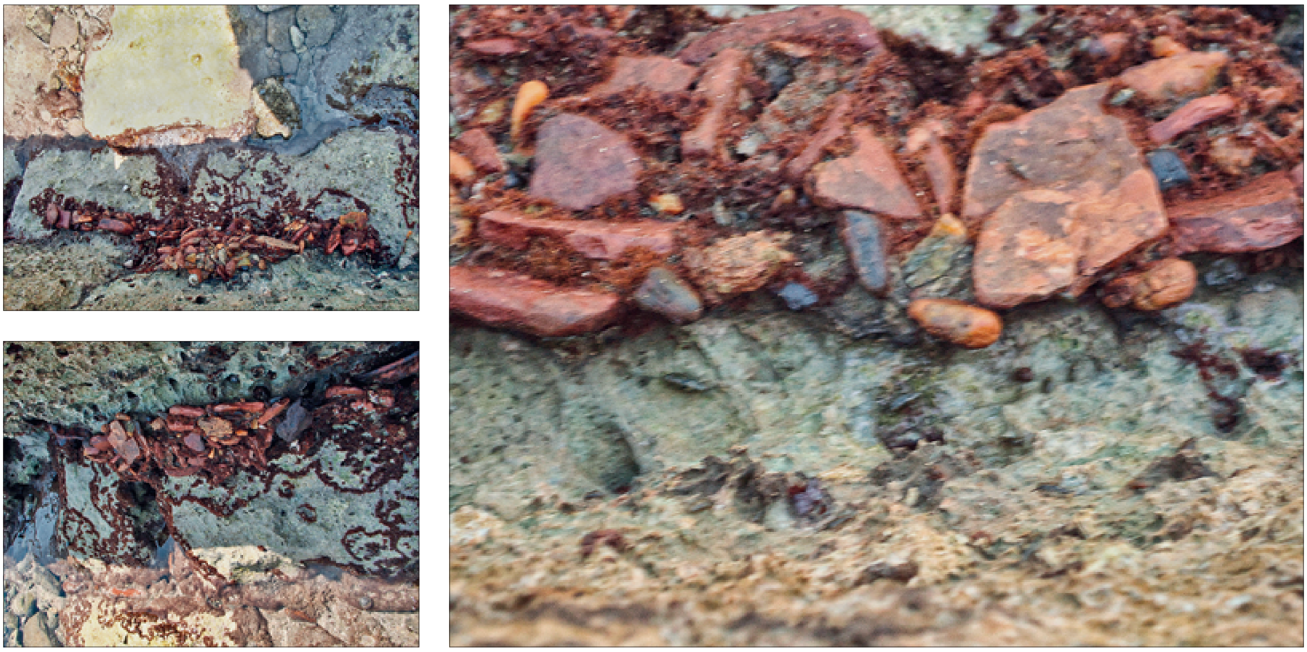


Fig. 38 Detail views of the southern quay of the harbour of Anthedon. – (Photo A. Ginalis, 2018).

shape of the quay, the existence of two different construction phases can be suggested, consisting of an earlier phase affiliated to the above-mentioned 6th century dated harbour facilities of the western quay and the eastern jetty and a reconstruction phase or repair, which is to be associated with the later dated northern mole.

Harbour basin

The broad range of ceramic fragments documented both within the harbour basin and around the wider harbour area point to different phases of harbour activities as well, which go along with the analogue harbour infrastructure discussed above. The earliest use of Anthedon's coastal area, including the harbour itself, goes back as early as the Hellenistic period. This is attested both, by a black glazed lamp from the middle of the harbour basin[43], and scattered surface finds collected south of the harbour area as well as east of the Acropolis. Despite the supposed destruction of the city and its harbour by the Roman general Sulla in 86 BC, a certain continuation of settlement activities is given by ceramic fragments found within the wider harbour area dating to the Roman Imperial and Early Byzantine periods.

Of particular interest, however, are the pottery sherds of Byzantine provenance that were found either embedded in the port facilities or in their immediate vicinity. In 1966, samples were taken of the embedded pottery sherds used as inclusions for the double mortar filling between the ashlars of the eastern jetty and the lowest block layer of the southern quay[44]. Although these comprise just diagnostic sherds, two types of ridged ceramic fragments can be determined, which most probably are to be attributed to LR 2 amphorae[45]. Indefinable pottery sherds largely and densely scattered south of the eastern jetty seem to belong to the same amphora type as well. By dating these presumably LR 2 amphora fragments to the mid to late 6th century AD[46], a first revival of the harbour during the reign of Emperor Justinian I appears indeed to be likely. However, another period of intensive harbour activity is shown also for the Middle Byzantine period. This is attested by numerous scattered surface finds from the harbour basin in the immediate vicinity to the northern mole and the southern quay as well as around the harbour entrance. Apart from similarly straight or wavy combed ceramic fragments that may well belong to globular-shaped LR13 amphorae dating to the 7th-8th century AD[47], the accumulations consist predominantly of amphora fragments of type Günsenin, which date between the 9th and 12th centuries[48].

Conclusions

Combining the visible remains of the harbour structures with the archaeological and philological evidence for the inhabitation of the area leads to the conclusion that the visible structures of the harbour probably did not belong to only one single building phase as suggested by previous scholars. Still rooted in archaeological traditions ignoring any later stratigraphy, the earliest interpretations, such as that by Lehmann-Hartleben, consider Anthedon a purely classical harbour. On the contrary, Schläger, Blackman and Schäfer finally demonstrate that Anthedon's harbour is rather to be attributed to the Byzantine era. For the first time, thanks to them it was revealed that the late antique and medieval periods show at least equally intensive coastal activities and harbour operations with the Classical and Hellenistic periods. As such, here the careful and detailed study of Anthedon's complex harbour site back in 1966 needs full admiration of the work by Schläger, Blackman and Schäfer. However, I believe that the existence of various strata can be suggested, most probably ranging from Classical or Hellenistic to Middle Byzantine times. But while the existence of a Classical or Hellenistic predecessor harbour site can only be deduced from a certain constructional characteristic of the breakwaters anymore, the Byzantine building activities are clearly visible in the preserved harbour features. This corresponds not only with the picture of the city's building remains and surface ceramic finds from the harbour basin and the wider harbour area but would also confirm Plutarch's account of the destruction of its harbour by the Roman general Sulla in 86 BC and subsequently its reconstruction in Byzantine times[49].

As far as this later construction phase is concerned, Schläger, Blackman and Schäfer rightly date the visible harbour infrastructure into the Byzantine era by carefully perceiving its physical remains and the ceramic fragments found embedded into the harbour facilities and throughout the harbour basin. While the pottery allows a rough dating, generally ranging from the 4th to the 12th centuries but with a peak between the 6th and the 9th centuries AD, based on historic criteria and the applied construction technique the authors correctly favoured a narrowed down historical time frame between the 6th and the 7th century AD, which is consistent with my observation of the harbour area in 2016. Four different scenarios were then run through that could be considered for the revival of the harbour of Anthedon, starting from Justinian's building programme prior to the so-called »Slavic invasion« in the first half of the 6th century AD and ending with the Byzantines' attempt to regain control over Central Greece in the second half of the 7th century AD[50]. In doing so, Schläger, Blackman and Schäfer eventually concluded that

43 Schläger/Blackman/Schäfer, Anthedon 86-87 fig. 87.
44 Schläger/Blackman/Schäfer, Anthedon fig. 88.
45 Vroom, Pottery 52-53.
46 Didioumi, Ceramics.
47 Didioumi, Ceramics 170. 172 fig. 3.
48 Schläger/Blackman/Schäfer, Anthedon 87-89 figs 89-90.
49 Schläger/Blackman/Schäfer, Anthedon 77. 86-88.
50 Schläger/Blackman/Schäfer, Anthedon 92-97.

the Byzantine revival of Anthedon's harbour could only have happened during the reign of Emperor Justinian I. However, in contrast to their perception of one only building phase back in 1966, I consider that also the Byzantine reconstruction of the harbour shows different phases. Based on the above-mentioned arguments, at least two phases can be reproduced with certainty: a partially protruding lower section dating to the Early Byzantine period and most probably to the reign of Emperor Justinian I in the 6th century AD and an upper section, which determines today's picture of Anthedon's harbour. This picture is mainly portrayed by a sophisticated chamber system together with a dense network of bedding channels, which back in 1966 has erroneously been identified as a supposed »emplecton« technique. The chronological-architectural differentiation is also supported by the pottery. Despite the limited and imprecise study of the ceramics in 1966, the latter also tend to confirm the interpretation of a second Byzantine reconstruction phase at a later date.

But into which period is the architecture of the upper section then to be dated? I fully agree that the partially protruding lower sections already show advanced characteristics where time-consuming stonemasonry was avoided by more intensive use of mortar as binding material. Nevertheless, their implementation is still rooted in the more traditional architecture of the Justinianic period as shown also by other sites such as the Mareotic harbour of Philoxenite. Then again, the introduction of the chamber system with a dense network of bedding channels seems to take the earlier 6th century construction a step further in the development of harbour architecture. This replacement of an already revolutionized type of construction is not an isolated case. In fact, a number of other major harbours throughout Central Greece can be compared to it, such as at the harbour of Thessalian Thebes, the Phthiotic harbours of Larymna and Theologos, the harbour of Aegina, or the outer harbour at Lechaion[51]. On the one hand, technically speaking the harbour architecture of Anthedon resembles particularly close to the chamber construction at the harbour of Larymna (fig. 39). On the other hand, its northern breakwater is almost identical with the outer harbour of Thessalian Thebes (fig. 40). With a length of 165 m and a width of 19-21 m, the latter has not only the same dimensions, but also an identical shape with a turning point dividing the structure into a part that is 78.75 m long and a part measuring 86.25 m long[52].

While regarded as post-Justinianic, based on the political, economic, and social developments in Central Greece a *terminus ante quem* of the 9th century AD is to be assumed[53]. The replacement of an already revolutionized type of construction within this time period apparently aimed to repair at least some parts of the previously destroyed or deteriorated Justinianic facilities by using a fast and cheap but equally highly efficient construction method. This supposes a time when the empire needed swift action in the area but obviously facing economic difficulties. As suggested also for Demetrias and Thessalian Thebes, I therefore believe that this corresponds to the consequences of the Arab conquest of Egypt, causing the immediate necessity for the reconfirmation of Byzantine authority over the Greek peninsula in the second half of the 7th century AD[54]. As such, due to the growing importance of central Greece and particularly that of Boeotia and Thessaly as major producers and suppliers of agricultural products, Anthedon's revival and its increasing role is rather to be associated with the importance of the rich Boeotian hinterland for the export of agricultural and industrial products from the 7th century AD onwards. In consideration of the creation of the theme of Hellas in AD 695[55], a date to the end of the 7th century AD or even slightly later appears therefore most likely for the post-Justinianic repair phase. Accordingly, Knoblauch even suggests a date of as late as AD 750 for the Byzantine reconstruction phase of the harbour of Aegina[56].

Finally, irrespective of the question of the date of the harbour construction itself, the high amount of pottery sherds throughout the entire harbour area reveals intensive maritime trade activities from the Hellenistic period up to the 12th century AD. If one takes now into account the different interpretation of the breakwater superstructures as open docking areas instead of the existence of sea walls, no military function whatsoever can be verified. Regardless the fact that Anthedon is situated in close vicinity to the major Byzantine stronghold and naval base of Chalcis (Byzantine Euripus), already Schläger, Blackman and Schäfer implied that it did not even possess a favourable strategic position[57]. Therefore, I agree with Lehmann-Hartleben that it is doubtful that there was any kind of harbour fortifications in the Byzantine era, unlike perhaps in the Classical to Hellenistic period. The harbour facilities, together with the large number of pottery sherds, tend to indicate that the harbour of Anthedon has always been commercially orientated.

In conclusion, it is suggested that the harbour of Anthedon was an important station for the coastal network of central Greece serving, along with Larymna and Halae (Byzantine Theologos) or Atalante, as one of the three key transshipment points for the entire fertile coastal area and as access points to the wider hinterland of Boeotia. After its destruction by the Roman general Sulla in 86 BC, the harbour was eventually reconstructed under the reign of Emperor Justinian I during the 6th century AD. Probably as a part of Justinian's building programme, it did not primarily serve to protect Byzantine

51 Ginalis, Byzantine Ports 190. – Paris, Lechaion 10-11. – Rothaus, Lechaion 295-296. – Schäfer, Larymna 533-537. – Triantafillidis / Koutsoumba, Aegina 169. – Knoblauch, Ägina 73.
52 Ginalis, Byzantine Ports 189.
53 Ginalis, Byzantine Ports 238-241.
54 Ginalis, Byzantine Ports 176-177. 238. 244-245. – Karagiorgou, Urbanism 31. 168 ff.
55 Koder / Hild, Hellas and Thessalia 57.
56 Triantafillidis / Koutsoumba, Aegina 169. – Knoblauch, Ägina 83.
57 Schläger / Blackman / Schäfer, Anthedon 95.

Fig. 39 Structures at the harbour of Larymna. – (Photo A. Ginalis, 2018).

Fig. 40 Structures at the outer harbour of Thessalian Thebes. – (Photo A. Ginalis, 2018).

control over the area. Similar to Thessaly's Pelion peninsula and the plain of Aghia, the aim was rather to strengthen the local economies and to secure direct access to the resources under direct protection of Chalcis. Finally, the need of Boeotia's rich agricultural resources was even greater after the loss of Egypt in AD 642, which resulted in the reorganization of state administration in Greece and the repair and last revival of Anthedon's harbour. However, despite intensive commercial activities this by no means necessarily meant a revival of the settlement itself. Although Anthedon remained an active commercial harbour until the end of the Middle Byzantine period, it finally seems to have shared the same fate as the Thessalian harbours of Demetrias and Thessalian Thebes from around the 9th century onwards. Probably influenced by the emergence of Western merchants and subsequently the domination of the Venetian maritime network along the Euboean coast as a result of the so-called *Partitio Terrarum Imperii Romaniae* in AD 1204[58], Anthedon faced an economic decline that eventually led to a slow but constant siltation of its harbour area.

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Summary / Zusammenfassung

Reassessing the Harbour of Anthedon

More than 50 year after the first systematic analysis of the ancient and medieval harbour of Anthedon in Central Greece done by David Blackman, Helmut Schläger and Jörg Schäfer, the paper presents a re-evaluation of this earlier study and new interpretation of central features of this important archaeological site. Based on a new survey of the harbour structure, it proposes novel approaches to the dating and interpretation of the architectonical dynamics of Anthedon's port.

Eine Neubewertung des Hafens von Anthedon

Mehr als 50 Jahre nach der ersten systematischen Analyse des antiken und mittelalterlichen Hafens von Anthedon in Mittelgriechenland durch David Blackman, Helmut Schläger und Jörg Schäfer präsentiert der Beitrag eine Neubewertung dieser früheren Studie und eine neue Interpretation der zentralen Merkmale dieser wichtigen archäologischen Stätte. Basierend auf einer neuen Vor Ort-Untersuchung der Hafenstruktur werden neue Ansätze zur Datierung und Interpretation der architektonischen Dynamik von Anthedons Hafen vorgeschlagen.