

## ANCIENT HARBOURS OF SAMOTHRACE – A PRELIMINARY REPORT

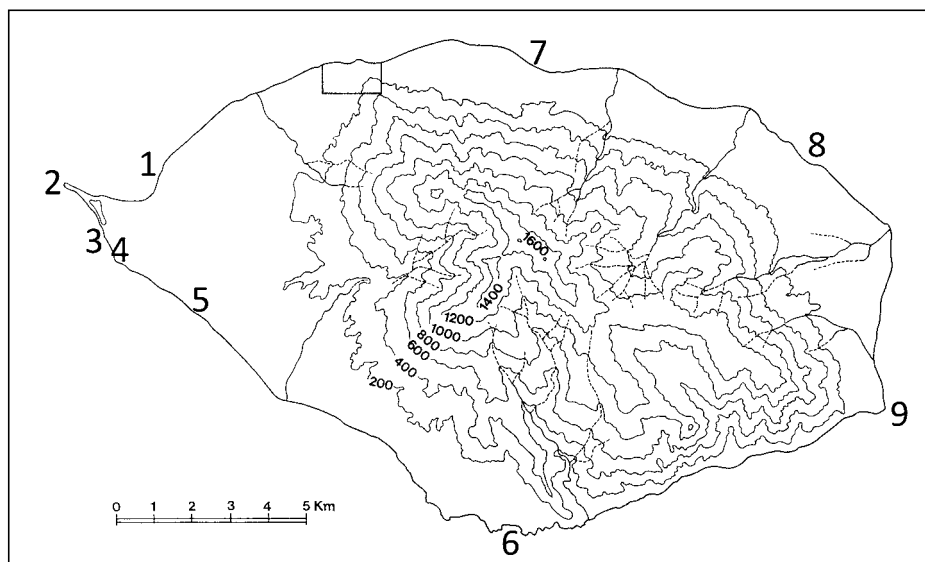
Samothrace (figs 1-2), a »mountainous and rocky«<sup>1</sup> island, opposite mount Ismaros and the Delta of He-bros river on the Thracian mainland, forms a landmark in the Thracian Sea, where only the mountainous pyramid of Mount Athos can rival the dignity of its mountain mass, and, notably, they both had similar importance in history<sup>2</sup>. In antiquity, Samothrace was the home of the mystery cult of the Great Gods; their initiation rites promised protection at sea and the opportunity to »become both more pious and more just and better in every respect than they were before«<sup>3</sup>. Mount Athos in more recent times is the Holy Mountain of Orthodoxy.

The island is situated in the SE part of the continental shelf of the north Aegean, the southern margin of which is the line connecting Mount Athos on the Chalkidiki peninsula in the west, the southern coast of Samothrace and the Gulf of Saros to the east<sup>4</sup>. South of this line, an extensive tectonic trench, the Northern Aegean Trough<sup>5</sup> dominates the seabed morphology with depths exceeding 1600 m<sup>6</sup>.

During the last glacial maximum sea level drop<sup>7</sup>, c. 120 m below present sea level, the continental shelf mutated into a dry land while the entire area fused with Eastern Macedonia and Thrace in Greece. The island itself became a continental mountain with the sea situated c. 0.3-2 km away from its SE side<sup>8</sup>; along its northern and western sides, morphology reveals gentle slopes towards the dry plain of the shelf.



**Fig. 1** Samothrace from NW (winter 1995). – (Photo D. Matsas).



**Fig. 2** Topographical map of Samothrace: **1** Kamariotissa. – **2** Akra Akrotiri. – **3** Ayios Andreas. – **4** Koufki. – **5** Mikro Vouni. – **6** Pachia Ammos. – **7** Therma. – **8** Skepastos. – **9** Akra Kipos. The rectangular area in the NW coast denotes the extent of the aerial view of **fig. 10**. – (Drawing C. Sismanidis).

Samothrace belongs to the Circum-Rhodope Belt<sup>9</sup>, consisting of Mesozoic<sup>10</sup> schists, marbles and Jurassic ophiolites (gabbro, diorite, basalt, and diabas)<sup>11</sup>. Eocene limestones were deposited on the ophiolites. The central and eastern part of Mount Saos consists of Miocene granite<sup>12</sup> that penetrated into the ophiolites, while Miocene volcanics and volcanoclastics were deposited along the western margins of Mount Saos<sup>13</sup>. Neogene clastic sediments (sands, sandstones, gravel, marly sandstones) were transgressed on the western side of the island. In several places, they contain Pliocene marine molluscs. Pleistocene terrestrial coarse clastic sediments originating from the erosion of Mount Saos (**fig. 1**) were deposited in the periphery of the mountain<sup>14</sup>; in addition, Holocene clastic sediments were deposited in the low altitude terrain, as extensive soil cover, recent alluvial fill of torrent valleys and as marshy deposits (Lambi and Koufki marshes; **figs 3-4**) along the SW coastal area<sup>15</sup>.

The first mention of Samothrace in connection with a harbour: εἰσὶ δὲ ἐν Θράκῃ πόλεις Ἑλληνίδες αἶδε· ... πόλεις Δίκαια καὶ Μαρώνεια. κατὰ ταῦτα Σαμοθράκη νῆσος καὶ λιμὴν («*There are in Thrace the following Greek cities: ... Dikaea and Maroneia. Opposite these are the island and harbour of Samothrace*»; translation by N. Lewis) is in [Scylax] *Periplus* (4<sup>th</sup> century BC)<sup>16</sup>. Livy<sup>17</sup> (1<sup>st</sup> century BC / 1<sup>st</sup> century AD) refers to a second harbour called Demetrium: *Demetrium est portus in promunturio quodam Samothrace; ibi lembus stabat* («*On a promontory of Samothrace is the Demetrium harbour; there the vessel lay*»; translation by N. Lewis) narrating the fate of the last Macedonian king Perseus after his defeat by the Romans at the battle of Pydna (22 June 168 BC); Perseus took refuge with family and fortune as a suppliant in the Sanctuary of the Great Gods pursued by the Roman fleet. After assassinating his only remaining friend Evander, Perseus applied to a Cretan captain to take him on board a swift vessel and convey him to Cotys. The agreed place of embarkation was the Demetrium harbour on a promontory of Samothrace. This promontory should be the present day Akrotiri (**fig. 2, 2**), SW of the village of Kamariotissa (**fig. 2, 1**), created relatively recently (when the sea level was c. 6-7 m lower than today) by significant longshore transport and accumulation of materials, mostly cobbles and pebbles<sup>18</sup>.

Plutarch<sup>19</sup> (1<sup>st</sup>-2<sup>nd</sup> century AD) refers to a sanctuary Demetrium rather than a harbour<sup>20</sup>. However, Pliny<sup>21</sup> (1<sup>st</sup> century AD) refers to Samothrace as the poorest of all the islands in harbours<sup>22</sup>. The significance of «*vel inportuosissima omnium*» relates not so to the position of the island on the maritime route leading from the Aegean to Hellespont and the Black Sea, as to its being the last stepping stone in the direction of the Thracian mainland; as it is well known, Hebros river, whose mouth is at a distance of 22 nautical miles from the





**Fig. 3** Samothrace, Mikro Vouni mound (near the beach, with the excavation shelters) and part of the Lambi area to SE (2016). – (Photo M. Page).



**Fig. 4** Samothrace, Koufki area from NW (2016). – (Photo M. Page).





**Fig. 5** Samothrace, ancient town from SW; the Gattilusi towers and part of the ancient harbour are visible in the background (2016). – (Photo M. Page).



**Fig. 6** Samothrace, the lower part of the ancient town and the shore with the ancient harbour and the modern pier from SE (2018). – (Photo M. Page).



north coast of Samothrace, was navigable by small boats in antiquity possibly as far as Pistiros<sup>23</sup>.

Although no specific research has been carried out so far, several indications are suggesting the location for the harbour of the ancient city (figs 5-6)<sup>24</sup>. The remains of an ancient mole (fig. 7) are included in the plan published by A. Conze et al.<sup>25</sup>; already in 1860 Conze had written<sup>26</sup>: »Below the steep base of the falling near the sea rock, on which the last parts of the east wall stand, several big boulders of the same stone from which the entire wall is constructed, lie in the direction of a small promontory, initially on the slope of a small hill then on the level of the roundstones of the beach; the waves foam around other similar boulders which lie in the sea, while further in, the deep green colour of the water reveals more of the same boulders under the surface of the sea. Baron de Behr is certainly right seeing here the remains of a mole, which protected this naturally exposed wharf at least against the northeastern winds, of the same date as the construction of the enceinte.

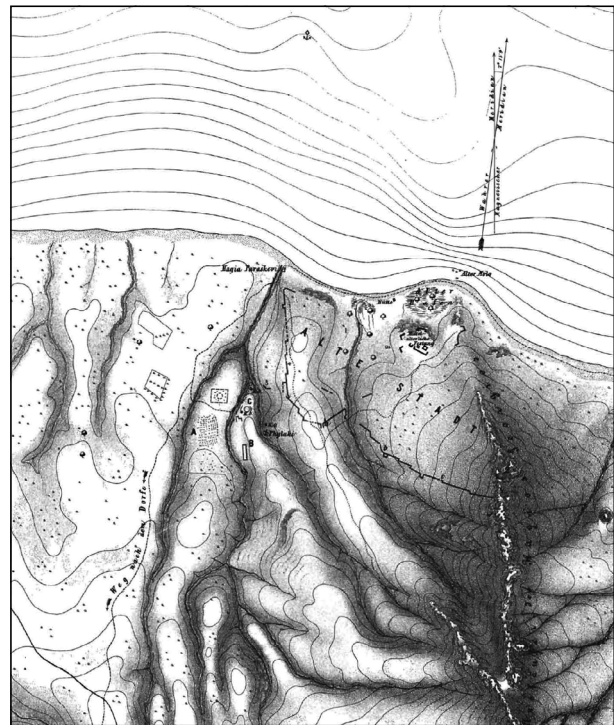


Fig. 7 Palaiopolis. – (After Conze et al. 1875, pl. 1).

The old people of the island narrate even today that

the sea extended to the swampy bushed flat area near the coast between the remains of the mole and an abandoned shop«<sup>27</sup>. The next mention in archaeological literature is by K. Lehmann-Hartleben in 1923<sup>28</sup>. Lehmann-Hartleben dated the mole (fig. 8) to the 6<sup>th</sup> century BC at the same time as the construction of the enceinte, in close relation and coherent unity with the latter, and connected it historically with the Samian settlers and with the system initiated by Polykrates; the mole, which constituted the seaward extension of the cyclopean eastern wall protecting a wide bay with the harbour was included in the ring of the wall.

More recently Jan Bouzek and Iva Ondřejová<sup>29</sup> made a short reference to the harbour of the ancient town providing a very rough sketch of it after examining (1978) briefly the underwater remains. They locate the ancient pier, partly visible on the surface of the sea, east of the modern one. The stones of the ancient mole (fig. 8) have a northward direction forming a line of about 60-80m from the shoreline. They report that »the whole construction has been heavily damaged and no remains of possible original stonework can be traced now. At a right angle to the northern end of the ancient pier there are other large stones, standing roughly in a row c. 150m long running westwards«. Although there are no remains of boulders today around the modern pier (fig. 6), they hypothesise that the latter was built on ancient foundations forming the western side of an almost rectangular closed area of 200m × 100m leaving an entrance only in the north-eastern corner, which seems unlikely to me considering that the prevailing winds have a northeastern direction. Finally, they date the construction of the pier to the Roman period.

During the summer of 2016 I paid several visits to the harbour with Michael Page<sup>30</sup>, Lecturer of Geospatial Sciences and Technology (Department of Environmental Sciences, Emory College of Arts and Sciences) and member of the American Expedition at the Sanctuary of the Great Gods; what we have seen among the remains of the ancient mole (fig. 8) is an L shaped double faced construction of considerable thickness protecting the harbour from the NE and NW, the area of which was enclosed between the lowest rock outcrop supplemented at intervals with the eastern wall (fig. 9), the area of the later Early Christian basilica, and the





**Fig. 8** Samothrace, ancient town, aerial photo of the ancient mole remains (2016). – (Photo M. Page).



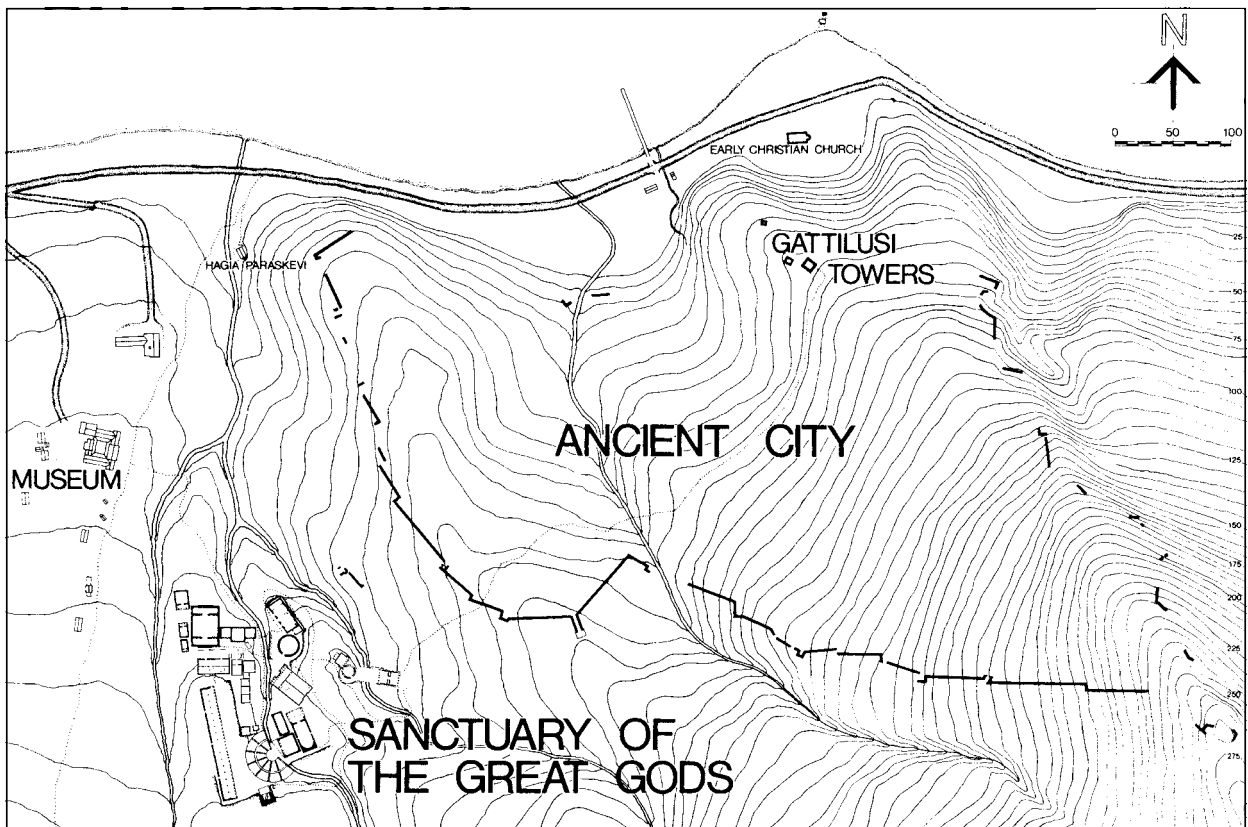
**Fig. 9** Gate D, NE wall of the ancient town (2001). – (Photo D. Matsas).

mole (figs 10-11). The ancient mole consists of large basalt breccia (= basalt that has been fractured and then re-cemented with jasper)<sup>31</sup> boulders (fig. 12)<sup>32</sup>. However, without a detailed underwater survey of the existing remains it is impossible to describe more accurately the currently underwater part of the ancient mole.





**Fig. 10** Aerial view of Palaiopolis, Samothrace: **1** Ancient harbour. – **2** Early Christian basilica. – **3** Gattilusi fort. – **4** Ancient town. – **5** Sanctuary of the Great Gods. – (IKONOS satellite image of Samothrace, 2003).



**Fig. 11** Sketch map of Palaiopolis. – (After Lehmann 1998, 50 fig. 23; drawn by J. Kurtich).





**Fig. 12** Samothrace, ancient town, detail of a boulder lying on the beach in line with the ancient east wall and mole (2016). – (Photo B. Wescoat).

Concerning the location of the Demetrium port, there are several proposals, especially around modern Kamariotissa (**fig. 2, 1**): the earliest proposal for it was put forward by A. Conze<sup>33</sup> who proposed the lagoon NW of the church of Ayios Andreas (**fig. 2, 3**) SW of Kamariotissa; G. Deville has been suggesting an indentation of the coast south of Akrotiri (**fig. 2, 2**)<sup>34</sup>; H. Hauttecoeur proposed two sites: Kamariotissa itself and the coast SE of the church of Ayios Andreas (**fig. 2, 3**)<sup>35</sup>; finally, K. Lehmann suggested an area c. 2.5 km east of Kamariotissa at the site Rodhofili<sup>36</sup>.

The excavation of the ΙΘ΄ Ephorate of Prehistoric and Classical Antiquities at Mikro Vouni (**fig. 3**), a coastal tell settlement site on the SW coast of the island, was accompanied by geoarchaeological work aiming at investigating the palaeogeography of the site, and especially the evolution of the coastal zone and the possible presence of a harbour near the settlement. This program included borehole drillings, geomorphological – paleontological – stratigraphical research, electrical resistivity tomography, and radiocarbon dating<sup>37</sup>. Mikro Vouni with an elevation of 12.80 m, and encompassing an area of about 1 ha, lies almost in the centre of the most fertile part of the island. The excavation has, so far, concentrated on the cultural sequence of the site, as it is preserved in the excavated stratified deposits, which, on the summit of the mound have a depth of some 8 m. The earliest phase of the settlement is dated to the middle of the 6<sup>th</sup> millennium BC. Radiocarbon dating shows that here, too<sup>38</sup>, there is a gap in the 4<sup>th</sup> millennium BC that divides the c. three metres deep Neolithic layers from the earliest layers of the Early Bronze Age. The re-settlement of the site took place c. 2900 BC, and its final abandonment in the advanced Middle Bronze Age, c. 1700 BC.

One of the most important discoveries of the archaeological research at Mikro Vouni and more generally in the northeast Aegean was that of some clay mini-documents of a Minoan (probably Knossian) archive from the Middle Bronze Age layers (19<sup>th</sup>-18<sup>th</sup> century BC), found for the first time so far from Crete<sup>39</sup>. The Minoan presence (**fig. 13**) in Samothrace and the northeastern Aegean, certainly a palace enterprise, had a commercial character, and its main target was most probably the procurement of metals. Two inscriptions in Linear A script are testimony of its earliest use outside Crete<sup>40</sup>, while the sealings with the first part of the Cretan Hieroglyphic »Libation Formula« or »Archanes Formula« perhaps underline the role of religious ideas in the economic activities of the Minoan elite.

Seven boreholes were drilled along the coastal area of the SW part of Samothrace<sup>41</sup>, aiming to investigate the Holocene stratigraphy and correlate with the ERT<sup>42</sup> readouts. Three ERT lines at Lambi (fig. 3)<sup>43</sup> examined the area's subsurface stratigraphy<sup>44</sup>. At present it is a reclaimed agricultural land with a ground elevation of 1.80-2.00 m a. s. l. A cobble barrier, 4-5 m high, isolates this area from the sea, while in the periphery a low hilly terrain isolates the former from the neighbouring torrent valleys allowing only surficial runoff and low terrigenous influx. The coastal area in front of Mikro Vouni and the Lambi marsh (fig. 3) was surveyed using morphological profiles and sediment examination. The beach sediments were examined by *in situ* statistical stone measurements, since most of the materials were cobbles and pebbles with maximum length up to 0.20 and even 0.30 m<sup>45</sup>.

Five marine shell samples and four marshy sediments rich in organic material were dated<sup>46</sup>. The mollusc shells originate from sediments deposited in a very shallow marine – lagoonal coastal environment that can be considered as near sea level indicators. The marshy sediments were deposited in a very shallow calm water environment. The <sup>14</sup>C dating results are divided into two different groups: the first one includes all the samples (six samples) from five boreholes in the vicinity of the site and the second group includes the three samples from Koufki (fig. 4), the present day ephemeral marsh mentioned earlier in connection to the Demetrium port. These two relative sea level datasets obtained in two different areas of the SW coast of the island did not match in the same way with the used sea level curves<sup>47</sup>. The present depths of four samples from the Mikro Vouni dataset compared with the sea level curves for the area indicate a characteristic uplift of the site's region, which can be estimated at 20 m in the last 10 000 years. The mean rate uplift is calculated at c. -2 mm/a<sup>48</sup>. The Koufki dataset compares well to the eustatic sea level model of Lambeck and Purcell<sup>49</sup> for the North Aegean Sea<sup>50</sup>. The conclusion is that the key to the evolution of the coastal region in the area studied appears to be the sea level rise coupled with the tectonic uplift of Mt. Saos, one of the highest mountains in the islands of the Aegean.

Therefore for the period before 6000 years BP, the net vertical movement resulted in a transgression of the coastline and landward migration of the beach system (stage I). Afterwards, longshore transport and high wave action formed a barrier beach along the entrance of Lambi embayment enclosing a shallow lagoon with a restricted connection to the sea (stage II). Fine grained sedimentation of silt and clay inside the lagoon along with the absence of mollusc fauna, indicates isolation from the sea (stage III). After that period, sea level rise decelerated and accordingly the combined effect of tectonic uplift and sedimentation eventually uplifted the bottom of the lagoon above sea level and transformed Lambi into a seasonal marshy environment (stage IV). Seasonal marshes existed until modern times, when reclamation of the marshes transformed the area into cultivated land. The present day surface is about 2 m above sea level (stage V)<sup>51</sup>. According to this scheme, Lambi could be used as a harbour when it was a lagoon during the Neolithic time-span of the settlement at Mikro Vouni (c. 5500-3800 BC). At c. 4000 BC the lagoon was permanently isolated from the sea and was transformed into a marsh with a constant presence of water. Since then, the Lambi marsh gradually became a seasonal marsh. This however, leaves open the question of the harbour



**Fig. 13** Mikro Vouni: Middle Minoan II (c. 1875/1850 BC - 1750/1700 BC) four-sided prismatic steatite seal decorated with two pairs of concentric circles around a central boring (tubular drill ornament; manufactured with a tool using fast rotary motion) and with incised lines. – (Photo S. Stournaras).





**Fig. 14** Keramidharia: stamped transport amphora handle (2<sup>nd</sup> half of the 4<sup>th</sup> - 1<sup>st</sup> half of the 3<sup>rd</sup> century BC); the *kerykeion* symbol refers to the fabricant/workshop and the name most likely refers to the annual official who exercised some sort of taxation(?) control. Samothracian transport amphorae have been found in cities of the Thracian coast, the NE Aegean, the Black Sea, and in the Balkan hinterland where their content was exported. – (Photo S. Stouraras).

used by the Minoans from the 19<sup>th</sup> century BC onwards, when they established a trading post on the island used for their long distance trade<sup>52</sup>. One may assume that the boats were pulled onto the beach, like the small boat rowed by two boys that H. F. Tozer boarded when he disembarked the steamer »Semiramis« off the coast of Akrotiri, the western promontory (fig. 2, 2) near the village of Kamariotissa in 1889. After landing, the boat was dragged over a high bank of shingle: »when this was surmounted we found a dozen caiques of various sizes drawn up out of reach of the sea«<sup>53</sup>.

Concluding, a lot of work remains to be done concerning the ancient harbours of Samothrace; in this paper I have tried to present the available evidence and outline the questions future research should answer.

## Notes

- 1) Samothrace is described in Antiphon's speech *On the Samothracian Phoros* (Περὶ τοῦ Σαμοθράκων Φόρου) as ὑψηλὴ καὶ τραχεῖα («lofty and rugged»): Antiph. Orat. fr. 50, line 2 (=Lewis 1958, 9 no. 21). There are not many fragments of this speech, but this one refers to the natural poverty of the island, especially after the detachment of its *peraia* in the 5<sup>th</sup> century BC (cf. Konstantakopoulou 2007, 238).
- 2) Conze 1860, 45.
- 3) Diod. 5, 49, 6, 1-2 (=Lewis 1958, 66 no. 142).
- 4) Vouvalidis et al. 2005, 29.
- 5) Syridis et al. 2009, 40 fig. 1.
- 6) SW of Samothrace and north of Lemnos.
- 7) Lambeck 1996, 595 fig. 3.
- 8) Vouvalidis et al. 2005, 30.
- 9) Kaufmann et al. 1976. – Pavlidis et al. 2005, 19.
- 10) Davi 1963.
- 11) Tsikouras et al. 1990.
- 12) See Heimann et al. 1972. – Tsikouras 1992. – Higgins/Higgins 1996, 121. – Christofides et al. 2000.
- 13) Eleftheriadis et al. 1994.
- 14) From a lithological point of view, all the sediments come from the erosion of the ophiolites and volcanic rocks: Syridis et al. 2005a, 39.
- 15) Syridis et al. 2009, 41 fig. 2a.
- 16) Skyl. 67, 10-11 (= GGM 1, 55. – Lewis 1958, 3 no. 1).
- 17) Liv. 5, 1-57 (= Lewis 1958, 48 no. 116).
- 18) Albanakis et al. 2005, 55.
- 19) Plut. Aem. 26, 1-2 (= Lewis 1958, 52 no. 120).

- 20) This sanctuary could be sought at the site of the present-day church of Ayios Andreas, just south of the Akrotiri lagoon; this small barrel-vaulted single-aisled church dates from 1871 and stands on the site of an earlier, perhaps Middle Byzantine, *katholikon* of a monastery, whose external semicircular apse it took over. Further east, the remains of a large semicircular apse of a still earlier church are visible on the surface; this church extended beyond the north wall of the present-day one. Ruins consisting of field-stones and mortar are reported outside the later annex to the present-day church. See Matsas/Bakirtzis 2001, 117.
- 21) Plin. nat. 4, 12, 73 (= Lewis 1958, 4 no. 7).
- 22) Cf. Mediterranean Pilot 1968, 491: »The island has no port or roadstead, but, occasionally, anchorage may be obtained on its southwestern side«.
- 23) For the discussion on the navigability of Hebros river, see Dimova 2015, 210-211.
- 24) The current place-name is Γκβάα, η, [Zdi Gv́aa]. Στην Κουβάρα. It is related to a mass of earth and stones: Katsanis 1996, 191.
- 25) Conze et al. 1875, pl. 1.
- 26) Conze 1860, 57.
- 27) Conze's description, written more than a century and a half ago, is an invaluable source of information for this part of the ancient town which suffered a lot of destruction and alteration since then, mainly during the construction of the coastal road: »Unterhalb des nahe am Meere felsig abfallenden Bergfußes, über dem die letzten Stücke der östlichen Mauerstrecke stehen, liegen in der Richtung auf die kleine vorliegende Landspitze zu anfangs an einem kleinen Hügel dann über das flache Steingeröll des Ufers hin einige große Blöcke desselben Steines, aus dem die ganze Mauer erbaut ist; um andere Blöcke der Art, die ins Meer hinaus liegen, schäumt die Uferwelle und weiter hin verräth die tiefgrüne Färbung des Wassers noch mehre dergleichen unter der Meeresfläche. Der Baron de Behr sieht hierin gewiss mit Recht die Reste eines alten dem Baue der Umfangsmauern gleichzeitigen Molo, welcher den von der Natur ungeschützten Landeplatz wenigstens gegen die Nordostwinde deckte. Dass an der Stelle des sumpfigen bebuschten Uferflachlandes zwischen den Trümmern des Molo und dem verlassenen Magasi ehemals Meer gewesen sei, erzählen sich die alten Leute auf der Insel noch heute«.
- 28) Lehmann-Hartleben 1923, 58. 70.
- 29) Bouzek/Ondřejová 1985, 142. 150 fig. 113.
- 30) With Michael Page we have launched a systematic survey of the coastal sites of Samothrace.
- 31) Personal communication with William Size (Professor Emeritus, Department of Environmental Sciences, Emory College of Arts and Sciences, and member of the American Expedition at the Sanctuary of the Great Gods).
- 32) I have measured 62 stones lying on the beach belonging to the ancient mole or the terrestrial NW extension of the eastern wall (the coastal and paleo-geographical evolution of this area is effected both by the sea level rise and the tectonic uplift); five of them are probably *in situ* seemingly belonging to the face of a wall. A representative sample of metric measurements follows: 2,70 × 2,00 × 0,90 (visible or exposed); 2,30 × 1,80 × 0,79 (visible); 1,80 × 1,10 × 0,75 (visible); 1,40 × 1,30 × 0,89; 1,00 × 0,91 × 0,64 (visible); 1,13 × 0,74 × 0,47; 0,94 × 0,63 × 0,55; 0,96 × 0,59 × 0,42 (visible); 0,52 × 0,72 × 0,19 (visible); 0,52 × 0,72 × 0,19 (visible); 0,58 × 0,28 × 0,36 (visible); 0,48 × 0,31 × 0,10 (visible). Their colour, measured in five boulders (Munsell Soil Color Charts, Year Revised 2009, Year Produced 2012) is 5R 3/4 dusky red; 2.5Y 6/4 light yellowish brown; 5Y 7/8 yellow; greenish grey; GLEY 1 5/10GY greenish grey; GLEY 1 5/5G\_1 GLEY 2 4/10BG dark greenish grey – 10R 7/6 light red; GLEY1 5/5G greenish grey – 5R 4/2 weak red; GLEY1 3/10Y very dark greenish grey – 5Y 5/4 olive; 10R 4/2 weak red; 10R 4/3 weak red – 5Y 4/4 olive; 5R 4/8 red; 5R 4/3 weak red. Granite dykes: 10YR 8/1 white; 2.5Y 8/1 white.
- 33) Conze 1860, 58. – Conze et al. 1875, 33-34; 1880, 110.
- 34) Deville/Coquart 1867, 256.
- 35) Hauttecoeur 1905, 172-173. The second alternative, where a seasonal marshy flat area called Κουφκοί, οι [Kufkí] (see Katsanis 1996, 206), a formerly lagoonal area communicating with the sea, seems very suitable (Syridis et al. 2009, 43-45); it is located on the NW edge of the most fertile part of the island cultivated with cereals and fits very well with a cult of Demeter, since Plutarch (Aem. 26, 1-2 = Lewis 1958, 52 no. 120) refers to a Sanctuary Demetrium rather than a harbour.
- 36) Lehmann 1948, 49. – See Saulnier 1999, 55-56.
- 37) Syridis et al. 2009.
- 38) The gap between Late Neolithic and Early Bronze Age exists, apart from Greek Eastern Macedonia and Greek Thrace, also in other regions of northern Greece and the Balkan peninsula; this gap refers to the lack of <sup>14</sup>C-dates from the 4<sup>th</sup> millennium BC. For a detailed discussion of the subject, see Matsas 2013, 225-232.
- 39) Matsas 1991; 1995; 2010, 33-37.
- 40) Matsas 1995, 240-241. – CMS V, Suppl. 1B, 312-313 no. 327. – CMS V Suppl. 3, 2, 510. – Del Frio 2005, 636; 2008, 201. 208-209.
- 41) Syridis et al. 2009, 43-46.
- 42) Electrical Resistivity Tomography.
- 43) Λαμπ, η, [Lab]; from ancient Greek λάπη [ᾶ], ῆ, scum which forms on the surface of wine, vinegar, or other liquids left to stand: cf. Katsanis 1996, 209. – LSJ s.v. – Lambi marsh is an 7,3-ha triangular flat area, adjoining the Mikro Vouni tell to SE.
- 44) Syridis et al. 2009, 42.
- 45) This is a typical characteristic of the shores of Samothrace apart from the beach of Pachia Ammos (fig. 2, 6; see n. 50).
- 46) Syridis et al. 2009, 48 tab. 1.
- 47) Syridis et al. 2009, 50 fig 7.
- 48) See Koral et al. 2009 for the uplift of Gökçeada (Imbros), just opposite Samothrace, respecting the Saros Trough along the North Anatolian Fault (NAF); this uplift totals to a few kilometres since the initiation of the NAF during Pliocene (or late Pleistocene) and varying yearly from a few millimetres to a centimetre according to the age assumed for this major fault. – For Gökçeada (Imbros) see also Öner 2000. – As it is known (Vacchi et al. 2014), the NE Aegean Sea is among the tectonically complex sectors of the eastern Mediterranean, mainly influenced by the activity of the NAF. – See Pavlopoulos et al. 2011, 723 and 725 for the causes of the RSL (= Relative Sea Level) changes. – Also Alpar 2001 for the uplift trend on the Turkish coast.



- 49) Lambeck/Purcell 2005. – See also Pavlopoulos 2010, 227 for the magnitude of sea level rise considering the Lambeck and Purcell model in the area of Thrace during the last 2000 years.
- 50) However, it is not possible to define a common Holocene RSL curve for the entire NE Aegean (although the data obtained so far are consistent with a continuous RSL rise in the last 6.0ka BP), as RSL history here is immensely influenced by changes in deformation patterns. This area was divided into three sectors (Vacchi et al. 2014, 304) and Samothrace belongs to sector A located north of the South Marmara microplate. In this sector RSL was at  $-9.9 \pm 1$  m at  $\sim 9.0$ ka BP. Then, rising rates by of  $\sim 3.5$ mm a<sup>-1</sup> placed the RSL at  $-5.9 \pm 0.5$  m at  $\sim 7.9$ ka BP. Mid Holocene records indicate rising rates decreased down to  $\sim 0.5$ mm<sup>-1</sup>. RSL was at  $-3.2 \pm 0.5$  at  $\sim 4.3$ ka BP.
- 51) Syridis et al. 2009, 52 fig. 8.
- 52) See Guttandin et al. 2014, 17 for the topography and the appearance of the Minoan port installations in Crete and south Aegean; however, the conditions on Samothrace are completely different: e.g., only the small shallow bay of Pachia Ammos (fig. 2, 6) in the SE coast of the island is provided with a sandy beach being the best place for small boats to beach between the precipitous and inaccessible SE part of the island and the W part of the south coast (Matsas 2007, 391 n. 25). – Generally, the description of Samothrace by Pliny (nat. 4, 12, 73) as »giving the worst anchorage for vessels in comparison with all other islands« provides a very eloquent description of the nature of its shores, except perhaps, as far as the northern coast is concerned, the secondary landing places at the bay of Therma, near Keramidharia ancient pottery workshop (fig. 14, late 4<sup>th</sup> century BC - 1<sup>st</sup> century AD: see Matsas/Bakirtzis 2001, 78-79), and the bay of Skepastos (fig. 2, 7-8).
- 53) Tozer 1890, 316. – The geographer and classical scholar Rev. Henry Fanshawe Tozer (1829-1916), M.A., F.R.G.S., Fellow and Tutor of Exeter College, Oxford, made three journeys to the islands of the Aegean, the last of which embraced Lemnos, Thasos, and Samothrace. Starting from Thasos, he visited Samothrace via Karağaç (Porto Lagos) and Dede-ağaç (Alexandroupolis).

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## Zusammenfassung / Summary

Samothrake ist seit der Antike als Insel ohne Häfen bekannt. Der Beitrag fokussiert sich sowohl auf die verfügbaren literarischen und archäologischen bzw. geoarchäologischen Nachweise als auch auf die langjährige Vertrautheit des Autors mit der Landschaft der Insel Samothrake. Nach einer kurzen Einführung in die Geschichte, Geografie, Geologie und Geomorphologie der Insel folgt eine Bewertung der bekannten Informationen bezüglich der Häfen, die im Rahmen wiederholter Besichtigungen und Feldforschungen überprüft wurden. Der Hauptteil des Beitrags konzentriert sich auf den Hafen der antiken Stadt an der NW-Küste, den vermuteten Standort des Hafens Demetrium sowie den Hafen der prähistorischen Tellsiedlung von Mikro Vouni. Die Erforschung der Entwicklung der Südwestküste der Insel mit ihrer Paläogeografie umfasste Bohrungen, geomorphologisch-paläontologisch-stratigrafische Untersuchungen, elektrische Widerstandstomografie und Radiokohlenstoffdatierungen zwischen den ehemaligen Lagunen- und Sumpfgebieten Koufki und Lambi. Die paläogeografische Entwicklung des letztgenannten Platzes umfasst fünf Stufen, die sich aus der Kombination von Landhebungsraten und Transgression im Kontext des Anstiegs des Meeresspiegels ergeben. Jedoch bleibt die Frage des Hafens an dieser Stelle unbeantwortet, da sie eines analytischeren Ansatzes und einer Verfeinerung der bisher gewonnenen Stratigrafie bedarf. Ebenso sind weitere Arbeiten im Gebiet von Koufki notwendig, das mit dem antiken Hafen Demetrium in Verbindung gebracht wird, sowie an der Nordwestküste der Insel, wo sich der Hafen der antiken Stadt befindet. Neben diesen maßgeblichen Häfen werden auch nachrangige, als Landungsplätze genutzte Strände behandelt (Pachia Ammos, Therma, Skepastos).  
Übersetzung: Th. Schmidts

Samothrace is known as an island without harbours since ancient times. This paper focuses on both the available literary and archaeological/geo-archaeological evidence, as well as on the long-lasting familiarity of the author with the island of Samothrace. A short introduction to the history, geography, geology, and geomorphology of the island, is followed by a review of the existing information about its harbours, tested through repeated autopsies and fieldwork. The main part of this contribution concentrates on the harbour of the ancient town in the NW coast, the proposed location of the Demetrium harbour and the harbour of the prehistoric tell settlement site at Mikro Vouni. The research on the coastal and paleo-geographical evolution of the SW shores of the island involved borehole drilling, geomorphological-paleontological-stratigraphical research, electrical resistivity tomography, and radiocarbon dating, between Koufki and Lambi, former lagoonal and marshy, areas. The paleo-geographical evolution of the latter comprises five stages resulting from the combination of the uplift rates with the transgressional processes connected with sea level rise. However, the question of the harbour of the site remains open, as it requires more analytical approach and a refinement of the stratigraphy obtained so far; also, additional work is required in the Koufki area, associated with the ancient port Demetrium, and in the NW coast of the island where the harbour of the ancient town is located. Apart from these »prime« harbours, secondary landing beaches are also mentioned (Pachia Ammos, Therma, Skepastos).