The Harbour at Perachora

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THE HARBOUR AT PERACHORA

(PLATE 42)

THE harbour was described briefly by Payne.[1] As he says, the enclosed part is extremely small and now much silted up. Even if it was much deeper in antiquity it can never have had room for more than two or three boats, and we may presume that ships normally anchored outside in the small bay, protected from the north and north-west wind, and only entered the harbour to disembark men or goods. No large ships could have entered the harbour at all; the small craft (*lembi*) used to ferry Philocles' force across to Lechaion in 198 B.C. would have been most suitable.[2]

The modern jetty on the west side of the harbour was built at the time of the construction of the lighthouse; there are now no visible traces of any earlier construction beneath it or on either side of it (PLATE 42(*a*) and plan, FIG.).[3] On the east side of the harbour there is a short breakwater just projecting above the surface at high tide; at about the same time that the jetty was built, part of the rock face above the breakwater was dynamited away to provide the stones necessary for the breakwater. Beneath these stones, at an average depth of 0·50 m. at low tide, there appear in places conglomerations of stones with a fairly even upper surface, and marine concretion distinguishes them clearly from the stones above and around. These, I believe, may well be the remains of an earlier mole in this position. That this existed may be deduced from the contrast between the heavy silting within the harbour and the sharp fall-away outside the breakwater. The harbour could hardly have silted up to its present state since the modern breakwater was built, especially since the clearance of the terrace above during the excavations and the construction of a terrace wall have necessarily limited the amount of recent rock fall and silting; so it seems likely in any case that there was an earlier barrier which retained the silt. Furthermore, I was assured locally that people could remember a line of stones in that position before the modern additions. Admittedly the sharp fall-away outside the breakwater could be partly due to an underwater shelf, if this exists; but not, I think, entirely.

No precise dating of the suggested earlier mole is possible without investigation of its core, which might produce dating evidence. Such a construction could date from the archaic period. Its original length is not clear; it peters out into a scatter of blocks curving south-westwards towards a very large block in the centre of the present harbour entrance. This block is now

[1] *Perachora* i. 14–15, 24–25, pls. 2–3*a*.

[2] Livy xxxii. 23.

[3] The plan is based on and seeks to supplement the plan in *Perachora* i, pl. 138. The depths given are those at low tide, at 12.15 p.m. local time (10.15 a.m. G.M.T.), on 28 May 1964, when the absolute level was 0·09 m. above chart datum. According to the weather charts for that day wind and weather conditions in the area will not have significantly influenced the water level. My datum level was the same as that of *Perachora* i, pl. 138. However, that level seems to have been intended to represent mean sea-level, though this is not expressly stated, as it appears from the notebooks to be approximately the mean between the two measurements made from a levelling point on the terrazza floor in front of the temple. These measurements differed by 0·69 m., and must have been taken roughly, though apparently not deliberately, at high and low tide. Even so the difference is surprisingly high, for the tide range at Perachora varies between 0·58 m. (spring tides) and 0·15 m. (neap tides), but a greater range is possible in the small enclosed harbour. The date when the measurements were taken is not given.

I should like to thank Mr. N. M. Verdelis, then Ephor of Antiquities for the Argolid and Corinthia, for permission to work at the site; to Mr. Ian McLaughlin and Michaeli Thodis, the Phylax, for their help on the site; to Mr. J. J. Coulton for a discussion of points concerning the original survey of the harbour area; and to Dr. Habich and the German Hydrographic Institute for information on tides.

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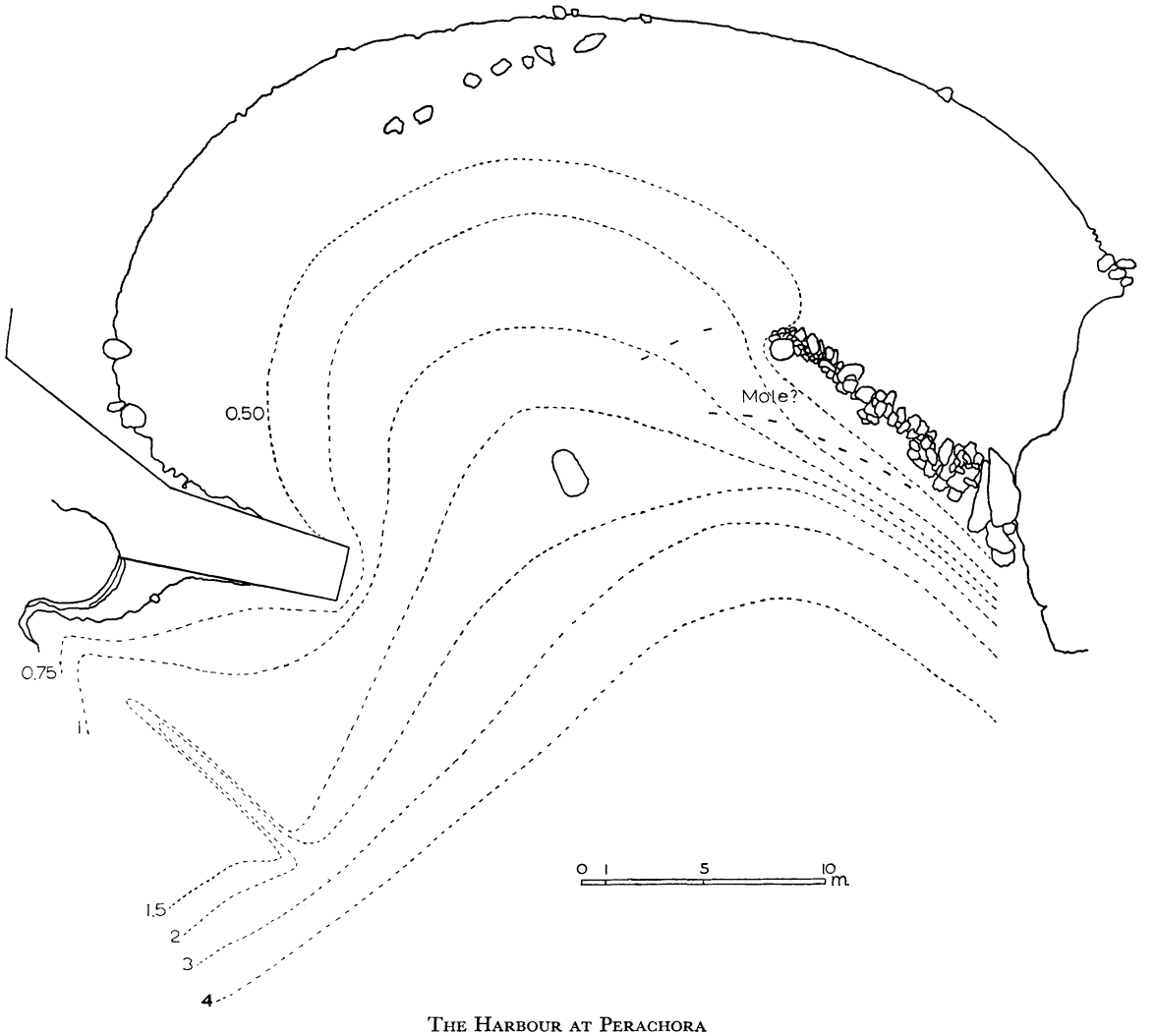
embedded in the shingle at a depth of 1·75 m. and rises to only 0·60 m. below the surface. Probably it is not *in situ* but has fallen from the cliff above.



THE HARBOUR AT PERACHORA

The remains of the 'mole', if ancient, would almost certainly have projected above the surface in antiquity, though now submerged to a depth of 0·50 m. There is a growing accumulation of evidence of coastal submersion in Greece since antiquity; whether this is due to a general rise in sea level, or to sinking of the coast, or to a combination of both factors, is still not certain. I myself favour the last possibility. A rise in sea level since antiquity seems likely, but at a site like Perachora geological instability is a certain factor.[4] If we assume a comparative

[4] On Perachora, cf. *Perachora* i. 3, n. 3 (Dunbabin).
Argument has continued since the end of the last century; geologists are reluctant to commit themselves on such recent phenomena. Incidences of coastal submersion, and occasional emergence, are found in many parts of the Mediterranean area and also on the coasts of northern Europe. Until recently these were usually explained as the result of isolated sinking or rising of the coast-line due to geological instability. The accumulation of evidence has now shown far more examples of submersion than the reverse. Many scholars now argue that this indicates that another factor is involved, a general rise in sea level during the past three millennia; others maintain that many areas of land may have sunk without compensating rises elsewhere. The

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rise of at least 1 m., the surface of the 'mole' would just have projected above the surface even at high tide enough to provide a protected berth inside the small harbour; the 'mole' might well have had a superstructure of cut blocks (now completely lost) to form a quay: for at the back of the harbour there are no clear traces of the ancient shore-line or of any embankment, and there would hardly have been room there for a quay and means of access to the terrace above. Thus it seems probable that the landing-places were at the sides of the harbour, possibly on the west side (though no evidence has been found here) and very probably on the east side, where besides the suggested 'mole', steps have been traced on the rock above.

The old shore-line on the rocks at the end of the promontory four feet above high water probably goes back to an earlier interglacial period, or alternatively it may be the result of an earthquake in prehistoric times, certainly before any historical period, for the buildings on the terrace above the harbour are at a lower level.[5] The bay to the west, just below the lighthouse, is less well protected. The existence of the ramp running down the cliff from the east does show that the bay was used and that there was a landing-place; hardly, however, a 'harbour'.[6]

There seems little doubt that Lake Vouliagmene was never a harbour for the site.[7] The only outlet channel to the sea, a modern cutting, is too narrow to have destroyed entirely all trace of an earlier channel on the same site. The existence of foundations in the water of the lake by its west shore, the 'round building' noted by Payne (PLATE 42(*b*)), and by its north shore, shows that the lake was not usable as a harbour in antiquity, being shallower and smaller in extent; the wide rocky shelf which runs all round the lake, now about a foot below the surface, will have been above the surface then. The road along the west shore of the lake cuts across the rock above the present shore-line, and Payne argued that if the rocky shelf had been dry the road would have run along it instead; but the road may well have been sited to avoid low-lying ground, normally dry but perhaps subject to occasional flooding.

The bay by the lake very probably was an important anchorage, as Payne suggests, sheltered from the prevailing north and north-west winds and connected to the main settlement by the road which runs right down to the point by the lighthouse. However, no remains of quays or other structures have been traced on the shore of this bay.

D. J. BLACKMAN

theory of a general rise in sea level was put forward, in a discussion of the Aegean area, by Ph. Negris (*AM* 1904, 340–63) and has been maintained more recently by A. von Gerkan (*Festschrift Dörpfeld* (1933) 37–42, 'Meereshöhen und Hafenanlagen im Altertum', now republished in his *Gesammelte Aufsätze* 139–42; *Nachrichten Akad. Wiss. Göttingen* (phil.-hist. Kl.) 283–99) and D. Hafemann (*Abh. des deutschen Geographentages* xxxii (1959) 218–31, 'Die Frage des Eustatischen Meeresspiegelanstiegs in historischer Zeit', with a clear exposition of the problem; *Die Umschau* 1960, Heft 7, 193–6). Negris suggested a rise of *c.* 3·5 m. since the Classical period, clearly too high a figure; Hafemann accepts a figure over 2 m., again too high, I feel; v. Gerkan suggested 1·50+ m.; I myself think that we cannot yet give a more specific figure than 1–2 metres. A minimum figure is provided by the depth of submersion of buildings which were obviously built as land structures (not, for example, moles or quays) and a maximum figure can be established from the evidence of fish-tanks and slipways which must have been built with a certain depth of water in them. Isolated evidence is insufficient since geological instability is a factor which must always be taken into account in the Aegean area (especially in the Corinth region). A mass of evidence must be accumulated before a rise in sea level can be proved as a common factor, and the amount defined more closely.

For other evidence of coastal submersion cf. N. G. L. Hammond, *JHS* lxxvi (1956) 35; J. M. Cook, *BSA* liii–liv (1958–9) 11 f.; J. Leatham and Sinclair Hood, ibid. 263 ff.; J. Schäfer and H. Schläger, *AA* 1962, 40–51; J. du Plat Taylor, *Marine Archaeology*, chapters 5–6. At Cenchreae, not far from Perachora, a change of 6–10 feet since Antiquity is indicated (R. L. Scranton and E. S. Ramage, *Hesperia* xxxiii (1964) 143). Cf., most recently, Hafemann, *Abh. math.-naturw. Kl., Akad. Wiss. Mainz*, 1965, 605–88, Nr. 12.

[5] Cf. *Perachora*, i. 15 (Payne); i. 3, n. 3 (Dunbabin).

[6] Payne, ibid. i. 15, 24.

[7] Cf. ibid. i. 9–10, 24–25.

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(a) (b)

THE HARBOUR AT PERACHORA

(a) THE HARBOUR. (b) FOUNDATIONS IN LAKE VOULIAGMENE

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