Natural Environment and Human Settlement in Prehistoric Greece

based on original fieldwork

Part ii

John L. Bintliff

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CHAPTER III

THE SPARTA VALLEY

In the summer of 1973 the author was invited by Dr. Hector Catling to join his excavation team at the Menelaion site, just south of modern Sparta.[1] The aim of the resulting study was to set the site under excavation into its regional context, in terms of its relation to its surrounding environment in the past, and into the context of the general development of human settlement in this part of the Peloponnese.

While the investigation was primarily concerned with the Bronze Age environment and settlement patterns, it proved both necessary and of wider interest to consider historical events and later archaeological evidence in the same area. In the case of the archaeological sites, with the exception of the few surface sites the writer discovered during his field-study, all data stems from the authors cited below. For the geology, basic data originated from Philippson and the IGSR, but I was led to make substantial alterations from detailed field observations. As for the geomorphology and soil science, no general work was available to assist the writer, and all such data presented here is his own field classification and plotting.

Data given (Map 2)

Hope-Simpson and Waterhouse (henceforth 'HS and W') were the latest to examine the development of prehistoric settlement in the Sparta Valley, in BSA for 1960 and 1961. Their admirable catalogue of prehistoric findspots, resulting as much from their own archaeological surveys as from a review of previous work in the area, is largely confined to the better-known and heaviest settled areas of Laconia, in particular the fertile plains of Sparta and Helos, although it could be argued that such a bias does not unduly distort the interpretation of the development of prehistoric Laconia in broad outline (see below p. 376) However a demonstrable bias within the areas of concentrated excavation and survey in favour of selected categories of sites does appear to lead to unjustified generalisations on settlement patterns (see p. 403ff). HS and W (1961:168) conclude that the distribution of known sites argues that the Neolithic people first entered Laconia by sea; we read the same of the EH period; quite apart from the unfounded assumption that a final settlement pattern primarily reflects colonisation routes rather than adjustment to terrain, we have only one Neolithic site for the Sparta Plain, where clearly many more await discovery. However they do point to the possible significance of discontinuous occupation at smaller sites corresponding to known phases of flourishing culture, and the traces of a background in the new MH settlement pattern for the complex hierarchy characterising the mature Mycenaean period (1961:170 ; cf. our discussion below, p 403ff). A further comment on HS and W is that

their data is frequently at odds with their conclusions, while the relationship of prehistoric sites to particular geological formations deserves more detailed and less ambiguous treatment than we are presented with (see below p. 375). Before these authors a considerable number of articles, chiefly of the early decades of this century and the latter 19th century were available, though discussion centred almost solely on Classical antiquities and the equation of human finds of that era with settlement and sanctuaries cited in classical literature and the epics. In particular the detailed tour of the Plain in the second century A.D. by Pausanias, during which he visited most of the famous contemporary settlements and shrines, as well as many of the locations mentioned in the Homeric and other legends, has excited much scholarly work on the routes he took and the exact site of each named locality (Pausanias, Description of Greece, Book III: Laconia). The main authors in this category are Bursian (1872), Curtius (1851/2), Wyse (1865), Hondius (1921), Ormerod (1910), von Prott (1904), and Bölte (1929). Since the recent BSA survey (HS and W, 1960-1) several new findspots have appeared in archaeological reports of the Greek Service and foreign schools, and all prehistoric and the main historic finds have been taken note of in the following examination of distribution patterns.

The Physical Geography of the Area (Maps 1 and 3)

Alfred Philippson (1959, ed. E. Kirsten: vol. 3:2) is a basic source for the geology and general geography of the area, cited frequently with minor additions in Bölte's comprehensive article for Pauly-Wissowa Real Encyklopädie (1929). Maps for the present chapter are based on the 1: 50,000 series of the Institute of Geology and Subsurface Research, Athens (IGSR) - from the Sparta sheets of which have been taken all contours and the main topographic features, and the major rock formations. However, as is noted elsewhere in these area study chapters, especially the study of the Helos Plain, in detail these maps are often seriously inaccurate, sometimes misinterpreting - in many cases completely ignoring - striking surface features, that though small in area can be absolutely crucial for comprehending preferences in settlement location. On the accompanying geology and geomorphology maps therefore, the writer has put in many details as a result of his own fieldwork - such as in fact to alter the whole nature of those parts of the plain closely associated with early settlements.

A brief summary of the regional geography is required to begin with, before presenting the author's own field investigations. It stems mainly from Philippson (vol. 3: 2: 446ff), and little alteration from this pioneering work is detectable in more recent discussions and published maps of the area e.g. IGSR, the Aubouin team (IGSR Sparta Geology Sheets 1969, 1970; J. Aubouin et al 1963).

The Sparta Valley is the centre of a giant tectonic trough running consistently south-easterly from the heart of the Peloponnese to the Laconian Gulf. Over much of this faulted depression runs the main course of the River Evrotas, the major watercourse of the SE Peloponnese, and with its tributary the Kelephina (which joins it just north of Sparta), the chief perennial streams in the area. The faulted basin-depression of Megalopolis to the NW, and the Helos Plain to the SE end of the rift, are equally the

result of the fault.[2] It has been shown that this extremely long depression was already in existence by Upper Pliocene times, for then an Aegean-wide sea-level highstand several hundred metres above the present filled the Sparta valley and the Megalopolis Basin, together with the low watershed area now separating them, with a single inland sea, and drowned the Helos Plain and its low hilland towards the Sparta Valley (Vardunochoria) with open ocean. The two massive and parallel ranges of Taygetos and Parnon, that were uplifted relatively as the intervening rift valley between then sank, and which likewise trend SE, were untouched by this marine swamping and consist of older rocks. The sequence of these older rocks from lowest to highest is: schist with large marble beds, in places topped with a thin layer of Labrador-Porphyrite (see Helos Chapter on ancient use of this latter stone); two series of very thick, hard, crystalline limestone.

Subsequently, after the Pliocene epoch the ocean lowered, the land emerged again, and the accumulated marine and lacustrine deposits, deep alternating beds of soft limestone conglomerates, marls and sands, known as 'Neogen' began to be eroded from their new plateau level of up to 500 m above sea level. At the same time and probably already during the marine period, the rift valley continued to deepen the central core of the depression all down its length, so that the central parts of the Neogen region were soon much lower than the original plateau surface. The depression, flanked as it was by almost sheer slopes of limestone on both east (Parnon) and west (Taygetos), formed the natural main drainage line, and throughout the Quaternary period up to the present day alluvium has been brought down to the plain thus created, either to be dumped there as the sudden change of gradient is registered by mountain streams, or carried off by the Evrotas and its tributaries to fill up the drowned depression of Helos on the coast - eventually to become another plain. This picture, already established at the turn of the century by Philippson, can be tied into the recent tectonic investigations of Aubouin and his team of French geologists (1963). The latter part of the Mesozoic era in Greece saw the end of a period of deep-sea marine sedimentation and the beginning of orogenic activity, by which most of Greece rose above the ocean. In the Sparta valley the two series of hard limestone making up the Taygetos massif and the upper part of the Parnon massif, the Tripolitsa and Olonos-Pindos limestones, represent approximately contemporary marine sediments of the pre-orogenic phases of the Mesozoic. They were deposited in quite separate areas of Greece, the Tripolitsa in the general area of Laconia where it is now to be found, the Olonos-Pindos in an area much further to the east. It is of interest to note that as also can be seen in the Argos Plain, the later uplift of the Olonos-Pindos limestone, after the Tripolitsa massif had arisen, led to a massive landslip of gigantic proportions, a mountain overthrust, whereby elements of the eastern Olonos-Pindos range slid over the top of the Tripolitsa massif. Thus the Taygetos range is predominantly Tripolitsa, split into two parallel ranges by the later post-orogenic warping, capped by islands of Olonos-Pindos limestone. Between the parallel ranges that comprise Taygetos there exists a sunken plateau zone created by an outward flexure, like an open wound, where the schists and marbles have been revealed, a well-watered area and the site of several seasonal settlements. After both series were raised up by the Late Mesozoic mountain uplifts and this overthrust accomplished, much of Greece was

subjected to post-orogenic subsidences along preferred axes, most notably a NW-SE trend. In this phase there were formed many tectonic depressions, while the intervening mountain ridges appear to have warped outwards and possible upwards. Thus was formed the great trough from Megalopolis into the Laconian Gulf, while the Taygetos range uparched itself and the limestone cover split to reveal the underlying deposits of schist and marble, all as part of the same regular flexure and along similar lines to those already established as later in action modifying the Plain of Sparta and its Neogen deposits.

As the Sparta Plain depression deepened throughout the Tertiary and Quaternary, while the mountain ranges alongside rose relative to it (possibly also absolutely), the drainage system adapted itself to the prevalent trends: the main drainage line naturally followed the core of the Sparta trough and contained the major Evrotas river, running with the dipping NW-SE axis. The considerable outflow through the year of rainwater stored in the lofty limestone formations of the mountains to east and west of the Plain emerged as schist-conditioned spring lines both at the mountain foot and in the schist and marble plateau up and between the twin Taygetos ranges which we shall henceforth refer to as the 'Step' plateau, and these fed perennial streams which ran across the plain into the Evrotas river depression zone.

By the time human occupation began in our area, according to previous investigators, most of the Neogen that once formed the core of the depression had been eroded away by the many mountain streams passing through the central Laconia hollow, or been submerged under their alluvium, and the Plain of Sparta had much the same appearance as (they hold), it bears today: to the west the sheer cliffs of hard limestone rise from the plain along all its length, followed above by a 'step' of schist that represents older rocks exposed between the eastern, front, limestone range and another, higher, limestone range further west, the latter being much higher and including the summit line of Taygetos at 2409 m above sea level. At the abrupt junction of cliff and plain (due to the fault line), the schist may appear again underlying the foremost limestone range, and gives rise to a spring line. On the east side of the plain a plateau of Neogen, heavily dissected by stream action, slopes down from a fairly sheer hard limestone ridge, Parnon, representing the two main phases in the progressively more confined downward faulting along our SE line. This Neogen plateau is generally a cliff at its western edge where it meets the plain and this point, being apparently that of most active recent downfaulting, is the lowest in the plain and hence forms the bed of the River Evrotas. The plain is bordered by other remnants of the former Neogen inland sea, as a fragmentary plateau to the north (beginning immediately north of modern Sparta) at about the same height above the plain as the eastern plateau just discussed - i.e. 100 to 300 m. North of Sparta the Neogen becomes more and more confined in extent, and is in any case heavily dissected by streams and represents poor agricultural land, as with the comparable Neogen plateau east of the Evrotas (cf. Tozer 1873:283; Bölte 1929:1297). But to the NW, around Mistra, there is an extensive fertile zone of gently sloping marls. To the south of the Plain again we find remnants of this

Neogen plateau, then a hard limestone ridge which cuts our basin off from the Neogen hilland to the south (which is also 100-250 m above our plain) but which belongs to the oceanic Neogen (i.e. open sea deposits) extending as far as the Helos Plain to the SE.

The River Evrotas is axially located along the SE trend but on the eastern side of the plain. Accompanying the river on the west bank are low, about 50 m high hills of remnant Neogen, again directed SE, and connected to the Neogen plateau on which modern Sparta is built as also to the Neogen hilland descending from the plateau on the SW edges of the plain. These deposits in the plain proper produce olives and cereals in great abundance. As Philippson alone noted, a low line of hills runs from the western edge of the plain to the central area of these riverside hills (1959:453) - he says it is conglomerate or scree. From the mountain edge on the west, massive fans of very stony character head steeply down into the plain, but between their foot and the hills by the Evrotas lies an alluvial depression, gently sloping down to the east and of great fertility. Finally, between the riverside hills and the present riverbed, is a wide area of alluvium of notably intensive use by modern farmers.

It is of particular importance to note that it is accepted without question by geographers and archaeologists alike, working in this area, that the Neogen of the Sparta Plain has been reduced by erosion from rain and the streams, and by burial under river deposits, to a few isolated hills along the west bank of the Evrotas, while the rest of the plain proper consists of the accumulated alluvial deposits of the Evrotas and its main tributary streams running from Parnon (e.g. the Kelephina) and Taygetos (chiefly the Magoula, the Parori/Pandeleimon, Riviotissa streams). Even these hills are noted as separated by broad bands of alluvial soils. Thus Bölte, following Philippson, writes: "the Plain of Sparta was formed by streams flowing from Taygetos to the Evrotas" (1929:1299; cf. e.g. Philippson 1959:451-2), and Hope-Simpson and Waterhouse: " the Evrotas flows through the fertile alluvial plains of Sparta and Helos... The Sparta Plain,... is one of the most fertile plains in Greece, and must at all times have been able to support a considerable settled population" (1960:67). But surprisingly enough, the same authors noted shortly after (1960:69) that a large number of prehistoric sites in Laconia occupy what the geologists call Neogen marl and conglomerate, especially the former. The significance of this correlation within their 'alluvial plains' is not taken up, and one must presume that this coincidence is seen to be due to Neogen hills being suitable acropolis sites, with the surrounding alluvium being the associated arable land; thus they claimed (quite incorrectly) that the three most prominent hills in the Plain are occupied by the three largest sites there (1960:70). Von Prott suggests " significant settlement must have lain at all times in the great plain - early settlers naturally preferred hills in the flatlands and also sites on the mountain edges" (1904: 3). When Hope-Simpson and Waterhouse discuss claimed Neolithic artefacts from the site of modern Sparta, they feel certain that such finds stem in reality from the prehistoric site at Kouphovouno a mile away, because "one would not in any case expect Neolithic occupation... from classical Sparta" (1960:70). Again we are left in doubt as to the reason-

ing for this statement, which in any case can be shown to be untenable (see p. 213).

Finally there is no lack of wtaer sources in most parts of the Plain and surrounding uplands. All the streams mentioned above are perennial, though in summer, with the exception of the Evrotas, Kelephina and Magoula, flow becomes slight below the spring heads themselves. Nonetheless the Romans and Byzantines had need of an aqueduct to bring supplies to Sparta town from the Mistra and Parori spring heads, which suggests that even the Evrotas could run very low (as today in summer) and be easily polluted by herds and refuse (Kahrstedt 1957:193). Again it is surely due to low summer stream levels that the larger ancient centres were provided with wells and famous springs (for Sparta we have the wells excavated by the British School, cf. pages 396ff below, and the Dorkeia spring mentioned by Pausanias in Imperial Roman times (Bölte 1929); Homeric Sparta was famous for its Messeis spring, though clearly close by the river Evrotas (see p. 413 below).

In general terms, the Sparta Plain is a fertile depression surrounded on all sides by uplands of varying ages, the latter sharing a common impediment of steep, rocky and generally infertile soils. This justifies us in concentrating on the Sparta Plain and its immediate periphery as an area of human settlement. Despite the admittedly scant attention paid by archaeologists and before them classical topographers to the poorer lands around the Plain, it seems still a fairly justifiable neglect in the light of the dense and extensive prehistoric and historic communities of the Plain and the predictably small and scattered sites that we have sporadically recorded and which surely await discovery in larger numbers in the mountains around. The evidence and the exact reasoning for this particular point will be discussed in the detailed study below (cf. HS & W 1960: 69; Philippson 1959: 414).

All these geographical features can be seen on the reproduction of Philippson's map (Figure 1). In the following section of the chapter full details are given of the individual stages of the author's field investigation of the Sparta valley.

Field Investigations

(The reader is referred to maps 2-3)

The Menelaion

The site recently re-examined (1973 to 1976) by the British School at Athens lies on a ridge on the edge of the eastern Neogen plateau, rising here as a cliff immediately above the river Evrotas and bordered along its western edge by the present course of that river; it is also opposite modern Sparta town. A gorge entering the main river from the NE isolates much of this ridge from the plateau to the east, while at its NE end eroding cliffs of Neogen separate our ridge from its companions in that direction. The ridge as a whole drops gradually literally in steps, to the south, and about its midpoint a change in its character can be noted: while the whole

ridge is composed of a series of increasingly elevated hillocks joined by thin saddles, those parts north of midway are far steeper and stonier than those south, which are small, almost level, plateaux. With rare exceptions the southern hillocks are cultivated in cereals, the north left as grazing land. At this midpoint lies the excavation area. To the west, on the cliff edge, rises the small knoll of the Classical Menelaion shrine, behind it the recently cleared building complex of Late Bronze Age date.

Summary of Excavations

In the nineteenth century many explorers were able to note the remains of an ancient shrine, supposedly that of the legendary king of Sparta Menelaos and Helen his wife (described in Pausanias amongst other ancient authors, with its associated ceremonies), but it was not until 1889 that we hear of earlier finds in the locality. Tsountas records many pieces of Mycenaean pottery, unaccompanied by visible walls, to the south of the shrine, beyond the modern chapel of Elias (1889:9). A BSA team fully excavated the shrine, revealing its long history back to Geometric times, and possibly earlier, since Mycenaean levels underlay the accumulated offerings from the Geometric period onwards in virgin soil immediately above bedrock. (BSA 1909:108ff). Continuity of worship from the Homeric era, as might be claimed for the Amyclaion shrine below in the plain proper, would seem to be ruled out on the pottery hiatus, though Dr. H. Catling has reopened the question in his recent preliminary report on the site as a whole (1975) (see also A. Reps. 1973, p.14ff; 1974,p.14ff; 1975, p.12ff). The early twentieth century BSA team (chiefly Wace, Dawkins and Droop, Thompson) surveyed the whole central and southern parts of the ridge, and concluded "It has now been shown that the whole of this area was covered with Mycenaean houses" (1909-10:5). With the exception of one house structure, known today as 'Dawkins' House', close to and east of the Menelaion shrine, and Late Mycenaean in date, the other remains of structures amounted to little more than widespread remains of small pieces of foundation, always associated with Mycenaean sherds, so as to leave no doubt as to their date. Post-Mycenaean finds were restricted to the immediate area of the later shrine building. It is important to note that over all the area of the ridge thus examined, these authors state: "The pottery was uniformly of the latest Mycenaean period" as in Dawkins' House, i.e. Late Helladic 3 (BSA 1910:5). The re-excavation of Dawkin's House has shown that the main occupation layer dug by Dawkins did indeed belong to LH3, and to 3/B, but there were also finds below in the same structure of LH3A date, and in a different structure beneath of LH2 date (Catling 1975), which were partly left undiscovered by Dawkins, partly removed in ignorance of their earlier age. However re-excavation of an ancient rubbish heap between the shrine and Dawkins' House confirmed that Mycenaean finds from that area were indeed 3B. HS and W (1960:72) on their visit to the site, confirm that Mycenaean sherds and walls continue for view for 500 m to the south of the Menelaion along the ridge, but not onto the south end, the walls being of stone and mudbrick. On the limited results of Dawkin's excavations, and given the extent of settlement, they conclude "a certain importance seems to be indicated by the seal impressions, but the extreme thinness of the ridge

seems to preclude the existence of a large building here". However in his later Mycenaean Gazetteer, Hope-Simpson notes (1965) under the site, that a recent study of the locality by Prof. Beattie has shown that Mycenaean settlement continues even further south along the ridge than had previously been ascertained, and the Menelaion must now be recognised as "undoubtedly a very important Mycenaean settlement". The recent excavations have raised the status of the settlement even higher (Catling 1975: Prof. A. Snodgrass, pers. comm. 1976). Limited finds of Middle Helladic ware were found in pockets in the bedrock west of the main area (which centres on Dawkins' House). An intramural burial of an adult appeared in a pit under later buildings on the north edge of the excavated area, probably of MH date. Also some reused ashlar blocks in Mycenaean walls could be MH in origin, since in one case such a wall was found in the succeeding Period I phase. Finally a group of postholes near the northeast corner of the Period I building seemed to be associated with MH ware. It is not clear what kind of occupation is represented by these finds. Pottery of LH2A date was found in a wash layer without structural evidence, and it is possible that some of the fill incorporated in an LH3A1 terrace stems from this period. It is with LH2B that we can identify the first structures on the hill, an impressive complex known as the Period I phase of construction: a megaron with parallel corridors on either side and rows of small rooms beyond on both sides (storerooms?). The central rooms of the eastern bloc of small rooms could have been connected with cult practices, for here were found two female figurines, one an early Mycenaean type, the other a Minoan form, and fragments of a terracotta house model that could represent a shrine. Other Minoan links in the finds of this period include a seal, and what seem to be Minoan sherds. It is termed a 'mansion' but there is evidence for further architectural features of this period elsewhere in the excavated area. Stubs of three parallel walls were found on the north cliff-edge of the excavation, west of the Period I mansion, but in the same orientation and indeed notably thicker (up to 1.50 m). It is considered likely that a sizeable structure has largely vanished over the cliff here as a result of the natural disaster that seems to have struck the Period I mansion. Possibly this fragmentary building was an even more impressive building that the mansion preserved to us. This mansion continued in use into 3A1, was then demolished for a Period 2 complex on a different orientation. Evidence is accumulating for a destruction by earthquake for the Period I community. Walls lean inwards, and in places show collapse from flying bedrock. The lost walls on the cliff edge, and the withdrawal of the succeeding complex back from the plateau edge behind a massive retaining wall, are strong arguments. Apparently no later earthquakes have been as effective, for the new complex remains undamaged, even though the terrace wall was presumably built close to the contemporary hill edge. This great shock cannot be directly linked to the tectonic-volcanic events on Thera and possibly Crete, being undoubtedly not strictly contemporary (possibly occurring c. 1425 b.c., while Thera seems to erupt c. 1500 b.c., Crete be devastated c. 1450). However, it is surely a remarkable coincidence that such events, unparalleled at least on Thera, and in Laconia in the following three and a half thousand years, should occur within the same century. The present writer

would point to 1) the existence of both Menelaion and Thera on very active sub-zones of the Greek tectonic zone scheme (cf. Geology Chapter), which sub-zones might be mutually sensitive to pressures deeper in the crust 2) the well-known phenomenon in studies of catastrophic events such as tidal waves, great river floods, hurricanes, that unusually violent natural events occur frequently in groups. There was a short period on the site, now called Period Ia, when workmen were in occupation to rebuild the settlement. Finds include kilns or foundries, with traces of bronze metallurgy associated. A number of structural traces may be the huts of these workmen. The Period II complex belongs entirely to 3A1, and the best-preserved group of rooms of this phase are built on a new solid and massive terrace, which incorporated earlier debris of the previous or possibly even earlier phases. This new complex was a larger and more impressive affair, though retaining the basic plan of the Period I miniature palace type, i.e. megaron with linking corridors and batteries of small rooms; it was certainly two storied and to it belongs the earlier phase of the building known as Dawkins' House (probably storerooms) which was linked to the main 'public' structures above and to the north by a staircase. This complex Catling likens to a Minoan villa. There are very extensive wall traces to the north and west of the basic 'mansion complex' of Period II. It may be that they represent the far more eroded remains of buildings superior in style and function to the 'mansion' unit - as in Period I - but their less substantial walls would seem to belie this suggestion. They do however include a massive foundation for what could be a defence tower. There is then an apparent hiatus, with no 3A2 finds, and the re-occupation of the excavated area is on a limited scale (Period 3) and in 3B2 times, probably 150 years later, Dawkins' House is rebuilt as a single-storey affair, the staircase blocked and the rest of the Period 2 complex is not reused. Towards the end of the period (still in 3B2 times), two bodies are deposited in an adjacent contemporary rubbish tip under circumstances pointing to violence on the hilltop (e.g. one case with suspected serious injuries); certainly in the same period Dawkins' House is burnt down and the charred final occupation layer, the roasted walls, and the carbonised door jamb were carefully noted by the original excavators. Also of interest in this period are the large number of vases in Dawkins' House, and two clay sealings with the jars they once sealed, one with impressions of a signet ring in nine different places, either to mark possession or record storage. Dawkins' House nevertheless had a long use in Period III, with rubbish from it in the adjacent tip lying two metres deep. While confirming the very extensive spread of finds along the ridge to its southern end, the researches of Dr. Catling and his team have demonstrated that it is very likely that Mycenaean houses underlie the Elias chapel, but also that there may be Mycenaean structures and an Archaic shrine on a level hilltop 300 m north of the Menelaion and at a similar height (due to the conglomerate terrace regularity discussed below), pots being found with structures on the summit and of these periods. Also, in the vicinity of the Menelaion shrine, excavation of deep Archaic and Classical fill uncovered Mycenaean levels, with pottery of IIIB2 date, no structures but stones perhaps from nearby eroded late Mycenaean houses. Amongst the most recent finds from this area are dedications of Archaic date to

both Menelaos and Helen, finally confirming the identification of the monument with ancient sources. In general Catling concludes that the site must be regarded as the principal settlement site in Laconia during the later fifteenth century B.C., i.e. the Period 1 and 2 phases at the excavated area (1975).

Catling is rightly hesitant in equating the site with that of Homeric Sparta, the palace of Menelaos, simply on the evidence from the excavation. For the period of the epics, 3B, is a phase of notable impoverishment in the excavated area, compared to the Period 1 and 2 structures. The rebuilding of Dawkins' House slavishly follows the Period II walls but in inferior workmanship. Pottery is also poor, the bulk of the sherds being from undecorated ware of low quality. Even the earlier 'mansions' are likened by Catling merely to the scale of Minoan villas. We will return later to the identification of the site and its status, in the context of the whole plain in the Mycenaean epoch, but it may be said now that a careful examination of several lines of evidence, together with aspects of the Menelaion finds perhaps understressed by Dr. Catling, point conclusively, at least to the present author, to the correct localisation on this ridge and within its prehistoric settlement of the site of Menelaos' palace, the centre of late Mycenaean Laconia, as was indeed originally claimed by the BSA team in 1909 (109).

The step nature of the hillocks on this plateau is due to an intriguing natural feature, the existence in the Neogen of our valley of regular near-horizontal bands of conglomerate alternating with sandy/clayey marls. The differential erosion that tends to bite away the softer marls, leaves the conglomerate jutting out in a sequence, that, multiplied many times, gives these hills the appearance of a step pyramid. It proved possible to link up the conglomerate bands from hill to hill and even across the gorge to the east of the next hill group, while the saddles between each hillock on our ridge on examination were bare but level conglomerate beds. This feature is also found on all the Neogen hills in the plain and both here and on the Menelaion it is clear that the architects of the LBA took advantage of this almost level series of firm steps, composed of fairly resistant rock, to erect structures for local rulers, and to provide an obstacle to easy attack. On a lesser scale various pottery clusters suggest that later farms of the C and R periods were well-founded on similar steps e.g. on the low Neogen hillocks south of Afissou village (see also the Anthochorio site, below; also UMME 1972 - the large Mycenaean centre of Nichoria in the adjacent Messenia region, lies on "nearly flat-lying Pliocene sediments" - the same seems to be true of the palace of Pylos also in Messenia [Field trip visit 1974]).

In terms of the areas devoted to different crops in the Aparta valley, it is noticeable today, and was noted in the early years of both this and the last century, that the irrigated crops - fruit, vegetables etc. - concentrate on the Evrotas flood plain and its tributaries, and on the depression between the Evrotas right-bank hill chain and the Taygetos piedmont to the west; the western piedmont is dense with olive groves, the area of the median hill chain is cereals and olives mixed on the lower land, often cereals alone on the upper parts of the Neogen hills themselves. This division corresponds to the constraints of geology and soils, since the

topography and physical properties of the Neogen, especially the conglomerate, preclude irrigated crops, while the scant depth of soil and the wind exposure often hinders the flourishing of the olive.[3] Throughout Greece irrigated fruit and vegetable crops flourish preferentially on the fine-grade recent river silts, on account of their very easy tillage properties (irrigated crops often demanding frequent weeding and soil loosening), their good drainage (without being drained of the valuable irrigation water too quickly) - factors closely connected to their admirable balance between heavier and finer fractions of grain size, and because such deposits are always the closest of all soils to the present water-table, and therefore irrigation is most practicable. The Neogen soils are either rather sandy for the water-demands of the irrigated crops - as with the sandy conglomerates (though the cereals seem to have been in origin adapted to a rocky and exposed habitat with but shallow soil depth, and do extremely well on the conglomerate steps); or they are rather clayey and too prone to changes in moisture (as in some of the marl series - a favourite habitat for the hardy calcium-loving olive tree); nearly always the Neogen series is some way above present watercourses and wells, if not existing as hill chains which prohibit irrigation. However there is a notable difference to the heavy clays of the mountain piedmont fans of Older Fill character. These latter are composed of beds of very coarse debris intermingled with those of very fine clay, and are extremely hard to till except after rains, when they become disadvantageously muddy and mobile. Once the rains have ceased a characteristic aridity afflicts these soils, and due to very long exposure to weathering many exposures are tending to become acidic, which makes them unsuitable for the basic preference of most crops. However the upper slopes of these fans are covered in limestone scree which considerably improves soil basicity, even if hindering adequate cultivation. The Neogen soils, owing to their very high calcium component, have a remarkable quality of residual water retention through the Mediterranean dry season, trapped by the calcium in the soil, which encourages tillage over much longer periods and nourishes the crops through the dry months. The calcium also acts to trap nitrogen, and hence a familiar name for their rendsina soil is humus carbonate soil (see Soil Chapter).

When the first settlers arrived on this Menelaion ridge they would have possessed a considerable area well adapted to cereal cultivation on the ridge plateaux themselves - it takes 15 minutes starting from the excavation to walk down to the river at the south end of the ridge. And at that time the citrus fruits were unknown and no nationwide market made large-scale vegetable growing worthwhile, nor was such irrigated culture then feasible, given the absence of deep wells for the Pleistocene clays, and the likely absence of the recent alluvial silts - as will be demonstrated below.

Field Survey of the area E and N of the Menelaion Site, E of the River Evrotas

But a centre of importance would have drawn its food supplies from a much larger area, and the nature of this is the next subject of investigation. The first sector to be examined is that of the continuing Neogen

hill chains behind and E of the site, which effectively comprise about two-fifths of the potential exploitative territory of the site's inhabitants (assuming that settlements tend, generally, to occupy positions central to their resource base in the landscape; see Economics of Settlement Chapter).

As we saw in the regional geography summary, this plateau rises to Mt. Parnon on the east and represents the remnants of the Pliocene inland sea sediments that once extended across the plain from Taygetos to Parnon. Having been left literally high and dry by the subsequent more limited sinking along the SE trending fault to its west, it has been deeply dissected by later gullying, and its high walls of marl rapidly eroded by wind and rain. The result is a maze of finger-like parallel ridges separated by deep gorges and with far greater vertical than horizontal exposures (see maps 2 and 3). Since the near horizontal conglomerate weathers slowly, the narrow ridge tops are usually composed of this with little marl cover, and it is only the lower steps (where, and this is rare, the ridge is wide enough for lower steps), that are sheltered enough for a marl lens to remain above the conglomerate shelf. In nearly all cases where these lower shelves exist, erosion has acted to make them slightly concave, whereby the outer lip of the shelf is bare conglomerate somewhat raised above the inner parts of the 'step', and the inner shelf is a gentle hollow, where marl is preserved and has weathered into a fertile soil, However, these lower shelves are very rare up on this plateau, in comparison to the lower hill groups on the plain below to the west, across the river, and around Afissou village in the marl depression to the north. The result is that except for the Menelaion itself and small patches on ridges to the east and south - the plateau hinterland of the site is fit only for sporadic cereal fields and grazing. Today and in the history of occupation of the site, settlement up here is limited to those areas of more extensive shelf marl, e.g. modern Chrysapha village and the prehistoric and historic site of Palaikastro between that village and the Menelaion (possibly the ancient village of Therapnae).

Summary of Excavations

HS and W 1960:82-3: Palaikastro has limited prehistoric finds, possibly Neolithic, definitely Early Helladic, questionable Late Helladic; for Classical and Hellenistic: definite and extensive occupation traces. In his Gazetteer HS claims that Late Helladic is likely from this site; Kahrstedt (1957:196) holds that Roman inscriptions from the Chrysapha area are actually from contemporary settlement in that area. Bölte (1929:1321) notes the finding of a Hero relief and inscriptions from this ancient town; HS also notes the defence wall and various buildings.

As might be expected from the nature of this plateau and its naturally small and undistinguished settlements, Pausanias in his travels, after crossing the river from Sparta to see the Menelaion, returns again at the same point to continue his tour of the Plain, there being really nothing further worth seeing on the plateau (von Prott 1904:2-3).

However the somewhat isolated Menelaion promontory has on its north a small but highly fertile sunken hilland of marls, forming the main fields

of the nearby village of Afissou, between the here withdrawn edge of the plateau and the Evrotas river bed. C and R sherds abound amid this rectangular undulating low hilland zone, and between the site ridge and Afissou the author found an LH2B goblet stem - it is to be expected that this area had many farms that fed the Menelaion occupants and Sparta townspeople. Around Afissou village and along the fertile Neogen depression south to where the Menelaion ridge runs out to border the river, numerous finds of historic date have been made: abundant sherds of C to Byzantine periods, Roman and Byzantine houses, and burials ranging from Classical to Byzantine times (HS and W 1960:82; AD 1961/2, 17:84; A. Reps. 1963/4:8). However our interest must inevitably shift to the more extensive territory available to our Menelaion site in the more obviously attractive plain below to the west.

A glance at the map we have taken from Philippson, and which reflects the main lines of the IGSR geology map (Figure 1) will serve as a reminder of the accepted composition of the central depression that we are about to examine in detail. First, below the sheer cliffs on top of which rests the Menelaion - the perennial Evrotas, with its recent floodplain on either side. Then, further to the west, a line of Neogen hills runs axially to the depression. They are said to be separated by wide bands of recent alluvium, up to the torrent fans at the foot of Taygetos.

With the aid of both theoretical and applied knowledge of the alluvial sediments (see Geomorphology Chapter), the large undifferentiated mass of 'alluvium' in the plain will, area by area, be broken down and dated, and a gradual reconstruction of the past environment assembled.

The Landscape between the Menelaion Plateau and the Kouphovouno Site

The visible natural features from a ford[4] over the Evrotas at the south foot of the Menelaion, across the 'alluvial plain' to the Kouphovouno site can be described as follows. From the far bank we pass over about 150 m of fine dark alluvium, very recent and of characteristic 'historical fill' nature. But at this point we arrive at a conglomerate terrace scarp c. 1½ m in height running north-south as far as can be seen. On all available geology maps no such feature is recorded - all this area as far as Taygetos being just 'alluvial' except for the hills. The scarp terrace is certainly not a Younger Fill feature, nor does it bear any relationship to the cemented alluvial/colluvial conglomerate fans often found within the Older Fill. It is, however, exactly paralleled by the lacustrine conglomerate beds of the Neogen hills, and like these is yellowy-white, reacts strongly with acid and is associated with a sandy marl of yellow colour. An additional fact that proves to be of importance is the crop change - below the scarp, dense citrus trees, above it - large areas of cereals and olives, the latter combination increasingly dominating away from the river and its E-W tributary system. From the scarp west to the Kouphovouno site, the land rises unevenly, no rock is visible and the soil varies from brown to red to yellow, and from hard clay to fine silt. Kouphovouno is an interesting low mound hidden amongst olives; its main occupation is N and EH, with a small amount of Mycenaean finds.

Summary of Excavations

The site was found by Von Vacano and discussed by O. Walter in AA 1942:156. Neolithic and Early Helladic graves and huts are reported from trial trenches. HS and W (1960:72, 74; 1961:168) suggest it was intensively occupied, and indeed the most important Neolithic site in Laconia. Since it and possibly the Palaikastro site are the only sites of that period in the whole of the Sparta Valley and hilland, while HS was clearly misled into thinking the hillock was entirely built up of prehistoric levels (but the natural surface is visible at points of the mound), we can safely limit our opinion of the site to its visible remains, which are not very extensive. According to HS and W, the surface finds are predominantly of the previously known periods, but there are also a few LH3 sherds (3B) on the edge of the settled area.

While the fields below and around the hillock are brown or reddish, the mound itself is a very bright yellow clay whose only parallel is in the Neogen marls. If we examine the natural features between Kouphovouno and Sparta, shortly before the latter's suburbs are reached, the gently sloping and undulating fields that characterise the Kouphovouno area meet a rounded scarp of 2 m or so height, below which lies the Magoula river and a clear 'Historic Fill' dark brown terrace of irrigated alluvium. The fields above this break of slope are lighter and more clayey and dominated by cereals and olives.

The results of these field trajectories are therefore confusing in terms of accepted local geology and geomorphology.

The Landscape Between the Menelaion Plateau and the Midplain Sites of Amyclaion and Vaphio

A similar pattern emerges if we examine the natural features of the area from the Menelaion to the famous sites of the Amyclaion and Vaphio, commencing at the ford again, but heading in a south-westerly direction. After 150 m of watery alluvium at about the level of the present bed (on the Evrotas right bank) and moving from the river, we reach a low scarp about 1 m high which leads onto a recent alluvial terrace of grey silt, with citrus orchards upon it. After another 150 m over this terrace we come across the yellow conglomerate scarp of c. $1\frac{1}{2}$ m in height, and behind it the citrus thins and cereals and olives become increasingly more frequent. Ten minutes (on foot) further SW we find the Riviotissa hamlet. The soil around is brown or red, the crops mainly cereals and olives, but citrus is still fairly plentiful. From here we pass south to the hill group, amongst which is to be found the Amyclaion, and the first hill of the chain is met with only 2 minutes south of the Riviotissa hamlet. These hills are the N-S Neogen remnant group, and the Amyclaion is a steep-sided high knoll with C walling around its summit.

The site has a long history of occupation, beginning in the EBA, continuing through MBA and LBA, with (rare for our valley) traces of Dark Age finds demonstrating a possible continuity from Mycenaean occupation into the PG and G periods. Finds carry on in the A and C periods, when we know it was a national shrine for the state of Dorian Sparta. In Homeric

literature it appears as an LBA town, that for long resisted the Dorian invaders. The comparatively low quantity of finds of the historic periods has led many workers to locate Amyclai town in the vicinity, leaving the hill itself merely as a religious centre.

Summary of Excavations

HS and W (1960:74-6) summarize the accumulated evidence from the excavations of Tsountas (Ephemeris Arch. 1892:1ff; 1889:131), Furtwangler, Fiechter and Buschor (JdI 1918, 114ff; Athen. Mitt. 1927:1ff). Of the prehistoric settlement on the site of the famous ancient shrine, they say it was fairly extensive but much less than sites such as the Vaphio major settlement. Occupation appears to have been continuous from the Early Helladic period until Late Helladic 3C, and there is a strong possibility of a further continuity through the Dark Ages, with PG and G finds, into the historic sanctuary (visited and described by Pausanias). There seems to be no tangible backing however to their statement that the Amyclaion hill was walled in Mycenaean times (1961:173), and this seems to stem back to their earlier suggestion that it may have been walled then because in later legends the Achaeans put up a strong defence here against the invading Dorians (1960:75). Again their description of the prehistoric settlement as being on the south-east slopes of the hill (74) does not summarise accurately the excavation reports, where the finds here are described as deep levels of rubbish - some of which most probably derive from the summit, on which in situ prehistoric levels and some architecture came to light above bedrock (cf. Buschor 1927:5). Mycenaean pottery is also to be found on a lower hill ridge just west of the site (HS & W 1960:75). In his Gazetteer HS notes of the site an apparent hiatus in occupation before 3A, and no LH1. He agrees with the excavators that throughout prehistory the settlement area on the Amyclaion was relatively small. South of the hill Tsountas excavated two Mycenaean chamber tombs and HS discovered an MH pithos burial (HS & W:76). The important evidence for claiming continuity of use of the hill as a sanctuary from Mycenaean into Geometric times will be discussed later, but there is no suggestion for such practices in earlier phases of occupation here.

The status of the Amyclaion settlement is thus hard to evaluate. A fairly small community for the finds up to and including those of Mycenaean times can be accepted for the hill, but the Homeric reference and that found in later legends to an 'Achaean town' can hardly be taken to correspond to the scanty if interesting finds of the latter age; the stress on apparently religious objects then, prompts the suggestion that during the Late Mycenaean period the hill was a sanctuary, though it could have still served as the centre of a more widespread Amyclai settlement, as with many acropolis hills of Classical towns. Did the ruler(s) live up here, and was he a major religious functionary? The surrounding undulating fertile fields would then presumably conceal the remains of the domestic settlement (as with Midea/Dendra and perhaps Malthi/Dorion - cf. Argos and Messinia chapters). We know from the Classical authors that in historic times there was a sanctuary on the hill and an associated village of uncertain location (Kahrstedt 1957:199; von Prott 1904:4-5); various authors located this ancient settlement at modern Sklavochori to the west, or in

the hills between that village and Amyclai hill - but von Prott stressed the likelihood of ancient remains in the village being removed from the sanctuary site when Sklavochori was a major Byzantine centre, though HS and W (1960:82) note plentiful C, H and R in the fields east of the village. Buschor (1927:2) follows a clue from Polybius and locates the town north or northwest of the Amyclai hill, and Bölte, while dismissing this apparently incorrect reading of that author agrees with the suggested location on a calculation of Polybius' distances. However we lack significant archaeological finds in this area. A third possibility is offered by the recent claims of Christou to have located the sanctuary of Zeus-Agamemnon and Alexandria-Cassandra about 1 km south of the Amyclaion; this was seen by Pausanias in the Amyclai village (HS and W 1961:174-5 with refs.). Tsountas had already located Amyclaion town here by Machmud Bey south of the shrine hill, on the basis of various historic finds (1892:6). Christou's finds are noted in A. Reps. 1956(12-13) as just south of the Amyclaion, in BCH 1957 (548) as 1 km south of the shrine. However HS and W claim that these recent finds are in an area 3 km SW of the Amyclaion by Sklavochori (1960:82). In Ergon 1961 (174) we learn that the new finds begin in G times, thus furthering the view that there may have been an Upper and Lower Town which were both sacked by the Spartans in the post-Mycenaean Dark Ages. It will be important to note that a possibly Mycenaean sanctuary may have acted as a lofty focus for its main domestic settlement, and that the same pattern is known for the C and R periods; in the latter case it is clear that the settlement was either just west or south of the hill or in both directions i.e. amid the predominantly cereal and olive land today.

The situation of the Amyclaion site is simply put. The Amyclaion hill as all the others in this group, is like the Menelaion in having its surface form controlled by alternating bands of soft yellowy-red marl and conglomerate. The latter tops the hill rim and was skilfully incorporated into the C defence wall. One wonders why the Mycenaeans did not do the same for their centre on the Menelaion ridge nor indeed here if this hilltop was the centre for Homeric Amyclaion (cf. p. 226). To N and S extends the Neogen hill group - mostly rolling low hillocks of good fertility and covered with cereal and olive fields. An important observation seen with great clarity from the top of the site is the clear evidence that these hillocks are bordered on the east (Evrotas) side by a slightly sloping plane of land of great evenness, that ceases at a distinct point several hundred metres east of our hills, can be seen to parallel the hill chain and always at the same distance from it. This ends with a break of slope and a drop of $1\frac{1}{2}$-3 m on to a more truly horizontal terrace of contrasting character - the recent alluvial terrace of the Evrotas. The former plane is predominantly cultivated with cereals and olives and is lighter and clayier than the alluvial terrace with its accustomed irrigation and darker sediment features.

There is a road running south along the east side of the hill that takes one to the Vaphio site in half an hour's walk. It is clear, in this area, that the alluvial intervals mapped between each hill in the chain are much smaller in extent than claimed, and the major distinction between the limited river and stream alluvial terraces (irrigated crops) and the extensive pediment (cereals and olives) continues.

Vaphio is an impressive horse-shoe shaped hill complex, on one arm of which lies a fine LBA tholos tomb, on the other a very large (on surface finds) LBA settlement. Settlement occupation is attested for all three Bronze Age periods.

Summary of Excavations

In 1889 Tsountas reported on his excavations of the impressive LH2 tholos tomb, and various trials on the south settlement hill (1889:129), where he found pottery, obsidian and grinders, but, just as at Therapne (Menelaion), no Mycenaean wall remains. Bölte has, however, claimed that Tsountas found building remains (op.cit., 1332) contradicted in the excavation text. HS and W (76-8) and HS (1965) claim it as the largest settlement of Mycenaean date in Laconia, and one of the largest on the mainland. However it does seem more likely that the researches of Prof. Beattie and their confirmation by Catling and his team must put the Menelaion ridge settlement onto an even higher footing, both in terms of its comparable if not greater extent of Mycenaean occupation traces. Although the Menelaion ridge is only ½ to two-thirds as broad E-W as the Vaphio site, it is twice as long N-S, and Mycenaean finds are known throughout this vast area. It is also, in the writer's opinion, unlikely that the lower slopes of the Vaphio ridges were built up with houses, since the marl soil here is of superlative quality and abundant in its grain crops today, whereas the Menelaion ridge is clearly in an edge position as regards its major arable heartland below to N and W, losing only a small part of its food resources by a complete build up of settlement along all parts of its comparatively thin-soiled ridge. It is noteworthy that EH, MH and early LH are rare from the Vaphio settlement, the vast bulk of the finds being Late Mycenaean (3B). Although, therefore, we can safely attempt to relate this great settlement to one of the cities of Laconia in Homer's Catalogue of Ships, without having recourse as at the Amyclaion to yet undiscovered ancillary settlements, it is clear that the location rose to major status only very late in the prehistoric period. Even more remarkable is the very rich collection of finds probably buried with one male in the LH2 tholos, when that period is only poorly represented in the adjacent settlement: precious metal, ivory, amber, alabaster, iron - general links are Minoan and via Crete to the E. Mediterranean higher cultures (HS and W, loc.cit.). This pattern is none the less very common on the mainland. There is good reason to suppose a particular identification of the site with Homeric Pharis - indeed HS and W claim "there can be no doubt" (78). On geographical grounds in relationship to the indications of Classical authors this claim seems sound, though it does create some problems with the associated legendary Dark Age history of Pharis. Apparently the Pharis community was subservient to the Dorian invaders but not finally 'taken' by them till c. 800 B.C. and by King Teleklas of Sparta - implying a continuity of pre-Dorian occupation through the Dark Ages. It is attacked by Aristomenes in the second Messenian War during the seventh century B.C. (PW 'Phari', Brandenstein 1938:1807; Bursian 1872:130). There is no trace of historic settlement in any of the discussions of the archaeological site. Nonetheless the geography seems to point with clarity to the Pharis identification, and possible a Dark Age occupation lies undiscovered somewhere localised on the vast areas of the hill or in the near vicinity. In AD 1968, Vol. 23 (p. 152) LH2A was found on the Palaiopyrgi settlement.

The location is comparable to the Amyclaion though the settlement ridge could only be defended with difficulty - there being again no evidence for walling around the very extensive perimeter. A field examination of the landscape south-east, between Vaphio and a ford opposite Skoura (a village on the Evrotas left bank), shows no interruption of the almost level plane zone of lighter clayier soils with cereals and olives, till, just before the ford a tributary stream is met on the right bank. The steam is deeply incised into the plane and the latter's eroded edge is revealed as a sheer wall of conglomerate exposed about 5 m high above the torrent, forming the structural basis for the whole terrace. The conglomerate is of the Neogen type. Again all this area is assigned to undifferentiated 'alluvium' on the geology maps. In fact at this point the recent alluvial terrace is not present at all beside the laterally cutting Evrotas river or its tributary.

From the field evidence cited so far it is now quite certain that the central hill chain was not swamped in Taygetos alluvium - it rests or rather rises out of a giant, almost horizontal, plane of Neogen conglomerate and marls (dipping slightly to the south, as all formations in Laconia, and even less noticeably east to the Evrotas). This pediment surrounds and underlies the median hill chain already recognised as Neogen by previous writers. The false identification of the pediment plane as alluvium/colluvium can be accounted for on various grounds. Firstly, on topography - the plane is very even and almost horizontal - as are the adjacent but lower recent alluvial terraces; furthermore, there do exist areas of slope-wash between the hills and derived from their weathering. Secondly the process of weathering: the well-developed marl soils are brown humus and this is easy to confuse with the colour of recent alluvium. Older weathering, chiefly due to Ice Age 'pluvial' processes, gives much of the superficial layers of the Neogen, both here and throughout Laconia, a garish red colour, which is easy to confuse with the equally and contemporaneously weathered levels of the Older Fill (cf. Geomorphology Chapter). Only more recently eroded Neogen seems to be bereft of such colouration. Philippson (op.cit. 450) notes that the upper levels of the Neogen in the Southern Plain have this characteristic bright red hue and the same is noted of the Menelaion plateau (451). The Sparta plateau has extensive zones of red-weathered Neogen, forming the virgin soil for the Acropolis dig (Woodward, BSA 1923-5:241, 244) and the Orthia dig (BSA 1908-9:6). The Older Fill proper is to be sought as making up the massive fans visible as a piedmont feature at Taygetos foot, and is distinct from this basically in situ weathering of the Neogen; the Younger Fill is confined in the plain centre to a large terrace along the immediate banks of the Evrotas and smaller terraces along its tributaries, and the N-S depression running through Sklavochori village. As far as concerns the Amyclaion and Vaphio prehistoric sites, therefore, they dominated large areas of gently rolling or nearly horizontal marls, with small conglomerate scarps, and the stepped but fertile hillock line. These light rich soils were then as now preferential cereal and olive areas, and this pattern fully confirms previous soil/prehistoric site correlations made by the writer in other study areas (see Soil Chapter).

Natural Features and Early Settlement from Skoura East to Melathria village and from Skoura North to the Menelaion along the East Bank of the Evrotas River.

There is a recently discovered Mycenaean necropolis behind and east of Skoura, near the village of Melathria. This Skoura hinterland is an inlet of low marl hilland within the loftier and infertile plateau already described in the Menelaion discussion. Not surprisingly therefore we have here the modern villages of Skoura and Melathria, and probably an important Mycenean settlement to be located near the latter, to judge by the evidence of the necropolis and its surrounding fertile region of marl soils. Various occasional finds of ancient historic time in this area should also point to continuing interest in the good soils of this zone after the prehistoric period (see A. Reps. 1958/9:9). The prehistoric evidence is confined to a series of chamber tombs of Mycenaean date discovered in the low slopes of a curious peak called Profitis Elias (about 4 km from Vaphio). The peak is to all appearances of heavily metamorphosed crystalline limestone and rises up to local conspicuousness from the surrounding Neogen. Its lower slopes are encased in softer marl, and it is in these that the tombs had been hollowed. They are five in number, probably fairly wealthy, and incompletely robbed, of LH3A and B date; they point to an important local community (A. Reps. 1968/9:17; AD 1967:197). Most of the hills around are very fertile - though for reasons noted before - crops are limited to cereals and olives. The centre for this cemetery is doubtless close by, perhaps at the Melathria village location.

From Skoura northwards to the Menelaion, along the left bank of the river Evrotas, the following landscape is encountered. Most of the way only a small alluvial terrace separates the river from the sheer cliff of the Neogen plateau to the east, but here and there an area of marl hillock downfaulted from the plateau remains unharmed by the laterally cutting river. The river face of the Menelaion ridge is particularly sheer and justifies the Alkman phrase — 'well towered Therapnae' (the name for the plateau zone of the Menelaion anciently) (Curtius 1851/2:140).

Detailed Field Examination of Natural Features in the North Central Plain between Sparta and A. Ioannes, Kouphovouno and the River Evrotas.

The evidence from field transects will clarify the extent of the hitherto unnoticed but large Neogen terrace that seems to form all the central plain, and account for the apparently complex situation existing around Kouphovouno (see above p.384). Between Sparta and Agio Ioannes (to its southwest) for example, the landscape provides a sequence east-west as follows: Sparta-Magoula river - Second Alluvial Fill terrace - 2 m abrupt rise on to lighter clayier soils with red/white/yellow colours, which form the undulating land around Kouphovouno and which rise slightly to the west: from here, dark alluvial silt, again slightly rising to Agios Ioannes - finally further west steep and stony red piedmont fans at the Taygetos mountain foot.

As will be demonstrated later, field examination shows the last named formation to consist of a series of giant colluvial/alluvial fans and slope-

foot sediment, running along the whole length of the valley at Taygetos foot. The apex of the fans may be over 120 m above the plain, and the breadth N-S on the larger ones e.g. Kalyvia over 2 km. Without exception these piedmont structures are very stony and the great mass of the deposits is highly cemented, bright red in colour. In all respects they are typical Red Bed deposits of Glacial (mainly Würm?) age and arose from massive slope wash and riverine overloading in periglacial and/or pluvial conditions (see Geomorphology Chapter and pp. 388, 395). The cemented Older Fill of this piedmont is clearly distinct from the Neogen conglomerate already extensively noted in the plain and on the Menelaion plateau, in unweathered colour, the number and size of coarse inclusions, topography (e.g. the almost horizontal 'plate' of the Neogen detected along the Evrotas - cannot in our present knowledge be due to any process hitherto known to operate in Older Fill origin).

Important evidence on recent landscape evolution exists along the Pandeleimon stream which flows just north of the Riviotissa hamlet, south of Sparta. In separating out geomorphic deposits, following a major feature like a watercourse allows the key terraces and soil changes to be made most prominent by repetition. If we begin at the main road (running N-S from Sparta to Gytheion), standing on the road bridge over the stream, along the road's path a clear doming is visible, commencing to rise from the Pandeleimon bed both to north (culminating in the Neogen hills of Sparta) and to south (culminating in the first of the prominent central valley hills - capped by the A. Georgios chapel). Let us now proceed downstream and eastwards towards the stream's junction with the Evrotas: on both sides we have a low and not wide recent alluvial terrace, generally dense with irrigated crops, then the ground rises to N and S on to the Neogen plane. Normally here, though, the scarp is hidden and a sudden rise in ground level topped with lighter clayier soils and heavy cereal and olive growth is the main indication. However when we get to the Evrotas the scarp facing the main river is that clear miniature cliff of conglomerate, here 2 m high, so we are left in no doubt about its continuation under the rest of this plateau behind. Next, from the main road again let us follow the Pandeleimon stream upstream and westwards in the direction of Kouphovouno, and on the stream's right bank we observe the usual clear difference between the immediate bank deposits on either side and the plateau further back and higher up. On the latter, with its characteristic yellowy tinge, the writer found a fresh drain-cut packed full of Red and Black Glaze pottery and tiles, while all around was a dense scatter of domestic pottery - a settlement of the A and C periods here might accord with the known location somewhere in this area of Classical Alesiai (hence the renaming of a nearby hamlet), while the fact that the bulk of the surrounding soil is our plateau Neogen and derived marls is of interest for locational preferences in historic times.[5] From here, if we descend east down the Neogen scarp to the narrow Historical Fill terrace and examine its face against the present stream bed - at this point the latter terrace is found to be 2 m high. The ground rises noticeably from the main Pandeleimon stream after the alluvial terrace is surmounted, and the doming is that already noted on the main N-S road. Among the smaller undulations that make up the gradual rise is the Kouphovouno hillock.

Cutting back to the west, we come across a small stream that enters the Pandeleimon on its right bank, and from the SW, having passed along close by the Kouphovouno site. Immediately above the stream bed and right on the perimeter of the Kouphovouno site, is a fresh alluvial terrace about 2 m high and 2 m wide; above and behind this rises a scarp of equivalent height but of yellowy/white marly sand. The upper zone of the latter is brown and shows good humus development, but the lower material of the latter - obviously Neogen, is part of the same body that was earlier recognised as forming the Kouphovouno hillock. To account for the varying shades of red, white, yellow and brown on the site and surrounding hillocks we can envisage a series of folded Neogen hills, weathered in glacial/'pluvial' conditions to shades of red, partly eroded by the postglacial climate and ploughing activities (especially on the hillock summits) - hence the original yellow and white coming through, finally developing in places a brown humus. The same area of landscape approached from a different angle provides full confirmation for this interpretation. If we take the Sparta to A. Ioannes road once more, we first surmount the scarp after the Magoula river that, examined earlier, was clearly the southern edge of the Neogen plateau there. We next cross over the Pandeleimon stream. Just before the bridge over the small Kouphovouno rivulet, tributary to the Pandeleimon, and where that stream is above the site in its course, if we travel to the east we meet up with the same rivulet at a point shortly after it has flowed past the site. At this point the rivulet is eroding a Neogen scarp a full 4 m high, while in places a $1\frac{1}{2}$-2 m high recent alluvial terrace sits unconformably at the scarp foot. The mighty scarp is c. 90% yellow clay, the rest small stones, and shows, just as the Vaphio-Skoura scarp demonstrated, the structural importance of the 'plane' in the bulk of the Sparta valley surface. In the clear rolling topography of this part of the Plain we may be observing that which led Philippson on apparently superficial analysis of the area to note a 'conglomerate' line of hillocks between Taygetos and the central hills (op.cit. 453).

In order to facilitate the mapping of the various natural features of the plain in relationship to the location of prehistoric settlements, the Neogen scarp by the Evrotas had to be precisely traced so as to estimate the extent of historical alluvial fill. The results of this mapping can be seen on Figure 3, and since we are subsuming all this low plateau into the category marl and derived soil, the contrast with accepted area classification for the plain (cf. Figure 1) is striking, though fully justified we believe from exhaustive field observations.

As a result of these accumulated field observations we are led to a considerable deviation from the accepted picture of the various constituents of the landscape, and further to the important conclusion that the Evrotas plain is for the most part not alluvial in character, but merely a tectonic event on older deposits. A corollary of this is that the concentration of settlement in the centre of the plain was due to the preference in both prehistoric and historic times for extensive and relatively undissected soils of origin in lacustrine sediments of Neogen age. The favourable properties of such soils in comparison to the hard limestone soil and the Older Fill of the piedmont zone we have already noted and

discussed (see Soil Chapter) while the key arable soil at present — the recent alluvium (as is shown in other study areas and will be shown later for the Sparta region), was absent during these periods.

The Sparta Plateau 'Island'

The site of Classical and Modern Sparta is surrounded by watercourses. The Evrotas and the Magoula pass by its east and south-west sides and flow together at one corner of its 'island', while the deep depression occupied by the small Musga stream cuts it off from the steep hill chain (also of Neogen) running from the NW and of which the Sparta tongue is the last outlier before the plain. The island thus formed is composed (rather as we have constructed the central plain) of an underlying level marl plateau with a scatter of low marl and conglomerate hills over its surface. The largest of these hills forms the ancient acropolis. According to Bölte (1350): in general "Sparta [is] an ellipse, even surface, c. 15 m above the Evrotas depression". Under threat the Spartans may have been able to divert stream waters so as to create a good moat around the island. Presumably the steep course of the Magoula river allowed its temporary diversion into the Musga, in the same way that it allowed ancient aqueducts to bring water right into the centre of the town. Bölte (135ff) mentions possible traces of ancient channels of this nature. A stone wall seems to have been built around the town only in late Hellenistic times under Nabis. (Bölte [1356]:317 B.C., first defences probably only a rampart and ditch; Nabian wall early second century B.C.). However the oft-cited opinion that Sparta had no need of fortifications ignores the patent fact that the island possessed battlements of considerable strength provided by nature. By the famous sanctuary of Artemis Orthia at the north edge of Sparta, above the Evortas, it has often been noted that a sheer Neogen scarp appears running south. At this point it is c. 3-4 m high, and about 100 m from the river bed. To the south the scarp is clearly visible as an indented wall varying from 3-6 m in height and from 100-300 m distant from the present river bed, until it sinks down to c. 1 m just by the confluence of the Evrotas and Magoula rivers. Above this fine feature is found the marl plateau of Sparta, a good rich yellow-brown silt devoted in the main to cereals and olives. On the geology maps all this large area was assigned to 'alluvium' and not separated from the Evrotas terrace silt.

We can say, then, that the Dorians chose a fine arable area for their settlement, in the dark years following the collapse of the Mycenaeans and the abandonment of the Menelaion centre on the cliffs above to the south-east (that almost certainly included this area in its territory). This would reinforce the case of those who derive 'Sparta' from 'sown-land', since without doubt both to the Mycenaeans of the Menelaion, as to the Spartans of the Classical and Roman town, the heartland of their fields was the island plateau on which the modern and ancient town was built, and the continuation of the Neogen 'pediment' south of the Magoula as far as the hills of the Amyclaion, over all of which distance we have mapped its perimeter scarp. (Cf. the etymology of Tozer [1873:284] and Bölte [1929: 72]: "sown ground".) It is no surprise that while Mistra totally

eclipsed the Sparta site, and the latter plateau was almost without settlement, Leake on his visit should note (1830:153): "All level parts of the site of Sparta cultivated with corn". But just as the Menelaion possessed natural defences of sheer conglomerate benches in the Neogen, and as far as we know from excavations hitherto, was unaided by walling, so the scarp around Sparta is a significant barrier to attack - especially the extent south of the Orthia sanctuary where it towers sheer for 6 m above the floodplain deposits.

Summary of Excavations

By 1910 Dawkins could report that only one Mycenaean gem from the Orthia site testified to a pre-Dorian occupation of the Sparta plateau (HS and W 1960:70) but in fact several appear in the final report (1929). His Acropolis dig produced about 25 LH3B sherds (BSA 1926/7:79) and HS and W note the sporadic appearance of more Mycenaean pottery since that time in various excavations, chiefly of the Greek Archaeological Service, on the Acropolis again or to its south in the area of the recent stadium (70). Odd sherds have also come up in some of the excavations even further south in the area of the modern town (mainly the work of Christou). Dark Age occupation is attested from PG through plentiful G into historic times. HS is unduly cautious in his Gazetteer (1965): it is apparently a smaller community to sites such as Vaphio and the Menelaion. But one can hardly doubt that despite continuing investigations by many archaeological teams no important settlement or structure of Mycenaean age is likely to be found on the plateau, despite its later significance. This should surely be no surprise for its fertile marl area was certainly under the immediate control of the very extensive Mycenaean settlement across the river at the Menelaion. It is probably the failure to recognise the Menelaion as Homeric Sparta that leads HS to leave the Sparta site of uncertain significance. Nonetheless, as was pointed out earlier, HS and W cannot dismiss the plateau as being a place "where one would not in any case expect Neolithic occupation" (70) in the context of the possible Neolithic stone idols and vases either from here or, as they prefer, from nearby Kouphovouno. The fertile expanses of marl would certainly, as is known throughout Greece, have attracted the attention of early farmers in Laconia, and if it is natural in Greece for dispersed burial to mark fields, one or two burials might be a possible source of these finds and from some corner of the plateau. In conclusion it is very likely that the plateau was cultivated and probably the site of temporary occupation for that purpose as early as the Kouphovouno settlement and through till historic times. The Sparta 'island' being only 2 km away from Kouphovouno, i.e. less than $\frac{1}{2}$ hour on foot, could easily have been within the field zone exploited from that prehistoric site.

The Taygetos Piedmont Zone and the Site of Kalyvia Tis Sochas

The correct interpretation of a natural feature can often depend on the method of approach, both in theory and quite literally. A good case of this may be cited with an account of the natural environment of the village of Kalyvia Tis Sochas, where a C sanctuary has been excavated, and

a Medieval tower and fortress long recognised on the cliffs of Taygetos above. We have already described the main points of note about this piedmont zone at the Taygetos mountain foot (see above pp. 374ff). From previous experience and general topography one would immediately expect to find large Older Fill fans and colluvial deposits, but the journey up to Kalyvia from the Sklavochori village to the east is confusingly one through a steeply rising fan of dark fresh brown silt, that can be none other than the Younger historic Fill. No other deposits are visible to north or south as one enters the village from this direction. However from the Menelaion there are clearly visible a number of bright red stony fans on this piedmont, and the whole zone had so been characterised by previous visitors to this part of the valley.

Since the origin of the different forms of alluvial/colluvial sediments to be expected in this zone should be closely connected to the alternation of steep cliff and mountain gorge directly above to the west, more data on local landscape evolution can be obtained from a different approach, a series of traverses north-south along the whole length of the Taygetos piedmont. It transpires that where cliffs are present with only rivulets and scree falls interrupting rock faces, a simple steeply sloping colluvium is met below the cliffs, of typical Older Fill nature - red and stony, not extending far into the plain. This is the norm e.g. for the area directly behind Katsaru and A. Ioannes (see maps 2 and 3). But wherever a major torrent issues from its gorge onto the plain, a mighty Older Fill fan has built up, a major feature to surmount, and whose radius both N, S and E is often one or two kilometres. The present day torrents have in all cases incised these big fans, and on either side of their stony beds exist more recent terraced alluvial deposits of dark, silty Younger Fill, that are being actively removed by the present courses. In many cases the proportions of the heavily cemented Older Fans are so mighty that they have caused subsequent torrent courses to take the easier path of running off down their sides rather than along the highest parts of the fan. As Vita-Finzi has described this juxtaposition of the two fills - the Younger alluvial sediments are 'nested' into the incised portion of the Older. Unexpectedly extensive recent sediments at Kalyvia can thus be resolved, for the normal approach to the apex of the fan and the modern village is via the course of one of the present torrent beds, which is surrounded by a nested historical fill. Since the power of this torrent is considerable, the extent laterally of the Younger Fill prevents one from seeing the vastly greater mass of Reds that forms the bulk of the fan beyond - only a side approach can show how comparatively insignificant the historic contribution has been on to the older structure.

Though our main study is the prehistoric landscape and settlement of the valley, attention must be given to later sites for comparative patterns of settlement and land-use, and also in a search for confirmation of the age of the historical fill. If, as elsewhere, the Younger Fill can be shown to be post-Classical, then its deposits have to be removed from consideration for a reconstruction of the earlier prehistoric environment. Kalyvia is of interest in both respects.

Already Von Prott located the sanctuary of Demeter and Kore/Eleusiniai here on the basis of the topography of the visit of Pausanias and ancient inscriptions from the village (1904:8). In BSA 1908/9 (12ff) Dawkins describes finds from a stream terrace by the village: the channel sides showed low down a layer of earth with numerous votive offerings of H date, 1.5 m below the stream terrace surface and below earth and stones of clearly alluvial sediment. The behaviour of the main (south) torrent is erratic and dangerous to the village at the gorge mouth, and there is a record of destructive flooding. In one such outburst, in 1947, a large area of the village was swept away and an extensive zone of land had its surface soil removed by a new branch of the torrent, sweeping laterally and northwards from its old bed. In the sides of this new bed appeared ancient walls, and many other antiquities emerged, pottery and metal votives, and were in some cases carried hundreds of metres downstream. The BSA carried out excavations after this devastated zone had been partly buried again by later gravel fill. (J.M. Cook, BSA 1950:261ff). They revealed further traces of the sanctuary of the Eleusinion. A close study of the area today and of the information given in the dig report makes it quite clear that recovery of all the buried objects took place within that limited zone of the fan occupied by 'nested' historic alluvium. Secondly there is a marked difference between two recent river deposits in this area; firstly we group together the new incised river-bank terrace of the Younger Fill and the alluvium that, unaffected by the erosive violence of the new torrent branch, surrounded the excavated ruins. Secondly, there is the material being brought down by the present torrent and the gravel fill that partially reburied the exposed antiquities. Both groups are quite different from each other but internally identical. This is as clear now as it was pointed out in the 1950 dig report. The latter, modern, sediments are little more than coarse stones with scarcely any fines admixture, but the former are fine deposits with well-bedded lenses of small stones.

While some of the ancient wall remains had been dislodged by the flood, other parts were traced by Cook into the undisturbed terrace of the historic fill, where they were exposed in situ at a depth of 2.8 m from the surface of that terrace. The bulk of the associated finds were Hellenistic but some rare A/C pieces were found. Presumably, since the sanctuary was in use in Pausanias' time (second century A.D.), Roman levels will be forthcoming from as yet unexcavated areas of the site. Indeed, the structures and small finds so far discovered seem to correspond to ancillary buildings - while the main ritual area is probably to be sought NW of the present village. The present writer's interpretation of the sequence of events is as follows (Cf Geomorphology Chapter).

During the last Ice Age and possibly previous glacial episodes, periglacial/pluvial processes led to a massive load of very varied sizes of sediment being supplied to the two Kalyvia torrents. To cope with such an additional burden these streams steepened their grades to a sharp slope so as to use gravity to help in sediment removal. They did this by building up this enormous fan. The fan, owing to compression and the strong lime constituents in the percolating water, turned into a cement

conglomerate, and contemporary weathering gave the stony clay its characteristic red colouration (see p. 388). During the succeeding Holocene period incision was dominant, as a considerably slackened bedload freed the energies of the streams, and they cut down into the great fan. Between the two torrent mouths was established, at least by the Archaic period, a sanctuary, that continued to flourish up to the visit of Pausanias in the second century A.D. During or subsequent to the Hellenistic age, the torrents began to receive increased bedload again, though this time a finer sediment, and the torrents themselves appear to be less erratic and violent than in the glacial phase of alluviation. Yet again the streams adjusted by building up their bed with an aggradation of this new sediment - in so doing burying H and earlier (and one might suspect also Roman) structures below alluvial deposits of more than $2\frac{1}{2}$ m thickness.[6] (Roman - on the general terminus post quem for the vast bulk of this recent formation). At the same time the great axial depression to the east, between the base of the piedmont and the blocking Neogen hill-pediment zone, was filled with fine alluvium and acted as a local base level for alluviation in the absence of easy sediment removal into the Evrotas. Subsequently, the flow of sediment decreased, and the torrent assumed its present character, eating into its old alluvium - and only after exceptional bursts of winter torrent energy dropping a little of its gravelly bedload.

Further Alluvial Data from an Ancient Suburb of Sparta

Further evidence to confirm the late date of the Younger Fill can be found in another early excavation by the BSA. As part of their investigations into the topography of ancient Sparta, members of the School in the opening years of the century carried out extensive research in the area of ancient 'Limnai' (marshes) on the NE edge of the Sparta town plateau, and directly over the Evrotas. Many trial trenches and field observations were made, and as often with the team of those years, open contradictions appeared in print between each member's report on the excavations (BSA 1905/6:277ff: "Excavations at Sparta": Bosanquet, Wace, Dickins et al). However a careful examination of their data combined with the author's own studies there, allows of the following reconstruction of events in this locality.

First, to localise it, we are looking at the small area bordered by the Neogen scarp on S and W, the Evrotas on the E, and with the Orthia sanctuary at its S end, the modern road bridge over the river at the north end. In this depression were found numerous traces of the Nabian city wall, a Heroon, a great altar, various tombs and sherd finds and the Orthia sanctuary.

The great altar offers us the clearest guide to landscape history in this depression (op cit : Dickins 295-302). It was discovered poking out of the riverbank, its top almost a metre below the top of the river terrace, and its base reaching to the bottom of that terrace exposure - giving the height of the terrace as 2.6 m. The altar is rectangular and broadly orientated E-W, and at the west end (hence the end away from the river) a flight of eight steps led up to the altar top from a paved floor. There were clear signs of mixing of the lower deposits by fluvial action,

and lenses of river sand were found on this side. Dickins, who describes the excavation, went through some odd contortions to explain away these steps and restored the original ground surface as at the level of the altar top. He suggested that the H ground level was originally at the altar top; later on the steps were added (perhaps in the Roman period) in a localised temporary depression behind the altar, which he claimed had been created since H times by a limited incursion of the river (300). Wace however confirms the obvious by pointing to traces of a road, drains and a wellmouth further along this river terrace, at an identical level to the bottom of the altar steps and of H and R date.

Dickins held that the ground level had only altered by c. 0.7 m, and that by recognisably recent alluvium of clearly post-Roman age which overlay the altar top. He had to admit that the steps were surrounded by alluvium and were laid at a time when the ground was almost 3 m below its present level. But Wace excavated various structures and occupation surfaces to the south, buried in the same alluvial terrace, between the altar and the Orthia sanctuary (BSA 1905/6:284ff: "The City Wall"). The Nabian late Hellenistic wall was encased in alluvium (appearing "in the river bank" here and north of the Great Altar - cf. also Dickins:295), clearly later in date, for inside the wall the road running along the defences was found 1.4 m down in the terrace, together with a wellmouth at the same depth (in secondary use for rubbish from H into R times), and a drain through the wall - again at 1.4 m. These features point convincingly to an old ground level buried within the terrace of at least 1.5 m down in both H and R times, and this fits neatly with a lower level for both periods at the altar site. Indeed Wace specifically compares the pavement found west of the altar and on which the claimed 'Roman' steps were built, with the street level within the H wall further south, though it is at a lower level in the alluvium. His explanation is that, in this area, the street is later (when more alluvium had been deposited) - but it is clear that all the buried features noted included artefacts of both H and R periods. It is far more likely that the difference in depth between contemporary finds reflects an undulating old land surface, and as we will see shortly, the Great Altar dig proves that post-Roman alluvium could be at least 2.6 m deep. Again the same irregular underlying pre-occupation surface, which is always beneath the alluvium but at different depths according to rises and depressions in the former landscape, accounts for a C pithos burial found by Wace 1.9 m down. This buried surface can appear as weathered marls (often red-tinged) covered directly by alluvium, or occupation levels may form a sandwich fill between the two. Dickins admitted to alluviation to about 2.5 m height on the inner side of the altar, but it is obvious from his photos, descriptions and the area today that on the outer side, facing the river, the altar was found projecting out of an alluvial terrace, i.e. the whole structure was encased in what must be more than 2.5 m of post-Roman alluvium, deposited at the same time as the structures of Wace were being covered up. Wace notes a definite stratigraphy for the finds on Limnai: above virgin soil (which is noted in detail only at the Orthia site - where it is a stiff red clay i.e. Older Fill slopewash or weathering on Neogen marl) - at c. 3 m upwards for less than a metre (e.g. Orthia and Heroon) G finds then, 2.3 m and upwards the

Greek material (A/C) begins and continues up to c. 1 m from the surface. Since we can demonstrate that the river is likely to have flowed more than 2.6 m below all the excavated remains in this area during H and R times, before rising by that much in the succeeding period, and since these constructions and occupation levels should be well above the average river level, while the G finds would again surely reflect a contemporary site above the river in the range 3-2.3 m below today, we are justified in claiming that the Evrotas flowed between 3.5 m and 2.5 m below the maximum high level recorded by the recent alluvial terrace top, throughout the period G to R. Therefore these depth figures of Wace do not relate to phases of alluviation at all, but to artificial levels of occupation above an undulating palaeosol of fundamentally pre-Holocene date, covered later by the recent alluvium of Roman and Medieval date which then formed at a locally uniform height above the present river bed. It is only subsequent to the use of the features excavated by Wace and Dickins that alluviation can be shown to have taken place: the remains of the superstructure of the altar platform lie in the surrounding alluvial sediment at the same level as a Medieval grave, and demonstrate that most of the alluvium should have been laid down after the Imperial period and by the Middle Ages.

There is really no doubt from all the finds in this area, that from G times through to R times the land surface along this depression was generally 2-3 m lower than at present — that it was then above the river, and that throughout this long period on this low ground by the Evrotas were constructed walls, sanctuaries, wells, roads. Burials were also made into this old ground level in e.g. the C age. After the R period the whole area was buried under a fine river silt to a notable height, and within this and about two-thirds of the way up in the alluvium immediately alongside the altar was found an 'early Medieval Christian tile-grave'. At a later date the river began to incise into its alluvium, leaving our terrace at its present 2.6 m above the bed. Due to lateral erosion by the Evrotas these monuments are once again exposed. Upstream, above the new bridge, where the Kelephina joins the Evrotas, a very fine alluvial terrace of the same proportions can be observed today. That the alluvial terrace further downstream from Sparta is, as we saw, much lower in height is due to the great width of the bed here, a couple of hundred metres of horizontal alluvial terrace surface replacing a mere fifty or so.

The data from the Artemis Orthia sanctuary and theatre is very much more confusing and the interpretation of the excavators altered without discussion with each new dig report. Many details of stratigraphy and the nature of the deposits met remain completely unexplained (Dawkins BSA 1905-6:303ff; 1906-7:44ff; 1908-9:6ff; 1909-10:18ff; full publication as 1929 Orthia volume). The final view was that there had been continuous occupation on the site from the G period to late Roman times, demonstrated by a vertical archaeological sequence with a depth of 3 m, beginning from just below the present ground surface. Lenses of gravel, once seen as periods of river overflow, were later accounted for by the deliberate practice of bringing quantities of sand on to the site to provide for a well-drained foundation for rebuilding, and to keep the site from waterlogging. The whole sequence, which would then have been mainly artificial 'tell' of occupation debris, was finally covered (presumably) by river

deposition in post-Roman times. We must state 'presumably' because the excavators were very vague about the nature of the surface layers, though in the light of the present writer's visit and the known sequence at the same level on the rest of this alluvial terrace we may have little doubt that this was in fact the case.[7]

An interesting piece of information comes from this dig, that the 'virgin soil' below the G earliest occupation level, and at or just below the present riverbed level (we lack data on the absolute heights as well!), was a red clay rising slightly to the abrupt Neogen scarp on the south and west of the sanctuary. Here in a small area of landscape is our sedimentary sequence as it is known for all the Mediterranean — Older Fill weathering features of great antiquity (here at least pre-G but we know it is pre-Holocene), in this case weathering of an 'Older Fill' type, i.e. under Glacial climate, on in situ older formations, contemporary to the actual deposition of similarly weathered sediments — comprising the 'Older Alluvial Fill' proper elsewhere; then in Late Roman times or afterwards renewed aggradation of a fine dark silt which is at present being incised. The Limnai area was notable for its reeds and was from its name little more than a slight shelf above the river, of no agricultural value and reserved for shrines. Bölte notes (1929:1352) that no part of the plateau of Sparta could be called swampy, and surely includes as is appropriate the alluvial terrace in which all these finds were made. Certainly the evidence just discussed accounts for the earlier appellation of marshes for this area, when the river was probably at about its present absolute height but the various monuments of Limnai only just above it and afflicted with water-logging. This palaeosol surface below raised alluvial terrace is necessary to re-establish in order to explain the appellation of the ancient Limnai — a low, wet, river-side area. Once the recent terrace was exposed by renewed incision which left it at a good height above the groundwater level, the fine alluvium was ideal for irrigated cultures, and when the BSA team first visited the area in the early twentieth century, they found "a hollow of luxuriant fertility that surpasses even the water meadows with their deep crops of vetch and clover that line the bank higher up". (As we come down off the Neogen plateau...) "olives yield to mulberries, gardens of cucumbers, melons, oranges and peaches" (Dawkins BSA 1905-6:303). This change of emphasis in crops and land fertility reflects as in a microcosm the Mediterranean picture, the dichotomy between ancient and modern agriculture and their respective farming landscapes, and giving further a chronological significance to the soil and crop changes noted in spatially distinct zones of the Plain at the present time.

The Environs of Sparta to the North, and Natural Features from Sparta North-West to Mistra

Behind and north of Sparta the Neogen plateau is comparable to the Menelaion hills, with sporadic patches of cereal fields and grazing, but if we proceed to the ruined medieval city of Mistra, to the north-west of Sparta,

with the exception of recent alluvium either side of the two major torrents crossed (Magoula and Pandeleimon), all the intervening land right up to the long recognised marl hilland by Mistra, is a marl plateau rising moderately steeply to the NW, and one enormous olive forest with cereals grown under the trees. Again this area was mapped as undifferentiated 'alluvium', but here only small areas of Older Fill slope-wash and in situ weathering of reddy-brown colour interrupts the yellowy-light brown, silty/sandy clays developed on marl and sands. Below Mistra itself and southwards along the Taygetos foot to the village of Parori and A. Ioannes, the proximity of plentiful springs (due to the notable schist exposures beneath the limestone here) has led to intensive irrigated culture on both marls and the locally predominant Older Fill. The abundance of good soils and water supplies add support for those who would see the ancient finds in Mistra (chiefly inscriptions and marbles) and its environs as remains of a C or R community rather than Medieval stone-robbing, and we should suspect prehistoric interest in this area also from the evidence of soil correlations and the spacing of known sites. Leake and Wyse (see the latter, 1865:168) agree that the Mistra area of the plain is too advantageous a location to be without ancient settlement, and suggest that here may have lain the Homeric city of Messe (whose site was unknown to the ancient world).

Natural Features from Sparta southward to the site of A. Vassilios

If we head due south down the valley from Sparta town and along the main Sparta-Gytheion highway we pass two surface sites beside the road; on the sides of a steep Neogen hill bissected by the road a little north of the vicinity of the Amyclaion, may be found plentiful C and later sherds; before the road passes Vaphio, again on the left of the road, a low marl hill is covered with similar finds. The first site is around the hillock chapel of A. Georgios, and finds from this area have long been known. Von Prott (6-7) notes C and H marbles and graves, architectural fragments etc. and identifies the site with a shrine and its associated settlement - possibly that seen by Pausanias, of Zeus Messapios, which Stephanus Byzantinus noted as a village of Laconia (Messapeai). In Deltion for 1968 (152) an LR cemetery is reported from this location. It is mainly important for us to note yet another example of an historic settlement in use perhaps from C through to LR times amid the fertile Neogen hills. The unnamed site by the main highway, near Vaphio and to its west, may also be that noted by HS and W (81) in this approximate area, (C and later sherds on a hillock). Again the locality is amid the Neogen low relief zone west of the main hillock line by the Evrotas depression. All the way from Sparta to the vicinity of Vaphio, we are accompanied on the east by extensive areas of the Neogen pediment, that often reaches up to, and a little across, the main road to the west. About an hour on foot further along the road southwards from the neighbourhood of the Vaphio site, the central Neogen hill chain sends off a side branch west across the main highway, heading off to link up with the marl plateau already mentioned as taking up the SW corner of the Sparta plain. At this point the road has again been cut through the hills, and on the west side of this cutting is a major prehistoric site, along the top of a large round hill of no great elevation - where sits the chapel of Agios Vassilios.

Limited pottery of EBA, MBA date culminates in the final Late Bronze Age period in a very large settlement with what HS and W claim as a defensive perimeter wall, and with possible Mycenaean chamber tombs close by. C and H finds are also attested. HS and W (80-1) note, interestingly enough, few EH and MH finds, and of LH they identify copious sherds, but only LH3B is recognised. In his Gazetteer HS only records, for LH occupation, LH3B (and a settlement then of 'considerable size', though less than Vaphio), thus implying the absence of recognisable material of earlier LH phases. Again, as with Vaphio, we have a small settlement rising without adequate local development to major status. Finds of C and H pottery are noted but are few and we have the 5th century B.C. inscription which was built into the chapel and is of uncertain origin (Von Prott:6). The whole area around for a considerable distance is fine low marl hilland and almost all cereals and olives. Considering the absence of a water-trap such as a schist exposure or any other signs of a locally arising water source, (not to be expected anyway from the geology), while the nearby stream is a seasonal torrent flowing from Taygetos, it is rather surprising to find HS and W suggesting that this admittedly important Mycenaean settlement could be the city of Bryseai cited in the Homeric Ship Catalogue, the name normally taken as singling out a location with good springs. Pausanias notes that the ancient Homeric town of Bryseai was occupied only by a temple of Dionysos in his time, of which the finds recorded by HS and others could conceivably be evidence. It is important to see that the very poor case made by HS and W for LH fortifications of the hill (their reconstructed giant circuit has barely three tiny wall sections to support its existence - see their Figure 5) fits well with their definite absence from Vaphio and the Menelaion and, almost certainly, also the Amyclai community. The HS and W walls could more plausibly be seen as ancient terrace walls or the temenos wall for an historic sanctuary on the hilltop.

Natural Features from A. Vassilios to the Ancient Sites and Modern Villages in the South-West of the Sparta Plain

From here to the south-west the landscape consists of gentle marl undulations to the village of Arkasadhes. At this village C and H/R finds have been reported, and, as is to be expected from the geology, only small areas have irrigated crops here. HS and W describe C pottery and H and R architecture and marbles from the church of H. Nikolaos (1960: 81) and note the belief of Kommenos that there was a Mycenaean tholos underlying the church. The latter suggestion would indeed be worth further investigation, supposing it to rely on tangible if slight evidence, but also for the appropriateness of a princely tomb for the Mycenaean centre in this part of the plain, which at least by 3B was located on Vassilios hill. Such a siting amid the fields of the territory of a Mycenaean prince is probably characteristic for most parts of the Mainland, though the Vaphio location - the tholos directly bordering the settlement - is a striking exception (paralleled however at Pylos).

A recent discovery is a major ancient site further south-west beyond Xerokambi, at Anthochorio, where by a chapel scanty amounts of Mycen-

aean, G, but copious A, C and H sherds came to light. The locality as much of the land around Arkasadhes, yet again was mapped as alluvial, but whereas in the latter case there really is no doubt on the ground that we are dealing with undulating marl hilland, simply with Older Fill weathering and slopewash in the depressions, and recent alluvium fringing the streams - here the immediate environs of the site appear very much like Younger Fill. However detailed field examination of adjacent areas of the plain to N, S and E showed that the fine dark soil was a very limited zone, and 100 m east of the chapel bright yellow marls broke to the surface to continue into the rest of the plain for at least several kilometres. The chapel knoll itself sat upon a Neogen bench, above which the brown soil had either accumulated or developed. Although the mountain slopes were in fact a couple of hundred metres west of the site, the author was unable to verify in the time available whether the brown silt was due to natural weathering and agricultural working of in situ marls, or entirely to wash from the clearly rapidly weathering schists uphill and to the west. However our detailed field examination of adjacent areas of the plain, taken together with the useful report on the site by the Greek Archaeological Service, accounts for the visible differences in soils centring on the ancient site. In Deltion 1961/2 (84) we learn that, although the central feature of the area, at the chapel, was an important Archaic shrine, there was located an extensive settlement from Mycenaean to R age, (also Byzantine - cf. Deltion 1963:86), and the perimeter of the occupation area was greater than 500 m. HS in his Gazetteer reported only LH (included LH3 but very rare) G, A, C and H. From the settlement remains (the Deltion continues) there was built up a low 'tell' centring on the chapel, where alone finds of all periods were noted; G and LH were found here, though in very small quantities, but later periods were found over all the extensive settlement area. LH is claimed to include all subphases. The soil changes are therefore due to accumulated occupation debris above what is clearly Neogen (from a conglomerate scarp exposure on which the chapel is built and open exposures in pits through the tell).[8] The arable land associated with Anthochorio lies to its east in the marl plain. The closeness to the rocky hills behind suggests a possible interest in the uplands for herding or even for seasonal agriculture - a system such as is practised today from the Xerokambi 'kalyvia' village nearby.

If we finally examine the adjacent piedmont villages it is clear that Xerokambi sits partly on exposed marls, mostly though on Older Fill fans, while the twin villages of Palaeopanagia and Anogeia lie as Kalyvia Sochas on the apex of a massive Red Bed fan. Behind Palaeopanagia a limited area of marls appears - the local 'Reds' however are derived mostly from the outpourings of a gorge in the crystalline limestone behind and above it. Altogether, no concentration of advantages, such as characterise other areas of the plain, may explain the scant interest in much of this piedmont till recent times. Limited finds of ancient historic activity along the piedmont region between Xerokambi and Kalyvia, and in the hills and 'Step' Plateau above, do not point (except predictably amid the Anthochorio Neogen area) to significant settlement in comparison to the rest of the Plain.

General Discussion and Interpretation

A glance at the site map Figure 2, compared to Figure 3, illustrates how 100% of the prehistoric finds in the valley are located on Pliocene marls and conglomerates (cf. Soil Chapter, Charts 1 and 2). In this we identify as an absolute rule the suggestion already quoted of HS and W (1960:69) that such a location is frequent throughout Laconia. We have further split up the Neogen into its fertile, silty/sandy, lowland component and that dominated by conglomerates and dissected relief. From this it can be seen how all the prehistoric sites, with the exception of the Menelaion, are closely associated with the more fertile component. The anomalous site will be returned to. As we have seen, this relates all our prehistoric occupation to that soil most favourable for the cultivation of dry-farmed cereals and olives, and this reminds us of references already in the Homeric epics to the palace of Sparti or 'sown-land', and to the 'wheat-bearing plain' of Sparti (Odyssey:3,495). We have further noted, that no evidence is available for significant human interest in prehistoric times in the Taygetos piedmont zone, while the Parnon hills are sparsely settled then, as throughout later history to today. The Menelaion location is overlooking its particular territory of very fertile land. The remaining zone of the landscape, the recent alluvium alongside the Evrotas and the Taygetos streams, and between the Taygetos piedmont and the Neogen 'plate' i.e. the Sklavochori depression, is never central to the location of prehistoric sites, and, as we demonstrated, was in all probability not in existence until late antique times. As regards other locational factors considered decisive for early settlement by many writers: the water supply question can be answered fairly clearly. Water scarcity is not a great problem in this region, for both the Evrotas and the Taygetos streams have continuous if meagre summer flow and together allow few parts of the plain to be far from running water. For a more secure supply it is, however, clear that the Taygetos piedmont is the best location, at the spring line (see discussion on page 376). We saw that springs were important enough to be noted in Homer and the later classics - a factor which nonetheless was less significant than soil zonation in determining the settlement preferences in prehistoric and ancient times. And on soil grounds the Taygetos piedmont is certainly not a natural location for prehistoric settlement. On grounds of defence, it may be argued with greater justification that the great acropolis sites point to a defensive priority from EH onwards. We can however point out (see below) that the limited settlements on these hills until Late Mycenaean times must imply numerous other contemporary settlements, in different locations, and, very probably, as yet unmapped as not visited by archaeologists owing to their lack of obvious 'acropolis' characteristics. Further we have seen the absence of, or feeble evidence for, walling even in Late Mycenaean times, whereas far more impregnable heights could be found up on Taygetos (e.g. Mistra). HS and W are certainly quite incorrect in stating (70) "the most prominent hills in the chain are the three Mycenaean sites of Amyclai, Vaphio, and A. Vassilios". Many other notable hills are available within the preferred soil area of the central Plain, while the latter two sites are provided with gentle approaches on several angles and are anyway

hardly massive steep eminences. Distance factors with the larger Mycenaean centres would also seem to be significant (see below). Moderately strong defensive positions were found advantageous in Mycenaean times for the main sites, though it is unlikely that earlier occupation on these hills was primarily concerned with such aspects of the Neogen hills chosen. In any case the prime reason for occupation was still demonstrably the surrounding Neogen soils, which continue to be cultivated with abundant harvests today.

The Neolithic period is represented for certain in our area merely by Kouphovouno; this is a commonly poorly recognised phase, though low absolute numbers of population could certainly be involved. Survey techniques can be shown to discriminate heavily against particular types of site (see Socio-Political Chapter). Our area of Laconia was surveyed by several 'acropolis-orientated' archaeologists, and to be fair to them the main centres in the valley hitherto known are of this nature, and in the opinion of the present writer preclude other major centres co-existing on different terrain. However the sheer abundance of sherds amongst the low Neogen hills is a relatively untapped source for the prehistory of our region and the chance find of Kouphovouno by Von Vacano in a typical N and EH location of a low hillock, actually looking for N and EH sites, is probably but the tip of the iceberg. As is fairly obvious, given the capability of Neolithic farmers to cultivate their preferred Neogen soils, there is in all probability a numerous group of contemporary communities awaiting discovery elsewhere in the Plain; for Kouphovouno can hardly have exploited a territory as large as the available soil expanses! (though HS and W seem to imply such a lack of other sites).

There are quite a number of EH sites in fact, but we have suggested from the evidence in other areas that this period was one of the dominance of dispersed farms, and the first occupation now of most of the later Mycenaean acropolis hills is likely to reflect the sampling error of sherding only on the latter, rather than the true distribution pattern. However these sites (and note that the Menelaion is not amongst them) might be claimed as already functioning as local centres. But there is no local evidence that a settlement hierarchy is widespread at this time, and these could be merely chance finds in an undifferentiated network of small sites, or farms dependent on a large lowlying centre. It is of particular importance, and this is not noted by HS and W, that the admittedly giant Mycenaean sites without exception replace very minor communities of EH, MH and early LH age. At the Menelaion a slight deposit of MH, at the Amyclaion a small earlier community in EH and MH times, at Vaphio rare finds of EH and MH, at A. Vassilios few EH and MH artefacts, lead without a bridge of corresponding settlement growth in early LH into the great late Mycenaean settlements. Without more excavation we cannot know whether, as in the Argolid, there is a possible pattern of MH sites at 'village' distances as compared to the small and denser 'farmstead' pattern of EH, and we have only the case of Kouphovouno, a location less obviously advantageous, to argue for the more peripheral location having discontinuous use in 'dispersed' periods. The topic is hindered by our data probably being limited to the generally con-

tinuous occupation of central and clearly important locations. Nonetheless it is quite clear from our general study of territory size, spacing and the extent of individual settlements at different phases of prehistory (Socio-Political Chapter), that the limited finds on the known EH sites correspond to small communities with limited field zones, thus forcing us to suggest either a neglect of more distant but highly fertile soils, or (more likely) a good number of EH sites awaiting discovery amongst the unobtrusive hillocks of the central plain Neogen.

Given such sampling problems, it is difficult to say much of changing aspects of small and large sites, and the recurrence of MH confined to these same acropolis hills, with blank areas of investigation all around, by itself is meaningless. We are driven once again to comment that evidence from the intensive S.W. Argolid survey suggested that the MH pattern was to abandon the farm and hamlet system and confine settlement bases to what could be widely-spaced nucleated communities, many of which are to grow into the later Mycenaean centres and which are often the sites of present-day nucleated villages. Our only hint of this is at Kouphovouno, where MH is not recorded, and at the Menelaion, where a small scatter of MH is reported from the recent dig as the earliest finds from the later major Mycenaean site. HS and W (170) suggest themselves, for other parts of Laconia, the traces of such a pattern - some smaller EH settlements e.g. in Mani, the Vatika Plain and Elaphonisi, are not reoccupied in MH; they also note the possible significance of Kouphovouno in this context, though one is surprised to read that the low hillock of the latter "may have been overlooked by the MH invaders" ! HS and W do note another common pattern for the Mainland, whereby Mycenaean sites are most frequently preceded by MH settlements, which is also often the first occupation at that locality. This is especially true of major 'acropolis' sites, and it is held that the Mycenaean dynasts rose to power in the Shaft Grave epoch and were already in late MH occupying or moving into 'Mycenaean-like' citadel locations. On this basis HS and W predicted that the major Mycenaean centre at the Menelaion would perhaps be found to have an origin in MH (HS and W, 1961:170). It adds further confirmation to the corollary suggested above, that lowlying smaller communities never destined to become local centres tend to be occupied in periods held by the writer to witness widespread flourishing of small dispersed farm and hamlet settlement (EH and LH). Kouphovouno is reoccupied in late LH times, and then also we find possible farm/hamlet sites at Sparta, Anthochorio, Aphissou arising to supplement the much better-known great centres of the Plain.

The LH or Mycenaean period is generally known over S. Greece, especially in its third phase, as an era of vigorous settlement expansion - though certainly this time in contrast apparently to EH, there were nucleated centres in control of large territories, within which many smaller sites seem to have been dependent. It is characteristic in many areas, that in later LH there is a return to the old dispersed small settlement locations, the low hillocks typical for EH, though the big centres are larger than ever - perhaps already a dichotomy Town-Country is developing.

This suspected series of changes in the point pattern of land occupation does not necessarily alter the total land area being farmed, and both throughout our area as others we have studied, when settlement seems to be more dispersed or more nucleated - people may live further apart but their fields could simply cover a greater radius from the base, or people could live closer and their fields exist within smaller radii. The general problem of recognising early LH pottery seems to have produced a picture over S. Greece of a hiatus at many long occupied sites. In many cases later and more detailed research has provided the necessary and indeed logical missing subphases of LH, and one would suspect that just as with the recent example of the Menelaion so the gaps at the Amyclaion (no LH1, doubtful 2), A. Vassilios (of LH only 3 clear) will be closed. Nonetheless it is still remarkably consistent that the LH3 occupation at all known sites is apparently vastly more extensive, even at the Menelaion if the available evidence is believed,and at the same time the smaller sites reappear e.g. LH3 first use of Anthochorio, Sparta, first use since EH at Kouphovouno. The appearance of the tholos tombs throughout the countryside in early LH, normally taken as a sign of the increasing wealth and influence of local princes, is not paralleled then in contemporary settlements, and HS and W comment with surprise on the poor LH2 finds from the Vaphio settlement to set alongside the wealthy tholos on the next ridge. The important Menelaion LH2 structures do help to correct this imbalance somewhat, though it is yet to be shown that this 'mansion' was in fact the centre of a great contemporary settlement - since the plateau site is apparently late Mycenaean over its vast area (cf. p 411). It still seems therefore as if the early Mycenaean period saw first a particular flourishing of conspicuous effort on monumental mausolea, together with the beginnings of modest palace structures, while the great climax of the Mycenaean kingdoms, with a probable diminishing of the importance of the local leaders in favour of the regional head and settlement centre, is to be witnessed more in the giant settlements and the appearance of a developed settlement hierarchy. The change-over particularly during LH2 may be connected to the fall of Crete at this time, the Mycenaean occupation of Crete and take-over of Cretan trade. The notable Cretan links recently emphasised by Catling in the finds from Agios Stephanos, Vaphio and the Menelaion in this key period reinforce this suggestion, covering as they do the crucial change of status in Crete and the Mainland (1975). The competition between the rising Mycenaean centres, culminating in the final predominance of the 'Sparta' Palace Centre within Laconia (localised as we shall demonstrate at the Menelaion), may be reflected in local legends, e.g. the mythical battle in the plain south of Sparta between the Dioscures (representing Therapne [Menelaion]), and the Aphareides (representing Pharis [Vaphio]) (Brandstein, PW 'Pharai' 1938:1807-8).

Having criticised the poor evidence for the smaller and earlier sites, we can still make some interesting observations from the distribution of large sites, at least in the Mycenaean period. First we might recall that in areas where more attention has been paid to all levels of settlement, this period is definitely one of large prominent centres surrounded by a cluster of smaller, less conspicuous satellite sites, and at similar intervals to centres known in the Sparta Plain. The writer would begin with

the hypothesis for our area, then, that in our acropolis series we possess an uninterrupted network, at least for the north and centre of the Plain, of all the big centres. This is not contradicted but to some extent confirmed by the few smaller sites of LH date cited above and their topography. Further confirmation is to be found in the exact spatial pattern of the known local Mycenaean centres.

In the Socio-Political Aspects of Settlement Chapter we examined the theory of settlement network regularities as developed by modern geography. In our valley it is worthy of note that one spends one hour in walking from the southern edge of the Menelaion settlement to Vaphio, a further hour from there to Agios Vassilios. These three sites dwarf all other Mycenaean findspots in size of occupied area. A smaller site, though mentioned in the epics, is the Amyclaion, which is located exactly intermediate in walking-time between the Menelaion site and Vaphio. For reasons soon to be summarised, the Menelaion site can be considered as the major centre for the whole region. The Mycenaean tholos tomb (outside of Messenia and discounting post LH3B examples) is generally considered to be reserved for royalty, and its appearance at Vaphio goes well with the vast area of Mycenaean finds here - most would identify the site with Homeric Pharis. A. Vassilios is another large site, though neither this nor the Menelaion have yet given us tholoi (however recent research may have shown a possible location at the latter, and A. Vassilios seems to have chamber tombs). Ideally Kommenos would be correct in supposing a tholos hidden at Arhasadhes. An hour from Vaphio and A. Vassilios is the Melathria site - merely five wealthy chamber tombs - but the existence of this rather self-contained extensive and fertile marl area on the left bank of the Evrotas calls, at this distance, for an independent administrative core probably not far from the tombs, and the distance is impressively predictable, both from Vaphio as from A. Vassilios (see Figure 4).

If the diameter of the exclusive territory of each nucleus is one hour on foot - then it is logical to see all sites within half an hour's radius of the nucleus as subsidiary to it. Hence the lesser importance of our other Mycenaean findspots fits into a larger pattern and in them we may see some trace of the lower levels of the settlement hierarchy. The half-way sites, being possibly villages, are characterised by chamber tombs, which are seen by most writers as the middle class and lower upper class burial, e.g. at the Amyclaion (see Socio-Political Chapter).

We would therefore suggest that the position of the lesser community of Amyclai, exactly intermediate between two major centres - should lead us to look perhaps in the fertile hills between A. Vassilios and Vaphio for a parallel community, and at Skoura for the median community between those two and Melathria. Furthermore we would expect further centres of respectively medium and major status of Mycenaean date to be found dominating the preferred marls in the Mistra sector and the Anthochorio area of the Plain.

It was noted earlier that distortion from regularity of settlement patterns reflects interference from diversity in the landscape. It will be clear from maps 2 and 3 that we are near to approaching what the geographers

call an 'isotropic surface' i.e. where geometrical adjustment of settlements is set in a landscape of equal values in all significant respects: in terms of distance the central plain and the Skoura marl inlet present little hindrance to communication, equality of land potential - gentle to moderately rolling silty/sandy marl hillocks. It can readily be seen also that the major centres, with the Menelaion excepted, are in the middle of this isotropic zone, and areas of poorer soil and steep varying topography such as the western plain, and the poorer north and east Neogen plateau, are remote from the nuclei and apparently the responsibility of smaller communities such as may be represented by the Anthochorio, Sparta finds, or Kouphovouno. Palaikastro is another good example - a small prehistoric site controls limited and discrete expanses of marls within a generally hostile physical environment, on the dissected Menelaion platform region. The number of sites considered here is hardly statistically significant, but these tentative hierarchical spacings compare very closely to those obtained from the Plain of Argos (see Argos Chapter) and the Soulima valley (see Messenia Chapter). Here major centres showed again a one hour on foot interval and sometimes had median smaller sites at regular intervals between them (for further discussion and analysis see Appendix A to this thesis).

The Location of the Menelaion

Let us now approach the location of the Menelaion. In our discussion of the land intimately associated with the site it became clear that the best arable land lay below, to the north towards Afissou, and to the west across the river. Though the ridge itself was certainly good cereal land, little of the plateau to south and east would have been of importance for crop production. Poor springs occur below the site, and a good spring (schist conditioned) half an hour to the north. If, as seems likely, the larger settlements have a territory of about half an hour radius, then only those quadrants to the N and W of the Menelaion are of great fertility, while the rest of its potential land is of low productivity for arable crops. Ancient references to this part of the plateau, such as 'high-towered, shady Therapnae' (Curtius 1851/2:140) describe well the sheer cliff edges of this area as they appear above the Evrotas from Sparta and suggest that the bulk of the plateau was left in a natural wooded state. This cover is totally absent and has probably been removed comparatively recently (see Vegetational History Chapter). This location contrasts with Amyclai, Vaphio, A. Vassilios and Melathria, which are more central to their preferred land. If we consider this far northern area of the plain, the immediate food base of the Menelaion, then it is clear that Classical Sparta is in a similar situation to the same area of land, being about half an hour distant from the Menelaion and hence sharing most of the Menelaion plain fields. Polybius (v:22): "to S. E. of the city are the hills upon with stands the Menelaion. They are rough, lofty, and difficult of ascent, and they command entirely all the ground between the river and city, for the river takes its course along the very border of these heights". Sparta is about half an hour away, Mistra one and a half hours; as can be seen in Figure 5 there would be, if we assume the necessary edge of territory location factor for both Sparta and Mistra, a substantial overlap of arable land in the same location for all three regional capitals. This should be taken as evidence

that the Menelaion settlement is the Mycenaean centre controlling the Sparta area of the Plain, and this is, in itself, one of the arguments for its identification as Homeric Sparta, being the major community commanding the likely arable territory of that city. As Lehmann once commented: the individual settlement location does change over time, but the key resource areas tend to remain the same. In the network thus established there is no place for further major Mycenaean centres here. Sparta has less fertile plateau marls to N, NW and NE, and both Sparta and Menelaion centres could be said to be in an 'edge situation' to their best land, though the actual site of Sparta was and still is good cereal and olive land. The explanation for such a perimeter siting might simply rest in a desire to possess adjacent fertile fields while still occupying a site free from surprise attack. Sparta, as we saw, had its scarp and streams against this contingency, only very late in its history building proper defences; the Menelaion has cliffs and the river along much of its perimeter, and access is quite steep on the less sheer NW and S ends of the ridge - but in contrast to the frequent walls found at the Argos Plain Mycenaean centres, no defences have been detected for the Menelaion settlement, nor at Vaphio, Amyclai, probably absent also at prehistoric Agios Vassilios. This reminds us very much of the picture in late Mycenaean Messenia, and the strong ties between both Laconia and Messenia with Minoan Crete, finds a further parallel in raised but unwalled major centres. Wyse (1865:112): the Menelaion "is in itself a fortress". The Evrotas might be difficult to cross in winter, but through summer, when campaigns were most appropriately conducted (after the harvests) poses today and before intensive irrigation few problems (Philippson:452, and the Admiralty Handbook [1920:462]: the Evrotas is everywhere fordable except after heavy rains). The availability of extensive arable land would seem to be decisive in the location of the Menelaion centre, its edge position chosen in order to take advantage of the commanding plateau site; defence may only be one point that determined the plateau preference, and perhaps equally if not more important is the effect such a location has on enhancing the status of the ruler in his palace up here. The view over all the plain and across to Taygetos is highly impressive, while the ridge can be seen with great clarity from every part of the plain. Such a situation is very close to that of Phaistos Palace at one end of the Messara Plain in Crete, and no one has suggested a defensive preoccupation with this palace location. Pylos in adjacent Messenia is not an ideal defensive location, and like the Menelaion is on a marl and conglomerate plateau and would have to bring all its drinking water from outside its ridge (achieved by a simple aqueduct), a provision easily cut off by an enemy force (contrast this with the elaborate underground water tunnels in some of the Argos Plain sites)

The question of priorities in locational analysis often revolves around strategic considerations. In this writer's view defensive sites that are also domestic settlements are very rarely chosen at any distance from a core of good arable land, and though both Sparta and the Menelaion, as also Mistra, i.e. the main regional centres in the LBA, C, R and Medieval periods, reflect in their raised plain edge siting, the need to prevent surprise attack, all are within reach of the necessary fertile land and neither of the

first two are impregnable strongholds. We have good proof of the only moderate strength of the Menelaion as a defensive position from a passage in Polybius' history of Hellenistic Greece. In 218 B.C. an enemy force under Philip V, having been dissuaded from a frontal attack on Sparta because of the difficult torrent bed crossings via the main plain, decides to follow the Evrotas left bank road that then, as now, led below the Menelaion cliffs, thereby hoping to approach the town from the easier NE side. The Spartans, under Lycourgos, believe they can forestall this move by occupying the Menelaion heights above the road. However, after a skirmish they are driven down from this position, apparently because they fear the mass attack of heavy infantry. This is good evidence that the position is hardly a dominating one, nor did the ascent appear very arduous, even against opposition, to heavily armed troops! (Polybius, v:22ff). Later the Romans were to overawe the Spartans into surrender by occupying the same heights (Livy XXXIV, 28). We might also make the point that the first substantial occupation of the Menelaion ridge saw the construction of large buildings, probably of an early mini-palace or 'mansion' and by this stage in the development of Mycenaean civilisation the imperative for a community to be maximally adapted to the zone it drew its food from may have been relaxed, especially for the largest most specialised centres, due to the network of farm groups and hamlets that were responsible for the actual labour in the fields and which were under the overlordship of the regional chief and his retinue. Such a system may be inferred from the Linear B tablets found in other palaces and from the settlement hierarchy within the probable territory of each major late Mycenaean centre and will almost certainly have held true also for the Palace of Menelaos, and probably on a less extensive scale for the early LH 'mansions'.

We have suggested that all the good marl land till about two-thirds of the way to Mistra would be part of the Menelaion's particular landholdings. Whereas the location of the regional centre, though on the circumference of its 'territory', was still equidistant from the next major sites - hence communications were undisturbed - the more optimal farming central location for its territory, a place right in the middle of the Northern Plain, was probably occupied by small farming bases. In other words, if the central plain is divided up into a N-S line of one hour diameter circles, two have a major site and satellites within them, but one has the inner satellites but a major site on its edge. Sparta and Mistra reflect the same locational strategy with the same zone of fertile lowland. A corollary of this is that, just as Mistra and Sparta replaced the Menelaion within the same territory, so the late MH founding of the Menelaion is likely to have replaced an apparently undiscovered MH centre in this zone.

Philippson confesses himself somewhat baffled by the pre-eminence of the Sparta location (457): good soils and water supplies are to be found elsewhere in the Plain, the site is hardly of great defensive potential. He concludes that a reasonable distance from the unruly hill tribes was sought for the centre. However later on he cites Mistra - high up on the hill edge of the Plain - as a refuge centre from similar unruly tribes in Medieval times! To the present writer, the major factor to explain all three regional centres is the form taken by the key arable resource zones -

primarily the Neogen marls. As will be seen on Figures 3 and 5, a centre in the far north of the Plain has a very significant expanse of such soil both in the main N-S zone of Neogen and in the extra 'wing' that runs NW to Mistra - far more than is available within the equivalent territory of Vaphio, A. Vassilios or Melathria. With the arrival of the Historical alluvium and the change of crop emphasis to irrigated cultures, silk and citrus, Sparta and Mistra continued to be central to major zones of the new priority land - the Evrotas and Magoula alluvium and the Sklavochori depression alluvium - while still central to the ever important cereal and olive land. In the Argos Plain study we suggested that the location of Mycenae was partly significant as a local centre for its surrounding soil, but mainly for its equidistance between Nauplion and Corinth (thus being central to two regions under its sway). The Menelaion is likely, as the Palace of Menelaos, to have been the centre controlling the Sparta and Helos Plains. We do not know if the Megalopolis Basin to the NW was under Menelaos' control, though the Menelaion location is approximately equidistant from Helos and Megalopolis, to SE and NW respectively (and the Megalopolis Basin is part of the same Neogen lacustrine series as the Sparta Plain Neogen - only separated from the latter by a low watershed - Philippson 446). This larger scale of consideration may be a significant factor in the predominance of the Menelaion location, though such an argument would fail to explain why ancient Sparta continued, in a similar location, to be the regional capital, before Helos was re-incorporated into the Dorian state and when Megalopolis was beyond Spartan control. Whereas once the Argos and Corinth regions developed in isolation, Argos naturally formed the Argive centre not assymmetric Mycenae - which sank to a village. On balance the writer would tend to place the predominance of all three regional capital locations on resource factors internal to the Sparta Plain.

We must now justify identifying the Menelaion site with the fabled palace of the hero Menelaos. The archaeological evidence so far give us two successive complexes of important LBA buildings. In a reoccupation area of the latter complex, as noted earlier, were found a mass of pottery and two clay sealings, one impressed with a signet ring, for use on pot containers, suggesting (on analogy with other Mycenaean centres) sophisticated arrangements for food contributions. The last, LH3B phase, admittedly only a limited occupation in the excavated area, saw destruction by burning contemporary to the similar events at other key Mycenaean sites over Greece. But, as was stressed earlier, the ridge as a whole shows signs of occupation over a vast area, undoubtedly more extensive than the settlements of this period at Vaphio and A. Vassilios. This enormous settlement area was, apparently, uniformly of the latest Mycenaean period (3B). Admittedly the original authors of this statement (the BSA team of the first decade of this century) failed to detect earlier LH in the lower levels of Dawkins' House and put all the pottery into 3B, but their general statement on the survey of the ridge is supported by the resurveys of HS and Beattie. Although neither Hope-Simpson nor Prof. Beattie have published details of their finds from the Menelaion lower plateaux, it is known that the LH material consistently included characteristic 3B kylikes, as far south as the lowest 'steps' of the hill (Prof. A. Snodgrass, pers. comm.) Catling re-examined the area between Dawkins' House and the Menelaion, and confirmed

the original reports of material confined to LH3B. The Menelaion shrine Mycenaean seems to be IIIb, as are the sherds with possible structural traces on the hill 300 m north of the excavation. Furthermore some confirmation comes from the early team, for they note that not only was the whole ridge covered with traces of houses, but "the traces of fire, which were found everywhere, shew that the city perished in a conflagration" (6) and in one of these destroyed houses a terracotta figure of a woman was found. The burning traces have indeed been confirmed for Dawkins' House and only a 3B burnt layer is known. If the traces elsewhere are also correctly noted, this is further support for the main occupation being in the key 3B (Homeric) period. The limited occupation in the only area excavated, during the crucial flourishing phase of Mycenaean kingdoms, 3B, when Menelaos and Helen should (if actual figures) be residing in the Sparta Palace, has led Catling to limit the stated flourishing of the site to earlier periods of LH. But if, as we have seen, it is likely that the main occupation of the ridge outside of the excavated area is 3B, then it is probable that the area does not fully represent the site at that time. HS and W noted that (1960:72) "the extreme thinness of the ridge seems to preclude the existence of a large building here". In fact all that the topography dictates is that a large settlement would necessarily have to be built as a series of discrete units or blocks, rather like the two main successive structures at Dawkins' House. If we were to suppose that a more open plan palace existed, rather like Pylos, then events in the Dawkins' complex might be quite the opposite to those in other building complexes on the hill, and the architecture noted all over the ridge gives us plenty of scope for other complexes. Let us assume then that in early LH Dr. Catling has found two successive mansion plans: this is indeed what we might expect for the rising princes here and at the other rival centres in the Plain. But by late Mycenaean we are to expect one regional centre, and it is quite possible that in that period a remodelling of the ridge buildings took place, to cope with this new status, whereby old buildings fell partly into disuse or were converted to lowlier functions (Dawkins' House) while perhaps a new and more splendid series of buildings was constructed on the ideally flat terraces to be found southwards along the ridge in a long succession to the Evrotas. Why, it may be asked, was this area, formerly the location of major early Mycenaean buildings, relegated to lowly functions in the suggested climax period of the total Menelaion site - IIIB? Firstly the poor architecture and the predominance of undecorated ware from Dawkins' House is in fact just as likely to reflect a humble part of a great palace-town complex as the best the total site can produce for IIIB. Secondly, we might bear in mind the situation of Mycenae, where the main buildings of the palace do not occupy the top of the acropolis hill, but a more spacious plateau lower down. Thirdly, and perhaps most relevant, is the case of Pylos. Here it is suspected that a change of dynasty took place in early Mycenaean times, evidenced not only in legends but in a dramatic remodelling of that hilltop settlement (cf. Messenia Chapter). Previous structures were levelled by the new rulers, for a completely new planned palace. Now Menelaos of Sparta, brother of Argive Agamemnon, what is he doing in Laconia? The legends do not provide us with a local genealogy, and it could be that he was in fact a recent arrival in the area, by marriage, invitation or conquest. To mark his dynasty, perhaps a grandeous new plan was executed for a great

palace on the Menelaion hill, in which the previous traces of the mansions of petty rulers were to play no role. Merely on the evidence of settlement size for IIIB2, we would maintain that this site, the largest by far at that time in Laconia, was indeed the seat of the Laconian king Menelaos. It is our hypothesis, based primarily upon the survey evidence from the rest of the ridge but seconded strongly from literary evidence and the locational evidence discussed below, that limited trials further south will reveal the necessary important structures and levels of 3B date more particularly to be associated with the events described in Homer than the remains hitherto excavated, and we believe of these vaguely known buildings, as HS and W suggested from other reasons, "there is no reason to suppose that the Palace of Menelaos, when it is discovered, will prove far inferior to that of Agamemnon or Nestor" (1961:175). If we accept details of Homer's description in Odyssey Book 4, we must agree with Wyse (1865:157) that Menelaos had a court of oriental luxury!

One of the most important pieces of evidence to make this site the palace of Menelaos is that of Classical tradition concerning this location. In the 8th century B.C when as Cook (1953) has shown, there was a revival of interest in the Heroic i.e. Late Bronze Age, worship began in many ruined tholos tombs, a shrine was built to Agamemnon at Mycenae, and a shrine and a cult instituted to Menelaos and Helen but 20 yards from the nearest structures of the LBA complex on the Menelaion ridge. Curiously enough local memory of the association of the most famous royalty of Laconia in the LBA (Menelaos and Helen) remained with this place, though the existence of the prehistoric settlement there was forgotten. Nonetheless poetic tradition remembered: while in historic times the area of Therapne possessed a village or hamlet (both 'chorio' and 'kome' appear), which on present knowledge can probably be identified with the Pakaikastro site, poetic references, generally dealing with its mythical associations, refer to Therapne as 'polis', which may well be a memory of its former greatness as the regional centre (Bölte:1329). Another strange partial folk memory concerns a spring Messeis - that is one of the few references to Menelaos' capital in Homer (Iliad 6:457). Hector warns Andromache that the sack of Troy could mean her reduction to slavery at the court of Agamemnon or Menelaos, and at the latter she would have to draw water with the other household women at this spring. Now the feeble springs at the foot of the ridge could never have fed a large community, owing to their geology, but the abundant source on the plateau behind nearby Afissou today, despite the general lowering of the watertable during this century, provides plentiful drinking water throughout the year for a large village. This spring is the same as that good one noted half an hour east of Afissou, in the hills, by Hondius and Van Haeften (BSA 1919/21:145). Bölte held that the city of the Menelaion could have had an aqueduct from the Homeric spring, which he held to be presumably in the direction of Chrysapha (1329), unaware of the Afissou source. Now Pausanias on his tour was shown, up on this part of the plateau, then still called Therapnae, a source claimed as this spring - though no mention was made to him of a palace! We could also cite numerous poetic references to former splendour up here, e.g. Pindar, Alkman and later writers (Bölte:1329), or the myth about the Sleeping Tyndarids (or Dioscuri -

the gods merge imperceptibly into the legendary heroic dynasts), resting under earth up on the Therapnae plateau, awaiting the clarion call to battle to defend Laconia (recalling Arthur and Barbarossa). The latter myth may point to an as yet undiscovered tholos mound (cf. Bölte, PW 'Sparta': 1329, PW 'Therapnae': 235off). HS and W (1960: 82) suggest an alternative location for the classical Therapnae community down near Afissou, but numerous ancient references confirm that it lay up on the plateau, e.g. Alkman, "well-towered Therapnae" (as we saw referring to the natural cliffs); Pindar (Isthmia 1: 3), "Therapnae high-placed". Furthermore, the earlier mentioned legendary conflicts between dynasts from Therapnae and Pharis point to prehistoric power struggles quite out of keeping with the insignificant historical status of the Therapnae and Pharis communities, as testified by ancient sources and archaeological survey.

The term 'Sparte' in Homer would presumably refer to this Menelaion town, the eponymous sown land, to the fields below (just conceivably to the cereal fields on the ridge itself), and hence, as we have seen, the name was equally suited to the Dorian town which farmed the same fields from another point on their perimeter. In legend, when the Dorians invaded the Spartan land from the north, they met stubborn resistance at Amyclai, and possibly only centuries later was this finally incorporated into the Spartan state, by then established by modern Sparta town. Achaean Pharis became subservient, but its actual conquest may only have been in later Geometric times (end of the 9th century B.C.). The other Achaean centres were lost to memory except for Helos on the sea coast, that also hung on as an Achaean survivor into historic times before eventual subjugation (traditionally in the seventh century B.C.). Archaeology partly confirms this - all the other Mycenaean centres seem to lack PG and G finds, but for the Amyclaion and finds near Asteri (where in the Helos chapter we have localised Helos). Both Amyclai and Asteri seem to have LH3C and PG (not absolutely definite at the latter for PG however). Vaphio, as Pharis, does pose a problem in this respect with a legendary continuity into G times but a lack of post-Mycenaean finds. It seems reasonable to see the Dorians entering the plain and establishing their main community not far from the main site of the older inhabitants, but in a more practical location, allowing for the breakdown of hierarchy, whereby it became again essential for each small community to occupy a site easily accessible to its arable land. Hence the lofty palace site of the Menelaion was not reoccupied, and the Aparta plateau begins to be settled in several locations already in PG times (after a very scanty Mycenaean 3B presence on and around the later acropolis hillock). Interestingly when, in a much later age, the economy had developed into a similar large scale institution, a new capital - Mistra - was again placed in a lofty and off-centre location above the key fields and orchards, whilst numerous dependent farms and hamlets scattered within its territory dealt with the everyday tasks of cultivation of the capital's immediate resource base. Here defence, a grandeous site, and a new factor - malaria in the recent allucial expanses - accounts for the locational shift.

The Geometric-Roman finds in the Aparta valley generally reiterate the preferences detected for prehistoric settlement. Most of the places known from ancient literature outside of the central plain, besides the rare

traces on the eastern plateau (cf. p. 382), are on the western piedmont zone (some possibly up on the 'step' plateau between the twin Taygetos ranges) and have nearly all been interpreted as sanctuaries or localities rather than settlements, which agrees well with the sporadic finds from this area of votive offerings and temple structures (cf. Von Prott, Ormerod, Bölte). The majority of finds and all known G-R settlements concentrate on the soft Neogen down the plain centre and on its Neogen limbs (e.g. Palaikastro).[9] The neglect of the western plain is understandable if we recall that, before the period of the second deposition, the arrival of the citrus fruits and the silk mulberry, and the inception of complex irrigation works, this area consisted solely of stony un-nutritious red bed fans with poor olive and cereal fields. In many places the stone cover is so dense one cannot see the soil beneath. But the early modern concentration of settlement on the piedmont and the Taygetos 'Step' plateau above shows a viable economy of a transhumant nature - in this case though particular pressures of conflicting nations and an enforced utilisation of more marginal land use patterns, together with the virtual disappearance of the complementary settlements in the main plain, account for an otherwise curious reversal of locational preferences (cf. further, below).

However during the Middle Ages we can look for the effect of the geomorphic changes. The Second Fill seems definitely to have occupied the N-S depression between the lower edge of the Red Bed fans along Taygetos foot and the Sparta-Gytheion road - also lining the banks of the Evrotas and its west to east flowing tributaries. Mistra takes the place of Sparta - which is gradually abandoned, and below and around the steep new city (sited above modern Mistra village) extended a mass of irrigated culture (as we know from contemporary descriptions). The water came from the abundant springs of the exposed schist in this NW part of the valley, and the new alluvium at the slope foot and along the streams was a major zone of fertility and investment in land. A new town began at Sklavochori not far from Vaphio, but in the moist depression newly alluviated between the west peidmont and the central plain marl pediment.

Mistra was founded by the Franks in the thirteenth century A.D. but the major movement of population from Sparta town took place in the fourteenth century (Bon: 'Franks in the Morea' [La Morée Franque]: 500). It can be seen from Map 5 that Mistra occupies the mountain edge but overlooks a major area of very fertile Neogen marls. It is very significantly adjacent to the recent alluvial depression running through Sklavochori, and seems to have combined these two major soil zones (with a flourishing export economy of olive oil and silk) and a secure mountain fastness citadel on the higher slopes (Philippson:458: already before the Turkish conquest silk was a major product at Mistra; later citrus fruit became a Mistra speciality: in Gell it is 'famed' for citrus [326]). As was seen its territory (of which it sits on the edge of the exploited area) overlaps considerably with that held to have been farmed from the ancient Sparta and Menelaion centres. The new siting therefore retained many of the advantages of the locations it replaced, with a stronger emphasis on defence and the availability of extensive alluvial soil and perennial flowing waters for irrigation (from the mountain foot springs). There was also a new danger of

malarial infection from the moist recent alluvial expanses, which the Mistra site on high would generally avoid - Sparta town was very much in the midst of the infected depression, and we read that the refounding of Sparta by King Otho in 1834 was a return to a site still troubled with malaria (Philippson:455). Nonetheless if the regional capital was able to exploit the old and new key soils at a healthy height from attacks by both pests and human foes, the main business of cultivation of the rest of the plain and the two key soil zones was necessarily to be carried on from the plain centre, given the distribution of the two zones there. Particularly important for the new priorities is the founding of Sklavochori, which seems to have been quite a considerable settlement in the Middle Byzantine period, and which sits on the eastern edge of the newly alluviated depression but within easy reach of the important cereal and olive areas of the Neogen pediment, the former zone of intensive settlement. Already in the 11th century A.D. Testament of St. Nikon we hear that the Saint had built churches in the communities of Parori (by Mistra) and Sklavochori, pointing to this new settlement picture (Bon 1969:501) and of Sklavochori Leake notes the 8 or 9 ruined Byzantine churches which show the former importance of the place - once a Christian town of considerable importance, as also Curtius: decrepit Byzantine churches of the extensive medieval town of Sklavochori (Leake 1830, vol. 1:133 ; Curtius 1851/2:245). The new town is significantly intermediate between the area of Amyclai and Vaphio. If we compare Figures 2 and 3, it is remarkable that a similar spacing to the Mycenaean emerges in medieval times, with Sparta and Sklavochori as centres replacing the LH axis Menelaion-Vaphio, at approximately the same distances, but with the shift recognisably into a position between the old dry-farmed and the new irrigated zones. The Mistra relocation, if we accept a continuing large territory for each centre, Mistra and Sparta being on the edge of their territory, would exhibit the same parallel division of the N and C plain with Sklavochori. The conditions of alluvial deposition as we can reconstruct them (Geomorphology Chapter) argue that throughout the Byzantine periods continuously disturbed and swampy conditons existed around streams, particularly the perennial ones, and it is likely that settlements such as Sklavochori were very prone to malaria - still in 1920 we read in the British Naval Intelligence Handbook (vol. 1:466) that malaria is very common on the Sparta Plain in summer.

We do not know exactly when the balance of settlement began to shift towards the Older Fill piedmont zone at the western edge of the plain, but by the late 19th century A.D. most of the valley population dwelt here and Sklavochori had sunk into unimportance. The new settlements were those that still exist on the piedmont and above on the high 'Step' plateau, and some that have since disappeared there. But in the most recent phase of the last hundred years the plain settlement is reverting once more to our hypothetical model for the EH period, where each family lives in a dispersed pattern in the full plain amongst the best land. Today of course the 'best land' is the alluvium recently deposited beside the rivers and in the Sklavochori depression. But since the marl cereal and olive land is still a necessary food source, and owing to topography is never far from the alluvium, even the irrigated agriculture pattern incorporates those areas formerly

prized above all, if somewhat removed from the immediate environs of many farming bases due to the lower value and lower requirement of labour with such crops. Thus the new plain settlements, generally dispersed farms, are not usually very far from the prehistoric sites, but are often on the W or E edge of the Neogen pediment - sharing thus the key irrigated land on one side, the key dry-farming land on the other.

It remains to consider the late medieval to early modern preference for the western piedmont, though it can already be noted that hamlets seem to have carried on existing beside the Evrotas alluvium e.g. Kalogonia, Riviotissa. In fact the settlement picture for the period of the later Middle Ages and early modern period is probably more complex than most of our evidence suggests. After the pre-Mistra Medieval records, we have the series of texts from the Mistra Monasteries which demonstrate that these had tenants living and working in the central plain, e.g. one Mistra 'Moni' has records of a metochi or local branch at Kalogonia, with associated fields and an irrigation ditch. These records cover the period before the fifteenth century and Turkish occupation phase, but it is clear that the Monis flourished with many possessions intact through the Turkish period, as generally over Greece. As late as 1830 Leake records meeting a tenant of the Mistra bishop at Riviotissa (by the Evrotas) (1830:1:147). When we pick up the story again, in the nineteenth century travellers, it is clear that the chief units of the settlement pattern are large villages at Taygetos foot, which are really seasonal bases for large villages on the Taygetos 'Step' Plateau above. The economy is therefore a neatly successive one of two specialisations: a lowland cultivation of the piedmont Older Fill, for a poorish olive and cereal harvest, some irrigated crops in the recent alluvial depression further down into the plain, based on the perennial springs at the mountain foot and the steep grade of the streams here; then a move on to the 'Step' for a later cereal harvest of no great quality (Curtius 1851/2: 204) and summer pasturing of sheep and goats on the upper Taygetos slopes (Philippson:428), more irrigated crops up there and those that are less susceptible than citrus to the cold e.g. vegetables are known and also hardy vines (Curtius:205). We have an ancient reference - Theognis, " drink wine from the heights of Taygetos" (Curtius 206). Philippson notes on the 'Step' (428) chiefly cereals and maize, some olives and mulberry confined to the deep valleys (warmer and more sheltered). This summer move takes the population away from the main heat and malarial ponds of the plain, though even up here stagnant waters cause some unhealthiness. Philippson, on his visit at the end of the last century to two typical piedmont villages, Anogeia and Palaeopanagia, commented on the bad malaria (453), but admits that in spite of its altitude of 700 m the 'Step' village of Anavryti is said to have an unhealthy climate (428).

At this period then major villages existed in the west and with this transhumant economy. Of the central plain, we hear of communities and particularly, hints of the existence of Turkish estates of the Chiflik variety. This economy is characteristic for the major Greek plains under Turkish rule, as is the complementary location of the Greek settlements on the less fertile borders of these plains. Gell tells us in the final Turkish period (1823: 323) that there are several villages and one very considerable country house

in the immediate vicinity of the site of Lacedaemon (Sparta); Leake at the same period (1830:190) tells us that the Albanian Varduniotes (Mohammedans) occupying the hilland south of the plain (Philippson:435), have chifliks in the plain of Mistra (i.e. Sparta Plain), that Magoula is a chiflik of a Mistra Turk (153). Gell (1832:348) records the villa of a rich Turk by Amyclai - where one can now see the tower of 'Machmud Bey' - the hamlet here was still called after this, well into this century. Sinaibey by Sklavochori is probably another chiflik settlement (Bursian 1868:131). Through the 19th century and even into the 20th we find a persistence of Greek names for the piedmont and Step villages, Turkish names for localities in the plain proper. If we take these hints with the general picture for the Greek lowlands it is reasonable to state that the settlement picture through the later Turkish period was one of fairly independent Greek villages working their western plain transhumant economy, but in the Plain proper (where the most fertile yields were to be found) despite the malarial infestation, Turkish landowners had large estates with Greek serf labour, and the monasteries continued to have a comparable series of estates there on similar terms. The Greek population had much to fear from the arbitrary violence and exactions of the Turks, and were clearly safer and further from Turkish life in the areas where Turks were far less interested, i.e. the poorer soils to the west, and healthier, and where they were able to preserve tenaciously their own way of life and prevent a distasteful mixing of nations. A very similar dichotomy of settlement for similar reasons can be found in presentday Israel with a general expulsion of Arab communities to the tougher soil zones less congenial to the Israelis (fieldtrip study in 1970). It is important to note in this respect that the main settlement in the western transhumant cycle was the Step upland one, and the upland Socha village for example had its piedmont lowland equivalent at the 'Kalyvia' (seasonal huts) tis Sochas (of Socha). Today the feeling is that the lowland village is the main one, partly perhaps because these have a much greater share in the fertile plain alluvium than permitted under the Chiflik system, but also because of the greater importance in having good links to the market centre of Sparta for the all-important marketing of cash crops. This change of emphasis may already be seen reflected in the early years of this century, when Ormerod writes (BSA 1909/10:63) "the villages of Sotira and Socha, though of considerable size, serve only as the summer-quarters of the inhabitants of Anogeia and of the Kalyvia tes Sochas".

Such a recent settlement pattern in the Sparta Plain is a general one for the early modern period amongst the basins and plains of Greece, just as is its present abandonment in favour of dispersed farms in the full plain (cf. Burgel 1965; our comments on Fournoi village in the S.W. Argolid Chapter).

The plateau villages then as now should be considered merely as a part settlement complementary to the W. piedmont settlements, and it has been noted that whereas they all have excellent downstream communication to their plain kalyvia, lateral communications with each other along the plateau are very poor (Ormerod 1909-10:62). In turn the peidmont villages all sit at the gorge mouths. These gorges can run dry at times in summer and their stream are only tappable then up on the plateau. At present the upland settlement halves are being abandoned and in summer water is pumped down to what have become perennial piedmont villages.

When the Turks left, we can fairly certainly say that the recent alluvium had begun to drain naturally via incision (see Geomorphology Chapter), and there would have been extensive lands in the plain left unoccupied by the Turkish withdrawal - and offering a far more attractive proposition to farmers than their W. Piedmont-Step system. By the turn of the century Philippson noted (453) "countless settlements in the plain itself though small in size, the larger ones besides Sparta lie on the Plain edge". Understandably, then, settlement in the west has gradually declined in favour of reviving or founding villages in the plain centre, to take maximum advantage of the combined Neogen and recent alluvium. Intensive irrigated plots on the latter are best tended on the spot in individual field houses, and the settlement picture begins to develop into continuous scattered farmsteads down the plain centre, alongside and amid the alluvium east and west of the Neogen pediment; and already Philippson records at the turn of the century, "countless small hamlets and individual houses are dispersed in the fruit orchards" (456).

Landscape and Social Behaviour

If subsequent research justifies and expands the writer's identification of a system of mainland peak sanctuaries comparable to those well certified on Crete (see Ritual Aspects chapter), then several prehistoric sites in the Sparta valley may repay close examination. Firstly it was noted earlier that the newly discovered Melathria chamber tombs, though lacking a known settlement, are sited at the base of a striking eminence quite distinct from all its surrounding landscape in size, shape and colour. This is topped by a Prophet Elias Chapel and is the goal of a yearly procession and nightly festival (during which fires are lit). Was it also a religious site for the Mycenaeans? The hill into the base of which the necropolis is hollowed, and on top of which the modern peak sanctuary is placed, is locally remarkable in aspect and geology, and would conceivably have formed a natural prominent focus for the Mycenaeans who cultivated the surrounding fertile marl bowl. Ludwig Ross on his visit to the area noted a votive cave of the Greco-Roman era that was "not recorded in the classics", half an hour behind Skoura (Wanderungen 1851, 2:203). This must be almost exactly the locality of the recent chamber tombs, though Ross was sufficiently acquainted with prehistoric artefacts not to be confusing his ancient material with the recent tomb find. If we knew more about the exact location it might be possible to investigate the chance of a recurrent use of this hill as a place of veneration and communication with the gods. More substantial a possibility is the Menelaion site itself. We drew attention to the step character of the ridge, and the LBA complex so far uncovered is a split-level construct utilising two low and adjacent conglomerate steps. But of interest is the fact that the Menelaion shrine just to the west is actually built around a small knoll, all that is left of the next highest conglomerate bench. The Classical monument is of a stepped design in dressed stone encasing this several metre high piece of natural rock, and originally totally obscuring its conglomerate interior. Around the base of the structure and beneath the dressed stonework were found late Mycenaean pottery fragments, always in the lowest level, at bedrock or in the original humus. In the LBA then the mansion or mini-palace complex, later a larger community, was

established beside this remarkable stub of rock, that can be seen from most parts of the valley. It would be an ideal feature for a small peak sanctuary/ altar, as is often represented on Minoan and Mycenaean art This recalls the evidence from the Mycenae citadel (cf. Argos Chapter); again the LBA palace buildings do not occupy the highest point of the hill and also a shrine was built at a later date on the summit. On the next small peak to the Menelaion is a recent chapel of Elias which is still the object of yearly pilgrimage from a large area of the plain.

The excavation of the Menelaion shrine gave, always at a lower level than G and A sherds, below the C shrine monument "a few sherds of Mycenaean and fragments of Mycenaean terracottas" (BSA 1908-9:108ff). The Mycenaean is claimed to be latest Mycenaean i.e. LH3B, with kylikes and figurines (2 female, one bull) (op.cit 113-115). This is partly confirmed by Catling's recent re-examination of the shrine rubbish tip which contained Mycenaean 3B2. Bölte significantly noted ('Therapnae' PW, 1934) that the use of a natural feature for the shrine monument suggests a ritual importance attached to that feature. Catling has shown that the Menelaion knoll was formerly more prominent, as it is surrounded by an artificial terrace built up during the shrine construction in A/C times. Incorporated in this terrace was a collection of older remains - LH3B2 pottery and stone debris of uncertain date - it is conceivable that some of the debris could be part of a prehistoric shrine on the knoll, associated with the Mycenaean finds from under the historic shrine (cf. below on this possibility). It is this writer's suggestion that as elsewhere in Mycenaean Greece this prominent stub of rock on a lofty ridge edge (which can be seen, standing out from its plateau, from every district on the plain) was the scene of rites - as a peak sanctuary such as is depicted in Bronze age art, and as part of a system spread throughout the valley of centres of communal worship. Worship began again here in late G times, but despite the discontinuity in offerings folk memory remembered the ridge as particularly associated with the now legendary figures of Helen and Menelaos, and the Tyndarid dynasts. I would prefer to stress the continuing appropriateness of the peak sanctuary and other prominent locations for such integrative practices, as regional communal foci, rather than as simply a memory of a particular prehistoric shrine or settlement leading to a reverence and eventual reuse - though the associations of the peak cult with particular types of practice and divinity could very likely have carried on in folk belief, as is known for Crete. Mainland peak sanctuaries seem to contain, in some cases, numbers of libation kylikes and female and animal figures as in Crete, which would lead one to suppose that the cult was worship of a female divinity - probably for the fertility of humans and animals, such as the Classical goddess Potnia Theron - possibly the Potnia of the Linear tablets. We know of the use of the Menelaion shrine in ancient times, that it was especially associated with women; Herodotus tells us of the daily pilgrimage of women with children to worship Helen, while we hear also in Hesychius of the procession of waggons full of maidens which pilgrimaged to the shrine (and the shrine is known to have been a major state shrine [BSA 1908-9:113]). Votives recovered show maidens and warriors, presumably Menelaos was prayed to by soldiers for valour. The early BSA team suggested that the Helen/Menelaos cult was basically that of a native cult centring on a 'goddess' and her paramour (op.cit. 108). All the attributes

of the main divinity, Helen, point to her fusion with a female fertility form that is often compared to a Bronze Age 'potnia' role - or again Demeter/Kore - 'maiden' and goddess of childbirth - and here we would stress the visitation by the nurse and child, and also maidens (Curtius:239-40;Bölte 1929:1371).

Immediately to the south of that raised part of the ridge with the Menelaion and the Mycenaean structures another small eminence of conglomerate plateau is found topped by a chapel of A. Elias. This is a modern peak sanctuary of the Orthodox church, and in summer with similar shrines throughout the valley it is the goal of a special pilgrim procession and night watch with a feast, drawing in a large congregation from the central and northern plain (after local informants). Again, but even clearer here, there seems no justification in claiming continuity of cult after the Roman use of the Menelaion shrine to the modern Greek edifice very close to it; rather the natural advantages of the lofty ridge edge and its eye-catching prominence together with the recurrent value of peak sites as regional integration foci explain this coincidence. In this we disagree with the recent suggestion of Catling, that the possible long worship at and around the shrine knoll was due to a real continuity of worship and custom of peak worship there. Dr. Catling has recently spoken in support of this writer's suggestion that peak worship took place here at least by LH on or by the Menelaion knoll and revived here in the 8th century B.C.; but we reject his idea that the custom was remembered for this spot. We prefer to suggest that elsewhere (at e.g. the Amyclaion), peak worship continued, and this hallowed Menelaion spot was seen as an appropriate place to institute a new focus for a custom remembered and practised without interruption on other sites, probably in ignorance of previous peak customs here. Dr. Catling has since suggested that finds on a hill to the north (a very small area with structures, LH and Archaic sherds) might also be an ancient (if not prehistoric?) peak shrine in the writer's terms.

The Amyclaion hill offers one of the most satisfactory cases to justify this writer's claim for the widespread custom of peak sanctuary foci in Mycenaean Greece. The excavations of Tsountas, Furtwangler, Buschor and others showed a small prehistoric settlement of EH and MH periods, with finds possibly also of LH2. LH3 finds were rich but not extensive and were held by the excavators to represent a shrine, which continued without a break in use through the Dark Ages (with PG and G votives) into historic times and the first literary reference to the shrine (cf. Buschor 1927:4). The evidence was seen by HS and W and in the HS Gazetteer as some support that there was already a cult place in LH3C times persisting into PG - they are more cautious than the excavators, but recently Dr. Catling has stated his belief that there was certainly continuity of cult here into historic use of the shrine and from Mycenaean times (1975). Buschor notes that the most striking feature about the LH3 finds were the very numerous cult objects - one large 'goddess' figure and 75 smaller female figurines were recovered from a small area of Mycenaean occupation debris, together with countless animal figurines and bronze double-axes (Buschor:11). The latest or Sub-Mycenaean votives were intermixed with the earliest PG votives (op. cit. 12) and we know further that the historic worship and the Dark Ages votives show clear prehistoric links.

For the national shrine of the Spartans at Amyclai contained two divinities, Apollo - who had an altar lower down on the hillside, and Hyacinth - long recognised as a pre-Classical divinity of probable Minoan origin (the word is not Greek) who occupied the supreme place of honour on the hill summit, i.e. a peak sanctuary divinity. Paul Faure (1963:501) records a Minoan peak sanctuary near the former Minoan centre at Tylissos, which was in use in historic times as a peak shrine to the pre-Dorian divinity Hyacinth. This Amyclai shrine was apparently his grave (after Pausanias) and this brings in the possible association of the all powerful maiden/mother god and her annually dying and reborn son/paramour, often seen as a significant group in prehistoric as clearly in historic Greek religion. The disappearance or repression of the strong female element in early historic times is a general one throughout Greece and is considered by some as a result of the Dorian arrival with a more male-dominated religion. Nonetheless we know that still in Archaic times Hyacinth was closely linked to a goddess and throughout antiquity women took a strong part in his festival - the actual direction of the shrine was in the hands of a priestess (Buschor:10-11). In fact we know that Demeter - who bears many features of the suspected prehistoric mother divinity - was also worshipped at Amyclai (Wide 1893:181). Every year there was a great three day festival of Hyacinth during which a pilgrimage of almost all the Spartiates took place from Sparta to the Amyclaion bearing a new robe for the divinity (Bölte 1921:1456-7; Bursian 1872:130). Renewal of life seems to be therefore a factor Hyacinth shared with our postulated Mycenaean goddess that one must suppose formerly accompanied him in the worship here of LBA times, represented by the figurines. Symbolic sacrifice consisted chiefly of oil libations (Buschor:18), which we have noted elsewhere as the probable type of offering for prehistoric peak sanctuaries. The site was well chosen with the pilgrimage underlining territory, to stress Spartan dominance over the Plain and a former Achaean centre (cf. the Panathenaic and Eleusis processions, once again with the new robe - to accentuate Athenian territorial awareness). With the pre-Mycenaean god we might suggest that two divinities (one male, one female) changed significance - unless the figurine type is (as has been suggested) simply the priestess or worshipper of a male god - but the predominance of Potnia in Minoan art and her role in the Mycenaean tablets argues the former hypothesis.

In Classical and Roman times we have enough evidence to reconstruct an elaborate system of integrative rituals for the whole valley and beyond, many of which have good modern parallels in traditional peasant practice for the region. The ancient town of Sparta itself exhibits in a microcosm a pattern of note: in reality it was a collection of four or five hamlets over the island plateau - between them lay the market place and assembly point, and the separate communities met at the communal Orthia sanctuary. This might well stand as a model for a very primitive type of integration applicable e.g. to the dispersed and poorly differentiated communities we have postulated for the Early Bronze Age over much of S. Greece.[10]

A fine example of a peak sanctuary in these periods is the lofty summit ridge of Taygetos (c. 2000 m), where a yearly festival involved horse sacrifice to Helios (i.e. Elias?). Some commentators have denied the feasibility of this operation, but each year if they left their armchairs they might see

many an 'old dear' heading up to the little Elias chapel on the top on mule-back with the other pilgrims. This shrine is of interest as it is certainly the most important single cult site today in Laconia - sitting on the spine of Taygetos it is a high-place equally visible to the devout in Kalamata town in the Messenian plain to the west, to the devout in the Helos Plain in the south, and of course all over the Sparta valley, upland and lowland. And the yearly worshippers come from all these regions. Nor should it be forgotten that precisely at the time of the festival the many flocks of all these distant regions are likely to be grazing together right around the peak itself.

Finally we hear in Pausanias of a yearly cult procession between the Eleusinion and the site of ancient Helos, involving the bearing of a statue of the Maiden in ritual pilgrimage. Quite apart from this interesting common cult between two areas we have already seen reason to pair, the details of the divinities suggest a great antiquity for this particular cult. Eleusinion may be related back to the LBA divinity Eilythia, an aspect of the Great Mother (as is the Helen cult?), and her sanctuary by the sea at a Homeric city in ruins by Roman times (the era of our source), if not earlier, could testify to an ancient communal ritual between Mycenaean Sparta (the Menelaion) and Helos in their days of splendour. At Helos we hear of a cult of Poseidon, and the goddess statue ritual might also be associated with this god, whilst the pairing of these two divinities has often been seen as at the core of LBA religion. But a slight problem is the use of the inland Eleusinion site, at Kalyvia, that seems to be only historic in date. Perhaps we might suggest that the abandonment of a Mycenaean centre, once the setting out point of the procession (perhaps Vaphio or the Menelaion, or A. Vassilios) led to the construction of a new shrine up on the piedmont.

Pausanias (in Laconia 20:5-7) tells us of his visit to the Eleusinion: "it is a sanctuary dedicated to Demeter and Kore surnamed 'Eleusinian', and on stated days a procession from the old Achaean city of Helos bears up to here a wooden statue of the Maid (Kore), daughter of Demeter". Early Greek inscriptions show 'Eleusinian' as Eleuhinias, elsewhere known as Eleuthia or Eleusia (Wide:176; Von Prott:9), and surely the goddess known from the Linear B tablets to have a shrine at Amnisos (Eileithyia) and later worshipped at a peak shrine near Tylissos (Faure, BCH 1963). In ancient times Eilythia appears as 'the Maiden' beside the Earth Mother Demeter, and not far from Helos at Gytheion we know of both paired significantly with Poseidon (Wide:176); in Linear B texts of the Pylos Palace Poseidon is the name mentioned most frequently as a probable male god (Vermeule 1964:293 : Poseidon is the commonest mentioned male divinity at Knossos and Pylos). At Helos we know that Eilythia the Maiden was worshipped but we know also of a Poseidon shrine here (Wide:180; Bölte:1335). The pairing of mother and daughter we have already seen embodied in the historic cult of Helen at the Menelaion, which we suggested carried on a Mycenaean cult group. It is possible that the Amyclaion was in historic times a shrine to the Earth mother/Maiden and her paramour, a function altered later almost to her exclusion, although the pairing remained in the historic cult of Helen/Menelaos. Artemis Orthia in the Sparta plateau may have begun in Dark Age times as a similar female cult, and the recent Archaic shrine

at the centre of the Anthochorio tell contained many lead goddess figures as at the Menelaion and Orthia (A. Reps. 1962-3:17).

Altogether there is a strong case for suggesting that these cults and the types of ritual incorporate a pre-Classical and indeed LBA age religious heritage, in some places at the same sacred spots. But as we have seen, the Eleusinion finds show no evidence for a use of that site till Archaic times (nor would we expect a prehistoric settlement at Kalyvia on soil grounds), though already by Archaic times the Helos city was reduced to a minor status (see Helos Chapter). If the gods and the type of cult continue prehistoric traditions we might suggest that the ritual linkage of the chief Homeric 'city' of the Helos Plain and the centre of the Sparta kingdom must have altered its goal - was the procession formerly to a Mycenaean centre by historic times quite unoccupied - such as Vaphio, or its status forgotten like the Agios Vassilios town? Or perhaps more plausible - did the chief city of Homeric Helos, which we would maintain was near Asteri and Strategos, connect in ritual integration ceremony with its counterpart in the Sparta Plain, the Menelaion city - whose former status as a settlement was forgotten except by the poets by historic times? Here surely we must bear in mind the recent excavations at the Menelaion.

Following this writer's original suggestions as to the significant link between a major Mycenaean elite settlement and a possible contemporary peak sanctuary of Minoan inspiration alongside it, Dr. Catling has pointed to the limited MH finds on the hilltop and a strange model shrine of clay of possibly Minoan form. Is it wildly speculative to ask whether the first use of the Menelaion plateau was as a rallying point for an integrative process of ultimately religious nature, and Minoan religion at that? Was the strong Minoan influence detected at Agios Stephanos on the Helos coast, at Vaphio and the Menelaion, (and remember the Minoan colony of Kythera off the Laconian coast), part of the process of integration on a Minoan model which formed an essential background to the rise of Mycenaean civilisation? The pattern of MH finds preceding new Mycenaean focal centres - was this really the rising prince moving his secular seat, or was this move related to the establishment of prominent integration centres on a Minoan model that combined ritual organisation with socio-economic ties? Perhaps the new evidence from the Menelaion is providing evidence for the latter view.

NOTES

1. I would like to express my gratitude to Dr. Catling for his kind encouragement and the opportunity to make this study.

2. Even the hilland intervening between the Sparta and Helos Plains is dominated by the same orientation - all the main ridges trend and sink in a southeasterly direction to the coast (Philippson:459).

3. Bölte (1929:1299) and Philippson (1959:456) describe the situation just as it is today and was also in the 19th century travellers, and Philippson notes particularly of the dry Neogen hills in the plain centre "olive groves in which cereals are sown; and they flourish here preferentially". Tsountas reports in 1892 that he found the Amyclaion hill (one of those in the median hill chain) before excavation to be cultivated on all its sides and its summit providing lots of olive oil (1892:1). The Amyclaion is notably marlier than the other Neogen hills and this probably accounts for the olive yielding nothing to cereals here.

4. The 'ford' is merely a particularly broad and shallow area of the river. Most geographers agree that the river poses no serious obstacle at any point to travellers, except during and immediately after the winter rains. We may dismiss this aspect as of little locational significance.

5. HS and W (82) suggest that Alesiai may be identified with a C site SE of Tseramio village, further west of this other find and amid the W alluvial depression, but hardly also 1 km S of Agios Ioannes'. See maps 2 and 3. For various reasons the present writer holds this less probable and would locate the village in preference in this fertile Neogen zone.

6. The maximum depth of recent alluvium nested into the Older Fill is hard to be precise about, but is probably not more than c. 3 m. We can presume that the excavated walls and votive catches were not placed in a contemporary stream bed but were later covered by the aggrading torrent. Hence the varying depth of the finds reflects the old land surface rising away from the vicinity of the torrent bed. One would predict from other areas that this palaeosol would be the Older Fill surface, but we lack a description of the underlying 'virgin soil' from both excavations, though noted by Cook as distinct from what is clearly recent alluvium surrounding the finds in the areas studied by both the BSA teams.

7 The virgin soil was a stiff red clay, which formed a natural depression near the Evrotas, and apparently rose to west and south, upwards to the Sparta Neogen plateau. This clay should be eroded Neogen partly in situ and partly brought here as slopewash from the plateau above - in both cases affected by Older Fill weathering. It seems fairly clear that much of the contemporary ground surface before excavation at the site was part of the alluvial terrace which runs northwards to the area of the City wall and the Great Altar finds, and which as we saw concealed such recent structures. This can be seen from a field examination of the terrain, a comparison of the published photographs and plans (e.g. Dawkins 1929:11-13)

and the several descriptions of the uniform terrace from the Orthia site up to the other Limnai find excavation. The likelihood that the river was in fact during historic times, till the Late Roman Period, between 2.5 m and 3.5 m below the modern terrace top level suggests that the artificial sand levels at the Orthia site were to encourage good drainage and stability for the large concourses and structures on the site, rather than to combat frequent high river levels (though of course sporadic high floods may have caused temporary damage). The soil around the Orthia theatre temple: much of this on our analysis should be post-occupation alluvium with some slopewash from the plateau above - compare the similar depth at the Great Altar upstream.

8. The attempt to link the scant Mycenaean finds here with the Arkines tholoi in the hills to the west, which the Deltion claims as only 2 km away, hardly squares with the HS description of these as many more kilometres away and very high and remote from the plain, in the mid-Taygetos area (cf. the HS Gazetteer map and that of Waterhouse in BSA 1956 (51), and that of Ormerod, BSA 1909-10:63, fig. 1). The finds from Arkines, HS adds (Gazetteer) are 3C which fits the diminutive tholos size.

9. Thus we have settlements at Sparta, Magoula, Anthochorio and Amyklai, Alesiai and around A. Georgios, between Vaphio and Agios Vassilios, at Palaikastro and amid the hillocks between Afissou and the Menelaion ridge. The status of the historic finds from Agios Vassilios and Arkasadhes is hard to evaluate - whether domestic or ritual contexts is unclear at present.

10. Hamlet-town dispersed (Philippson 454; Bölte 1355); linkage achieved by their common participation at the cult of the Orthia shrine, the market agora that lay between them (where sacred dances took place and the ball game was played, each community providing a team), and the acropolis for communal refuge and another religious sanctuary (Curtius 227ff; Bölte 1362).

APPENDIX

The Classical Topography of the Sparta Plain and the Identification of the Homeric Cities (see Maps 2 and 3)

The main source for ancient (post prehistoric) settlements in the Sparta Plain, after the archaeological evidence, is the visit of Pausanias in the 2nd century A.D. The cities of late Mycenaean Laconia should be listed (according to one's opinion of the accuracy of Homer) in the Catalogue of Ships - Book 2 of the Iliad. Here we read of Laconia: "They who held the most spacious hollow of Lacedaimon, Pharis, and Sparta, and Messe of the dovecotes, they who dwelt in Bryseai and lovely Augeiai, they who held Amyklai and Helos a city on the sea, they who held Laas, and they also dwelt about Oitylos, of these his brother (i.e. Agamemnon's) Menelaos... was leader."

Owing to later associations prehistoric Sparta is clearly in the vicinity of ancient Sparta, and as should be clear from the preceding chapter is almost certainly to be localised at the great Menelaion settlement above the modern and ancient city; Pharis, Amyclai, Bryseai, Augeiai, Helos and Oitylos are all approximately localised by ancient writers, notably by Pausanias. Amyclai is centred on the classical shrine as we have seen, we know that Pharis, Bryseai are somewhere in the part of the Plain of Sparta beyond Sparta and Amyclai, Pharis definitely south of Amyclai in the direction of the Helos Plain, Bryseai to the west towards Taygetos, but whether in the NW or SW of the Plain is unclear. Messe remains; HS and W claim that it is in the south Mani (1961,174), but at both Oitylos and their site for Messe - Tigani - we find them recording only possible Late Helladic sites (their map, p. 171). They admit what is obvious - that it is unlikely that these last two were important settlements in the Mycenaean period, since there appears to be little LH in south Mani and anyway arable land is extremely scanty here. Oitylos, one would agree, is reasonably located in the Mani (at a fine harbour site), but Homer's terms "those who dwell about" fit with the lack of concentrated Mycenaean finds; rather some sort of coastal centre with outside links but low permanent population is suggested, a focus for a dispersed inland population - perhaps for all of south Mani? The location of Messe was already lost by ancient times and we must resort to inference. It is more probably to be sought in the areas of Laconia with extensive fertile lands, especially the large areas of marls that have an unnamed, or lack, a major Mycenaean site but were as capable as the known centre territories of supporting an important LH town. We will return to such gaps in the finds plotted against soils. Classical Aigai may occupy the site of Homeric Augeiai, while Medieval Passava could be the site of Laas, both localities lying not far from Gytheion in fertile marl hilland.

It will now be seen that the list bears no direct relationship to actual directional geographical patterns, but there is a general tendency to move from north to south in Laconia, and deviations from this are probably for the purposes of metre (HS and W 1961:173).

It has usually been assumed that Pharis is the site of Vaphio-Palaiopyrgi, on the grounds that it was noted by Pausanias as being beyond Amyclai from Sparta, and in the direction of the sea; as will be seen from a large-scale map one might draw a straight line through Sparta, Amyclai and Vaphio and it would run to the sea at its nearest point - the Helos Plain. But why not the major Mycenaean site of Agios Vassilios? It also lay beyond Amyclai and could have been passed in a passage to the sea by Pausanias. As Von Prott (1904,5-6) argued, if we take the road to the sea as running to Gytheion, rather than to Helos - Vassilios would be right on a possible line to Gytheion - indeed it is bissected by the modern Sparta-Gytheion road! Von Prott's argument, that the Vaphio tholos lies too close to Amyclai not to belong to that centre, can be dismissed after our earlier study of spacing in the Mycenaean centres of the Plain. Hope-Simpson's suggestion that Vassilios was Bryseai, as we have seen, is hard to accept unless we reject the usual meaning of the word as 'springs'. On the other hand, Pausanias tells us that there was only a temple here in his time and that the Taleton peak of Taygetos rose immediately behind the site of the former city. As we noted, there are indeed Greco-Roman finds from the A. Vassilios hill and we have suggested that the claimed Mycenaean defence wall is more likely to be a Classical or Roman terrace wall, possibly marking the precinct perimeter of a shrine. However it is now generally agreed that the inscription at Vassilios has been transported from Sparta or Amyclai. The Elias summit shrine of Taygetos, from the Plain, does (as HS and W remark) seem to rise behind that site to the west, although again we have no finds to confirm that it was that particular peak that was the ancient peak sanctuary.

Father Levi remarks in his edition of Pausanias, that there are too many important prehistoric sites in the Sparta Plain for the Homeric list (1971:75), but this depends very much on the correctness of such correlations as have been made hitherto. If, e.g. A. Vassilios is not Bryseai, on grounds of etymology, no other known prehistoric sites in the Plain will fit the sense and we will have to suggest appropriate areas where there should be early settlement; he is probably fairly correct however in saying that the whole problem is hardly completely soluble until inscriptions come to our assistance.

We have seen that the major Mycenaean centres form a regular and hierarchical pattern with satellite settlements, in well-explored areas such as the Argos Plain, and this pattern seems apparent in fragmentary fashion in the Sparta Plain and other study areas. It is my conclusion that the accepted intervals between major centres, which should represent names appearing in the Ship Catalogue, preclude intervening large communities, and since all these major sites exist in strictly confined geographical zones, particularly with regard to key soils, one might predict within such soil areas the discovery of new prehistoric centres with hitherto 'unoccupied'

territories i.e. zones of a soil known to be heavily exploited by prehistoric farmers but not under the control of a hitherto known settlement and beyond the reasonable territory of known centres nearby (in the light of average territorial spacings). If we examine the Sparta Plain and the distribution of Neogen marls, it is clear that the spacings of major settlements on average 5 km apart leaves a notable gap in the far NW and SW of the Plain, where fine soil lacks significant Mycenaean settlement. True, we have the Anthochorio find, but so far only a meagre prehistoric presence is arguable from an admittedly extensive historical site. In the area between Magoula and Mistra we must certainly expect to find further Mycenaean settlement on the soil potential. But since we have suggested that the Menelaion is in an anomalous 'edge' location to its roughly circular arable territory below in the plain proper, and the 'ghost centre' for its territory should lie somewhere near and just south of Sparta (cf. Figure 5), it is clear that the hypothetical territory of the Menelaion occupies most of the far northern Plain. In fact, since the walking distance from the Menelaion to the far NW edge of the Neogen, at Mistra, is about $1\frac{1}{2}$ hours, and the expected diameter of the Menelaion territory is about one hour, there is exactly enough territory space remaining in the NW plain for a 'Grade 2' Mycenaean community, such as Amyclai - with probably chamber tombs - sitting on the border of the Menelaion land and having the customary half hour distance to the end of the marl to its NW, and to the 'ghost centre' near Sparta.

The new Melathria cemetery argues for a large Mycenaean community in the basin behind Skoura, but despite the distance factors which could give it a major status, the soils are not as extensive and undissected in the Melathria hilland as in the full Plain, and the community here is of somewhat uncertain status (though clearly likely to be important). Of course it must be remembered that Homer not merely lists the largest centres but also some smaller centres - those with a famous history or other thing of note, e.g. the Amyclai site actually appears on the archaeological evidence to be of middling to small size in the Late Bronze Age, though we have supposed more domestic settlement around it, and possibly its fame rested more on its great antiquity and the reverance of its shrine. In the hierarchy as on the strength of its Mycenaean finds it is second grade in rank. One might look then in the Catalogue for names that might refer to the Melathria community, or to as yet undiscovered but now predicted medium to large settlements around Mistra and Anthochorio/Potamia. If Bryseai is not at A. Vassilios for water reasons, more appropriately close to major springs but still with extensive and as yet unclaimed marls we might look for it in those NW and SW sectors of the Plain, and Messe could profitably be sought for there also or at the Melathria settlement, or of course at the unclaimed Vassilios site.

The Pharis name for Vaphio I would maintain as justified, and it is clearly in the right place for the topographical references of Pausanias. For, on Von Prott's point about 'roads to the sea', it can be preferred instead of Vassilios on the evidence for ancient roads in Laconia. There were, as today, two main highways running south of Sparta. Firstly one ran straight to the important Helos Plain and thence east to various cities;

the straightest way if one assumes that Classical and Roman settlement was concentrated in east Helos (this can be shown to be so, cf. Helos Chapter — dense Greco-Roman finds around the former Homeric city of Helos), was due SE along the tectonic line i.e. down the Evrotas valley. This route is in fact not the one taken by Pausanias when he moves south after his tour of the Sparta Plain, for he is going SW to Gytheion first, and only later travels along the coast eastwards to see Helos, (cf. Helos Chapter). Traces of this carriage road through the Evrotas gorge were noted by Leake and rediscovered by Hope-Simpson (85). Leake, 1830, (195): after leaving the gorge it branches at Tsasi both west and east — to Helos and the Malea Peninsula. HS found the road to emerge in the Helos Plain near Tsasi, west of here it branches — one, the west track, went towards Skala, and might link up to stretches HS and W note on the SW edge of the Helos Plain, clearly running towards Trinasos and Gytheion. (Philippson also notes, [1959:p. 447], that the late antique road from Sparta to Helos ran through the Evrotas gorge as waggon tracks show.) Leake and Gell confirm the Peutinger Table in this split of roads, and saw a Constantinian milestone at Priniko (Wace and Hasluck, BSA 1907-8:162) on the eastern edge of the Helos Plain, probably past Helos on the way to Acriae and other towns. The other main road in antiquity ran directly through Vardunochoria (as the modern road) via Krokeai to Gytheion, and it was this which was taken by Pausanias after his tour of the Sparta Plain. It is very important that Vaphio and Vassilios occupy almost exactly those positions as would be passed by these two individual roads, Vaphio the Evrotas road, Vassilios the Gytheion road. And whereas Pausanias took the latter, and not the former, if Vaphio was indeed Pharis this would account for his never actually visiting the site (conceded by Von Prott, p. 6), though he saw it, as we can, in a straight line from Sparta via Amyclai on the sea road. This closest link to the sea must be meant rather than the Gytheion route (as Bölte notes, 1929, pp. 1332, 1342).

In the preceding chapter we have taken note of the historic settlement traces in each area of the Plain. We saw possible Classical-Roman settlement at Palaikastro in the poorish Menelaion/Parnon plateau country. At Skoura, beside both the main Plain and the Melathria marl basin, there are traces of Classical-Roman occupation (A. Reps. 1959:9) as is to be expected. In the main Plain dense finds from the Sparta plateau and the area NW to Magoula, and south to Arkasadhes, have been noted in our tour of the Plain (e.g. the sites of 'Alesiai', A. Georgios, Amyclai, Vassilios, Arkasadhes — and the abundant sherd finds of C-R date in the intervening marl hillocks). At Anthochorio we are still in the marl zone and we note the recent extensive C-R community discovered here. No known finds in the literature stem from the rest of the southern Plain, though such are surely to be expected, both of the prehistoric as historic periods, on soil grounds.

If we turn westwards, to the Taygetos piedmont, the Sklavochori alluvial depression and the Taygetos mountain proper, ancient finds become much sparser, references in antiquity far vaguer, and prehistoric occupation as far as is known ceases. Although we have pointed out that these areas are the least known of the region, and are not devoid of resources, so we are to expect some settlement if only of a seasonal nature, yet the general inferior

quality of the landscape in these zones (including the Sklavochi depression if we remove the recent alluvium) prompts our belief that these areas were always marginal to early settlement. Let us examine the ancient finds of these areas in detail, from N to S:

Mistra - Parori: Finds of ancient marbles, inscriptions. Generally accepted as brought here when the Medieval city was built - but we would expect some settlement of C-R date at least in the vicinity of these villages.

A. Ioannes - Tseramio: O. Walter in AA 1942, 156, records "countless remains of ancient buildings between Katsaru and A. Ioannes - a tower, graves and offering caches"; Bursian (1872, 131), records an ancient temple west of Sklavochori and near Katsaru; HS and W (1960, 82) note a widespread C site near Tseramio. Kahrstedt (1957, 198) notes of 'Alesiai' that Pausanias probably found a village and an Heroon shrine - we have suggested that the abundant pottery site found by the writer near Kouphovouno amid the fertile marls is more likely to be the village than finds in the modern irrigated alluvial zone by Tseramio where HS and W would prefer it - but it is possible that the Heroon may have lain in the less fertile zone towards Tseramio. In general we lack evidence in the C-R literature for ancient settlements in the Sklavochori depression, and we would interpret these finds as sporadic farms and shrines only.

Anavryti: Up on the 'Step Plateau'. Bölte (1332) records possible ancient graves from here, contradicted by Ormerod (1910, 64) though there is a possible route across to Messenia via this village (Ormerod, 62).

Kalyvia - Socha: At Kalyvia we noted the sanctuary in a poorly fertile (relatively) zone of Older Fill; Kahrstedt (1957, 199) claims we are only to expect a cult centre with its staff quarters. Ross and Von Prott (Ormerod, 65; Von Prott, 11) claimed finds of a Greek fort in the gorge above Kalyvia, on the way up to its seasonal village Socha, but Ormerod argues that all the finds are Medieval (Ormerod 1910, 64-5). At Socha itself a pot with Greek coins was found (Bölte 1332).

Anogeia - Sotira: Again a pair of linked seasonal settlements, the former on the Older Fill piedmont, the latter on the Taygetos 'Step Plateau'. Von Prott notes from around Anogeia (13) ancient and Byzantine coins, A and C finds in the fields including graves. Ormerod (65) notes for Anogeia finds of the Archaic period and from the hills behind, H vases with graves and an enclosure - the Archaic finds might also derive from the hill site. At Sotira we hear of finds of ancient coins, bronzes and graves (Von Prott, 13; Bölte 1332) but Kahrstedt holds this unlikely location for such wealth to be actually the villa of the Roman owner of a Taygetos marble quarry (1957, 200).

Xerokambi - Anthochorio: At the former, Von Prott notes H coins, bronzes and pottery, and the famous bridge and R water conduit from Taygetos (13-14); HS and W decide the bridge is H, Prof. Snodgrass suggests Medieval (pers. comm.). Ormerod notes (62) another possible pass to Messenia over the mountain here. But the finds could also stem from the large Anthochorio settlement nearby on the marls!

In conclusion, we would agree with the general opinion of most previous writers (e.g. Curtius, Von Prott, Ormerod) that the Taygetos 'Step' was little if at all permanently settled in ancient times, and was used for some temporary cultivation, hunting and grazing. We noted earlier the limitations on settlement and cultivation on the 'Step' and the intriguing reference to an early start to the modern practice of seasonal cultivation of the hardy vine up there (otherwise little cultivated in the Plain below) - Theognis: "drink wine from the heights of Taygetos" (Curtius, 1851/2, 206). We would also, on the evidence of soil zoning and the collected evidence just cited for actual archaeological density of finds of C to R date, argue that the western piedmont and Skalvochori depression zones were little settled, and most of the finds from here are indicative of limited domestic activities, or are chiefly ritual sites. We can with these possibilities in mind approach the tour description of Pausanias to attempt to limit the feasible identifications, in the hope that this may influence future survey for important prehistoric sites.

After a description of Sparta town Pausanias makes several excursions along definite trajectories into the surrounding countryside. First he visits Amyclai, then follows a trip to Therapne with the Menelaion, then to the north he goes along the road to Arcadia, finally there follows the journey out of the district and to Gytheion (Pausanias, 3, 19-21). The whole sequence is admirably discussed by Von Prott, though we differ from his ultimate conclusions (1904). From Therapne, which is certainly our Menelaion plateau, Pausanias crosses back onto the right bank of the river and visits some shrines between Amyclai and the city. From there he says he goes to a place called Alesiae by proceeding in the direction of Taygetos, i.e. west. This place is further localised for we know that he is still north of a river Phellia which, he tells us, we should have to cross to get to Amyclai. In his trip to Amyclai from Sparta on the main road he had already, earlier, noted that he crossed another river, the Tiasa river, which was nearer the city, from his description, than the Phellia. A final stream is known to us from Aristotle and Plutarch - the Knakion, which with the main bridge NE of the city characterised the town perimeter. In the Plain, as the map will show, there are three well-established streams between Sparta and Amyclaion: the Magoula, the Pandeleimon and the Riviotissa (Von Prott, 3-4). It is accepted by Von Prott that they were basically in their present form in ancient times, and we can confirm from our geomorphological studies that this must indeed be so, for they exhibit a well-developed incision trench filled with alluvium of the usual post-Classical formation. Therefore the Phellia river, near which, but to the north, Alesiai lay - not close to the Evrotas where we saw instead sanctuaries - must be the Riviotissa. Indeed the hamlet that has been renamed Alesiai is certainly close to the approximate position, though on grounds of geography (soils especially) we would prefer to see this ancient settlement as being further east amid the Neogen, and where in fact we discovered a large C site (see discussion above). The Alesiai 'Place of Grinding' with its reputation locally as the original location where milling of corn went on, could just conceivably refer to a folk memory about prehistoric settlements such as nearby Kouphovouno (HS and W, 74), but in any case the best corn zones were then, as now, not in the alluvial and colluvial zones of these other finds but on the Neogen to the east, very close to Kouphovouno.

At this point in his tour we find a valuable clue that we are following Pausanias' footsteps correctly, for between the Tiasa river and the Phellia he has just made an excursion in the direction of Taygetos, clearly beyond the main Sparta to Amyclai highway - the 'Sacred Way', but now he tells us that he is turning right again, i.e. west from his stance on the main road looking south towards Amyclai/Vaphio, and sees the road leading to Taygetos at the Phellia river crossing. Now clearly for other reasons only the Riviotissa stream can be the Phellia, for the previous two rivers closer to Sparta have a natural flow from NW to SE, the Riviotissa flows SW to NE, and the land between the Pandeleimon and Riviotissa towards Taygetos is therefore (cf. maps) a large wedge getting wider as you go west. Only here therefore, could Pausanias move west from near the Menelaion to see Alesiai, then move south to the Phellia and move west or right again, without having to backtrack over ground already covered in the opposite direction. He does not necessarily but could take that road to Taygetos; in any case he mentions in its vicinity or some way along it the Zeus Messapios sanctuary. We hear from Stephanus Byzantinus that Messapiai was a village in Laconia (Von Prott, 6-7) and around the A. Georgios hill we saw extensive finds of ancient architecture, graves and the likely evidence for a shrine and an associated domestic settlement, (with a recently dug Late Roman cemetery). Von Prott already identifies this locality as the Messapios shrine, and it is exactly in the right position (6-7). We now get a little lost; for although Pausanias has shown us the branch road going west to Taygetos from just north of the crossing of the Riviotissa, he has remained in the level Plain to see "on the plain...a precinct of Zeus Messapios"; he next tells us that "leaving Taygetos from here you come to the site of the city Bryseae" with a temple of Dionysos, and "above Bryseae rises Taletum, a peak of Taygetos". One must surely assume that he is now turning away from the range of Taygetos, and this should be a move back to the east, but since (as we have seen) he has already covered this area and this direction would only take him back to the Amyclai/Therapne zone, we must, I think, realize that he is going either SW or N (the only trajectories remaining that combine moving away from a route to the mountain and not returning to ground already discussed). We cannot follow Von Prott (1904:8) as others have shown also (e.g. Ormerod 1910:64), in the unjustified rewriting of Pausanias' text at this admittedly complex point - in order to make Pausanias continue towards Taygetos - thus locating Brysea at Kalyvia! Further, it is not necessary to assume that Pausanias is necessarily moving away from Taygetos beginning at the Messapios sanctuary (Von Prott, 7). He is describing the Taygetos road and a shrine in its vicinity - it is quite possible that he is observing the shrine from a point on that road closer to Taygetos than is the shrine of Messapios, and his next move 'from Taygetos' might therefore be in a direction that still keeps the traveller on the Taygetos side of the Messapios shrine.

The only problem remaining, though a major one, is which of these two trajectories he takes. HS and W follow the school of topography that assumes he went SE to Bryseai, and since he never got to Vaphio/Pharis this takes us to the only other major Mycenaean centre which can exist in this direction, A. Vassilios (1960:81); this is the reason for calling it Bryseae, and leads I think to the necessary rejection of the etymology of the name (though

HS and W never discuss the etymological problem). From here we see the Elias peak at close quarters, the natural as loftiest peak of all the summit ridge of Taygetos to choose as the chief peak sanctuary; in this viewpoint Pausanias then takes us on a tour of the localities up on the mountain, apparently as far north as the area of the Eleusinion site at Kalyvia which he describes, presumably descending in his description from a list of the 'Step' localities to treat the notable shrine at Kalyvia at the mountain foot, (there is regrettably a lacuna in the text at this point). Pausanias' description runs thus: after Bryseae we hear of the Taleton shrine on Taygetos, then "not far from Taleton is a place called Euoras, the haunt of wild animals, especially wild goats. In fact all Taygetos is well-stocked with both deer and bears. Between Taleton and Euroras is a place they name Therae" — then the text breaks off and we pick up the narrative again in a description of the Eleusinion at Kalyvia.

From this shrine Pausanias tells us of another straight line series of places or localities which appear this time rather to be half in the Plain, half above it. This passage runs as follows: "15 stades distant from the Eleusinion is Lapithaeum...so this Lapithaeum is on Taygetos, and not far off is Dereium...about 20 stades past Dereium is Harpleia, which extends as far as the plain". After this Pausanias describes a new trajectory from Sparta town north to Arcadia, upstream along the Evrotas. He then is seen on the main Sparta to Gytheion road, but begins his description at Krokeai well into the Vardnochoria hilland.

We must assume therefore, given the two major zones of Neogen soil without significant prehistoric settlement (SW and NW plain, as we saw), and with some traces of occupation in the Step villages on Taygetos, on the piedmont and in the Anthochorio area of C-R age, that only three main systems of travel are possible, in which we can fit the description of Pausanias to known finds and the constraints of physical geography.

1) Pausanias goes SE to Vassilios (which is then 'Bryseai'), describes the Elias peak (then 'Taleton') as seen from the plain, and then, without apparently actually visiting them, runs through the localities of the Taygetos 'Step' plateau northwards until the Socha gorge brings him down to discuss the Eleusinion at the mountain foot. From here he then describes another line of localities and/or settlements in a line south of the Eleusinion, similar to the modern piedmont villages of Anogeia, Xerokambi, etc. This is basically the HS and W favoured view (cf. 1960:82).

2) From 'Messapios' (at A. Georgios) we go SE to Vassilios (again 'Bryseai'), then up along the 'Step' and down at Kalyvia (as in scheme 1), but now move in a line north and discuss places or settlements in similar positions to the modern piedmont villages of A. Ioannes and Parori/Mistra, and/or Anavryti up on the 'Step'. The latter series localised on the northern piedmont and/or 'Step' zone, is a common theory - cf. Curtius, Heberdey (Von Prott, 12).

3) From 'Messapios' (again at A. Georgios) or a bit further along the Taygetos road west from there, Pausanias turns to the north but still clearly away from the NW-SE trending Taygetos range (cf. maps) and heads into that

very fertile but unclaimed zone of Neogen extending between Magoula and Mistra/Parori. Somewhere here amid the perennial headwaters of the Magoula and Pandeleimon streams, surrounded by key arable land, one would confidently predict the existence of important prehistoric and historic settlement which includes an area of some size beyond the estimated exploitative territory of known sites of those eras, (though in neither case of major status). In fact we have seen an exact lattice position here for a medium-sized Mycenaean centre on the perimeter of theMenelaion territory, one partly taken up by later historic Sparta and wholly by Mistra. Von Prott admits that this NW plain area cannot be without ancient settlements - though mainly on grounds of abundant water resources (1904,12), and before him Curtius, Leake and others had sought in some of Pausanias' references an indication of the expected ancient settlement of this fertile area (Von Prott:2). A. Ioannes was, e.g. seen as a suitable location for Bryseai or 'Quellstadt'. In our scheme 3, we suggest a siting for Bryseai a little further downstream from Ioannes - where the strong Taygetos foot springs are close enough for the appellation but where the settlement would be amid fertile marls rather than the poor Older Fill by Ioannes. From Bryseai, somewhere in this zone, Pausanias sees a peak of Taygetos above - Taleton. Even if we need not suppose that the Taleton shrine is necessarily the actual summit peak above Xerokambi in the south part of our region (the Elias peak), we do not believe that a peak on the lower range of Taygetos is a likely place for the Helios shrine. Von Prott's objections on the siting of Taleton along the true summit ridge (1904:7) as noted earlier, are easily contradicted by modern peak sanctuary practices! After Taleton, Pausanias describes the 'Step' localities south to Kalyvia which he 'descends' to describe and from there outlines for us as with scheme 1 a line of places running south but along the 'Step' above Kalyvia, only descending again in the area of Xerokambi/Potamia. The broad outlines of this view (which is basically that favoured by the present writer) are those of Bölte (1929:1332ff), and P. Levi (1971:73).

We can be fairly confident that the first part of the description after Taleton is up in the mountain, for the names are clearly localities and with reference to hunting etc. rather than apparent settlements; Von Prott admits this for Euoras, Therae in the first sequence before Eleusinion (1904:8,11), (cf. Ormerod 1910:64), and we lack all hints of nearness to the Plain. But the second series after the descent to the Eleusinion, as noted, seems to end at least in the Plain, and also may probably include settlements - this fits far better the potential for settlement in the fertile piedmont zone of the SW Plain and the actual remains of ancient occupation here. Von Prott is surely right in pointing out that Pausanias must have passed close to this SW zone on the road to Gytheion as he left the region, but does not mention anything here at that time, having noted the SW plain on the earlier post-Eleusinion excursion. But to use the same powerful argument we might point out that in all schemes but the third Pausanias totally ignores the very fertile NW plain, where indeed we suggest three regional capitals have derived a good part of their sustenance in basic food resources from Mycenaean into Turkish times. In the HS and W scheme we have, it seems to the writer, certain basic difficulties: firstly the Bryseai appellation for A. Vassilios; secondly the very curious tour of Pausanias here, implying that he discusses from the south end of the Plain the localities of interest IN Taygetos north to Kalyvia, then

discusses the piedmont localities of interest all the way back to the south of the Plain again, thereby doubling back completely on himself and deliberately taking no note at all of the landscape NORTH of Kalyvia both in the mountain, on the 'Step', or on the piedmont. In fact even this view of 'Step' south to north, followed by a backtrack 'piedmont' tour north to south, is not followed consistently by its proponents. Von Prott, e.g. questions (in order to fit his views to the obvious facts of geography and finds of the right age) whether Pausanias' expression — 'on Taygetos' cannot mean 'at Taygetos foot'! HS and W also appear very inconsistent and strain credibility when they attempt to place Lapithaion on the piedmont at Anogeia (1960:82). Furthermore, from the Taygetos branch road near Messapios/A. Georgios, Pausanias could turn AWAY from the mountain to N and SE without retracing his tour, but only the northward route is really moving distinctly in the opposite direction to the Taygetos range, going SE is generally parallel to the range (which trends NW-SE). A. Vassilios is then in an area roughly SE of the Messapios zone. This favours the view that Bryseai lay towards Magoula/Mistra. Owing to these objections, the present writer tends to favour scheme 3. The latter has the further crucial advantage that it can account for all zones of the west Plain and mountain in Pausanias' tour description and such as would be expected from physical geography to be of interest in ancient times: for we move from our hypothetical siting of Bryseai amid the fertile, unclaimed zone between Mistra and Magoula, up into Taygetos onto its summit ridge for Taleton, then we look at the hunting grounds perhaps with some settlement (possibly seasonal in the limited and localised arable areas), as far south as the Kalyvia gorge. Pausanias' description (cf. above) of this first series of places between Bryseai and Kalyvia, clearly denotes localities up on Taygetos: Taleton the summit shrine, "near it Euroras...a place (not a settlement) the haunt of wild animals...In fact all Taygetos...well stocked with...deer...bears. Between Taleton and Euoras is a place they name Therae" — a place not a settlement, Therae = wild beasts! It is only to fit particular finds and the modern village pattern that writers have ignored the obvious evidence here that this series is up on the generally uncultivated mountain and 'Step' area. We have no mention then of the piedmont zone from Mistra to Eleusinion — why? Because it was then poor quality Older Fill and quite unlikely to carry significant ancient population permanently settled - clearly likely to be an outfield area for fullplain-based communities. Pausanias only descends here to the piedmont solely to discuss the Eleusinion shrine. He then discusses localities to the south, both in the mountains and on the piedmont, doubtless places in the latter where Neogen is extensive e.g. Anthochorio and Potamia. He tells us that after Eleusinion we proceed 3 km to get to Lapithaion, which, as he reminds us, "SO THIS Lapithaion is on Taygetos" (ignored by many writers including HS and W:1960:82). Surely this should be the area around the modern Socha village on the 'Step' where scanty ancient finds have been made, and which is indeed this far as the crow flies. 'Lapithaion' as has been noted by several writers, is again clearly a place of 'Lapiths', wild upland creatures of myth - hardly the piedmont at Anogeia, and anyway contradicted by the specific reminder that we are still 'on Taygetos'. Steph. Byzantinus in fact lists 'Lapithe' as a mountain in Laconia. Not far off is Dereion, which should then be in the direction of, or by, the 'Step' village of Sotira (and note we must still be in Taygetos, there is no mention of descent till the next comment)

— "about 4 km past Dereion is Harpleia, which extends as far as the plain" - an ideal description for the area of piedmont from Xerokambi down into Anthochorio, as the crow flies somewhat more than 4 km. The clear evidence in the text that we begin at Lapithaion ON Taygetos, and stay there until we are specifically taken to a settlement which reaches from Taygetos down into the Plain (Harpleia), accords well with the given distances to get us from Kalyvia to the newly discovered settlement at Anthochorio. If we take the finds at Xerokambi with those at nearby Anthochorio as part of the same community - "extending down into the plain", and with an economy based on the fertile marls of the plain, the herding in the hills above, perhaps some seasonal cultivation above Xerokambi - we are agreeing with the commentary of Von Prott at this point on Harpleia. For Pausanias' description is ideally suited to the great Older Fill fan at Xerokambi, running into the equally descending Neogen marls of Anthochorio - both trending down into the central Evrotas depression - here we can see the community of Harpleia 'half on, half off Taygetos' as it appears from Pausanias' description (Von Prott, 13-14). We can then contradict HS and W (1960:69): "Pausanias is an indispensable companion for a field worker, but hardly a guide for discovering prehistoric settlements", for such a description of Harpleia is clearly that of a reliable eye-witness account (as Von Prott remarks). The MISUSE of Pausanias has, we hope been demonstrated, and his value in limiting the possible lines of field research for major settlements seems far greater than is normally acknowledged.

If Bryseai is most logically to be sought in the 'empty area' of the NW Neogen, (but we would argue surely if there a second grade LH centre like Amyclai - perhaps more significant before the late rise of the nearby Menelaion), which Homeric city was A. Vassilios, for it is certainly a major community? We also have an empty area near Anthochorio and Potamia, without a large prehistoric settlement and beyond the suggested territory of the A. Vassilios centre. Providing that Homer is concerned with listing such key centres known or unknown in the most important kingdoms, we might therefore look at one of these localities for Messe - at the moment on rather negative evidence Vassilios is favourite. While this is extremely speculative it is a striking feature of this Mycenaean centre, in contrast to all the other major centres of the region, that it actually sits in mid-Plain and at fairly equal distance from the Evrotas and Parnon plateau scarp, the Taygetos cliffs and the Vardunochoria plateau edge to the south - surely then a suitable name might be 'messe polis' or 'town in the middle' (Epic form 'messe polis' for Classical 'mese polis')?

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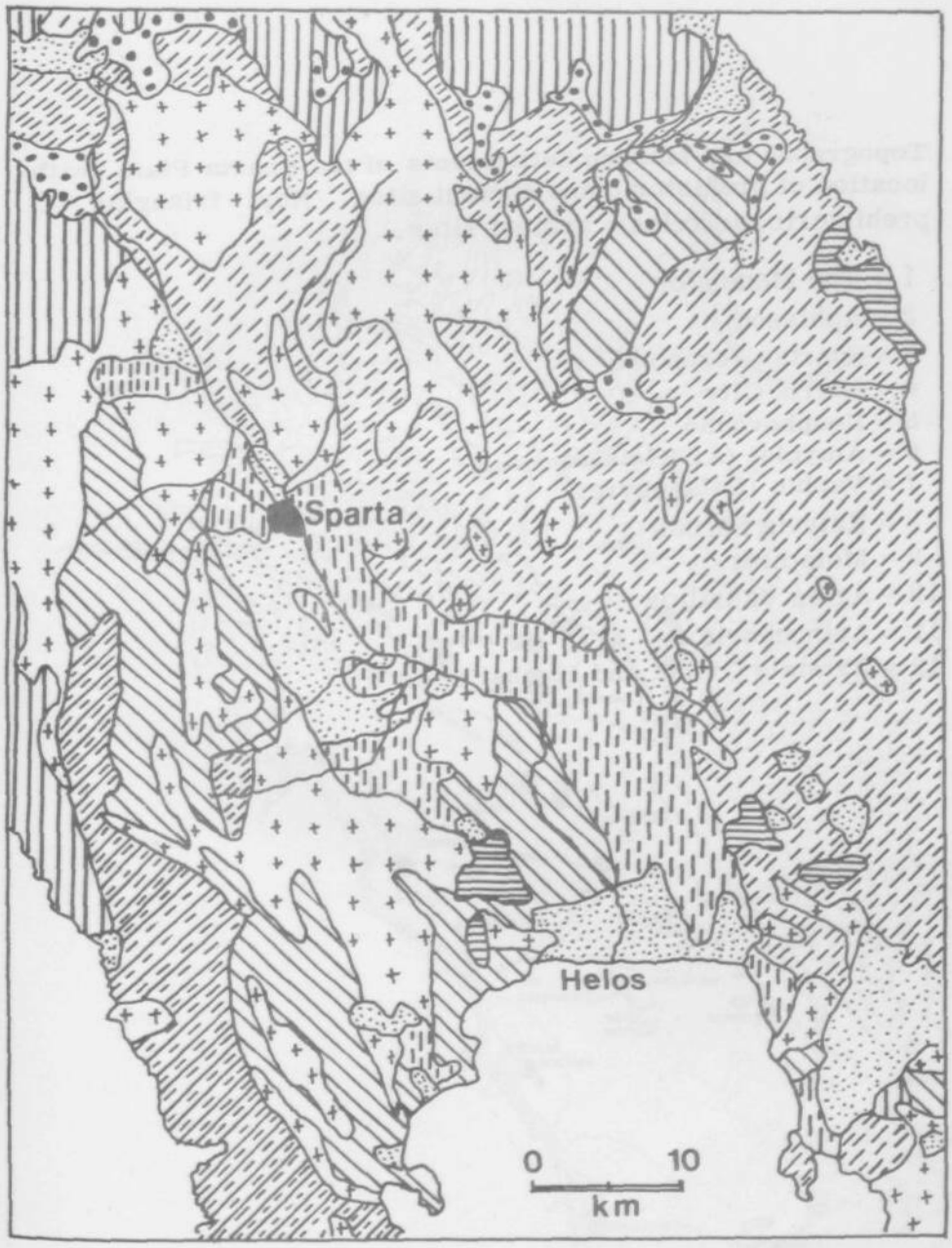
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Map 1 The Geology of the SE Peloponnese, after A. Philippson (1959).

Key:-

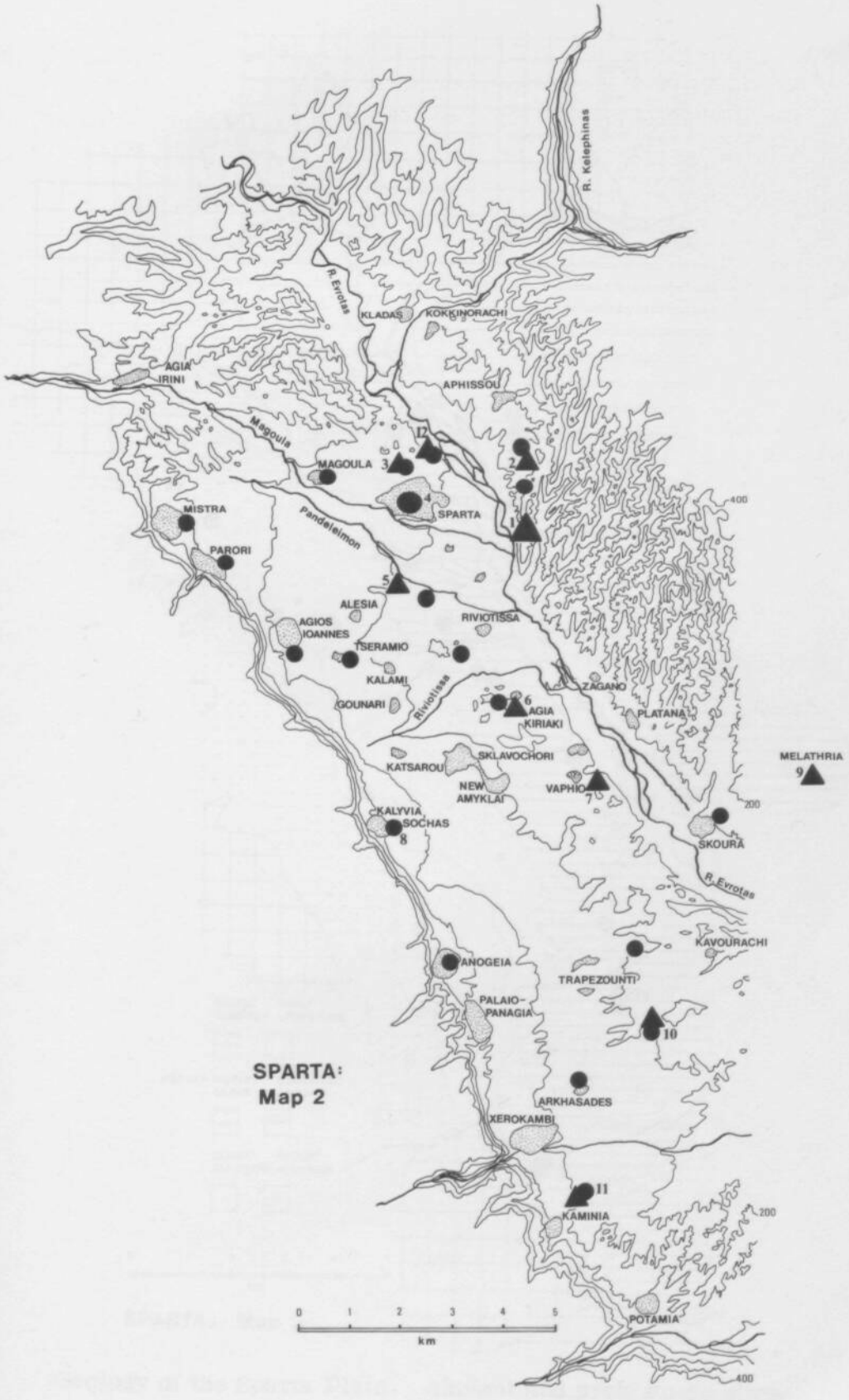




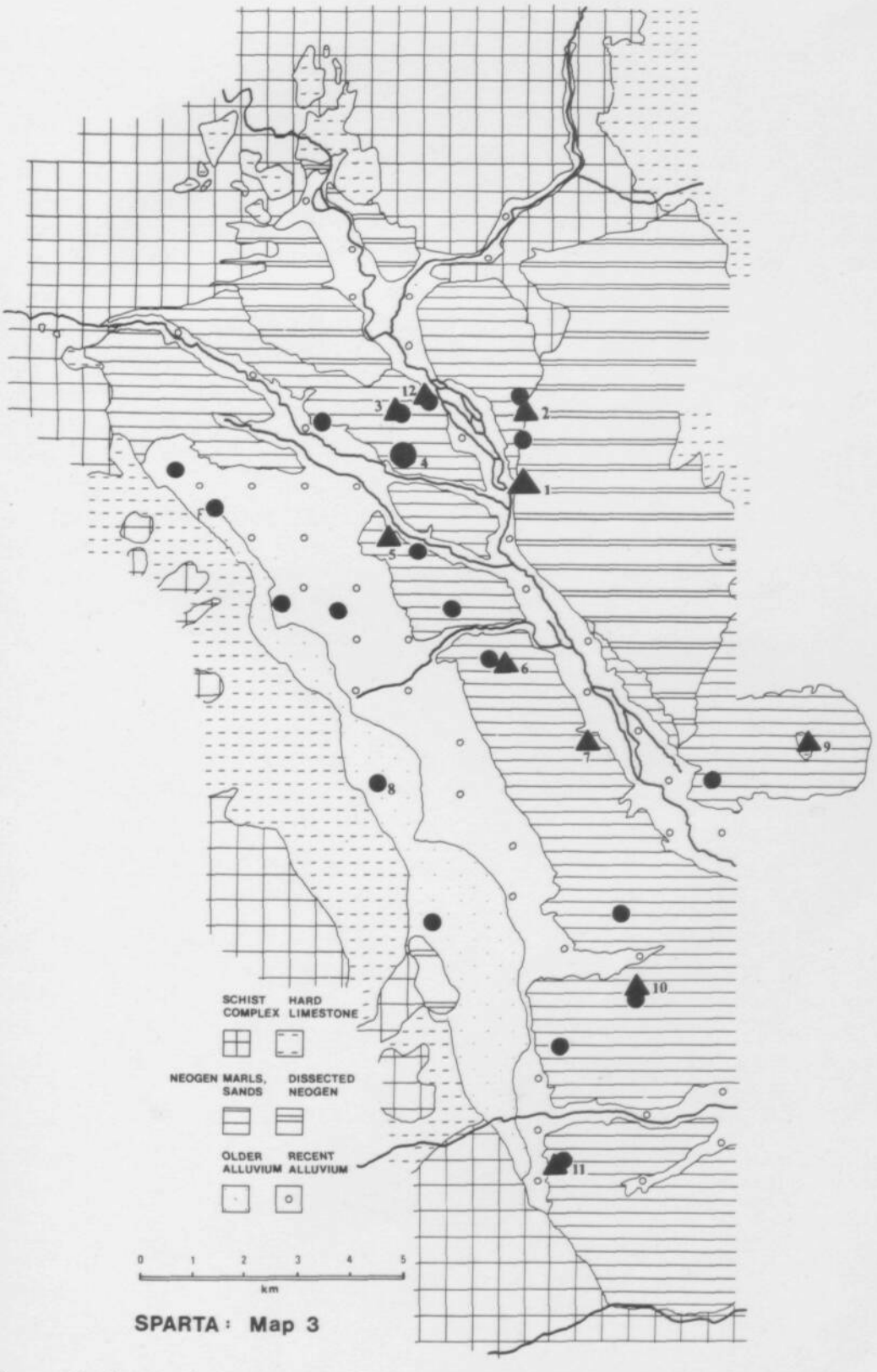
a = Alluvium
b = Flysch
c = Upper Tertiary (Neogen)
d = Tripolitsa Limestone
e = Tyros Igneous Beds (with Labrador-Porphyrite)
f = Cretaceous Limestone
g = Marbles
h = Triassic Limestone
i = Palaeozoic (Schists)

Map 2 Topography and Modern Settlements of the Sparta Plain, with location of prehistoric and ancient sites. Key: triangles = prehistoric; circles = ancient sites.

1 = The Menelaion
2 = Aphissou
3 = Sparta Acropolis
4 = Sparta City
5 = Kouphovouno
6 = Amyclai (A. Kiriake)
7 = Vaphio (Palaeopyrgi)
8 = Kalyvia Sochas
9 = Melathria
10 = Agios Vassilios
11 = Anthochorio
12 = Artemis Orthia and Limnai sites


R. Kelephinas
R. Evrotas
KLADAS
KOKKINORACHI
AGIA IRINI
APHISSOU
Magoula
MAGOULA
SPARTA
MISTRA
Pandeleimon
PARORI
ALESIA
AGIOS IOANNES
RIVIOTISSA
TSERAMIO
KALAMI
ZAGANO
Rivio tissa
GOUNARI
AGIA KIRIAKI
PLATANA
SKLAVOCHORI
KATSAROU
NEW AMYKLAI
VAPHIO
MELATHRIA
KALYVIA SOCHAS
SKOURA
R. Evrotas
KAVOURACHI
ANOGEIA
TRAPEZOUNTI
PALAIO-PANAGIA
ARKHASADES
XEROKAMBI
KAMINIA
POTAMIA
400
200
0 1 2 3 4 5
km

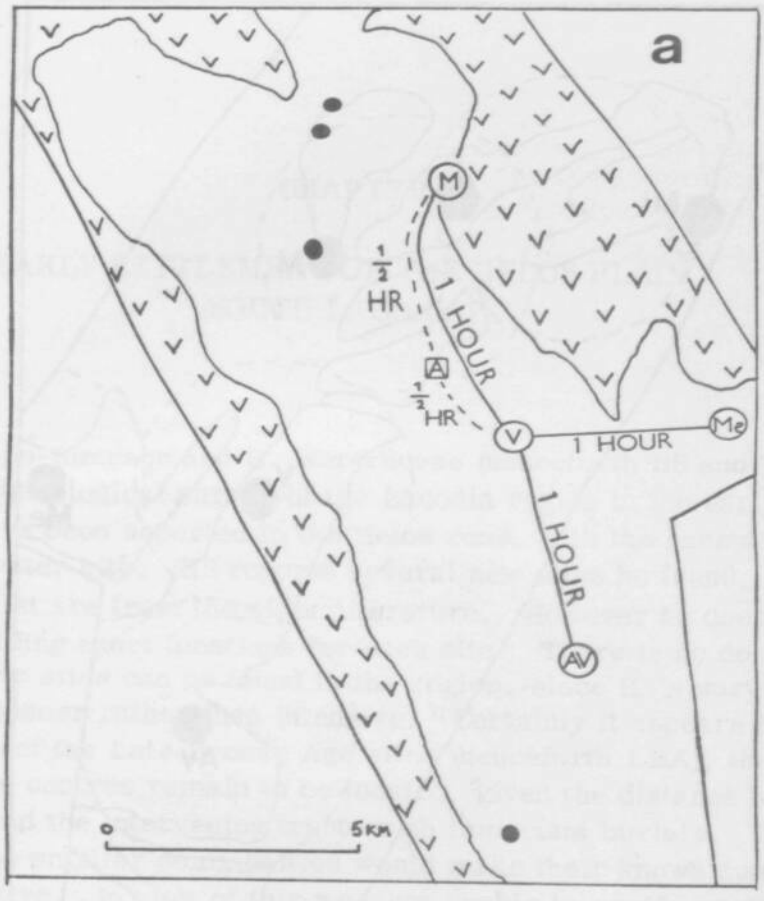
SPARTA: Map 2

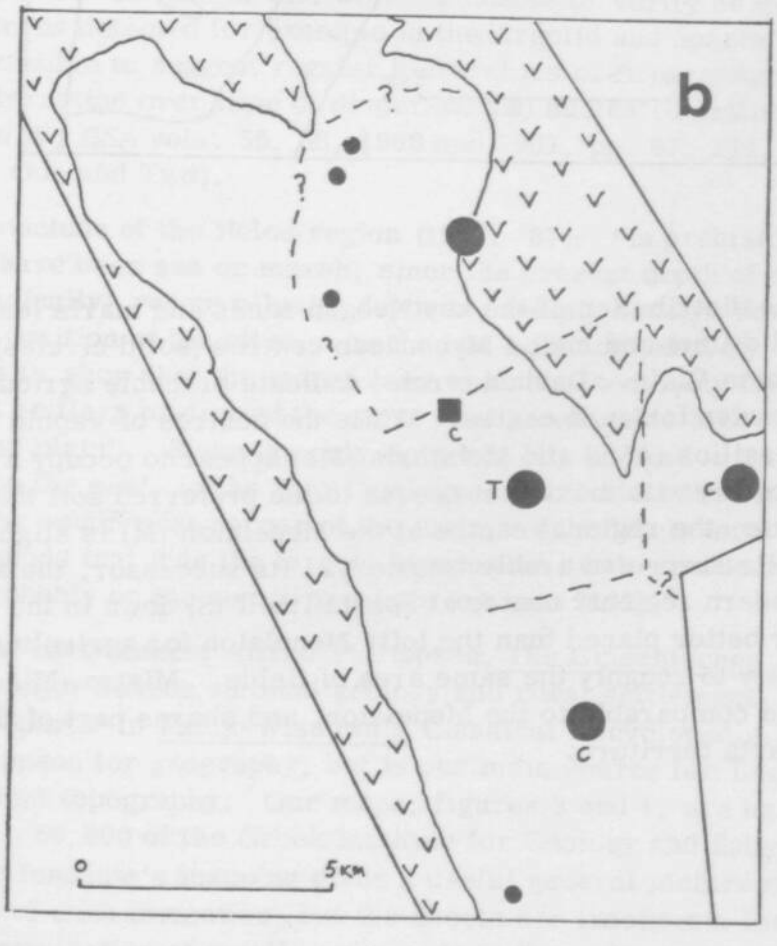


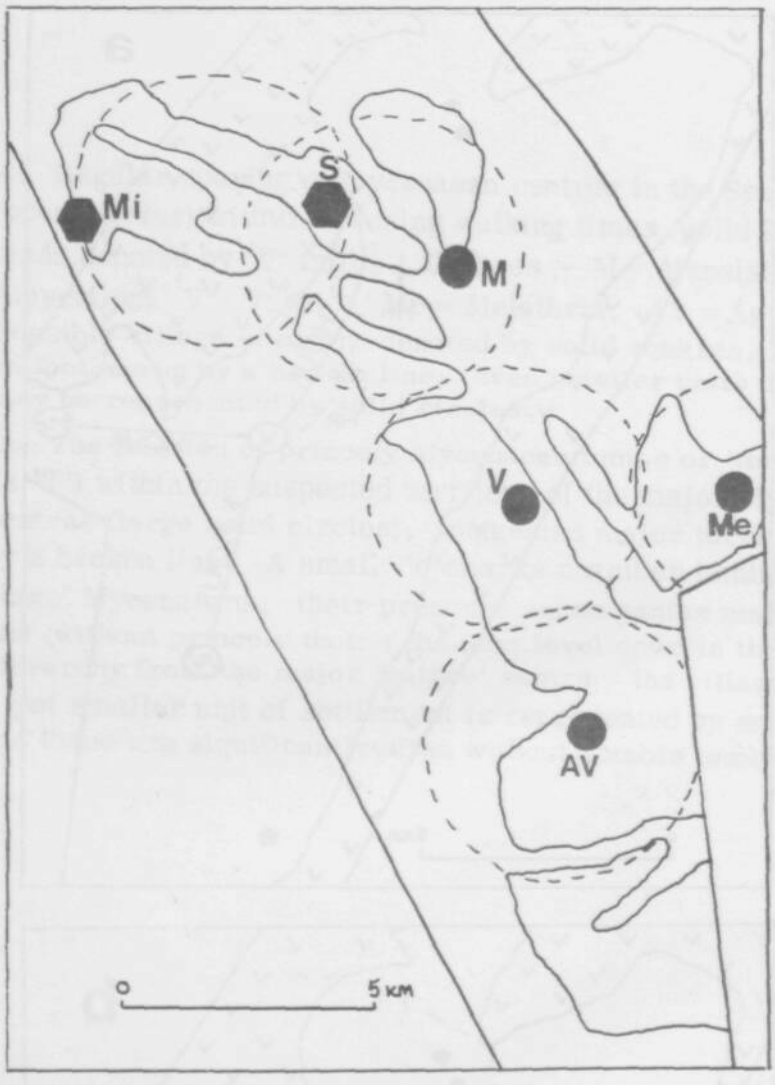
Map 3 Geology of the Sparta Plain. Ancient and prehistoric sites numbered as in Map 2.

Map 4 A: Regular spacing of Mycenaean centres in the Sparta Plain (open circles) with intervening walking times (solid lines). Uplands denoted by 'V' infill. Centres - M = Menelaion; A = Amyclaion; V = Vaphio; Me = Melathria; AV = Agios Vassilios. Possible village sites are denoted by solid squares, their distance on foot shown by a broken line; even smaller units of settlement may be represented by solid circles.

B: The location of princely Mycenaean tombs or 'tholoi' (marked as 'T') within the suspected territory of the major Mycenaean centres (large solid circles); suggested major territories indicated by a broken line. A small 'c' marks chamber tombs of the 'middle-class' Mycenaeans; their presence accompanies major centres and (without princely tholoi) the next level down in the settlement hierarchy from the major 'palace' centre - the village (solid squares). A yet smaller unit of settlement is represented by small solid circles, and these are significantly often without notable tombs.


a
M
½ HR
1 HOUR
½ HR
V
1 HOUR
Me
1 HOUR
AV
0
5KM


b
?
?
?
C
T
C
C
?
0
5KM



Map 5 The distribution of the key Neogen sands and marls (enclosed by a solid line) and major Mycenaean centres (solid circles) in the Sparta Plain. Dashed circles indicate probable agricultural territories for each centre. While the centres of Vaphio (V), Agios Vassilios (AV), and Melathria (Me) appear to occupy a central location with maximum access to the preferred soil that they dominate, the regional centre at the Menelaion (M) is slightly offcentre to its suspected arable territory. Its successor, the ancient and modern regional centre at Sparta itself (S) down in the plain, is far better placed than the lofty Menelaion for agricultural accessibility to roughly the same area of fields. Mistra (Mi) occupies a site comparable to the Menelaion, and shares part of the Menelaion/Sparta territory.

CHAPTER IV

EARLY SETTLEMENT OF THE HELOS PLAIN (SOUTH LACONIA)[1]

Data Given

Since R. Hope-Simpson and H. Waterhouse (henceforth HS and W), published their archaeological survey of the Laconia region in the early 60's, no notable finds have been reported in the Helos zone, with the exception of the Trinisia underwater site. HS reports several new sites he found, but the bulk of those in his list are from the older literature. However he does the great service of providing exact locations for each site. There is no doubt that many more prehistoric sites can be found in the region, since HS's surveying is extensive and pioneer rather than intensive. Certainly it appears likely from our examination of the Late Bronze Age sites (henceforth LBA), that several of even the large centres remain to be located, given the distance between known centres and the intervening tracts with important burials. The problem of picking out the smaller communities would make their known number even less representative. In view of this we were unable to verify as general, settlement patterns detected for example in the Argolid and Sparta Valley, where it was possible to suggest regular hierarchies of Bronze Age communities, and an alternation over time of dispersed and nucleated settlement preference (HS and W, BSA vols. 55, 56, 1960 and 1961, pp. 67, 114, 'Prehistoric Laconia', Pts. One and Two).

HS and W conclude of the Helos region (1961: 87): "In prehistoric times the plain must have been sea or marsh, since the present depth of earth is the result of (geologically) recent alluvial deposits, mainly brought down by the Evrotas. The position of the sites...on the low hills immediately bordering the plain, tends to show that the marsh land was not extensively farmed, but that the ancient settlers preferred the more easily cultivable hillocks or terraces around the plain". Since the only Homeric city known for the area is Helos, 'a city on the sea', in the Ship Catalogue, they select the site of Agios Stephanos, in the south-west corner of the plain, as the likely location of that city, on the grounds that it is the largest Mycenaean settlement known (1961: 101) and was probably on the sea in prehistoric times (102).

For the local environment Alfred Philippson, Die Griechischen Landschaften (1959) is a major source on local geology and rural settlement. F. Bölte in his article, 'Sparta' in Pauly-Wissowa's Classical Encyclopedia, draws heavily on Philippson for geography, but is our main source for Laconian history and ancient topography. Our maps, figures 3 and 4, are based on the geology maps 1: 50,000 of the Greek Institute for Geology and Subsurface Research. The Institute's mapping gives a useful general picture of the major expanses of each formation, but the sheets are inaccurate for large scale surface examination of small areas. It is the writer's common

experience that natural features of small extent can be absolutely vital to the understanding of the locational preferences of past settlement. These features are sometimes misinterpreted, often quite lacking on the 1: 50,000 series. In a study of the soils of the Helos Plain by N. Memmou, a map figure shows the general relation of the plain sediments to the watercourses that created them, and also the former extent of the two major marshes in the area (cf. our map figure 5) (Philippson A. 1959: vol. 3/2; Bölte F. 1929; IGSR Helos Sheet, Athens 1969; Memmou N. 1967).

We shall briefly summarise the regional geography (Philippson op.cit. 412ff. and figure 1 taken from Philippson. The chief feature in the geology of the SE Peloponnese is the existence of a great tectonic trough running due south-east from the centre of the Peolponnese peninsula to the Laconian Gulf. Over most of its length it forms the course for the main river, the perennial Evrotas. Besides this and its major tributary the Kelephina all the other streams of the region have their main flow as winter torrent beds. The perennial Vassilopotamos is derived from the Evrotas (Vassilopotamos as a coastal outlet of the Evrotas: Philippson: 461, Memmou: 7). On either side, this trench is flanked by lofty mountains, also running due S-E, and continuing into long rocky promontories jutting out into the Gulf; these ranges in inland are Taygetos (West) and Parnon (East), their respective capes in the sea Tainaron and Malea. There is far more to the tectonics of our area than a simple downthrust faulting of the total Evrotas valley, but in general the mountainous flanks have risen relative to an intervening depressed trough.

The sequence of the rocks composing the mountains around the trough, and appearing also in the hillands between the Sparta and Helos Plains, is as follows (cf. figure 4): at the base crystalline metamorphic schists, with plentiful marbles embedded within them; above this massive crystalline 'hard' limestone of two series. Between the schists and the hard limestone at several points is found Labrador Porphyrite, a stone composed from labradoric and diabasic lavas and quarried in prehistory and late antiquity as 'Lapis Lacedaimonius'.

If we leave aside the mountains, Philippson (446ff.) divides up the sunken Evrotas Trench into four zones, from north to south. (1) From the low watershed with the related Megalopolis basin to the NW, to Sparta in the south; hilland of hard limestone and schist, some soft limestone of later date. (2) The Sparta Plain, once filled by an Upper Tertiary inland sea, but the soft limestone created by this or 'Neogen' largely eroded or overlain by Pleistocene alluvium and colluvium. (3) Diverse - to the west the hill country of Varduno-choria, directly tied to the geology of Taygetos; since this reaches across to the eastern rim of the south continuation of the Sparta Plain, it effectively cuts it off from the sea, to which the hilland itself runs to the SE. In the east a Neogen plateau which extends south to the coastal plain, but which is cut off to the north from the remnant Sparta Plain Neogen by a ridge of hard limestone. This block of Neogen is likely to be of oceanic origin as opposed to the former inland sea of the Sparta Neogen. It is composed mainly of coarse conglomerates with stretches where the underlying sandy marls are revealed. (4) The depression of the Laconian Gulf and the Helos Plain; to the west hilland relating to the Taygetos rocks, to the east Neogen hilland, in between the broad alluvial plain of the river Evrotas and smaller watercourses.

This whole sequence takes up an area north-west to south-east 70kms in length. It is clear that already in pre-Pliocene times the important sunken zone existed between the ranges of older rocks, and was the only part flooded during the Pliocene, the Sparta Basin and the Megalopolis Basin by an inland sea, the eastern part of '3' and of the Helos Plain by an oceanic transgression. Thus arose the extensive layers of Neogen marls, sands and conglomerates. Subsequently the main SE trending fault continued to operate, and the central part of the trough sank relative to the original bed of the Pliocene lake and sea, while the whole region emerged from the sea upwards about 500m. During the Pleistocene, high ocean levels left a coastal fringe in many areas of marine deposits, often with well-preserved shellbeds, locally called Poros. The combination of recent tectonics, worldwide sea-level changes and the normal processes of erosion of the soft limestone of the Neogen led, according to accepted opinion, to the removal of much of the Neogen in the furrow as a whole and its burial under alluvium and colluvium from the steep mountains beside the rift. Thus was created the fertile alluvial plain of Sparta, and that of its southern partner, Helos.

Finally, some particulars on the Helos district. The Vrondamas plateau (the eastern part of '3') is a Pliocene formation consisting of uppermost, conglomerate, under this sandy marls, and is inclining both to the SE and to the W. Except for a marl area by Geraki it is mainly the infertile conglomerates that dominate, but to the south (as we enter area '4'), the plateau breaks off with an even edge at about 150m above sea level and by Myrtea (Philippson 460) (see figure 4), and out from under the conglomerate appears the sandy marl, which forms a long tongue projecting to the SE into the Helos Plain, reaching as far as the vicinity of the sea-coast near Asteri. Some hard, crystalline limestone outcrops are exposed in places beneath the marl. West of the tongue of Pliocene is the main plain, while a smaller one is found to its east, both consisting at least superficially of recent alluvium. On the main plain's northern border the hills are of hard limestone, but at their foot runs a small seam of Poros with seashells (Philippson 461).[2] By the Trinisia isles there is some Poros on the coast, and soon afterwards to the west the Neogen marls crop up towards Gytheion.

The general scheme of Philippson can be elaborated with the aid of the recent researches of J. Aubouin et al. (1963), and A. Strid et al. (1971). Laconia as a whole belonged to a 'shallow' underwater ridge in a 'ridge and furrow' tectonic system, when nearly all of Greece was under the sea, from Triassic (Mesozoic era) till Tertiary (Cenozoic era) times. Thus shallow-water limestones of considerable depth - the Tripolitsa series (hard crystalline limestone) overlie much older schists and quartzites. No traces appear in Helos area of the massive overthrust of the Olonos-Pindos limestone series from the east, as in the main Sparta Valley, but as with the Gavrovo-Tripolitsa throughout Greece, these limestones were raised on high above the waves by the Alpine orogenic activities (see Geology Chapter) in middle Tertiary times. Subsequently post-Alpine subsidences manifested themselves as characteristic NW-SE trending faults and depressions. Various ridges of older rocks remained, such as the Taygetos and Parnon mountain ranges, but intervening depressions, chiefly the great Evrotas trough, arose and were filled by extensive marine and lacustrine deposits during the final Tertiary period (Pliocene Neogen sediments). But the characteristic subsidence pattern, which

seems to continue today, was interrupted by temporary phases of uplift. During the Quaternary (Pleistocene) Laconia emerged above a lower ocean and the raised shoreline is found preserved extensively throughout southern Laconia - shallow beds of marine shells and sand locally known as 'poros'. Yet again the NW-SE depression began to operate and the Helos and Sparta Basins were formed as distinct hollows below even the early Pleistocene deposits. The result of these events is a typical landscape for both S and C Laconia: the highest points of the relief consist of NW-SE ridges of the early schist/marble and the later Tripolitsa limestone series; fringing these highpoints and forming hills around the lowest zones of the relief are Neogen marls and sands and in the south some Quaternary poros marine sediments; finally the hollows wherein are to be found the numerous rivers and torrents have extensive cover of recent alluvium and colluvium of middle or late Pleistocene, also Holocene age (see Geology Map by the author, Figure 4).

A correlation of the known Helos archaeological sites with local geology, purely by the use of previous maps, showed a number of findspots were clearly on the Neogen hills of the east and north-east fringe of the main plain, but an equal number were placed on the alluvium of the plain itself (cf. Maps 1, 3 and the plans of HS and W, *op.cit.*). Finally two findspots, including the site of Agios Stephanos, lay on schists.

We will now describe the development of our field survey in the Helos region (cf. Figure 3 for topography, 4 for the results of this examination of natural features).

Cumulative survey of the sites of the Helos Region

The prehistoric and ancient sites of the main Helos Plain will be discussed in the following order: from those in the south-west and north-centre we move to those in the south-east; finally several locations in the hills west of the Plain are examined.

Agios Stephanos

The site occupies a rocky promontory, mainly of schist with lesser areas of hard limestone and eruptives, projecting out of the hillock zone of older rocks at the west end of the main Helos plain through limestone and schist continuations of the promontory to the west. It is surrounded on north, south and east by dark recent alluvium (grey-black). The sea is about 2km due south of the site. While the appearance of the schist from beneath the hard limestone is a common situation for a spring line, and in fact ten years ago such a spring was in use at the site, the farming potential of the promontory is very low. Hard limestone gives a rugged relief and weathers but slowly, hence very little soil is created from it and this is of poor quality. Schistose rocks, on the other hand, weather very easily, and contain many useful components for a good soil in terms of minerals and clays. In addition, while the limestone is porous and all of the scant Mediterranean rainfall soon disappears into its depths, the schist is impermeable and surface vegetation thrives, and as noticed the combination of the two rocks superimposed makes the schist boundary a spring-line. However the schist produces so many eroded fragments and allows such rapid incision by streams, that its normal surface is one of an unstable scree, prohibiting that further comminution and chemical weathering

that would produce a good soil from the promising rock components, and giving no support to a dense growth of the less tenacious plants. Only in depressions and on plateau surfaces close to the local watertable, where schist residues are more stable, can the schist potential be brought to fruition. Both the Stephanos promontory and the mixed schist/hard limestone hills to its west lack conditions for extensive soil development, the schist hills being steep, the limestone missing those solution hollows where its meagre and anyway poor quality residues can gather to constitute a clayey red soil.

Yet the occupation of the site is quite a significant one from the Early Bronze Age through to the Late (or Mycenaean), and in the M and LBA the wealth of finds, evidence for imports and the suspected size of community point to the site being one of the major centres of the plain.

Summary of Excavations

The site of Agios Stephanos was surveyed by HS and W (1960:97ff.). EH finds were not very common, most sherds were MH and LH (99), the floruit seemed to be LH3A and B (100). There were probably a few LH3C sherds, and an A/C or H jar with a few BG (Black Glaze or C-H pottery) sherds were picked up. Obsidian was not very frequent, but a number of pieces of lapis lacedaimonius with pounders were identified. About 200 m away on a lower terrace above the alluvial plain a few LH3 sherds were also recorded. HS reconstructed a possible defence wall around the upper part of the promontory, including a bastion, in small stones (97).

Excavations have been conducted by Lord William Taylour for several seasons immediately after the survey report, and again in the last few years (cf. Arch. Reps. 1959: 9; Deltion 1960: 104; Arch. Reps. 1964: 9; Deltion 1964: 146; BSA 1972: 205; Arch. Reps. 1973: 15, 1974: 15, 1975: 15). The hill was extensively occupied, and walls were found in all trenches opened, together with pottery of all Bronze Age periods. The first occupation, EH2, is associated with remains including housewalls over all the hilltop. No EH3 is yet attested, but MH of all known subphases is very rich in every part of the site. A very significant feature of the later MH and early LH pottery from the excavation is the pronounced Minoan influence, including actual Minoan imports as well as strong imitations. The particular influence of the nearby Minoan 'colony' at Kythera has been detected. The remains of a possible defence wall were uncovered on the east slope, between 2-4m wide, built of small rocks. Pottery associated with it may point to its construction in LH3B times. A few metres higher up the slope evidence for another, smaller defensive wall was found. A possible Mycenaean chamber tomb may lie on the lower hillslope. Despite the claims of HS, the only finds between the Late Mycenaean and Byzantine occupation of the hill are the odd Roman Imperial coin. However the present writer has seen what appears to be a farm structure of Greco-Roman date on the next hilltop to the west. The Byzantine material begins in the seventh century A.D. and includes house-remains, but does not imply any significant population at Agios Stephanos.

Molluscs were plentiful on the site, and from the end of LH3A the purple mussel is found, that the Laconian Gulf was famed for in antiquity (Wyse 1865: 54); significantly in recent seasons of excavation (1974-) a water-sieve

in operation recovered what may be a total of several hundred sea-urchin spines from the occupation levels (Lord William Taylour, pers.comm.). Many drill core leftovers from the working of lapis were found on the site. The excavation reports affirm the belief of HS that the site was formerly on the sea, though admittedly his view was coloured by a preliminary identification of the site as Homeric Helos 'a city on the sea'. The nature of the possible landscape changes are not discussed, though we do read rather surprisingly (BSA 1972: 205) that the promontory is now surrounded by dry land because the land has risen since Classical times.

The author's experience has been that only very rarely and temporarily will a mixed farming community occupy a location remote from high quality agricultural land and this is usually for seasonal fishing and herding activities. If we take the appearance of the present landscape as similar to the prehistoric, the site dominates a good part of the western half of the alluvial plain; while we might say therefore that it lies on a defensible ridge above a spring, it is within easy reach of a large area of very fertile, moist recent alluvium. We might apply the same interpretation to the other sites known in this half of the plain.

From the evidence summarised in the Geomorphology Chapter, however, it is predictable that the vast bulk of 'recent alluvium' in the Helos plain is a formation post-Classical in date. While this recent sediment generally forms a terrace of several metres height beside the incised beds of large and small inland watercourses, in the coastal plains it may reach far greater depths of fill - and in the case of a major river such as the Evrotas with its rare quality of perennial flow - the amount of post-Classical deposition is to be expected at 10 or even 20m in the coastal delta zone.

Skala-Agios Nikolaos

A short distance WNW of the town of Skala in the north-central plain is a site that gave evidence of occupation in the MBA and LBA periods. No EH was observed by HS (op.cit.: 95) and he mentions only one MH piece, but several LH 'predominantly LH3B'. The site is very small even at this time. West of Skala a group of springs emerges from the interior of the hard limestone to form a river, the Vassilopotamos. Between branches of its streams is the site location, and according to published maps on 'alluvium'.

After the Upper Pliocene Neogen in Greece, with the exception of the Poros, rare volcanic eruptives and the present bedload of streams, all later deposits can be separated into two groups, known as the Older and Younger Fills (see Geomorphology Chapter). The alluvium marked on the maps by Philippson and the IGSR is undifferentiated, but on observation the plain surface itself, as expected, shows all the features of the Younger or Historical Fill.

The site of A. Nikolaos is actually a natural hillock amid the Younger alluvium, but the mound is not marked as such on any of the maps cited. The finds were collected on the top of a knoll c20ft high. Below it and to the west is found a low plateau, and here there are positive indications as to the composition of the eminence - yellow sands and fossil shellbeds. At the east end of the overgrown knoll we find a scarp face recently cut back by the farmer,

showing a section right through the knoll - red and yellow, rarely white sands, with numerous fossils of marine plants and shellfish. Most of this formation should be Pleistocene Poros, and though a detail absent from all published geology maps of the area, belongs to the 'seam' of such deposits noted by Philippson and Memmou on the northern edge of the plain. However some of the lower parts of the hill, especially the low plateau, could well be Pliocene Neogen. Since in any case the Poros has most of the advantageous properties for agriculture that the true Neogen possesses, we have an interesting link to correlations of sites and soils frequent in other study areas. But here the hill is surrounded by recent alluvium, and the visible area of soil of marine origin is very small. Across the marshy Younger Fill to the edge of the hard limestone hills to the north, traces of similar depositis of small exent can be seen running into the alluvium - without doubt they link up to our knoll. Further south into the alluvium another knoll appears, about the same height and of similar composition, again surmounted by a chapel.

Agios Ioannes

Further west, beside the main Sparta-Skala road, on the edge of the hard limestone hills and just above the level surface of the alluvial plain, we find the next site, described by HS and W as a 'small terrace' with a few LBA sherds and some Classical material (HS and W: 95). Again a very minor site. The location is a thin strip of yellow-white sandy marls overlying the lower edge of the hard limestone, and once more disappearing under the marshy black soil of the plain to the south. A pattern is therefore becoming apparent. Again a small area of Neogen/poros admittedly, but ignored on the geology maps, and just here we find early occupation.

Xeronisi

The site lies some way out into the plain south of the last site. A plentiful if localised amount of EBA, MBA and LBA pottery, together with some Classical sherds are reported (HS and W: 95. EH, MH, LH3A- C1, and Classical). The main occupation was apparently EH, though even this is hardly in the present author's opinion a community on a larger scale than a few farmsteads at the most. It is part of the alluvial plain on the geology maps. From the main road, having crossed several hundred metres of intervening moist plain soil, with it countless drainage canals, a long low 'island' appears to rise out of the plain, hence the name 'Xeronisi' - or dry island. Its composition is, unexpectedly, yellow sandy marls. The mound is quite extensive but was formerly a good deal higher than today (still 5 m above the plain on HS's visit), the upper surface having been recently artificially levelled. This may well have been to remove the original surface of conglomerate that characterises the top of many of the less eroded marl hills of the eastern part of the Helos Plain and in order to expose the highly fertile marls below. At present the highest preserved section of the hill is only a few metres above the muck soil of the surrounding plain, and the long axis north-south might be 100m.

Lekas

A number of sites are known from a raised area that takes up the NW corner of the plain, to the north of Agios Stephanos and separated from it by dark

alluvium. The corner itself is 'alluvium' to Philippson but is grouped by IGSR as 'slope wash, conglomerates etc.'. The district consists of rolling hills at the most 15 m above the plain floor. An important natural feature for its understanding is found just NE of it, where by the main road a side-valley runs into the plain. The deeply incised stream here is accompanied on either side by a heavily concreted red terrace of typical Older Fill, extending at a steepish angle from the hard limestone hills to east and west of the valley. This red alluvial terrace can be followed a short way south, below the road, until it disappears under the fresh dark Younger Fill of the Plain. Just before its disappearance and on its western edge, where it adjoins the Lekas hill group, a well shaft is visible. The shaft is freshly cut into the bright red Older Fill, and the latter is visible forming the shaft sides for a depth of 3-4 m into the ground. Beside the well is the earth tip from the excavation of the shaft, the top layer being fine yellow marl of Neogen type, then in reverse stratigraphy the red deposits form the bulk of the tip. Though the level at which the marl appears is not clear in the lower reaches of the shaft, it is certain that it has been penetrated not far below our 3-4 m estimate. The Lekas area has a surface cover of Poros shellbeds, but its main structure consists of alternating soft clayey-sandy marls and pebbley conglomerates. The former beds should be Pleistocene, the latter Pliocene Neogen. Since it is difficult to differentiate the sandier parts of these two marine formations, the well find is important, for here the clayier Neogen was well down, and the combined height of the hill group is inconsistent with the normally quite thin cover of Poros for the region. On either side of the reds the marls come to the surface and rise up onto the hills, which show the characteristic near-horizontal ledges of harder Neogen (cf. Sparta study). Conclusion: the bulk of this raised area is weathered Neogen hillocks, covered in places by a thin layer of Poros conglomerate and shellbeds; later 'Pluvial'/Ice Age processes weathered these deposits (mainly in situ but with some colluvial action) into surface horizons with a characteristic red colouration; furthermore the lower parts of the hills were overlain by colluvial/alluvial deposits also of a red 'pluvial' nature derived from the loftier hills behind the plain. The numerous potsherd finds over all these hillocks reflect the preference of early settlers for the Rendsina soils formed on Neogen (see Soil Chapter).

The main location in this Neogen corner is Lekas Panayiotis, 'a considerable Bronze Age settlement' with limited EBA, MBA finds and major occupation of the Mycenaean period (e.g. thick defensive wall, extensive pottery). There was also some Classical and Hellenistic occupation (HS and W: 95ff.: EH, MH, LH3A-B, C and H). HS and W claim that there exist two rings of ancient walls around the settlement, though the available sections are undated and hardly very massive, and we should perhaps be cautious on such points. The hill is steep on all sides, but only c 15 m above the surrounding fields. EH and MH were rare, and significant occupation on surface finds begins only with the Late Mycenaean era, and then over a fairly considerable area. The reoccupation of these sites in historic times will be commented on later but exhibits continued Neogen preferences.

From this NW corner the hills sink SE into the plain (as all formations of the Helos region). 200 m SW of Panayiotis and still in the hillocks another site gave MBA, LBA3 and Classical material; surface pottery continues amongst the other Neogen hillocks at the southern edge of the raised area. Where the

hills are at their lowest, a low mound 'Lekas South' is found, with likely Neolithic occupation, definite EBA, MBA, LBA, C and H. This last site is situated where within 50m or so the marls sink under the dark even plain that runs south to the promontory of Agios Stephanos (HS and W: 97). The first unnamed surface site is not a concentrated find, but Lekas South may well represent a small settlement: it is a mound now about 5m above the marsh, and the settlement area is c150 by 120m. Neolithic occupation is likely but not definite, EH and MH common but not apparently LH3. A small settlement.

Tsasi Region

Proceeding NE of Skala, and travelling up the Evrotas valley, one leaves the floodplain and with only narrow Younger Fill terraces either side of the river, is soon shut in by hard limestone hills. After a kilometre, while the main river veers to NW, we take a tributary valley northwards. This valley has a floor that is dry and little incised, filled with red clayey Older Fill aloping down from the low hills either side. After only a short distance we are at the watershed that descends NE into the rectangular depression that is bounded by Tsasi and Myrtea villages on N and NE. This depression is a deep inlet of the main Evrotas floodplain east of Skala, running northwards into the Neogen hills. Just at this point the soil changes colour from red to yellow as we leave the Older Fill terrace for the Neogen hills. The NW-SE ridge that bounds this side-plain on the west is composed of a core of hard limestone with a marl overlay that reaches on east and north-east sides almost to its summit. Right on the NE corner a hill stands out somewhat from the ridge

Romaika

A name with reference to its antiquities, collected by HS, giving C and H tiles and sherds, evidencing historic settlement locally concentrated on the Neogen areas (HS and W: 94). The writer noticed possible G or A material at the foot of the hill. From here the Neogen sweeps to the north in low, rolling hills, in the soft form as far as the Phlision hamlet, and around to the east through the Tsasi village across and uphill to the large Myrtea village. Several tongues of Neogen descend from the area of Tsasi to the south into the alluviated side-basin, and a major tongue from Myrtea reaches to the main Sparta road, that marks the junction of the side-plain with the main plain. The Neogen of all this area is dotted with sites. What is quite important is that the natural geological frontier about the level of Myrtea is respected by settlement distribution, i.e. where the Vrondama Neogen Plateau to the north loses its infertile conglomerate cap and from here south its soft fertile sands and clays beneath are presented - only below this line do we have occupation traces of any significance.

Not far south of the conglomerate/marl border just noted, and built into the conglomerate scarp, is a chamber tomb of Late Mycenaean date, at around half a kilometre east of Tsasi village. On hills around EBA, LBA, C and H pottery is known, especially to the south (HS and W: 92ff. EH, LH3A-B, C and H). The chamber tomb contained vases of LH3A-B type, but the settlement of that date is undiscovered. EH sherds are numerous all around, particularly on the rather barren conglomerate plateau above the tomb, but also more understandably on the marl hills to the south (in which the Tsasi village has its dense olive groves). LH is rare around the tomb.

Kokkinadha

Along the marl tongue south of Myrtea there is a large red hill called, for this reason, Kokkinadha, about 1 km NW of Vlachioti (HS and W: 92). A scatter of Late Mycenaean 3 sherds were found on it, and on a low knoll below to the west 2 possible chamber tombs were located. Scattered EBA and C pottery appeared on a hill 200 m north of the Kokkinadha hill along the marl tongue. These finds continue a frequent pattern around the Helos Plain of extensive traces of prehistoric occupation but only limited finds of nucleated communities. Myrtea itself was not visited by HS and may provide the answer to the lack of a major Bronze Age centre in this fertile side-basin, for we have one definite and two possible tombs for such a settlement, and our experience in other areas has shown that local administration units (at least in the LBA) appear at regular intervals over the landscape. The nearest major centres - Agios Stephanos, Lekas Panayiotis, Asteri, Agios Strategos, are clearly too remote to this natural pocket of fertility. Either the centre underlies Myrtea, as HS has suggested to the writer, or further detailed search of the known localities where finds have been made may reveal a major concentration of settlement.

Vlachioti

Near the town Kahrstedt reports a Roman villa. HS and W locate C and H pottery on a hill a little west of the town centre (Kahrstedt 1957:212; his site also NW of the town, so probably the same site as HS records). However HS is incorrect in stating (HS and W:92) that column drums were found in the area. These are thought to have been brought to Vlachioti from the extensive Greco-Roman site of Sto Manolaki in the SE plain (Hondius and Van Haeften, BSA 1921:150). This north-east corner of the Helos Plain consists of the recent alluvial floodplain to west and south, and a giant ridge of Neogen marls and conglomerates descending from the Vrondama plateau due SE as far as the coastal marshes and separating the main western Helos plain from a smaller one to its east. Within the edge hillocks of the latter hillchain nestles Vlachioti, and the hill with antiquities is similarly placed. Between the hill and Kokkinadha on the parallel but smaller tongue to the west, runs the Bourba torrent. The whole depression between these hills has been mapped as alluvium, but again we find that much of it is gently undulating marls, sometimes with a thin veneer of in situ, or limited colluvial, 'pluvial' weathering features. In the centre of the depression the river has incised into its own bed to a depth of 2-3 m and in its well bedded Younger Fill section we recovered pottery from over 2 m down, regrettably undatable but showing at least how recently the fill has accumulated here. Doubtless the marls extend at no great depth under the alluvium to join up the two parallel hill tongues on W and E.

Asteri

A number of sites are known amongst the Pliocene hill chain that, as noted, runs down through Vlachioti, past Asteri and almost to the sea, and which cuts off the main plain from the smaller one to the east (which we have left out of the study). At the north end of the chain hard limestone appears as a cliff under the marl, but soon disappears as the Neogen hills decrease in size to the SE. Up on the tops of this chain, just SE of Vlachioti, there is fine plateau land, and by a farmhouse limited finds of Mycenaean and Classical pottery. Two

kilometres north of Asteri and also up on the fertile tops there is another small Mycenaean site with C finds and possible Medieval buildings (HS and W: 92).

Only 200m north of Asteri village is a large hill, 'Karaousi', with a long and rich record of occupation, beginning in the Neolithic, continuing through EBA, MBA, LBA, PG or G, C and H, while presentday Asteri is immediately adjacent. Here some would see Homeric Helos. Unfortunately surface collection proved better than trial excavations, since heavy erosion accounted for the wealth of surface pottery but also the loss of settlement features. To the east a scarp of conglomerate with a good scatter of Mycenaean, Dark Age and C pottery, contains a number of collapsed 'caves' that quite possibly represent a series of LBA chamber tombs.

Summary of Excavations

HS and W: 89ff.: surely mistakenly they compare the hill to a Thessalian High mound site - but whereas the latter are generally artificial tells, this is clearly natural with but a scanty cover of soil and occupation debris. Pottery on surface sampling was very rich, and indicated a settlement from the Neolithic period, EH2, MH and throughout LH up to a few possible 3C pieces. On a hill beside it more Late Helladic sherds were found, together with some that may be either PG or G, and with BG (C) ware. Above these last finds the possible chamber tombs (?) were identified. A trial excavation of the hilltop site was very disappointing (Arch. Reps. 1959: 9; BSA 1972: 262), as hardly any depth of soil was found above the conglomerate bedrock, and only a fragment of wall was located to go with the very rich surface finds. No Neolithic finds are recorded from the limited excavation area, but the other periods noted by HS and W were confirmed, including the LH3C occupation. It is worth pointing out, that this considerable quantity of finds of so many prehistoric periods, and amid such an extensive zone of fertile Neogen marls, calls for an important community. There are similar traces though little explored at the Strategos site half an hour to the south-east, but it is surely an unnecessary assumption to confine one's attention to prominent hilltops as the only place in a particular location to look for a major settlement. The Karaousi hilltop is clearly part of a major and long-lived prehistoric settlement, but we may doubt whether this was actually concentrated on this steep hill. Possibly the height was part of the community, and would have been useful for defence (though as HS and W note there lack walling traces); the writer is convinced that in the low rolling hillocks around this site and Strategos there indeed lies such a major settlement, but such a location is not of great interest to acropolis-orientated archaeologists.

Dhragatsoula

Not far SE of Asteri village and on a hill above the marshy plain is Asteri-Dhragatsoula: EBA, MBA, LBA (LH3); along the top of the marls here is visible a surface cover of Poros shellbeds (HS and W: 89). A small site, EH common, rare M and LH. A possible pithos burial from the neighbourhood. In addition to the west of the road entering Asteri from the north is a very low marl promontory surrounded by alluvium, on which a good quantity of pottery appeared on the writer's visit, some of which was identifiable as Classical. In the hills to the east of Asteri scholars of the BSA reported finds of 'antique

marbles', tiles, sherds at 'Sto Manolaki'. The locals referred to this locality as the whole area from Asteri to the highest ridge in the centre of the marl hills to the east, though HS and W in their discussion of the site suggest an actual if widespread location within this zone. In fact C, H and R material is abundant over all this area from the Asteri hinterland down to the coast at the south end of the hills (Wace and Hasluck: BSA 1909: 161ff.; HS and W: 89). The locality and its finds are examined in detail below (p. 467).

Agios Strategos

At the very end of this Neogen hill chain the heights descend lower and lower, as is characteristic for the regional tectonics, and finally the marls have almost disappeared under the plain alluvium, when they meet a small coastal marsh only about 200m from the sea. At this point a number of low hills with a chapel mark a major site, with important finds from Neolithic, EBA, MBA, LBA and C periods. The Mycenaean includes a small tholos tomb - outside of Messenia and except for post 3B examples always taken as a mark of local royalty and the only one known from the Helos area. The site consists of a western part - the chapel ridge with N, EBA and C finds, and on the hills to the north undated building remains possibly medieval, and an eastern eminence with EBA, MBA and LBA. Somewhat between the two, and northwards, the uppermost of the tholos appears out of a marl hillock.

Summary of Excavations

The western part of the site, between the Strategos chapel and the coastal marsh, gave plentiful Neolithic settlement material, and evidence for a smaller EH occupation: pottery and stone artefacts (obsidian, celts, pounder). The eastern site has apparently a limited amount of EH, MH, more plentiful LH2 to 3B. Classical material exists around the Strategos chapel itself, and, as noted, continues for almost half an hour northwards to Asteri, with Roman finds. The small tholos tomb is almost completely buried, only its summit visible, but HS reports apparently associated LH3 sherds - probably of 3A-B type. Remains of houses near the chapel and to its north are probably of no great antiquity (HS and W: 87-9).

Between the two settlement areas, on the south, the ground is very low indeed, the marl sinking to sea level, and a lagoon enters the small depression, today only 150m from the site. The location has to NW, N and NE Neogen, and, if a port, two former beaches on either side - since the smaller eastern plain is by the coast, Younger Fill, its rear half Older Fill and Neogen hillocks, and the main plain is all recent fill.

A prehistoric site is known at about the level of Vlachioti and to its east in the small side-plain, corresponding to our sites near Vlachioti in the adjacent region, and at the outer limit of the effective exploitation from Agios Strategos and Asteri (Agios Ioannes - MH, LH?, C, H; HS and W: 87).

Trinasos Region

West of the promontory of Agios Stephanos, the plain is rounded off by rocky hills belonging to the Taygetos complex, i.e. schists and porphyrite,

and marbles with hard limestone. As noted already the general characteristics of these formations are unfavourable to settlement, and soil development is limited in their steep, scree-filled valleys, where in fact much of the soil today has clearly developed on the Younger Fill terrace. Stephania, the only village in this western half of the plain, and its nearby hamlet of Tsouli, have the main part of their fields in the plain itself and the Lekas Neogen, using the hinterland of older rocks for pasture and very extensive olive culture (i.e. widely spaced trees). However two archaeological sites are known in this hinterland.

Trinasos

The first is on the coast several kilometres SW of Agios Stephanos: Trinasos. We have reports of a large fortification on the plateau above the coast here, said to be of Classical date - the writer was unable to locate its exact whereabouts, but it certainly lies not far above the visible remains of an ancient harbour by the Trinisia islands. These three islets are linked up at a shallow depth underwater, and once formed a natural breakwater for boats, apparently anciently aided by seawalls. The name Trinasos occurs as that of a Perioeci community in the Classical period, a subservient neighbour of the Spartans, whom we know to have personally occupied the Helos Plain.

Summary of Excavations

Boblaye (1836:94) reports that the harbour was used as one of the ports of Mistra during the Turkish period. Curtius (1852:287) located the ruins of Trinasos high on the steep rocky cliffs by the islets - a semicircular area of perimeter wall of c 400 m circumference. Bölte (1929:462) recognises in the references a perioeci community, and notes Dukas on the possibility that the harbour was a loading place for the export of lapis lacedaimonius from the Krokeai region. Kahrstedt has considered the site in most detail (1957:206): Pausanias noted a small fort here, but he suspects also a civilian settlement. Through wave ramparts an artificial basin in the sea was created by Roman times, c 200 m long and 70 broad, continuing into the former dry land; this he identifies with the 'new harbour of Gytheion' of Strabo. The purpose of the harbour was as the centre of lapis export; after the limited prehistoric interest in the stone (cf. below p. 477) there appears to be no evidence for its export until the rise of Rome. Strabo noted the new quarries of Laconian marble and Kahrstedt claims that this new mining activity is a result of the growing Italian building industry. The Krokeai quarries appear to have been state-owned (op.cit. 197).

The major feature to be seen in this area is a remarkable underwater site noted by N. Flemming in his coastline studies. In a long but narrow inlet just west of the remnants of the three island harbour, and with its surface courses just awash, can be seen a large complex of walls running from the beach of the inlet 25 ft or so into the sea. They form a regular rectilinear pattern, and seem to be built of concrete and stone (the Roman rather than the modern type of concrete). Flemming dates it about 1000 years before present, without citing evidence (Flemming et al. 1973:12). He claims that the walls run for about 10 m into the sea, and the deepest submerged wall is in 1 m of water. The date of these walls is probably a guess on his part from a nearby Medieval

church buried in the sand. On the present writer's visit there, pottery was gathered from the submerged chambers that Mr. W. Younger kindly identified as being Late Roman to Early Byzantine date, i.e. 6th to 7th century A.D. This site is also of interest because the inlet has a well-preserved terrace of dark Younger alluvial Fill at present being incised by its stream and eroded by the sea. This terrace contains late antique pottery and forms an abrupt scarp about a metre high at the land end of the beach, which would be about 2 metres above sea level and the building complex. Around the terrace has accumulated sand, but since it is clear that the sea has risen relative to the land in this area, and that the deposition of the Fill should correspond with a lower base level at the sea end, taken together with the broken scarp face of the Fill itself - we can safely conclude that at the end of deposition the Younger Fill here extended some distance into the present ocean inlet and the sea was further out than today. The exact former shore might be indicated by the angle of the Fill - if we extrapolate the angle of the fill beds (which are obviously graded to the old shoreline) from their remnant height now, they would have entered the sea, even at today's level, well beyond the building complex and above its surface. Our interpretation of the situation is this: an inlet of the sea received sediment from a stream, that by LR times was a thick enough deposit to allow the construction of substantial buildings upon it. Subsequently alluvium overwhelmed the complex, but this was removed by the more recent marine transgression, to a lesser extent by stream incision from behind on the land side; the buildup of beach-rock around the ruins is a confirmation, as this is generally recognised in the Aegean as marking retreating shorelines (see Geology Chapter). The structure, now mainly underwater, was revealed again, but sand accumulation prevents the sea from continuing its erosion of the fill into the scar left from its former attacks. Whether the local occurrence of poros and possible also Neogen on this rugged coast was connected to the reported ancient Trinasos community seems highly improbable on the very limited exposures available for cultivation in the area. The district is unlikely to provide a livelihood for anything but a marine community, unless it represented a seasonal harbour base - possibly the main centre of Trinasos lay inland near Lagio, from whence indeed a valley leads to this inlet.

Lagio

The site reported here is a good hour on foot from Agios Stephanos, in the hills to the west of that site. It is mostly rocky and infertile country, alternately hard limestone with very little soil indeed, and schist that is too steep and scree-like to furnish a soil worth cultivating. However about halfway to the site we emerge from the rough country on to a high but flat depression of schist between towering ridges of hard limestone, running NW-SE from Krokeai to Trinisia. Above on the west ridge is Lagio village, while 20 minutes along the fertile plateau to the south is a conspicuous hill, where HS collected a good amount of EBA and scanty Mycenaean pottery (HS and W:105). The EH occupation is well-attested, but the LH3 sherds are so few that despite its 'acropolis' appearance HS is forced to suggest merely a farm in Mycenaean times. As will be recalled from the discussion on Agios Stephanos, given certain conditions schistose formations can produce very fertile soils - but these prerequisites are rarely met; in this depression, controlled by both differential erosion in comparison to the harder limestones, and tectonic

sinking along the regional fault lines, the necessary closeness to the local watertable and absence of erosive incision have allowed the stable development of a mature schist soil. The plateau is notably without immediate local parallel in fertility and is clearly the centre of modern Lagio's food supply and farmland, as it was patently for the prehistoric community sited upon it. The way the early site dominates this oasis of good land, the absence of other local sites, quantity of finds, and the distance from the nearest contemporary centres argues strongly for its status as a local centre in its own right in the EH period; it seems likely that the low LH finds of the hill itself may reflect a temporary acropolis site for a larger domestic settlement in the low-lying ground around - though as at Asteri, the acropolis above has been the object of survey. Its easy downstream links to the sea by sheltered Trinisia gave it its own port facilities, and we may plausibly look up on this plateau for the Classical perioeci community of Trinasos. As a perioeci community it might well have had a separate port from the Spartiate land of the Helos Plain.

Finally three low rises above the evenness of the Helos plain, unnoticed by previous visitors, will aid our regional analysis. The first can be found to the east of Lekas South (in the NW Plain). A hundred metres into the plain from the low Neogen of the latter site, a very low rise was observed by the writer; on it a few sherds, possibly prehistoric, were visible, and the hillock of marl, strikingly yellow amid the black of the surrounding alluvium, is perhaps 20m long by $1\frac{1}{2}$ high above the surrounding plain.

Secondly, in the NE Plain, south of the Skala/Vlachioti road, midway between the Kokkinadha ridge and Vlachioti and about 150m south of the main road, is a small but steep hillock rising several metres above the plain. It is composed of conglomerates and yellowy-white sands, probably poros with possible Neogen as its base (especially on a small ledge on its northern edge) - certainly a remnant of eroded or sunken pre-alluvial marine deposits, and a likely continuation of two Neogen tongues that disappear below the alluvium further north across the road.

Finally in the N.C. Plain, to the north of the same road and between Kokkinadha and Skala, within the alluvium of the Tsasi side-basin, low undulations culminate in a hillock about 1 m above the plain, with remains (according to local people) of a chapel. These could well be submerged 'marine' sands and marls, from the Neogen hills running into the basin from N, W and E, since the torrents feeding this side-basin are all insignificant and the Younger and Older Fill unlikely to be very deep here. This opinion is confirmed by Memmou (1967: soil map detail) as the small locality is classified as sandy soft limestone and conglomerate rather than alluvium. The tectonic effects which could be involved in the Neogen undulations, with a pattern of regular troughs and lateral faulting within the regional SE trend, are shown on our Figure 2.

General Discussion: The Development of the Regional Landscape

With the exception of the locally remarkable schist plateau site of Lagio, the as yet unexplained promontory location of Agios Stephanos, and the harbour site of Trinasos, we have demonstrated that all known prehistoric and pre-Medieval findspots are confined to Pliocene and Pleistocene marine sands and

marls. One has only to consider on the map, figure 4, even allowing for swamping by recent alluvium, how much of the landscape exhibits no trace of occupation, to see that our sample is no random one, but shows a very clear locational preference, and one which is to be found equally strongly throughout Greece (see Soil Chapter, and Table 1 in Appendix A).

However whilst the early settlement in other study areas mentioned can be shown to concentrate on the Neogen rendsina soils because they there form extensive zones of easily workable fertile soil, in this area most of the sites on the Neogen exist merely as small islands of rendsina amid alluvium. We have already begun to set out evidence that this alluvium is, to a depth of many metres in the Plain, a post-Classical deposition. The pottery in the Bourba valley fill, the relationship between the LR Trinasos building and the 2-3 m high fill behind it (which contains LR sherds and formerly overlay the submerged building) and the complete absence of any ancient or prehistoric finds from the surface of the plain alluvium proper, are completely predictable from fieldwork on the Younger Fill elsewhere (see Geomorphology Chapter).[3]

The key to the pre-Roman landscape reconstruction, essential to set our sites in their original environmental context, lies in regional tectonics - a long term and fairly consistent moulding force in landscape evolution throughout Greece. We have stressed in the geographical discussion a fact very clear from map Figures 2-4, that there is a dominant South-Easterly trend to all the mountains, hill chains and valleys in Laconia. In this direction some areas are consistently depressed, others experience relative uplift. Again along this line NW-SE there is a consistent downward faulting towards the sea. Although in places the transition between 'down' and 'up' areas is abrupt and a cliff is found, e.g. where the Taygetos massif meets the Sparta valley, in most cases we can find examples where the uplifted or remnant raised zones are warped at the edges, i.e. to east and west there are steps leading down to the sunken zones. Diagram 2a illustrates these three tendencies, and diagram 2b shows, schematically, their operation in the Helos topography. We know that these processes have been consistent from pre-Pliocene times. The low Neogen features (as on Figure 2) can be related to the downwarping trend to E and W from regular SE dipping ridges, whilst the bridging saddles and hillocks that must connect up the smaller to the larger hills are certainly to be found at no great depth. We have already suggested the necessity of picturing the Helos area in prehistory minus the top 5-15m of recent alluvium, and this would definitely reveal these linking deposits. What we are suggesting on field data, is the existence of a 'buried landscape' - whose form is in many places barely hidden by later sediments of terrestrial origin. This landscape, in the NW, N and NE parts of the plain, was one of alternating high and low hill groups of fertile Neogen, and formed the centre of all pre-Medieval occupation and agriculture, with the exceptions noted.

The place of the Older Fill should be considered. We have noted a fine example in the small valley NE of Panayiotis Lekas, which sank rapidly under the plain and at a steep angle. Also near Asteri a small fan was seen at a gorge mouth. Between marl hills the usual effect we have noted elsewhere occurred - reddish in situ weathering and slope wash fills the intervening hollows and represents the Older Fill on Neogen deposits. The Older Fill has been shown to grade to a sea level much lower than present - since its last height

of deposition was mature Würm - we know this level to be c 50 m-100 m or more below today's sea-level. The steepness of our valley fill could be used, small sample though it is, to suggest that at the time the gulf was much further inland than now and a considerable amount of sediment in it now did not exist then - marine or terrestrial. Prof. Rapp's core proves this with c 40 m post 7000 b.c. fill within the plain (see below). During the time-span of prehistoric occupation in the area the Neogen hill chains would be divided by areas of Older Fill slope-wash of their own composition in depressions - e.g. the Tsasi side basin where as we know only a shallow second alluvial fill is suspected, and older features are almost visible on the surface. The Older Fill should also appear at no great depth between the site knolls near and west of Skala - where these knolls are certainly not joined at great depth and a direct sediment bearer is lacking. In this area in fact we observed undulations in the plain that cannot be due to the Historical Fill but should reflect older features obscured by ploughing. In any case this data precludes an Older Fill creating an extensive land body in our plain after the postglacial sea-level rise, nor was the 'plain' as such created till early Medieval times after this transgression. Indeed, this is surely why we now refer to the Helos Plain, but not so the ancients, for whom it was a 'district'.

Let us turn to the enigmatic Agios Stephanos. The promontory drops sheer into the alluvium, and there is over a kilometre of this before the Lekas Neogen slowly rises from the marsh of black earth and fen, as far, respectively as the Evrotas and the sea. As can be seen on map figure 4, the schist at the promontory's east end that forms the knoll of the site, separated by a slight saddle from the limestone of the bulk of the ridge further west, is continued by schist hills to the NW, and the same goes for the limestone - our tectonic trend affects all the rocks of the area equally. Remove the historic alluvium and more of the schist may appear to the NW, but the extrapolation of the Lekas Neogen hills from the north to this point would put them tens of metres below the present surface of the plain. There would therefore appear to be a notable depression existing north of the site, now filled with recent sediments.

A crucial but complicated factor to introduce at this point is sea-level change. It is generally agreed that the Aegean coasts have experienced relative sea-level rise since the Classical period, and there is evidence that this process goes back into the prehistoric period. Trinasos in our area, and sites around Gytheion further along the coast to the W, and to the east around the Malea peninsula, are part of a large body of sites now partly or wholly underwater. In nearly all cases a figure of 2-3 m relative rise since the Classical period can be accepted. If more than this depth of post-Classical alluvium is present at a coastal location there is a strong possibility that that area was previously ocean. In these cases the amount of alluvium which we now can date to historic times exceeded the transgressing sea. It is very probable that the pace of relative sea-rise throughout the prehistoric occupation of our area was of the same order as that attested over Greece for the last $2\frac{1}{2}$ millennia. For the first well-attested settlement at Agios Stephanos then (EH times), sea-level would be about 5-6 m lower than today.[4]

Let us now bring into the discussion another site, one that has been mythical for rather too long - Helos. This city, after which the modern Plain

is named, is cited in the Homeric Catalogue of Ships as contributing forces to the Trojan War - it is here explicitly 'a city on the sea' (Iliad:2, 584 - 'ephalon ptoliethron'). The same description recurs in an early 'Homeric' hymn. It is significant that, throughout, the ancient references to the Plain refer to only one centre, that of Helos. In early historic times it was conquered by the expanding Spartan kingdom, having been till then a bastion of 'bronze age' stock against the intrusive Dorian settlers to the north. The Achaean town resisted the Dorians of the Spartan Plain for long, and despite Argive help, were finally subdued by King Teleklas, either at the end of the 8th century B.C. or in the early decades of the 7th (Wace and Hasluck 1909: 161; Forrest 1968:33). However it continued as a centre, apparently not destroyed, though under direct Spartiate control (Huxley 1962:271). For the 5th century B.C. we have evidence from inscriptions for a Poseidon cult at Helos (Bölte 1929:1335). The settlement is subject to hostile attacks by Athens in 424 B.C., Epameinondas in 370/69, Philip in 218 (Bölte 1912:201). Huxley comments that such interest points to the continuing importance of the place (1962:271). Inscriptions demonstrate the existence of the community for the second and first century B.C., and about the year 1 B.C. we have the comment of Strabo: "After Gytheion...comes a marshy district situated above the gulf, and also a village called Helos, formerly a city" (8, 5, 2). Helos was visited by Pausanias in the second century A.D. in his tour of Greece. Pausanias notes that the site was in ruins, though a very ancient cult continues here. He located it quite clearly on the eastern edge of the plain, and it was the collection of marbles, tiles and pottery in the hills near Asteri at Sto Manolaki (and also a milestone on the main road in its vicinity) that led the British School to locate Helos here.

Pausanias' comments on the old Achaean town being in ruins, refers to his belief that the small contemporary community he found bore no comparison to the Homeric and early historic 'city' of tradition. We know a domestic settlement was probably still in existence, together with the various cult centres. He only notes the famous shrine of Kore/Demeter, with its yearly procession up to the Eleusinion in the Sparta Plain. This practice may well be a continuance of Mycenaean religious practices from this Achaean centre to the Sparta Plain (see Sparta Chapter for a discussion). Inscriptions, also of second century A.D. date affirm a cult of Kore and Temenios at Helos, and in the third century A.D. a sanctuary of Aesculapius is attested from the same sources (Bölte 1929:1335). The name continues as the area of the eastern Helos Plain in Medieval texts, and the seat of a Bishop (Wace and Hasluck 1909:160ff.). Today it refers to a recently founded settlement in the east-centre of the Helos Plain.

The Location of Helos: The History of Research

Homer; The city on the sea; our analysis of coastal change will point to the most likely locations.

Strabo; He takes the Roman village as the site of the former city.

Pausanias; Also refers to the presentday community as living in the ruins of the legendary one. His distance measurements are: 30 stades from Gytheion to Trinasos, from there 80 stades to the ruins of Helos, then a further 30 to Acriae. In terms of present day landscape features 80 stades beyond Trinasos

brings us to the side-plain east of Strategos, a few kilometres beyond the suggested location of Helos in most authorities.

Expedition to the Morea (1836); The 'Relation' of St. Vincent holds, without field evidence, (mainly relying on ancient literature), that Helos lay south-east of Priniko (Asteri) i.e. in the 'sto Manolaki' area north of Agios Strategos (455). Boblaye, of the same team, found only Medieval finds at Priniko and relying on Pausanias' distances, looked further east at Kalyvia Vezani. This settlement is now called Vezani and lies at the north end of the small side plain that is east of the main Helos Plain and the Asteri-Strategos hill-chain. But it is quite clear from the text that the ancient finds in this area which Boblaye identifies as those of Helos (he found C-R pottery and building debris, little 'shrines'), lie in the hills just north of Strategos and west of the Vezani side-plain, i.e. in the sto Manolaki area (cf. the Expedition Maps) (Boblaye 1836: 94ff.). Boblaye also suggests that the large Asteri marsh might have formerly been open sea and formed the harbour for Helos, in Homeric times. He finds no problem with the number of stades, but this is probably because he calculated the distance from Trinasos on a course around the marshes and lagoons of the lower Plain, rather than straight across it.

Curtius (1851/2); Sites Helos below and east of Kalyvia, in a location, from his map, identical to that of previous authors - in the low hills north of Strategos. He notes sherds and rubble, and repeats the suggestion that the former harbour bay has now become the Asteri lagoon (later the Asteri marsh) (288).

Bursian (1872); Makes the important suggestion that in antiquity the Helos Plain was only half as extensive north to south as present, due to recent alluvium, and confirms that the lagoons in the south-east plain were probably formerly the open water harbour of Homeric Helos (131-2).

Wace and Hasluck (BSA 1909: 161ff.); Find Greek pottery at Agios Ioannes north of Kalyvia (cf. HS and W 1960: 87), and also at 'sto Manolaki' to the west of Kalyvia more pottery and marbles; a little to the south at Strategos they record small house remains (which HS and W believe to be of more recent age). On their map these authors place Helos in the Manolaki-Strategos area. They also point to the significant evidence of ancient roads in this area, which will be discussed below.

Bölte (1912: 200); Repeats the argument that Pausanias' distances would site Helos somewhere in the eastern side-plain; he cites the previous finds at Ioannes and Manolaki but makes no definite location himself. In fact he seems to have assumed that earlier writers left no exact record of their discoveries, when a careful study of those sources, as is attempted above, demonstrates how they all refer to the same circumscribed location.

Hondius and Van Haeften (1912: 150); Identify Helos as a site half an hour SW of Kalyvia - where ancient walls are found; they were also shown ancient columns at Vlachioti said to come from this ancient site. This is the Sto Manolaki location again.

Hope-Simpson and Waterhouse (1960: 101ff.); Conclude that Pausanias' Helos is probably at the sto Manolaki location, given the very abundant C-R finds in the hills here between Strategos and Asteri. However they repeat

the argument that this is not 80 stades from Trinasos, which would, they claim, put Helos in the area of Acriae several kilomentres southeast of Strategos - and Acriae is 30 stades from Helos in Pausanias. But in the light of their survey of prehistoric sites in the region, the site at Agios Stephanos is preferred for Homeric Helos: this is because it is the largest Mycenaean site in the survey, and was probably once on the sea. However the traces of a very long-lived prehistoric settlement at Asteri, and its position approximately where Pausanias places Roman Helos, in the eastern plain, cannot be ruled out as the site of prehistoric Helos.

With the two locations - A. Stephanos and Asteri/A. Strategos in mind, let us look at the map of N. Memmou (1967), our Figure 5. According to his brief accompanying note, it shows how the sediments of the Helos Plain have been deposited by the major Evrotas river and the minor Bourba torrent. It also shows the former extent of two large marshes - that of Trinasos on the west, and Helos/Asteri on the east - these have been drained only in the last few decades, and in fact patches of marsh still exist amongst a maze of drainage canals over the plain, especially in these areas, cf. map 4. The two rivers dumped their sediment load on reaching the lessened incline of the plain, in characteristic alluvial fans, with the typical radial and convex form. The radial factor is shown well on his map, and the marked convexity of the Evrotas is a very obvious feature if one looks across the plain from either the east or west edge — the centre of the plain is markedly many metres higher than its edges. Again according to Memmou, the areas least affected by this alluvial spread were those most remote from it - clearly the lower and outer parts of the plain towards the sea (cf. Figure 5). These areas received least sediment and last, in his view they were areas of sea or open lagoon till very recently. In support of his argument he mentions cores going several metres into all areas of the Plain, meeting recent alluvium everywhere (unfortunately no cores were made near our 'buried landscape' zones around the plain edges inland) but in the two marsh areas levels of recent saltwater mussels were found only a metre or so down (1967: 13). His other service is to give on a series of cross-sections of the plain, incidental data on the actual heights above sea-level of its various sections. From this it is clear how the central fan of the Evrotas descends from 11m above sea-level near Skala in the N.C. Plain, to c3m near the sea in the central part of the Plain, while our former marsh zones, the one curiously exactly around Agios Stephanos, the other around Agios Strategos, are at present areas of negative sea-level almost a metre down. Memmou (1967: 13): "the low areas of the former marshes have still a negative height above sea-level". These negative zones are only prevented from reverting to ocean by drainage canals that actually convey water from behind the marshes at a level over a metre above them to the sea, and by the sand dune barrier at the coast. The removal of only two metres of alluvium in these two areas would, allowing for sea level change, put the sites in question in the Classical period in ocean lagoons or even (if the dunes were removed) on the open sea. Memmou's cores show dark recent alluvium to descend at least three metres in these areas, with intercalations of marine shells. The juxtaposition of these two deposits clearly reflects a rivalry between transgressing sea and accumulating alluvium. In areas where more than 3m of Historical Alluvium have accumulated above the former Classical-Roman sea-level, the land has won, in e.g. the plain centre where the mighty Evrotas has deposited certainly many more metres

of alluvium over the last 2000 years; but where sediment was thin, as on the fan edges in the major marshes, the sea won until sand build-up and drainage projects recovered the land. The sand dunes seem to reflect a post-Classical build-up over the Aegean (cf. the Trinasos case where they overlie an already eroded Younger Fill and the Late-Roman/Early Byzantine building).

The present marshes were up to the early decades of this century seasonal lagoons with great swamps around them: the Expedition Map (1835) shows a very extensive lagoon in the later Asteri marsh/Helos marsh area reaching across the eastern plain shore as well as the main plain, as does Leake - and the latter records (1830: 199) that the lagoon begins opposite Priniko (Asteri) and extends a mile along the shore, then becoming a marsh as far as the southeast extremity of the plain where the beach ceases and the hills end in cliffs; this lake is half a mile broad in its widest part. A similar picture is found in the descriptions and maps of Curtius (1851/2) and Bursian (1872). In 1912 Bölte states (200) - from the mouth of the Mario torrent (west of the southern end of the Neogen ridge) up to the foot of the Kurkala chain (the mountains on the east of the eastern side-plain) there is drawn a stretch of dunes, behind which the stopped-up water forms in the west a beach lake, in the east a swamp. This treads close to the southern end of the Neogen ridge. Still in his time, then, the lagoon covered the lower Helos Plain at its eastern end and the lower part of the small plain to its east. In 1920 the map of the area in the Admiralty Handbook shows an equally extensive lagoon, which had shrunk to a small lagoon and a large marsh by the 1943 Naval Intelligence map sheet of this part of Laconia. Since the travellers were little interested in the rest of the plain we are poorly informed as to the extent of the Trinasos marsh, though Philippson tells us (1959: 461) that (after Fels) the large Trinasos marsh had been drained by 8 sq. km since 1933. Memmou gives a general reconstruction of the Trinasos and Asteri marshes, suggesting a very great extent for the former, but very clearly underestimating the considerable former extent of the Asteri marsh - which the authors previously cited depict as 2 or 3 times as large as Memmou allows, with open lagoons opposite Asteri (cf. our figure 5 based on Memmou).

It is normal for river deltas to sink as their sediment compresses, and the perennial Evrotas is also likely to have been emptying sediment into the Plain before the Younger Fill increased general stream alluvial accumulation. However until the 'slow phase' of sea-level rise began (see Geology Chapter), in Neolithic times, sea-level transgression would have hindered substantial delta growth. We would predict therefore that in the prehistoric period there would already exist a smaller version of the present delta around Skala, but its thinner expanses would be more prone to marshiness. In other words, the present situation which prevails in the low areas of the former marshes with thin sediment and high watertable, is transferred to an earlier stage of the Plain formation and moved further up the Plain, perhaps as far south as present day Helos and Leimonas. This would account for the name, which already seems to be used for the area in LBA times of Helos or 'marsh'. The smaller delta of the Evrotas in prehistoric and historic times would still be sufficiently striking a feature of the region that it be given to the area and its main settlement by Homer and later authors. Cf. Strabo (8, 5, 2), "After Gytheion...comes a marshy district situated above the gulf, and also a village

called Helos". That the marshes in the north-central 'plain' did not spoil the fine impression given by the very extensive low and medium height Neogen hilland on all sides of the 'plain' is seen by the description of the area a century or so earlier by Polybius (5, 19): "Philip bypasses Gytheion arsenal, a secure harbour, and encamps in the district of Helos, which taken as a whole is the most extensive and finest in Laconia".

That the Helos Plain has been for a long time an area of alternating sediment - terrestrial and marine - is shown by deep cores under analysis by Prof. Rapp of Minnesota. Bedrock near the south end of the present delta was reached in places at 60m (marl), but elsewhere not reached at 69m down (bearing out our conclusions on the steep fall of the hills to the north - cf. our discussion on Agios Stephanos) and the bulk of the deposit seems to be marine; however a peat level c40m down reflects lagoon - estuary conditions in this area at about 7000 b.c. C14 (Prof. Rapp pers. comm. 1973). This position can be directly related to the post-Glacial sea rise, as the glaciers progressively melted in the period 8000-4000 b.c. Though soon presumably swamped by transgressing sea, the depth of this peat find shows both the lower sea level still prevailing at that time and most probably a certain degree of sediment compression. Most of the deposits above this peat up to the recent fill at the top seem to be marine on preliminary analysis. The figure of 40m below present at c7000 b.c. for a backswamp peat can be taken as a reasonable estimate of contemporary ocean level, and would then agree remarkably well with a generalised plot of worldwide sea-level for this point of the Holocene transgression. Butzer's ocean-rise chart (1971, Figure 44, based on Farrand and Lind) gives between 30 and 40m below present for the world level at that time. There is scope for corrections in C14 and absolute years, and sediment compression.[5] We can show (see Geomorphology Chapter) that the Older Fill ceased to be deposited over the Mediterranean by about c40-20,000 B.C. and the next major period of subaerial sedimentation was the deposition of the Younger Fill. A significant proportion of the 40 or so metres deposited in the Helos Plain after 7000 b.c., allowing for the intervening deltaic-fill stage, should be either post-Classical alluvium or marine sediment - in either case this would leave us with the inevitable conclusion that previous to the historical deposition a major part of the present plain was sea. Certainly full-plain aggradation in Helos, rather than thin delta marshland, is as elsewhere post-Classical. The present writer's reconstruction of the Helos Plain at different periods is illustrated in Figure 6.

The swamp and lagoon nature of the south-east and south-west zones of the Plain can be shown from the maps of the last few centuries to continue till recent reclamation work. In the records of the nineteenth and early twentieth centuries A.D. travellers and geographers, the Plain appears as consisting of a very extensive area of fertile alluvium but frequently waterlogged and malarial. Corn is the main crop in the upper and inner parts of the plain, with some mulberry and olive trees. The lower plain, with the exception of the formerly very extensive lagoon-swamps of Trinasos and Asteri, is used as pastureland and in winter herds of sheep and goats are driven here from the cold and wet uplands of Arcadia in the centre of the Peloponnese. The high watertable in most of the Plain, and the lagoons, create such summer hotbeds of malaria that all the Helos population, together with various village groups that cultivate in the plain seasonally from other regions, withdraw inland at this

time to escape disease (Leake 1830: vol. 1: 195ff; Wyse 1865: 59; Bursian 1872: 132; Bölte 1912: 200; Bölte 1929: 1301; Philippson 1959: 461; cf. further, below).

It is also possible that the combination of the open lagoons and the wide river Vassilopotamos made access by boat to Skala feasible as late as the Middle Ages, and hence the name 'Skala' - as Leake notes "so called as the place of embarkation of the district" (1830: 196). The Vassilopotamos is a very curious river. It arises from a number of powerful springs just west of Skala and flows perennially with great force to the sea through the former area of the Trinasos marsh. Philippson and Memmou show that it is a major outlet of the Evrotas, which takes its origin from the main river in Vardunochoria, disappearing underground to re-emerge by Skala. Its flow in the Helos Plain is far greater than the Evrotas. It once inundated a notable zone of the Trinasis marsh-lagoon with several mouths emptying to the sea: in 1836 we read in the Relation of the French Morea Expedition "in the great plain there is a stream that is more like a real river than any we have seen in all the Morea - it is not the Evrotas but the Vassilopotamos - it is short in length but its width compares to the Seine in its middle reaches. The maps confuse these rivers Evrotas and Vassilopotamos - but whereas the former is subject to being sanded up, the latter owing to its great volume of water remains open" (St. Vincent: 450). Curtius in 1852 (288) tells us that there are two mouths to the Vassilopotamos, one runs south, the other south-west of Skala - both are more open compared to the silted up Evrotas mouth. However the possibility of confusion exists; the 1920 Admiralty Handbook tells us (453) the name Vassilopotamos is also used for the lower Evrotas river (repeating the observation of St. Vincent).

Dr. Malcolm Wagstaff has kindly provided the author with the following information (pers. comm. May 1974): the Emperor Manuel II Palaeologus was conveyed to Vasilopotamo by a Venetian ship in 1404 and there made a treaty with the Hospitallers for the evacuation of the Morea. This place might well be the site of modern Skala and in any case should derive its name from the Vassilopotamos river. If Skala was a landing place, this would tie in with the name 'Vigla' for a tower behind the modern village. But the Vasilopotamo place might also be near a tower called Veschili Potamo at the mouth of a large navigable river in this region portrayed by Bernard in 1599. Dr. Wagstaff has prepared maps of medieval and recent settlement development in the plain, and these show an apparent absence of settlement of the alluvial plain proper until the eighteenth century A.D. He also marks several medieval churches of fifteenth century and earlier date; significantly these churches are clustered around Skala (5 definite, one possible) with one at Asteri and the Strategos chapel, another possible example being the Stephanos chapel. The concentration around Skala points to this being by then the main settlement, and since it is at the head of the large Vassilopotamos river it is very likely that this is the place where the Emperor arranged his conference. The Strategos and Stephanos chapels would be appropriate regional landmark shrines if, we we suggest, both were still on coastal promontories at this time. And the definite medieval chapels at Priniko and Strategos (and the possible chapels seen by Boblaye at Manolaki?) agree with the continuance of settlement in the Helos area after the decline of the Roman centre (Emperor's visit: cf. Barker 1969; Wagstaff in press).

The Case for Locating Homeric Helos Between Asteri and Agios Strategos

Ancient traditions; As has been noted, classical sources agree in locating the Homeric city at the site of the historical village. Pausanias saw ruins of earlier buildings in the area of Roman Helos. The location of Classical and Roman Helos, by unanimous agreement, is within that very extensive zone of C-R pottery, marbles, walls between Asteri and Strategos. Furthermore, we know that there was an important cult of Kore at Helos, with a procession to the Eleusinion that for various reasons may well carry on a Mycenaean religious tradition (cf. Sparta Chapter) which just possibly once symbolised the integration of the Sparta and Helos Plains under the Mycenaean dynasts at the Menelaion. The 'overestimate' of distances in Pausanias is explained below. In Medieval times the name of Helos continued to be used for the east side of the Helos Plain. In the Chronicle of the Morea e.g. it is the district from the Evrotas river east to Mt. Kourkula, and the seat of the Bishop must have lain in this area between Vlachioti and Strategos (Wace and Hasluck 1909: 160). Various medieval building remains have been noted along the Neogen hill-chain, north of and at Asteri, probably also at Strategos, while the numerous 'chapels' noted by Boblaye in the Manolaki area could be C-R or Byzantine. No comparable post-prehistoric density can be shown elsewhere in the Plain.

Archaeology; So far three recognisably important Mycenaean communities have been recorded in the region, at Agios Stephanos, Lekas Panayiotis and Asteri/Strategos. Whether the (LH3A-B?) tholos at Strategos belongs to Asteri or to the poorly known Strategos site is still uncertain, and it is clear from other regions that major Mycenaean centre frequently located the princely tomb amid its arable territory some distance from the centre itself (cf. Socio-Political chapter). We have already noted that the indications of very long-lived and widespread prehistoric settlement in the Asteri/Strategos area suggest that a major complex of Mycenaean buildings and its domestic settlement is to be sought here, though the 'acropolis' orientation of previous archaeological survey in the area has given us perhaps merely the fringes or specialised quarters of such a community. The presence of a tholos argues strongly that the one named centre for Helos, the eponymous Homeric city, cannot lie far from the rare princely tomb (and its probable association with mature Mycenaean pottery suggests that it is a princely burial of the climax period, which are invariably associated with key centres). The persistent tradition of continuance of occupation at Helos during the Dark Ages into historical times, and indeed through to the Roman period, can only be supported at the Asteri location, where LH3C may be associated with PG or G finds, then abundant C-R material - which as seen above, can only represent the Helos of Strabo and Pausanias. The Agios Stephanos site may possibly have slight LH3C occupation but no traces of later settlement except for the rare Roman coin until a Byzantine reoccupation; Lekas Panayiotis ceases to have significant occupation in LH3B, with a few C and H sherds near, but not on the site itself. In any case Panayiotis should be withdrawn from the list of candidates if we accept Homer's 'city on the sea' and the present writer's landscape reconstruction (which in this corner of the plain is based upon the intervention of numerous hillocks with further sites, and the absence of recent alluvium - which must separate the Panayiotis site from a possible prehistoric shoreline).

Ancient Helos; Apart from the archaeological survey evidence which points very clearly to a concentration of C-R settlement in the Asteri area, we have also the distances of Pausanias. Pausanias travels from Gytheion to Trinasos in 30 stades, then to Helos in 80 stades, then to Acriae in another 30 stades. We know fairly exactly the positions of ancient Gytheion and Trinasos and in Figure 7 we illustrate how the 30 stades or c. $5\frac{1}{2}$ km compares very closely to the most plausible route between those sites (allowing for slight alluvial accretion in the small valleys along the coast here). From Trinasos there is no conceivable way in which a traveller could cover 30 stades or c. $14\frac{1}{2}$ km to reach Stephanos or Panayiotis, even if those sites had possessed significant C-R occupation traces. However, as has frequently been pointed out, a straight course through the lower plain would bring the traveller well past our other contender at Asteri and down to the accepted location of Acriae at Kokkinia (a little way down the coast to the south from the small eastern plain). But such a route was a practical impossibility till the 1930's A.D., for as can be seen from the reconstructed course of the Plain's development (Figure 6) the lagoons and swamps of the south-east and south-west, the marshy lower central plain, extensive former ocean inlets, all prohibited passage directly across the plain, and all through roads in the last few centuries and even today pass through or just south of Skala at the edge of the hills in the north central plain. If we make the necessary adjustments to a through road course so as to avoid the swamps and lagoons, and former inlets, we find that $14\frac{1}{2}$ km brings us from Trinasos to the locality of sto Manolaki, east of Asteri - the very area of maximum C-R finds. Finally, from sto Manolaki to the probable Acriae site, allowing for a recent alluvial accretion at the mouth of the small eastern side-plain, a figure of 30 stades or c. $5\frac{1}{2}$ km is very appropriate (Figure 7).

Partial confirmation for these routes can be found in the evidence for ancient road networks in the Helos region:-

> Leake followed the main ancient Sparta-Helos road, running beside the river Evrotas between the two plains (and exactly identified by Pausanias) with a characteristic shell-rut gauge preserved in the rock. It is very complete on the northern edge of the plain of Helos, as it emerges from the Vrondama Neogen plateau between Grammousi and Tsasi/Phlision. Here it divided, one branch running west along the northern rim of the plain towards Gytheion, the other running past Tsasi and Myrtea and towards Helos. Perhaps $1\frac{1}{2}$ km south-east of Asteri-Priniko, Leake (as Gell) found a Roman inscribed column that later writers refer to as a Constantinian milestone from an Imperial road (cf. Wace and Hasluck 1909: 162), and on the eastern edge of the small side plain the same wheel tracks reappear ascending Mt. Kourkula heading towards Zarax and Epidauros Limera, leaving a side-branch to run down the coast to Acriae and other ancient settlements as far as Cape Malea (Leake 1830: 195, 199-200). Wace and Haluck onfirm these observations (1909: 162). HS and W state that the Grammousa-Tsasi section is preserved almost all the distance through that area, and is visible in many more places than Leake records; again west of Tsasi there is a branch running towards Skala, separate from the branch running via Myrtea to Helos (1960: 85). Very significantly they record further traces of an ancient carriage

road in the far western plain. Rather more than a kilometre SSW of the Agios Stephanos promontory, cut into the foothills alongside the former Trinasos marsh, they note wheel tracks in the limestone of the same gauge as the other roads of the region, running north to south - nearby are ancient houses in the rock and C tiles and sherds (op. cit. 100). These tracks with other stretches discussed above are illustrated on Figure 7, and all confirm the road network as running around rather than across the plain. In particular the stretch beyond Stephanos is only understandable in its wayward course if we assume that it was skirting the former Trinasos sea-inlet. The fragmentary course we have traced also confirms the path necessarily taken to produce the distance figures given by Pausanias.

Helos and Landscape; First and foremost, the 'city on the sea' description. As we have seen, landscape changes have almost certainly landlocked both Stephanos and Asteri sites within historical times; Homer's description could fit either site. However if we bear in mind that Helos is the only centre known to us for this region in both prehistoric and ancient times, then the relationship of the two sites to their region is diverse. Stephanos lacks an immediate hinterland of farming land, and indeed its only significant function would appear to have been marine (probably a promontory with open-water on three sides in prehistory). It does seem to exist in a complementary relationship to the landlocked Panayiotis community amid the extensive Neogen soils of the north-east corner of the plain, and almost certainly this hinterland provided those living at Stephanos with much of their food resources in terms of corn and olives. We suggest that they may even have been occupied on a seasonal basis by the same community along the lines of ancient and modern Greek villages with their Ano and Kato system, to unite winter cultivation and shelter with summer fishing and trading. Asteri and Strategos could conceivably have existed in a similar pattern, but this depends very much on how far the Asteri harbour once reached inland and whether they represent the 'suburbs' of a major centre located between them. It is actually more likely that the sea was close enough to Asteri for it to be both an agricultural as well as a marine centre, and it is certainly in the mid-part of the most extensive zone of Neogen soil of the whole region. Its probable territory would then have encompassed very rich soil and both freshwater and saltwater fish and shellfish, and its preeminent resources are a further argument for its identification as the ideal regional centre.

One can support this reconstruction from several points. Firstly, to those who suggest that early settlers throughout S. Greece like present day farmers in the same areas concentrated on irrigated crops, one can show how nearly all the sites of all periods before the Late Roman are found on the Neogen hills, which are first rate dry-farming zones - centres of modern wheat and olive production, but practically useless for irrigated crops nor used for such today The reason for this past neglect of the alluvial areas is simply as we have seen that they did not then exist in their present form. The pre-Medieval farmer, as can be shown also in our other area studies, was generally confronted with valleys filled at the edges with Neogen, and lower down occupied by Older Fill piedmont terraces of mediocre quality. At the coasts the Holocene erosion that followed the final deposition of the Older Fill led to alluvium of a deltaic nature

- i.e. thin, poorly drained and of little value except for summer grazing. Only with the massive amounts of sediment that accumulated in the early Medieval Younger Fill did there arise a large area of fresh alluvium of good fine consistency, and with lucky coincidence there arrived mulberries, fruits and also cotton to take full advantage of it. Possibly the time lag between the early stages of the Younger Fill and the late evidence of exploitation of the new alluvial lands, was due to the need to reach a high level of alluvium easier to drain and cultivate. The drainage problems with concomitant malaria plagued most of lowland Greece and help to account for the edge siting of many communities. Now irrigation/drainage is secure and the rivers well incised the centres of exploitation have shifted to the more economical plain centre - where modern Helos and Leimonas are rapidly growing at the expense of the rim communities. Skala, Tsouli and Vlachioti were, from their location, more concerned with the plain alluvium than the Neogen, but in the previous fever-ridden and swampy conditions of the plain other edge villages such as Stephania, Myrtea, Tsasi, Asteri, may have devoted much of their labour still to the surrounding marls. The literary sources support our suggestion that the plain proper was too mobile in its rivers and sediments for settlement until the 18th century A.D. (cf. comments of Wagstaff above). At this time the major settlements in the plain proper begin, and it is surely no coincidence that we suspect that this was the very time at which the Historical Deposition had ceased and a regime of natural drainage via incision had set in along Mediterranean watercourses.

The pre-Medieval settlement patterns in the Helos area are most adequately explained as farming settlements concentrating on the Neogen hills for cereals and olives, with grazing for sheep/goat and horses on the delta marshes and amongst the infertile hills of schist and hard limestone; the exceptional Lagio schist plateau formed another core of farmers, and three coastal locations were occupied - only one of which had an immediate hinterland, Asteri/A. Strategos (hence its overriding regional importance?).

Hopefully future seasons at Agios Stephanos and the ongoing analysis of recovered sediments will give us a collection of fauna to confirm the importance of marine exploitation, though already seashells seem to be fairly plentiful in the occupation levles. The good evidence from the small samples hitherto from the site for marine exploitation at Stephanos is very predictable given the likely prehistoric coastline situation - both the shells and the very numerous sea-urchin spines (cf. Figure 6). The site would be surrounded on three sides by sea and especially to the north more sheltered shallows might have been an ideal port and fishing ground. The wide Vassilopotamos river must have flowed into the sea not far from the site with plentiful freshwater fish, and the delta marshes of the north-central plain would have harboured abundant fish and shellfish. The remnant Asteri and Trinasos lagoons were fishing centres until their recent drainage in this century (cf. Leake 1830: 196). The site certainly exhibits strong overseas contacts in the Middle and Late Bronze Age - e.g. with Crete and Kythera. Since the well-known sources of Lapis occur within ten minutes of the site[6] it is most probably the export centre for the finds of lapis e.g. at Bronze Age Knossos in Crete and elsewhere. Trinasos in a later age may have assumed the same role and was well placed for sending out the stone quarried nearer to Krokeai (where we know the Romans had quarries for this often used architectural ornament).

However we would not stress the significance of the stone in the establishment of A. Stephanos, which after all began in the Early Bronze Age before lapis is attested as exported; not till the Roman period is there any evidence that the demand for the stone justified the existence of a self-sufficient export centre. Lapis is actually not frequent in the occupation levels.[7]

We were able to establish a tentative settlement hierarchy for the Late Bronze Age in both Sparta and Argos Plains. Major centres, frequently associated with tholos tombs of royalty, were at about an hour's distance from each other, smaller centres often with numerous chamber tombs of the lesser landowners and folk-leaders were intermediate and at about half-hourly distances on foot. The clear gaps in the evidence for local centres in some parts of the Helos Plain despite chamber tomb finds in the vicinity led both HS and the present writer to consider the survey data inadequate for a discussion of the larger communities of the LBA. However we can say that there may exist at either side of the plain two paired centres of Mycenaean date, each pair being about 25 minutes apart on foot. In the case of Agios Strategos and Asteri, the former has a tholos, the latter likely chamber tombs - the latter location seems to be dominant. We should then look for another centre for the Tsasi side-basin. If we take Asteri as the major centre for the hill-chain on the east of the Plain, the average intervening distance common in other areas of 1 hour between major Mycenaean centres brings us to the Myrtea/Tsasi areas, where from poorly known field evidence and the great arable potential we have already been led to predict a significant Mycenaean settlement. None of the sites so far known there can be taken to represent large settlements, and the corresponding community for the Tsasi chamber tombs is so far lacking (perhaps to be found by Myrtea?). Then the possible chamber tombs at Kokkinadha are hardly accounted for by the scanty Mycenaean finds on the adjacent hill. In theory one might expect another intermediate or 'second rank' centre near Vlachioti (corresponding with the large modern village) then a major affair for Kokkinadha/Tsasi Myrtea (which are actually quite close to each other) - but this prediction is really little more than speculation based on numerous examples of regular spacing of Mycenaean centres in other study areas. A gap between centres, large and small, is to be expected for the infertile rocky mass constituting most of the edge hills in the northern plain, and the smaller area of Neogen here supported what are certainly farms and hamlets only, at A. Nikolaos, Ioannes, and Xeronisi. We would certainly not expect a community larger than a hamlet in the zone between Tsasi and Lekas in prehistory, since it would then have been the area least well endowed with the major soil - the Neogen (cf. Figure 6). The concentration of presentday settlement in this area at Skala and Helos/Leimonas is purely a result of the arrival of the historical alluvium, which reduced the Neogen to second-best soil (and perhaps for Skala former port access is significant). In antiquity the north and central plain had but limited Neogen amid the marshy delta of the Evrotas, and hence we find only small farm and hamlet sites in this zone. It would then have been as unpalatable to dense settlement as the lower delta area of the Plain till the 1930's drainage work. Only with the more extensive Neogen to east and west are we to expect, and do we find, larger settlements in these periods. The Lekas area is even now a large zone of fertile rendsinas, and the surviving evidence of several smaller 'farmsites' around a large centre at Panayiotis is justified by the abundance of preferred soil, even more extensive

in prehistory Panayiotis is 25 minutes from Agios Stephanos, while the latter lacked formerly any areas of fertile fields until late Medieval times. We have suggested that the two contemporary centres were complementary - Stephanos exercised the fishing and trade functions of Panayiotis but depended on the latter for agricultural products. It is quite possible that both settlements were occupied by the same community, which may have moved to Stephanos in summer, when fishing and sailing in general were most favourable and least pressure of field work existed. Finally about an hour from Lekas and Stephanos lies the suspected Lagio centre at the heart of its locally excellent fields and probably with its own access to the sea and a harbour at Trinisia (or perhaps at Paizoulia just down the coast, where prehistoric finds are known).

The Mycenaean centres could thus in theory take on a regular if fragmentary pattern over the landscape, within limited and prescribed zones, and at the intervals recognised in other study areas; the gaps in the regular chain of larger settlements correspond neatly to zones of low settlement density due to low natural fertility (see further Appendix A).

In several study areas we have detected a pattern of dispersed and more nucleated settlement associated with particular prehistoric periods. This is found to some extent in the Helos Plain; important and long-lived settlements generally have almost continuous occupation, while many smaller sites are only occupied in 'dispersed-settlement' periods such as EH and LH. However this region shows a notable contrast with several small sites (farm and hamlet settlement) that have MH occupation (elsewhere usually a period represented only at nucleated settlements of some size). But we cannot as yet decide how significant this pattern is for the nucleation/dispersed theory - since much of the land between the known sites is 'buried landscape' under recent alluvium. Quite possibly we have a good sample of MH sites but numerous EH and LH farm sites await discovery under recent fill.

The location of settlement has often been examined solely in terms of water supplies and defensive requirements. Water is not a problem commodity over much of our area - with the perennial Evrotas and Vassilopotamos, the schist underlying permeable deposits and creating a spring line - no settlement in the west, north and centre of the region need worry about supplies. The Asteri hill chain and the Tsasi zone however are of permeable sandy marls and by Strategos we are really cut off from freshwater on the surface, though near the sea wells would find a high watertable. Strategos, though probably a significant medium grade site, shows a neglect also of defensive provisions - very low hillocks with no sign of walls, nor is Asteri walled (perhaps the acropolis of a lowlying centre). Stephanos has its spring, functioning ten years ago, but all the western edge of the plain has spring lines and the source would be another advantage to add to the priority of coastal location. Lekas is close to the same juxtaposition of schist under limestone which gives good springs round its modern neighbour Stephania. The Vassilopotamos springs are available for the sites west of Skala - though actual locations and size of site (of farm type) reflects the arable potential rather than the abundant water. Skala, with a steep hill, the Vassilopotamos and the Evrotas water supplies, in the old view should be a priority location for a major settlement, but here there are no pre-Medieval finds at all - and the answer to its late significance lies in a changed natural environment in Medieval times. With the exception

of Lagio no sites are known in the water-rich hills to the NW and W of our area - it is the soils that determine, here as elsewhere.

As for defence - Lekas and Stephanos are not lofty hills, admittedly not prone to surprise attack and with fairly extensive views around, but hardly chosen for their notable difficulty in scaling. Both sites have a saddle linking them to apparently unoccupied hills, thus making the enemy's job easier. Defence walls at both sites are somewhat suspect and not in any case clearly ancient. Asteri is a very large hill to defend, as Kokkinadha, and both have accessible slopes, neither have defence works noted. The Lagio site is a steep hill on all sides, and its position somewhat off-centre to its land (near the south end of the fertile plateau) could reflect a concession to defence.

In conclusion, whereas some large sites show a concern against surprise attack by taking a degree of height advantage, all are chosen from a limited area primarily selected for exceptional arable or marine possibilities. The fresh water situation is even less influential.

NOTES

1. In summer 1973 the author was invited by Lord William Taylour to make a study of the region around his excavation at Agios Stephanos, namely the Helos Plain and its surrounding hills. The purpose of my investigation was to place the important Bronze Age settlement being uncovered into the context of the environmental features of the area, and to relate the history of the site to the general development of human occupation in the Helos district. I would like to express my gratitude to Lord William for his help and encouragement.

2. Memmou (12): the hills surrounding the plain are Neogen, overlying these sediments are similar deposits but of Quaternary date - a perimeter zone between contours 25 and 50 m asl. with beds of well-preserved Pleistocene oysters. Whether the Poros around the Helos Plain includes Upper Pleistocene beds is uncertain, though Dufaure (1970) has observed such around much of the south Peloponnese coasts. The Poros farther inland must however be placed in the early Quaternary (see Geology Chapter).

3. It is probable that a considerable area of ancient Gytheion lies under recent alluvium in the plain north of the modern town; Forster records the excavation of architectural remains from 3 m below the present surface (1907: 221). In a small plain along the coast towards Trinasos Forster also notes Roman ruins amid the recent alluvium (230).

4. For a detailed discussion of sea-level fluctuations see Geology Chapter. Around the shores of Southern Laconia numerous authors have recorded ancient (Greco-Roman) buildings submerged in shallow water: at e.g. Gytheion (Boblaye 1836: 86; Wyse 1865: 43; Forster 1907: 225; Kahrstedt 1957: 205; Philippson 1959: 463; Deltion 1962: 85). Besides dry-land structures now submerged we may note the Roman temple and bath remains, which Boblaye records in 1836 (86) as lying on the present shore, but on land now below sea-level. Philippson describes numerous Greco-Roman and Byzantine submerged sites around the Malea peninsula (op. cit.: 490-8) including ancient and Byzantine town remains near Elaea not far south along the coast from Strategos Not far south of this point a further harbour site suggests a 2 m relative sea-rise since antiquity (490). The recent survey of Flemming around the Peloponnese gives variable figures of submergence over time for ancient coastal sites of this region, though in nearly all cases a general figure of c. 2-3 m sea rise since antiquity is admitted. As usual his work is not very reliable in any greater detail, and his attempts to use such data to contradict an eustatic rise throughout the last 6000 years lacks support from the worldwide eustatic picture and is contradicted by his own data (Flemming 1973; see Geology Chapter). The present

writer's preference for a scheme involving rapid sea-level rise to about Neolithic times (c. 7000 years ago: C^{14}) then a steady rise of c 1 m per millennium, is confirmed by all the local evidence from S. Laconia - with numerous Greco-Roman sites and the Elaphonisi Helladic settlement (discussed in Geology Chapter), and especially the Helos core of Professor Rapp (see below).

5. The core gave a C^{14} date of 6955 b.c. for an horizon of 44 m down of backswamp peat land, more than 60 m down bedrock of marl was found; this particular core was taken in the present delta zone and begins about 3 m or so above present sea-level. In another core further inland, where the present plain surface is c. 10 m above sea-level, a predictable horizon of conglomerate of suspected Pleistocene date (the Older Fill?), was met with at c. 24-35 m down (however this conglomerate could well be a Neogen conglomerate linking deposit, cf. p. 467).

6. The writer came across considerable surface finds of the stone very close to the site along the hill edges to its north-west, and Philippson says (1959:460); "Near Stephania an especially hard variety of Lapis ...forms some hills in which the ancient quarries of the 'stone of Krokeai' and 'Porfiro verde antico' are placed".

7. Although a number of cores from the process of drilling lapis were recovered in the excavations and two pestles may be of lapis from EH levels. The occurrence of the purple mussel from LH3A is of interest as it is commonly held that it is only at this time or in 3B that purple dye was being systematically extracted by the Mycenaeans (cf. Mylonas 1959). The quantities found on the site hitherto hardly justify more than local use .

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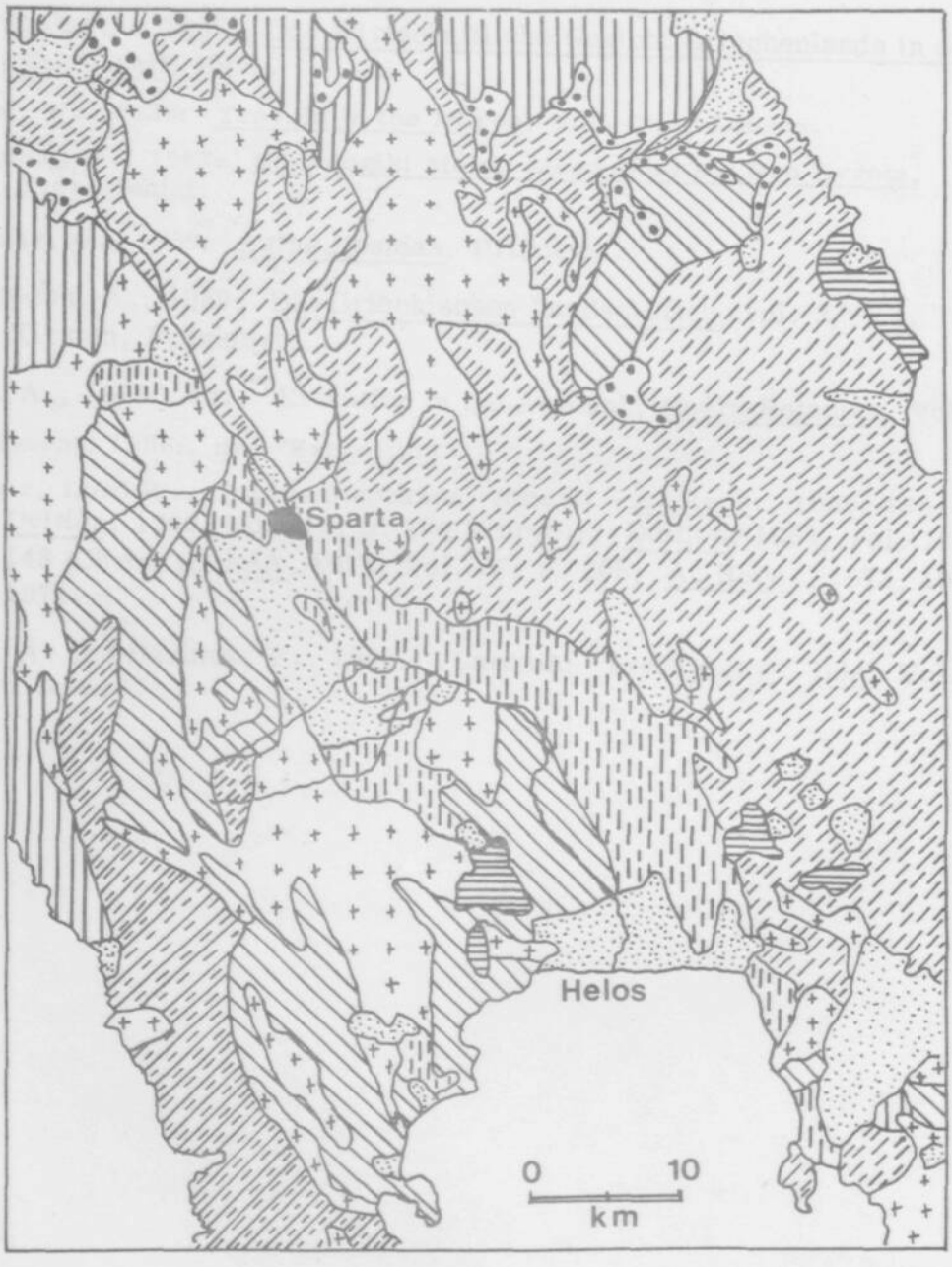
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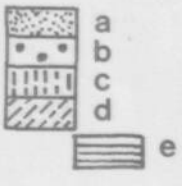
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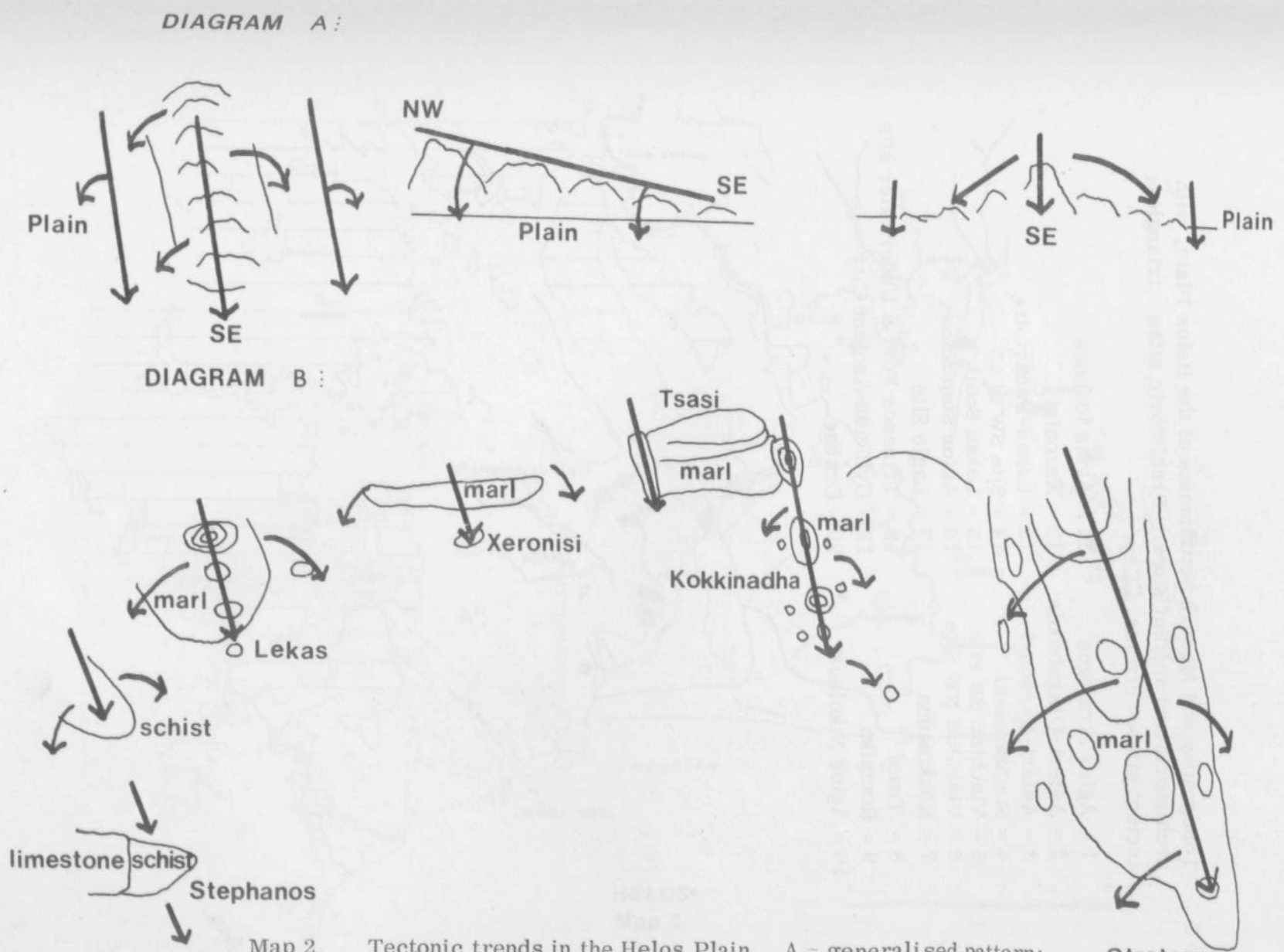
Map 1 The Geology of the SE Peloponnese, after A. Philippson (1959).

Key:-





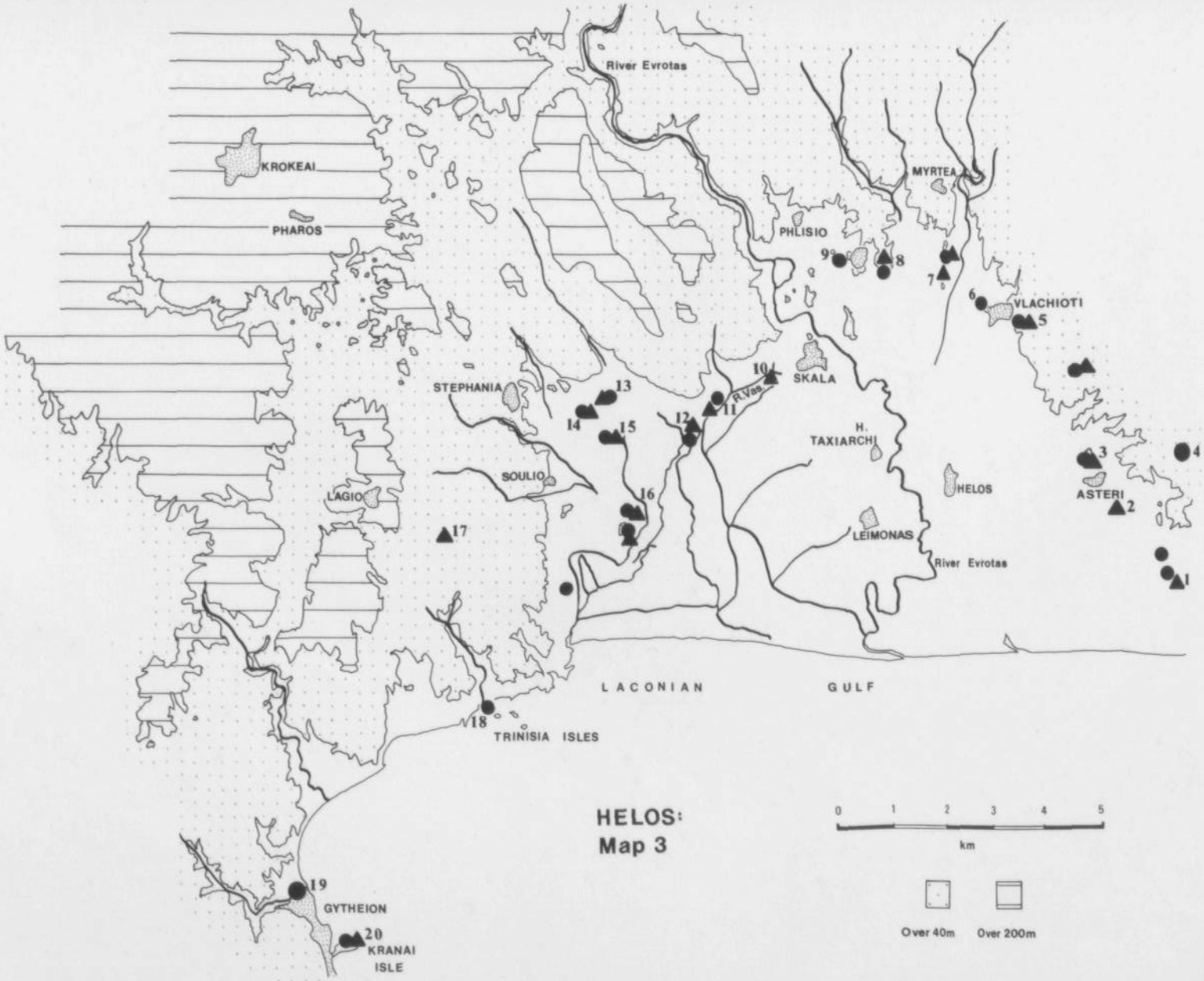
a = Alluvium
b = Flysch
c = Upper Tertiary (Neogen)
d = Tripolitsa Limestone
e = Tyros Igneous Beds (with Labrador-Porphyrite)
f = Cretaceous Limestone
g = Marbles
h = Triassic Limestone
i = Palaeozoic (Schists)



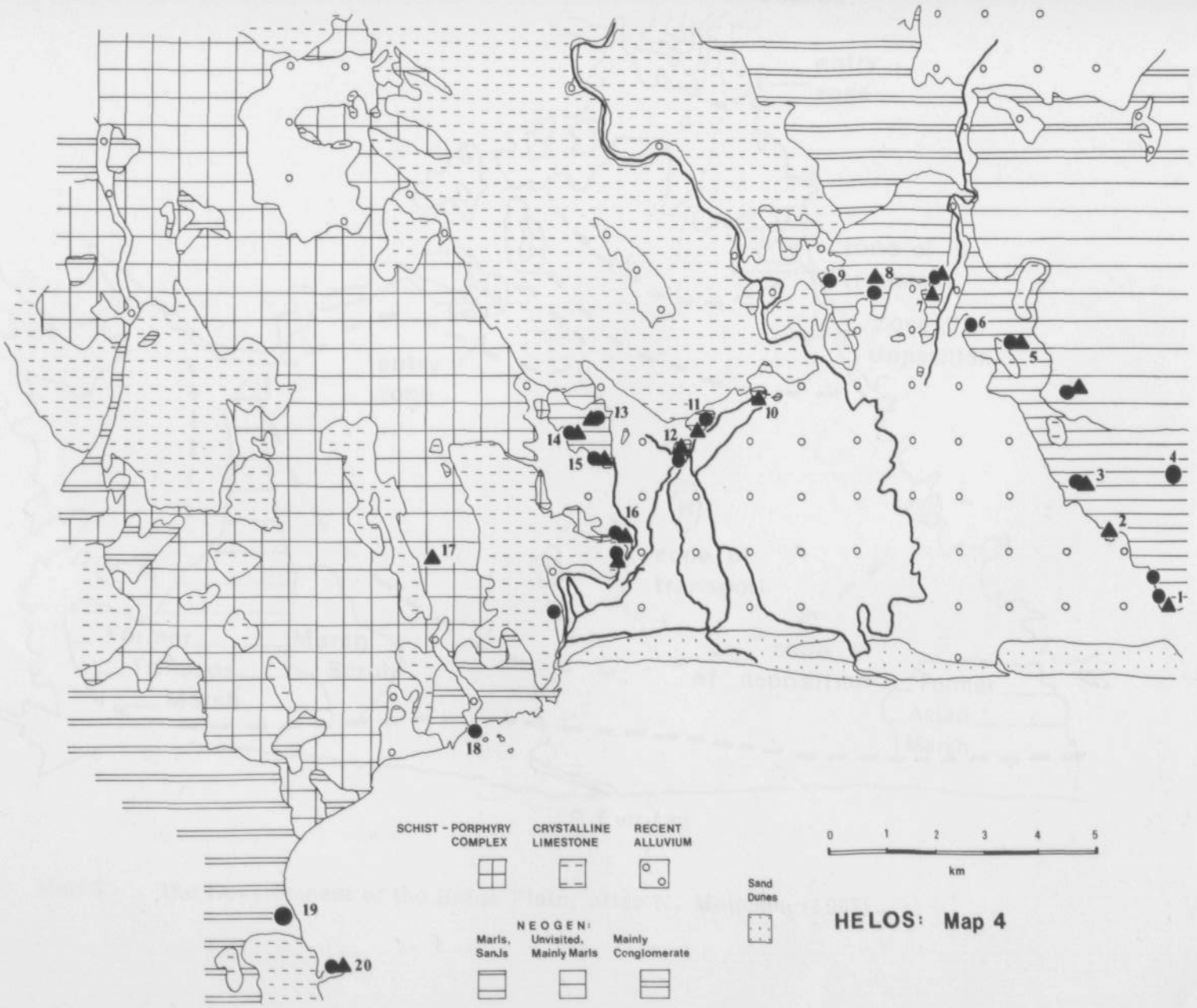
Map 2 Tectonic trends in the Helos Plain. A = generalised pattern; B = actual operation in Helos topography.

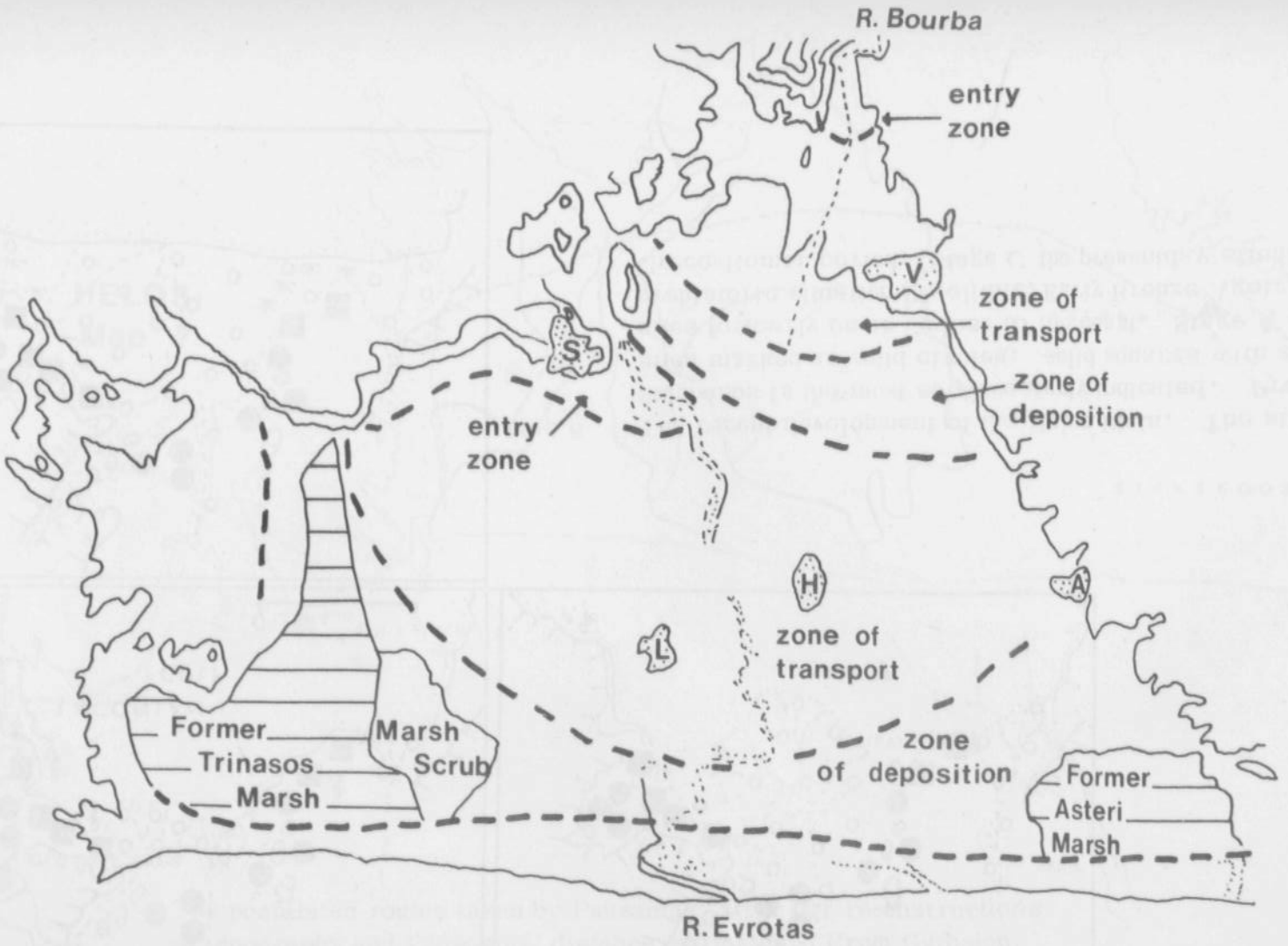
Map 3 Topography and Modern Settlements of the Helos Plain, with prehistoric and ancient sites. Prehistoric sites = triangles; ancient sites = circles. Key:-

1 = Agios Strategos
2 = Asteri-Dragatsoula
3 = Asteri-Karaousi
4 = Sto Manolaki
5 = Vlachioti SE Site
6 = Vlachioti NW Site
7 = Kokkinadha
8 = Tsasi
9 = Romaika
10 = Agios Nikolaos
11 = Agios Ioannes
12 = Xeronisi
13 = Lekas-Panayiotis
14 = Site SW of 13
15 = Lekas South
16 = Agios Stephanos
17 = Lagio Site
18 = Trinasos Fort & Underwater site
19 = Gytheion Ancient City
20 = Cranae

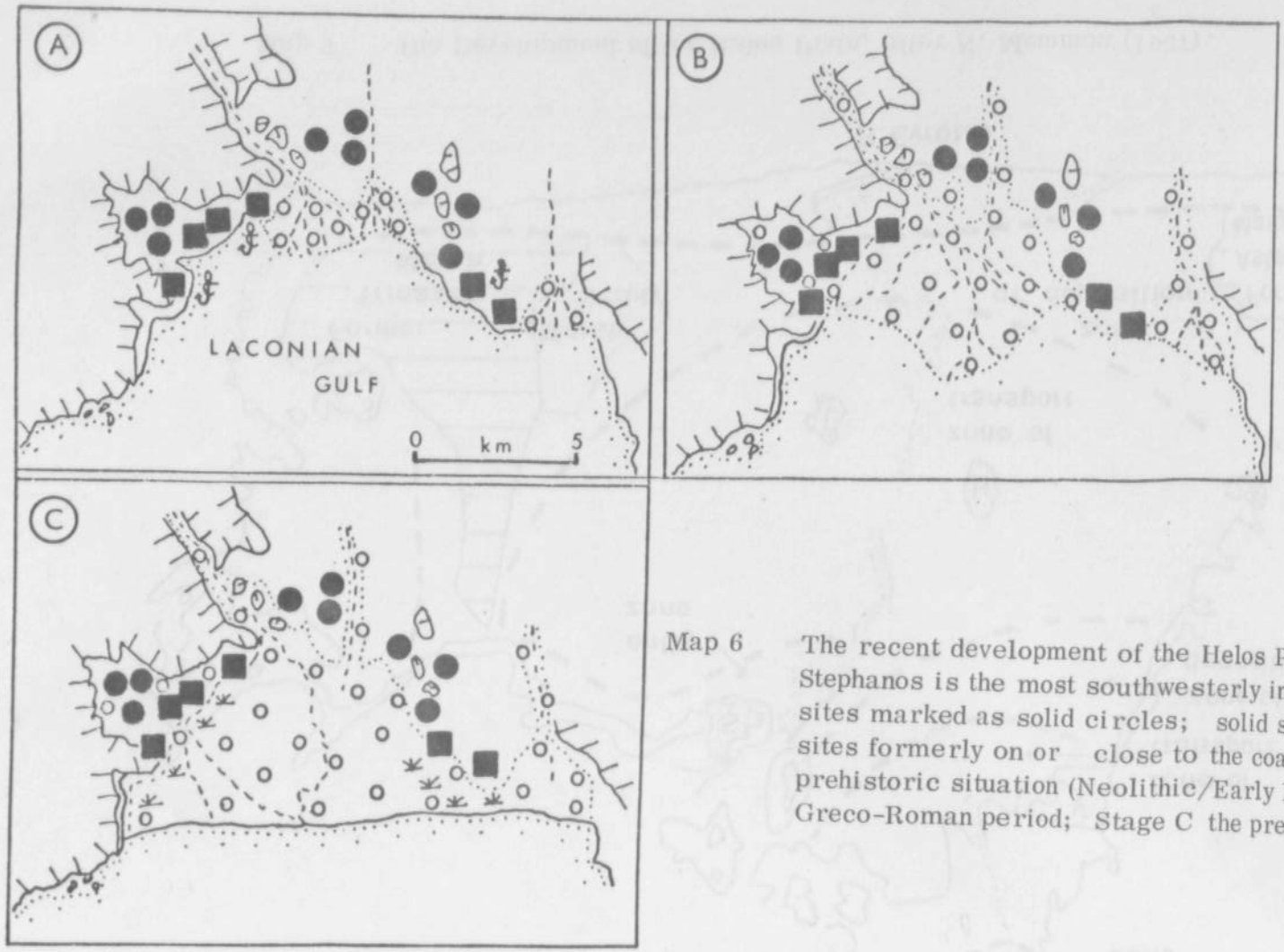

River Evrotas
KROKEAI
PHAROS
MYRTEA
PHLISIO
VLACHIOTI
STEPHANIA
SKALA
R.Vas
H.
TAXIARCHI
SOULIO
LAGIO
HELOS
ASTERI
LEIMONAS
River Evrotas
LACONIAN
GULF
TRINISIA ISLES
GYTHEION
KRANAI
ISLE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
HELOS:
Map 3
0 1 2 3 4 5
km
Over 40m
Over 200m

Map 4 Geology of the Helos Plain. Sites numbered as in Map 3.


SCHIST - PORPHYRY COMPLEX
CRYSTALLINE LIMESTONE
RECENT ALLUVIUM
Sand Dunes
NEOGEN:
Marls, Sands
Unvisited, Mainly Marls
Mainly Conglomerate
0 1 2 3 4 5
km
HELOS: Map 4

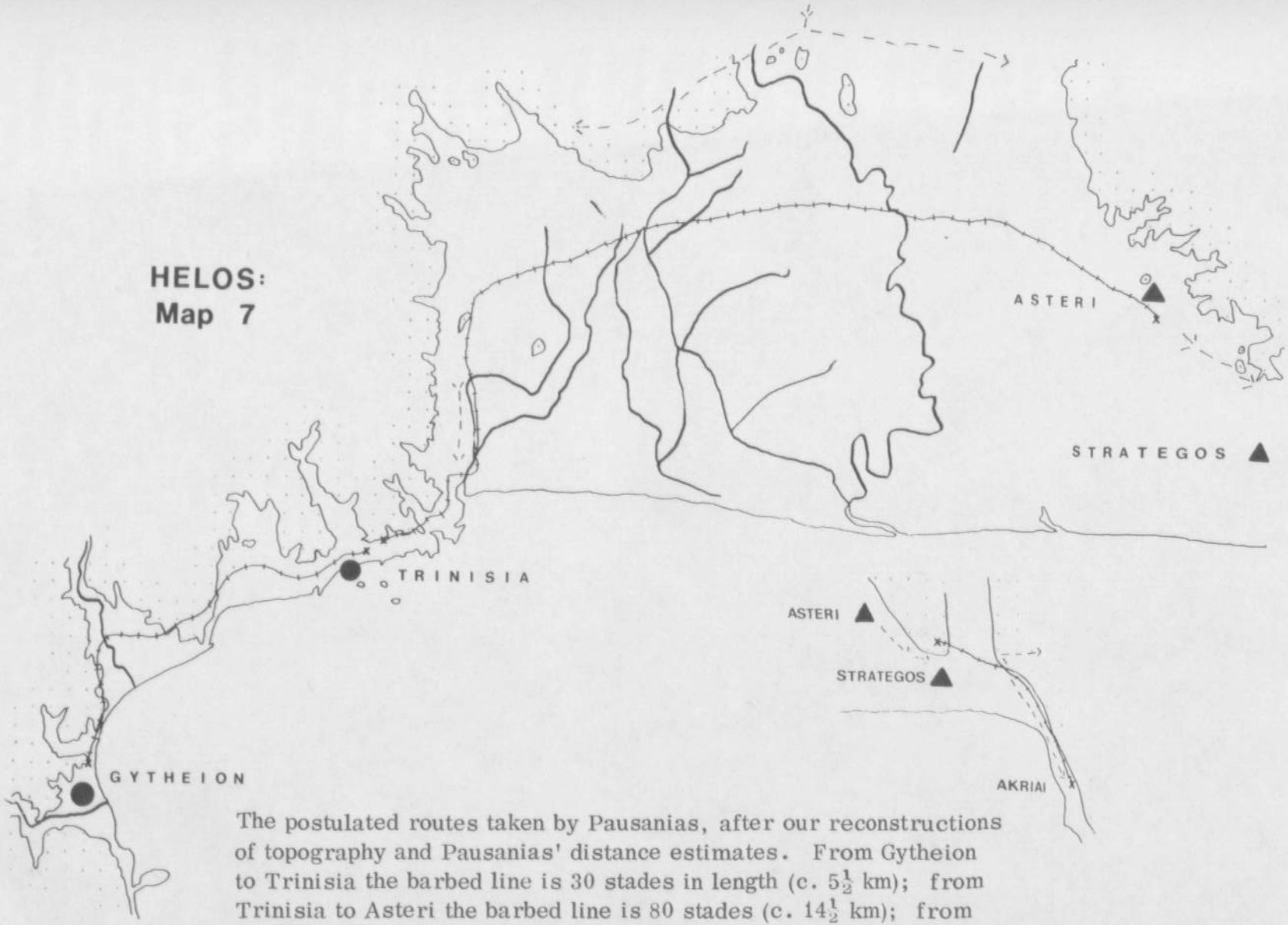


Map 5 The Development of the Helos Plain, after N. Memmou (1967).



Map 6 The recent development of the Helos Plain. The site of Agios Stephanos is the most southwesterly indicated. Prehistoric inland sites marked as solid circles; solid squares with anchors mark sites formerly on or close to the coast. Stage A shows the early prehistoric situation (Neolithic/Early Bronze Age); Stage B the Greco-Roman period; Stage C the presentday situation.

HELOS:
Map 7



The postulated routes taken by Pausanias, after our reconstructions of topography and Pausanias' distance estimates. From Gytheion to Trinisia the barbed line is 30 stades in length (c. $5\frac{1}{2}$ km); from Trinisia to Asteri the barbed line is 80 stades (c. $14\frac{1}{2}$ km); from Asteri to Akriai the barbed line is 30 stades in length (c. $5\frac{1}{2}$ km). Traces of ancient road networks are indicated by a dashed line.

CHAPTER V

MESSENIA: THE SITES OF AKOVITIKA, MALTHI AND PYLOS

Akovitika

Messenia is the province of the Greek Mainland that occupies the south-western part of the Peloponnese. The major area of lowland of the province consists of the great Lower Messenian Plain. On the eastern edge of this expanse of recent alluvium, on the coast and backed by Pliocene and Pleistocene sediments, lies the modern city of Kalamata (Figure 1). Three to four kilometres west of Kalamata, and directly on the textural boundary between recent alluvial bottomland (to west and north) and older alluvium amid Pliocene hills (to east and north) is sited the village of Akovitika.

Minor classical finds had been reported from this locality, but it was only after substantial building remains came to light that a full-scale excavation was mounted by the Greek Archaeological service, under the direction of P. Themelis (Themelis 1969, 1970).

About 500 m south of Akovitika, and 650 m north of the present coast of the Messenian Gulf, mechanical diggers were occupied in excavating flood-control ditches along the former course of the river Areos. The substantial foundations of a monumental construction came to light, and archaeologists revealed a large single structure including fragments of Doric stoas and associated with a contemporary well, all buried under a level of recent river deposits.

The earliest pottery finds were Proto-Geometric, and continued through to the Classical period. The main building remains appeared to belong to the 6th century B.C. Amongst the small finds, besides pottery, the most numerous articles were tiny replicas of oars or rudders, and given the proximity of the sea these were interpreted by the excavator as dedications from poor fishermen. The probability from this that the building formed part of a temple of the maritime god, Poseidon, received support from a pottery fragment inscribed with the name of that divinity, and it was suggested that at this site were held the games of Thourian Poseidon (as recorded in ancient sources). The building uncovered was more likely to be a major annex rather than the main temple edifice, which should be close by.

A year later, continued excavation in the area but at a site about 150 m to the north of the temple finds, brought to light an Early Helladic building-complex that rivalled Lerna and Troy 2 in its monumental proportions. The main feature of the complex is a corridored megaron with many details closely paralleled by Lerna House of the Tiles. It seems to have been built and abandoned within the EH2 period, but the site may have been reoccupied during Middle Helladic times. Again, the building foundations and occupation

levels were buried beneath a shallow layer of recent riverine alluvium. The excavator suggested that in contrast to similar large structures of the Early Helladic civilisation, which had been abandoned after violent destructions, the Akovitika megaron may have been deserted because the prehistoric predecessor of the river Areos swamped the site with layers of clay and sand. In 1973 (A. Reps, 1973, p.17), further excavations have uncovered a second EH megaron, Megaron 'B', also very large and alongside but on a different axis to Megaron A. It is considered to precede Megaron A, and in this as in its form it is compared to House BG with its successor the House of the Tiles at Lerna. Other EH structures were met in the vicinity.

The location of the Poseidon temple was examined by W.G. Loy as part of his investigations into the prehistoric geography of Messenia (Loy 1967: 58-61). He was interested in the site for the possibilities it offered for calculating the rate of riverine alluviation and coastal aggradation. He recognised that the ancient site lay on a tongue of Pleistocene colluvium/alluvium running out seawards from low Pliocene hills. As can be seen from his diagram (Figure 2) to north and south recent alluvial bottomland encircles the location, while a wide sand-dune zone covers much of the land between the temple and the present shoreline.

It was clear that since the classical period the only visible changes in the local sediments were an overlay half-a-metre thick of recent silt above the temple site, and a maximum of 600 m of coastal aggradation - assuming the temple was originally on the coast. Since the site now suffered from waterlogging a lower sea-level in the classical period was locally confirmed. The designation of the deposits overlying the site as 'colluvial silt' allowed Loy to interpret the bottomland accumulation as a continuation of the Pleistocene colluvium/alluvium, and he concluded that there have been no significant changes in local geomorphology since the Bronze Age in this region.

The locality was studied by the author in 1974. In its main lines, the division of deposits as proposed by Loy was confirmed. The Pliocene sediments are occupied by the present village, and they provide a fertile zone of dry-farming land where cereals and olives flourish. Beyond and below the village the Pleistocene deposits, derived from the Pliocene, consist of a sandy-clay with a strong red colouration, moderately sloping both to west and south, and typical of the Older Fill colluvium as described by Vita-Finzi (see Geomorphology Chapter). Just before reaching the two archaeological sites the red sediments are overlain by a dark fresh alluvium, that continues out into the main plain to the west and is the same material that has buried the sites under at least half-a-metre of silt. It is certainly not recent colluvium, for it is virtually level from east to west and slopes downplain from north to south. In section, at the temple site, the silt exhibits typical riverine sorting in alternate beds of coarser and finer materials. There is no doubt that the recent silt is a uniform sediment laid down approximately contemporaneously over the Lower Messenian Plain, and quite distinct in origin and from the Pleistocene colluvium behind and east of the ancient sites.

Loy recognised that the red sediments were Pleistocene and formed the old landsurface on which the temple was built. If we put the necessary stress

on the very considerable differences between the Older and Younger alluvia and colluvia, it is obvious that the Older deposit was laid down before the classical era, the Younger - at least at the temple site - only after the classical era (and probably in post-Roman time, see below). Now the first structures may well have been erected in the Proto-Geometric period, from the pottery finds, and this puts back the terminus ante quem for the Older sediment even further. Details of the stratigraphy are shown on Figure 3 (based on a photograph), from which it is clear that there is a sharp disconformity between the underlying red deposits and the overlying brown silt. The ancient walls are immediately overlain by a thin level of reworked occupation debris with numerous pottery pieces, that suggests that river action swept together surface debris before coating the whole area with its alluvium.

Loy did not have the additional information from the Early Helladic complex, for this might have given him second thoughts about his interpretation of the temple site. Not only were most of the Bronze Age buildings covered by about $\frac{1}{2}$ m of the historic alluvium, but according to the former owner of the field in which the prehistoric site is situated, Andreas Christou, the walls rest upon a red sand, that can only be the Pleistocene colluvium, and that is to be seen emerging above the site only a short distance away to the east. The site is too overgrown at present to confirm these observations, and only the recent alluvium is visible.

We may conclude, then, that an Older colluvium was deposited before the Early Bronze Age, and during the latter phase the 2 megara were constructed on its surface. Between then and the classical period no sedimentation is recorded in this area, and the various occupation levels and walls of the temple site from Proto-Geometric to classical times continue to rest on the Older deposit. Only after the classical age is renewed geomorphological activity evidenced by riverine reworking of the uppermost levels at the temple site and an alluvial burial of both Bronze Age and classical monuments. This sequence is illustrated as Figure 4.

Loy suggested that the Pleistocene slope deposit was interglacial, and is relying on the standard equation Red Beds=Riss-Würm (see Geomorphology Chapter). Elsewhere I have demonstrated that such sediments are generally assignable to Early and Middle Würm, and there seems no obstacle to presenting the Older and Younger Sediments at Akovitika as well-dated type-exposures of Vita-Finzi's Older and Younger Fills. In so doing we must directly contradict the opinion of Loy, that no great changes in local geomorphology have taken place. It is also very unlikely that Themelis is correct in associating the abandonment of the megaron with alluvial swamping, for by the identical sequences at both megaron and temple sites and the parallel amount and form of the overlying silt the alluvial cover is almost certainly post-Classical at both locations.

It remains to try and reconstruct the wider environment of these sites. We have seen already (Geomorphology Chapter) that a typical coastal plain in the Vita-Finzi scheme would register thin deltaic fill along the main river-courses during the long intervening period between the Würm Older aliuviation and the historic fill. In the case of the Lower Messenian Plain, which is in the main a creation of the Pamisos River, we would expect a continual

growth of delta flats throughout the later prehistoric period (Neolithican), but probably down the central and lowest part of the plain, rather than at its higher edges. Thus Akovitika and the opposite (western) edges of the Plain would have remained relatively unaffected by alluvium until the change of regime to steam aggradation in Roman times. In the historical alluviation phase, all parts of the Plain were alluviated as streams swept back and forth with a constant supply of silt, and it was at this time that the Plain was built up to such a height and width that older deposits above and beside it were buried.

It was of course a fallacy that the depth of $\frac{1}{2}$ m recorded by Loy at the very Plain edge was an adequate guide to the depth of alluvium in the centre of the Plain. Indeed he actually cites a report from a village inland and in the Plain centre, suggesting that there the recent alluvium is at least 12 m thick (cf. Figure 4) (Loy 1967: 60; Loy and Wright 1972: 42).

In the Early Bronze Age, sea-level was perhaps 5 m lower than at present, and the megara lay on the sloping Older Fill at no great distance from the sea (allowing for the slope of the red colluvium). Behind them lay the preferred Neogen hills with a fine rendsina soil, but almost certainly the main attraction of this location lay in its maritime location, for it would appear to have been surrounded on west and south by the sea. In this it very much resembles Lerna House of the Tiles, also built on to a Würm Older Fill slope by the coast, though Lerna lacks the close concentration of good arable land available to Akovitika. If the latter site, with its parallels clearly also in groundplan to Lerna, served a similar function, we would have two 'proto-palaces' on the sea - and in a period when maritime activity is more evident in the archaeological record than any before or after. To hypothesize from the 'accounts' found at Lerna, are we dealing with local centres with control over the redistribution of products from their hinterland and products arriving by sea?

It is worth noting that on the far side of the Plain the great Mycenaean centre at Nichoria sits amid a very extensive zone of Neogen hills, and couples this abundant resource for dry-farming with an adjacent valley now filled with recent alluvium - but almost certainly then an inlet of the sea and a major harbour (Kraft 1972: 82-96; Yassouglou 1972: 175).

Up to and including the classical period, the environment around Akovitika would have changed little, with the limited exception of the steady rise in sea-level. It is significant that the temple annex is associated with a well, as this implies a contemporary sea-level probably at least a couple of metres below today's level. This seems a necessary conclusion from the observation that part of the site is at present watertable, which is little above sea-level, while the well descends some way below this level - implying that water was apparently nowhere near the surface in the classical era. Furthermore, the freshwater tapped by the well is likely to have been some way above the saltwater to be palatable. Confirmation that the site continued to be coastal is supplied by the fishermen's offerings, and if these gifts were really fishermen's and not just from varied types of boatmen and sailors, we might speculate whether the immediate shore was a good fishing ground or anchoring ground for local fishermen. It would very probably, as noted above, have

been a deeper inlet than was available further into the centre of the Plain, and a fishing base nearby might go some way to explain the early interest in the locality by prehistoric settlers. It has been shown in several other important coastal sites, that trading interests would seem to have grown out of fishing bases, and it would be another parallel to Lerna if the Akovitika Megaron was associated with a suspected fishing community.

Since the author's visit to this district, and the composition of the above reconstruction, Professor J. Kraft and Professor G. Rapp have published a detailed study of the recent environmental changes in S. Messenia (1975). Resting on numerous sediment borings and C14 dates, it naturally offers much detail for testing my conclusions. It is indeed gratifying to find clear evidence from their analysis of the Pamisos Valley and the Nichoria coastal plain for a dramatic landscape change to be dated to Roman and post-Roman times. Before this period the sea reached far into the land and washed pre-Holocene deposits in most areas; in some places beach gravel and lagoon backswamp had however begun to accumulate by Late Geometric and Classical times. Associated with, but largely post-dating Early Imperial and Late Roman finds, is a new phase of full floodplain build up by river alluvium, overlying the thin and recently deposited beach and lagoon/backswamp deposits. This deposition had ceased by the Turkish period, and since that time it has been eroded by marine transgression. In places there is evidence for an earlier deposition of Pleistocene/Pliocene age below the Holocene sediments, including a red facies and a 'tufa' (?) facies. At the Akovitika site the finds are recognised as overlain by the recent alluvium, and it is claimed that the archaeological material beneath this fill includes some of Roman date.

This recent study is fully in agreement with our own findings, with traces of a red 'Older Fill', (that may also include a final tufa facies (C14 c. 30,000 b.p.)), and at a deep level in the coastal zone (up to 90 m in the lower central Pamisos valley). Also a watery 'deltaic fill', not really much in evidence before the 1st. millennium b.c., probably because of a slower eustatic rise in recent millennia (cf. similar events in Macedonia, Bintliff 1976). Finally the historic fill, with lowest levels containing Imperial Roman ware and overlying backswamp dated as late as 50 a.d. C14, cessation by at the latest the Turkish period. However, Kraft and Rapp fail to integrate these findings into an overall scheme such as we have proposed. The observed changes are left to an undetermined degree of possible interactions between sea-level fluctuations, local tectonic events, human erosion, longshore drift and so on.

Evidence those authors present on the 'sea-level problem' is somewhat inconclusive. It is however of value to hear of evidence from Greek scientists that local tectonic pressures are horizontal not vertical, thus contradicting the claims of Flemming for a long-term downwarp of Greek coasts (cf. Geology Chapter). Moreover, several pieces of evidence presented by Kraft and Rapp agree with our eustatic model of around 1 metre per millennium ocean rise for the last 6-7,000 years or so. Two C14 dates from the lower Pamisos valley for backswamps suggest sea-levels of about 6-7 metres and 2-2.25 metres below present at dates in calendar years of around 5500 B.P. and 800 B.C. However 10 metres below the earlier date is a further one of around 6000 B.P. calendar years - a dramatic change in relative sea-level, which these writers attribute to local tectonics or sudden eustasy on a world-

wide level. Such an eustatic jump does not appear in most general surveys of this period's sea level curve, and our Macedonia study suggests a more gentle curve still in the 1 metre/1 millennium into this period (Bintliff, 1976). We might offer an alternative solution - a dating error for the lower level (bearing in mind the problem of wiggles in the recalibration curve for C14). Yet Kraft and Rapp add two further dates of the same order for a similar sea-level, from their unpublished work elsewhere in the Peloponnese. Perhaps the relevant dates from elsewhere, e.g. Macedonia, are the ones to change, and sea level did in fact rise very rapidly in the 7th. and 6th. millennium B.P. in calendar years, before settling into its 1 m/millennium pace? A further date for present sea level of 50 A.D. C14 comes from a section that is of variable height - an alternative height about $1\frac{1}{2}$ m lower is not only plausible for the same date but would then fit our eustatic curve. Indeed, it is clear from Akovitika in this district, that sea level was at least $1\frac{1}{2}$ m lower in Classical - Roman times.

Malthi

The Soulima valley runs between the western coast of Messenia at Kyparissia, and the Upper Messenian Plain to the east. About 6 km from its eastern end a long ridge of hard limestone projects into the valley from the hills to the south, opposite the villages of Kokla and Vassiliko (Figure 5). The prehistoric village on its summit was the main object of the Swedish Messenia Expedition directed by N. Valmin (1938). The excavation of this acropolis site remains one of the few completely cleared settlements in Greece, and has served as a model of a Middle Helladic town plan (Vermeule 1964: 77-9).

According to Valmin, the site was first occupied in the Neolithic period, then the Early Bronze Age, reaching its greatest importance in the Middle Bronze Age. The site continued to be occupied in the Late Bronze Age, and on the slope to the west of the settlement two Mycenaean tholoi are witnesses to its significance as a local centre. Valmin's equation of the acropolis with Homeric and Classical Dorion has been questioned in the light of recent survey evidence and the virtual absence of post-Helladic pottery finds (McDonald and Hope-Simpson 1969: 141; Loy 1967: 94).

W.G. Loy made a detailed study of the area around the site in order to relate its location to the surrounding natural features, and thereby discover the forms of agriculture being practised in the Bronze Age (Loy 1967: 94-105).

He very rightly stressed that the site may appear to dominate an important route across Messenia, but this would have been of small significance when, as today, much of the movement by land went across the hills on donkey or foot. The importance of the location had to be sought in the available resources of the immediate area around the Malthi hill.

The nearby villages have dry-farming of cereals, figs and olives, some stock, and grow a limited amount of irrigated fruit trees. In Loy's analysis of land-use the dry-farming was concentrated on the low hills of flysch soil, the limited areas of hard limestone where soil has developed, and the upper and drier regions of the alluvial and slope-wash deposits. In contrast the irrigated crops are grown on small zones of low-lying alluvial and slope-

wash deposits above the present-day watercourses. These wet-farmed sectors are watered by irrigation channels and mechanical pumps, and the available water is exceptionally great in this area throughout the year, thanks to a magnificent spring by the village of Kokla. Smaller and more seasonal springs exist in the side-valley running by the western edge of the Malthi ridge, in the main Soulima valley to the north-east of the ridge, and in the hills on the north side of the main valley.

The acropolis hill itself is for the most part bare rock, with only sparse patches of limestone and shale soil. It is steep and easy to defend on three sides, only the south approach being gentler, along a thin neck slightly lower than the acropolis hill. This neck connects the hill to hill chains further south, but would also have been relatively easy to defend against attack.

A brief examination of the alluvium and colluvium persuaded Loy that they already existed in approximately their present form during the prehistoric period, and assuming that the present irrigation arrangements might have been within the technical competence of the Middle and Late Bronze Age peoples, and taking into account the strategic potential of the acropolis, he concluded: "The primary reason for the location of Malthi was as a defensible site dominating nearby irrigable land" (1967: 97; Figure 6a).

The area was studied by the writer in summer 1974. The results of a detailed field survey of the surrounding landscape form Figure 6b. Two points are very obvious to the eye. Firstly, the amount of cereal and olive land, on flysch and Older Alluvium/Colluvium, is many times the area of irrigated fields (on Younger Alluvium and the lower parts of the Older group). Figures in Loy suggest a ratio of 6 or 7: 1 (Loy 1967: 98). Olives in the area around the site number c. 52,000 compared to 1000 trees of citrus fruit. Given that a very large part of this dry-farming land is on flysch soil, that is known to be an extremely fertile arable soil (see Soil Chapter), that citrus fruit were unknown in prehistoric Greece, and that fresh vegetables would hardly have formed a viable transportable product then, we must conclude that the main core of the agricultural economy of the people of Malthi, subsistence and surplus, just as today with the people of Vassiliko and Kokla, rested upon an abundant production of cereals and olives. Olive oil is in fact still the staple cash crop of these modern communities.

The second point to make is that the recent sediments must be divided into Older and Younger deposits, a serious omission in Loy's study. Loy seems to have conflated them, though they are remarkably distinct in size, lithology and topography, colour and inclusions. The Older deposits are typical Older Fill in Vita-Finzi's grouping. They descend into the valleys at a steep angle, are red in colour, show no graded horizontal bedding, consist of a clayey amalgam of very coarse and very fine fragments, and contain no pottery finds. Typically these sediments are incised by present torrents to a height of 20ft. or more. Loy has pointed to a lower level of these deposits as characterised by a bed of massive concreted boulders (1967: 102). Elsewhere this formation has been shown to be early to middle Würm in date, and Loy himself points out that the 2 tholoi west of the acropolis are dug into the colluvial slope-deposits (1967: 104). We can agree with him that the Older Fill has certainly remained the same since prehistoric times.

The Younger sediments are typical for the historical fill of Vita-Finzi. They are only to be found as a 2-3 m terrace running horizontally beside presentday streamcourses. It is a dark-brown deposit and generally exhibits horizontal bedding. This formation is 'nested' into the Older Fill, in such a way that it is clear that the latter was incised by streams before renewed deposition refilled the channel thus created, but to a lesser height. A brief search along this alluvial formation brought to light a number of embedded pottery fragments, (contra Loy, who claims to have seen none - 1967: 104), at all levels of the exposure. They are wheel made but regrettably none were diagnostic for period. Thus the Younger Fill would have been deposited here in all probability only during and after the Middle Bronze Age. Since this alluvial formation is shown elsewhere in this thesis to consistently date to Roman and later times, it is almost certain that this deposit must be removed from consideration in evaluating the prehistoric landscape and its farming potential.

Loy compared two stream-terrace exposures, whose locations are marked on Figure 6a (1967: 102). The first ('a') is a terrace of Younger Fill from the Malthi side-valley. He described it thus: the upper metre is a dark brown, in places calcareous, sandy silt while the remainder of the exposure is a calcareous gravelly boulder bed - poorly sorted. He then compared this with a sample from the main valley ('b'), where the torrent has cut into the Older Fill. At the top is a quite irregular 1-3 m deep bed of reddish-brown non-calcareous silty material, underlain by a jumbled level $1\frac{1}{2}$ to 3 m deep of coarse boulders, gravel and silt, the lowest section of which is cemented by calcareous silt. Below this is visible a metre of brown calcareous sandy silt. Surprisingly Loy holds that these two exposures are identical.

There is in fact no comparison between the brown and the reddy-brown, the calcareous and the leached, the lack of sudden change in the proportion of individual lithological units and their frequent presence. If Loy had travelled from one end to the other of each streamcourse he would have noted the gross discrepancies between the relative heights of the Older and Younger Fill terraces and the consistent steep slope of the former down into the present bed, the gentle downstream slope of the latter horizontal to the present bed.

The major cause of error seems to have been the recent activity of the torrents. As throughout Greece these are incising down through both Fills, and in some places they are now cutting laterally into Older, now Younger terraces. In parts of the main valley along the River Kleissouraiika, north of the acropolis hill, the result is that the present bed is bordered on the north by a typical Younger Fill terrace, on the south by a much higher Older terrace (see Figure 6b). It is this juxtaposition of different fills that has misled Loy into conflating them, though clearly spatially distinct almost everywhere else.

One can scarcely agree with Loy that "the geomorphic changes in this valley since the Late Bronze Age have been slight" (1967: 102). The presence of a boulder bed below both of his sample exposures simply indicates phases of stream activity similar to today, and such debris can be seen collecting in the torrent bed now. The boulder bed under the Younger Fill

would have been a remnant of the eroded Older Fill or a deposit of the phase between depositions, while its counterpart in the Older Fill section could be representative of a phase preceded or interrupting the deposition of the Older Fill.

The overall significance of this subdivision of the alluvia and colluvia and their respective chronology, is to rule out any of the low recent alluvial terraces from available farming land in the prehistoric period. But it is this formation that constitutes the main zone of irrigation farming today. The only area that remains for an early irrigation agriculture is the lower portion of the Older Fill. Apart from the poor qualities of this as a soil, its average height above the riverbed - 20ft. or so, precludes irrigation without the aid of sophisticated mechanical pumping and extensive pipelines, and this is how these raised fields are watered today.

Loy's claim, that a dam one metre high in the stream-bed, with diversion canals dug by hoe, would be quite adequate to replace the present irrigation system, falls down completely on the following points:

(1) The lower parts of the Older Fill are too high to be watered without the present mechanical technology.

(2) The recent alluvium or Younger Fill was not present at the time of prehistoric occupation.

(3) In any case, the spring sources are at Kokla and beyond the Vassiliko village, and the Malthi side-valley lacks a good spring (Loy 1967: 98), though it is here that the tholoi and traces of a Lower Town have been recorded.

These further settlement remains provide the key to the locational priorities of the Malthi acropolis occupation. If we examine the survey maps of the Minnesota Expedition, the most up to date account of prehistoric finds in this area (McDonald and Rapp 1972; see Figure 5) the only certain pre-Middle Bronze Age site is a low hillock by the Kokla village (27B). For it is now suggested that the Malthi acropolis was first extensively occupied in Middle Helladic times (McDonald and Hope-Simpson 1969: 141). The Kokla site has EH, MH, LH, H and R finds. Available resources were the vast expanses of very fertile flysch soil, now dense with olive woods and cereal fields, the plentiful water supply from the springs, and a limited zone of land immediately around the spring for kitchen gardens. The choice of a low mound for the Early Bronze Age is a typical location, and probably explains why the Minnesota survey shows an uncharacteristic low number of sites of this phase in comparison to later ones; for their survey techniques were specifically directed to the identification of Mycenaean acropolis hills with commanding height (McDonald and Hope-Simpson 1972: 122). Doubtless many more EH sites await discovery in this area (see Socio-Political Chapter, Table 1).

Although the Kokla site continues into MH, it is noticeable that this period sees the first settlement of several upland locations, that are to become local centres in the LH phase (definitely 23B, 27 (Malthi acropolis , probably 24, 24a, the 26 cluster of sites, 23E). Several new smaller MH

sites, generally in raised locations, are hard to evaluate with a predictable body of EH sites still to be discovered throughout this area.

In the Late Bronze Age (Figure 7) most sites are known, and from the recorded extent of settlement remains at each we might reconstruct a possible network of larger centres at regular intervals over the landscape (partly pointed out by McDonald and Hope-Simpson themselves). It is now held that the Malthi acropolis is not a major settlement in Mycenaean times, being primarily an MH centre, though the two tholoi close by on the western slope of the same ridge point to the contrary. The answer seems to lie in site 27A, the 'Minoan Settlement' that Valmin excavated not far from the tholoi. It is now reinterpreted as a Lower Town of Late Helladic date (McDonald and Hope-Simpson 1969: 141).

Now the tholoi and the Lower Town lie in the Malthi side-valley, a landscape dominated by a great extent of fine flysch soil. The settlement is actually on the flysch, the tholoi - as noted - on the old colluvium just above. In the Middle Bronze Age there may have been a general trend to relocate villages on defensible heights, possibly incorporating previously dispersed units of settlement into one large community. Malthi acropolis would neatly fit into this model, and a defensive wall around the summit was held to date to this phase, as would the first occupation on the neighbouring upland positions. The continued use of the Kokla site (27B), a typical low mound settlement, is unusual but has its parallels in the Helos Plain. In general, such sites were abandoned until the return of security in Mycenaean times saw the revival of numerous low-lying and often small-scale farming sites. At this time, the Malthi community moved down from their acropolis to a location from which their fields were far more accessible, leaving the ridge-top to house perhaps the local chief and his entourage (McDonald and Hope-Simpson 1972: 137). In addition to the large area of flysch soil up the Malthi valley, the occupants of upper and lower towns could exploit the considerable amounts of the same soil across the valley to the north, by Vassiliko village, and to the north-east. Probably the Kokla site with its flysch hills was subsidiary to Malthi, to judge from the evidence of the tholoi and the next nearest major Mycenaean centres. There is in fact growing evidence for an EH settlement pattern of wide dispersal over cultivable lands, followed by an MH pattern characterised by wider-spaced nucleated communities consisting of an acropolis hill and close satellite sites (Bintliff, 1977).

The other prehistoric sites in the area also appear to correlate with the intermediate zone of the landscape - the flysch hills, neglecting the barren limestone ranges to north and south and the less valuable Older Fill of the valley sides and bottoms. The average distance between major Mycenaean sites is 4-5 km - which strikingly parallels that determined in the Argos and Sparta Plains. It may be significant that the Classical city of Messene, in the north-west Messenian Plain, was built on the lower slopes of the renowned refuge mountain Ithome, but faces on to an extensive zone of flysch soil running from one side of the plain to the other (Admiralty Handbook 1945, Figures 29 and 30).

Pylos

The Mycenaean palace at Epano Englianos is situated amid rolling and dissected Pliocene marls and sands, about 10 km as the crow flies from the splendid harbour of Navarino Bay (Figure 1).

The complexity of this centre, its association with a concentration of Bronze Age settlements and Mycenaean princely burials, and the evidence of its preserved accounting system, together with its pre-eminent place in the known sites of its region, all lead to the obvious conclusion that it is none other than the palace of King Nestor, a hero of the Homeric poems (Blegen and Rawson 1967: 31-2). The place 'Pylos' occurs frequently in the Linear B records found in the Archive Room of the palace, and this is surely the same place as Homer's Palace of Nestor at Pylos, and the Mycenaean name for the Englianos centre.

Even the approximate location of this palace was forgotten in the Dark Ages that followed the fall of Mycenaean civilisation, and a scholarly battle was fought over suggested sites in many separate parts of the province of Messenia. A strong school even maintained that Nestor's Pylos lay in Elis, the province to the north.

With the full surveying of the Messenia region, and the excavations at Englianos, the importance of the new palace left no doubt in most minds that the location of the Homeric city was revealed. The site suited at least one ancient geographical reference that Pylos, now by Navarino, was formerly 'under Mt. Aegaleon' (Chadwick 1972: 103).

The name 'Pylos' had been preserved around the Bay of Navarino as the peninsula at its north, and the modern town to its south. And it is here that some will continue to seek for Homer's Pylos. Englianos seems to them too far from the port, for convenience, to suit the journey in the Odyssey of Telemachus and Nestor from the shore to the palace, and more importantly - for the standard Homeric epithet 'sandy Pylos' (Kraft 1972:64).

Although Kraft suggests that the shore may have been a kilometre or so closer to the Englianos site in prehistory, that hardly makes much difference to the problem, and even this suggestion may be contradicted by more recent geomorphological work (Kraft 1972: 57, 64).

In his description of the churches of Melos, A. Baou quotes from land transactions of the last few centuries (see Melos Chapter). Melos is predominantly composed of tuff from various eruptions, and the resultant soil is extremely sandy and devoid of clayey or silty particles. When a lump of Melian soil is grasped in the hand it trickles away just like desert sand. Hence most of the land records talk of so many hectares of sandy soil, sandy land, and the word used is 'Ammoudios'. Now this word can also be used of a sandy beach.

The source of the Modern Greek word is the Homeric word 'Amathiodis', and this is the adjective applied to Pylos in the celebrated epithet. Could it not refer, rather than to the sea-shore at Navarino Bay, to the soil around Epano Englianos? The site is situated in the centre of a large zone of Pliocene sands and silts, and these sediments have a very characteristic 'chalky'

feel to them. To the eye and the hand, 'sandy' is a very apt description of these deposits, and we need not invoke beach sands to account for the Homeric catch-phrase. Of course these sediments were once marine sands and hence the similarity.

Interesting confirmation comes from Macedonia. The large alluvial plain between the cities of Edessa, Verroia and the river Axios, was known to Homer and the ancient Greeks and Romans as Emathia (though the latter also used other names for the area). Again, the root is the same word meaning 'sandy'. But this description is exceedingly inapt for the plain today. Its present surface is composed of a mucky silt, that in winter puddles into a vast quagmire. As a study by the present writer on Western Macedonia reveals (Bintliff, 1976), the landscape has changed drastically since the prehistoric and Early Roman periods. Before the Late Roman era the major part of the plain consisted of a gently undulating surface of calcic lake sediments. In texture and appearance they would have been almost identical to the marine sands and silts around Englianos today, and there is little doubt that Homer's description of the region (Iliad 14, 226) struck upon what was then the characteristic feature of that northern landscape. No-one would claim that the region was being qualified by its beaches in this case.

Part of the confusion derives from the attitude of the Minnesota Survey Team to the Pliocene hill country. Some recognise it as the major resource of the Mycenaean kingdom of Pylos, others maintain it was neglected in favour of the far more fertile bottomland with its moist alluvium (McDonald and Hope-Simpson 1972: 122, 131).

Members of that team are now verifying for Messenia the conclusions of the present writer and Vita-Finzi, that the recent alluvium postdates all prehistoric settlement in the region (see Geomorphology Chapter) but for long the Pliocene sediments were given a low significance precisely because the modern Greek peasant frequently earns far more from his irrigated crops on the alluvium than he does from his cereals and olives on the Pliocene formations. In Homer's day the Pliocene deposits were practically the be-all and end-all of agriculture over much of Greece, and since settlements were concentrated almost exclusively on such deposits, it must have been the most natural thing in the world to describe the region of a great palace by its fundamental and all-pervasive resource. It is also clear from Figure 1 that Nestor's Palace was situated near the major valley leading to Navarino Bay, so it was reasonably accessible to its port.

In Figure 1 two other key sites are located on their respective soils - Akovitika, and an important town of Nestor's kingdom at the Nichoria site (marked 'N').

Nichoria is very similar to Nestor's palace; it occupies a lofty position amid a very extensive area of Pliocene hill-country; and it is not directly accessible to its probable harbour site on the Messenian Gulf. This apparently wayward position from the present-day key resources of the Messenian Plain to the east caused problems to those such as N. Yassoglou, who reconstructed the Mycenaean land-use as forest on the surrounding Pliocene hills, arable land away on the Plain and far down in the tributary valley bottoms (Yassoglou 1972: 71-6).

In the light of the significance of these hill soils elsewhere, and the necessary removal of the alluvium from Greek prehistory, we can add the Nichoria site to the model examples of soil determinism. The two centres are very alike in their surroundings, and it is very clear from Figure 1 how Nichoria and Pylos correlate with the two most extensive zones of Pliocene sediments in the province. Akovitika, a major Early Bronze Age centre, and the Homeric centre of Pherai at Kalamata, also very obviously correlate with extensive bands of Pliocene silts, and with harbour facilities.

It may be objected that both Pylos and the large provincial Nichoria settlement occupy very steep hills, and were placed away from the plains and the sea to avoid sea-raiders. It is certainly true that both hills, just as with the Menelaion, are very steep on all sides and provided freedom from sudden surprise attacks. But in the mature Mycenaean period neither of these Messenian centres, nor apparently the Menelaion, were walled (though Englianos had an MH and early LH wall around a nucleated community). Indeed the Palace of Nestor relied on an aqueduct for its water supplies, linking the palace hill with a spring source on another hill, and the main water sources of the Menelaion would appear to have been beyond the natural defences of its steep plateau (Blegen and Rawson 1967: 16; Vermeule 1964: 161; Sparta Plain Chapter). The remarkable density of early settlement along the Englianos Pliocene zone (McDonald and Hope-Simpson 1972: 135) is in any case witness enough to the locational priorities that led to the regional centre being set up here. Naturally such a position, though admirable for the awe-inspring view that the ruling house got and received throughout its lands, was not immediately accessible to all its surrounding areas for the everyday business of tending the fertile soil. Hence the ordinary people lived on lower slopes of the plateau in a Lower Town and in satellite settlements by the fields, and this seems to have been the case also at the Menelaion and Mycenae (Blegen and Rawson 1967: 4; cf. Sparta and Argos Chapters).

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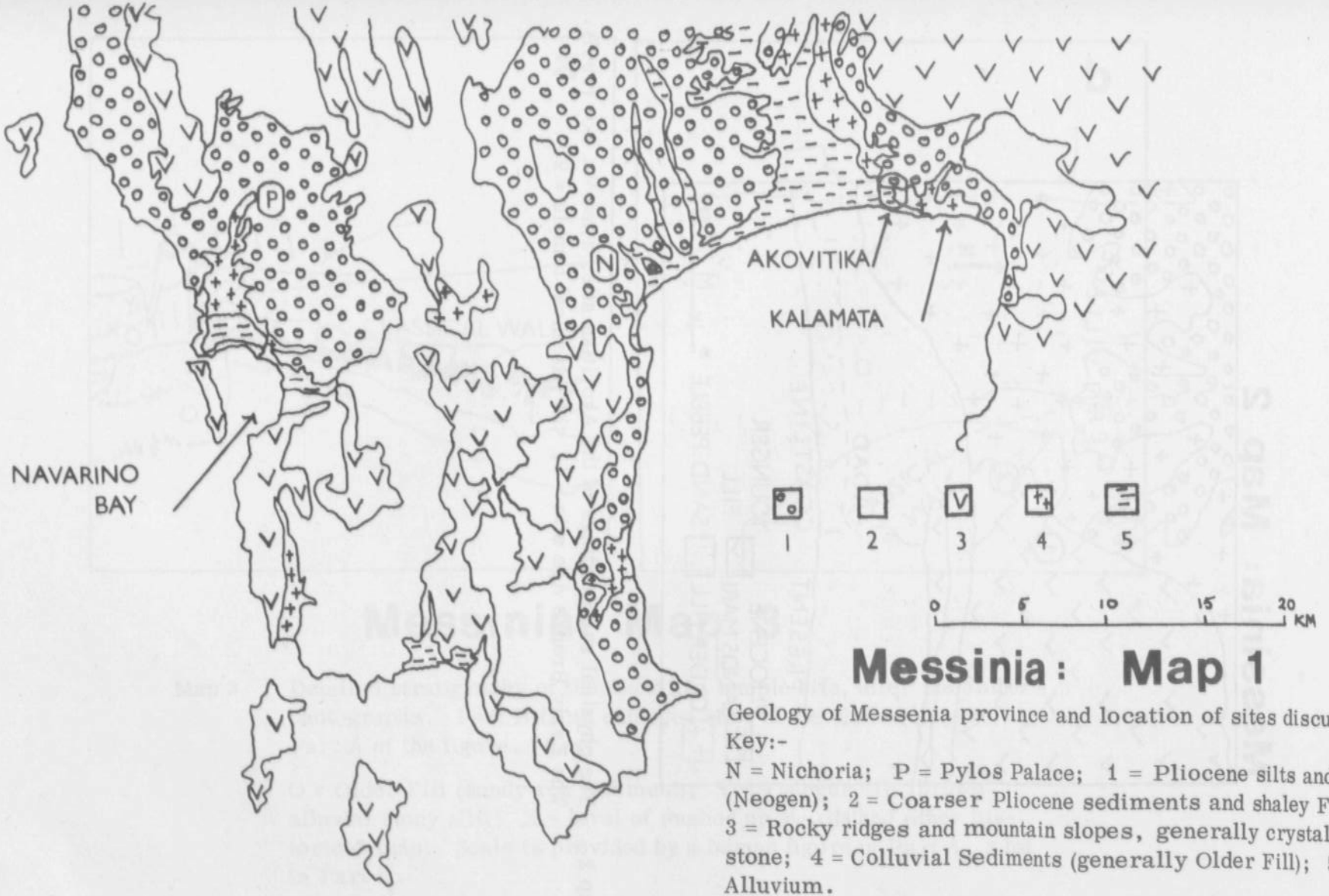
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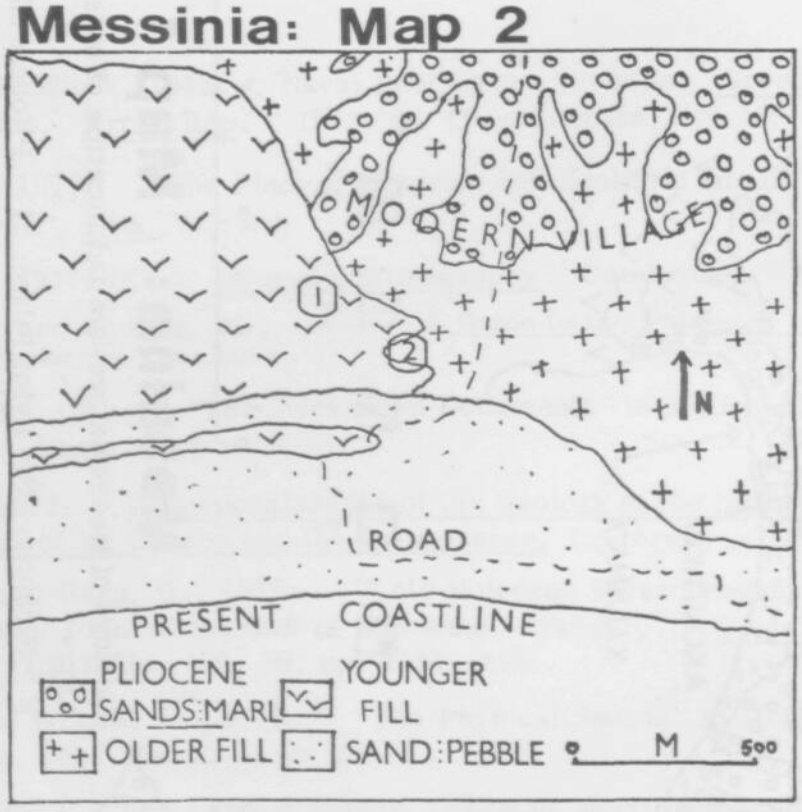
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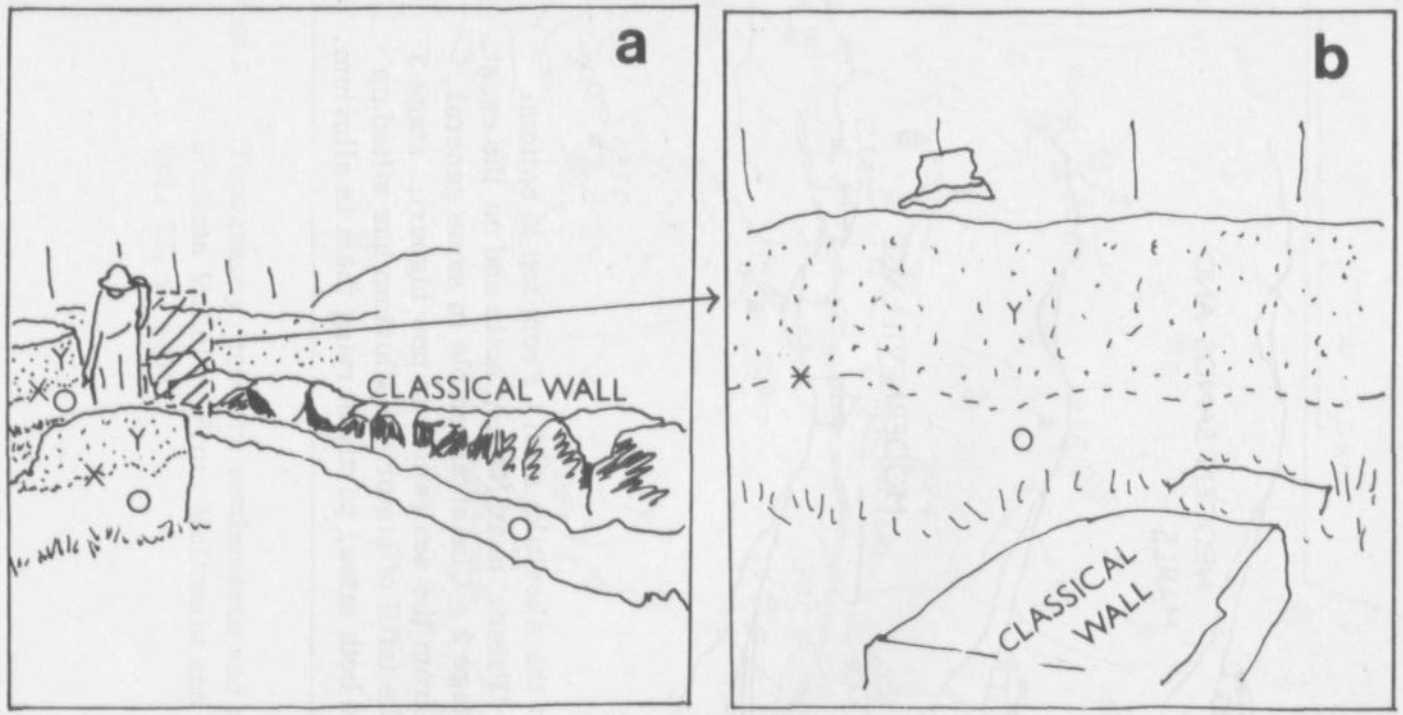


Messinia: Map 1

Geology of Messenia province and location of sites discussed.
Key:-
N = Nichoria; P = Pylos Palace; 1 = Pliocene silts and sands (Neogen); 2 = Coarser Pliocene sediments and shaley Flysch; 3 = Rocky ridges and mountain slopes, generally crystalline limestone; 4 = Colluvial Sediments (generally Older Fill); 5 = Recent Alluvium.



Map 2 The physical surroundings of the Akovitika site, after W. Loy (1967). The Early Bronze Age site = 1; the Classical temple = 2.

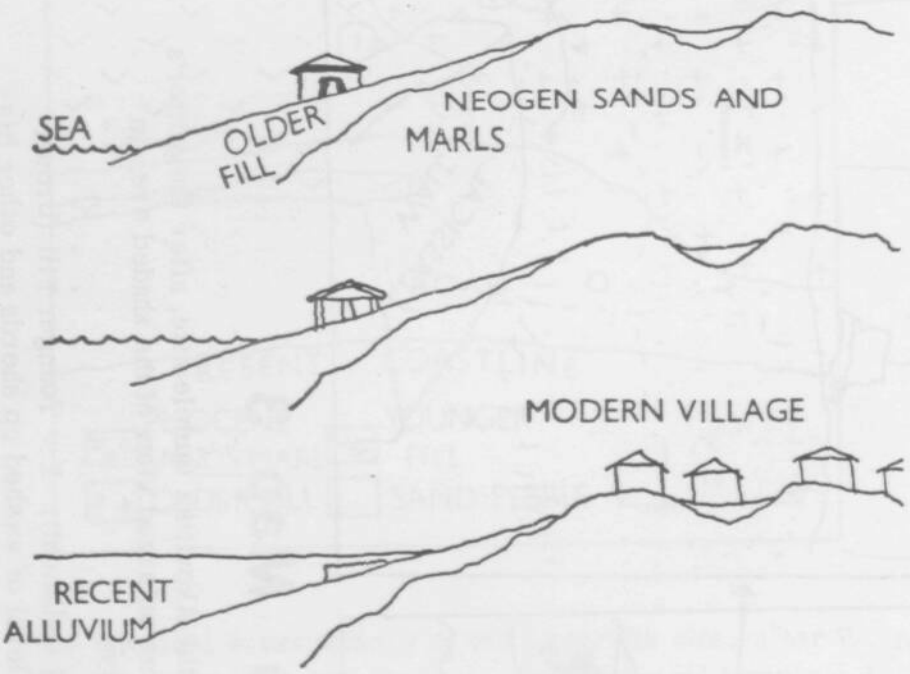


Messinia: Map 3

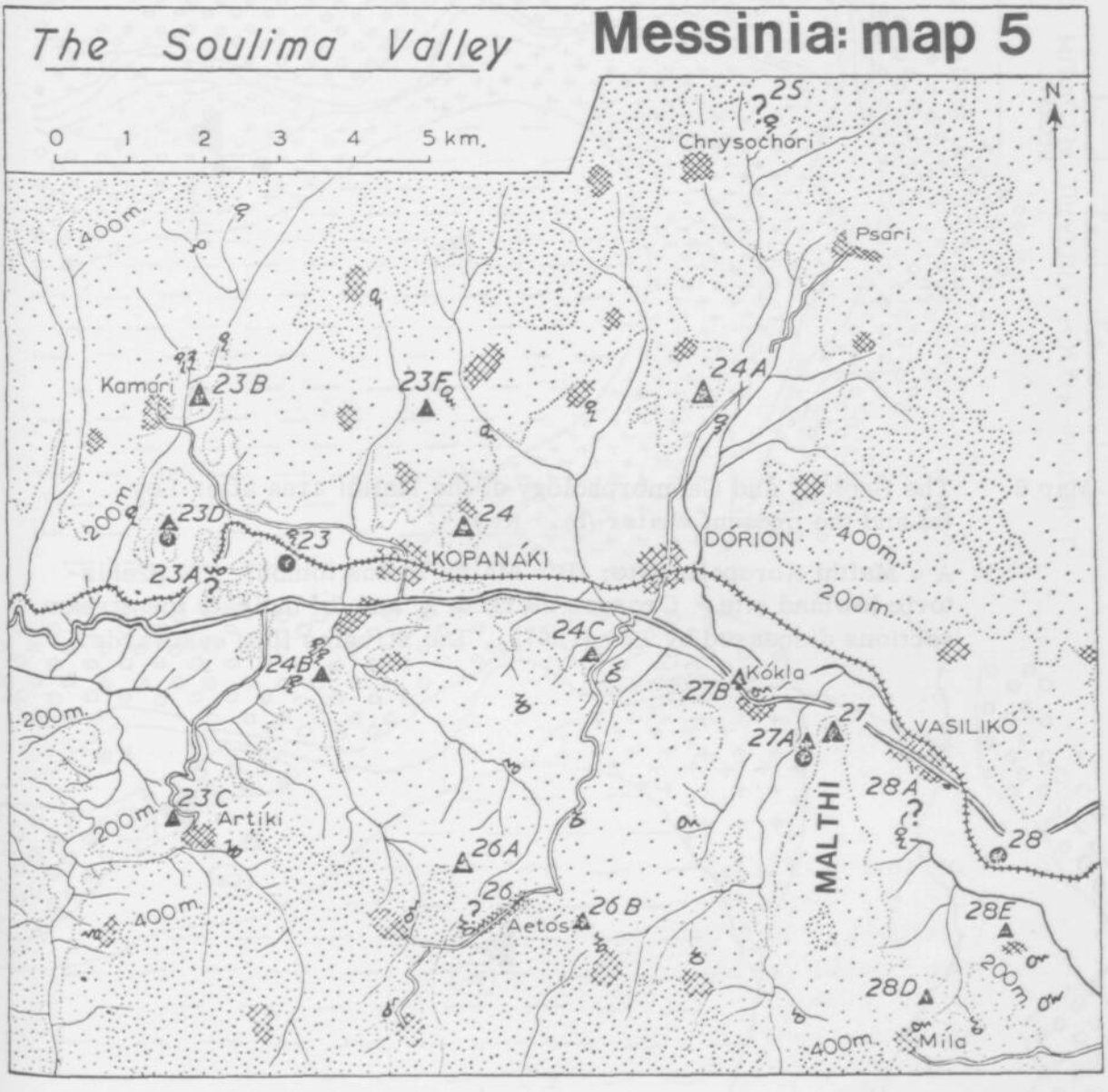
Map 3 Detailed stratigraphy of the Akovitika temple site, after the author's photographs. Part B is an enlarged view of the shaded area in Part A of the figure. Key:

O = Older Fill (sandy red sediment); Y = Younger Fill (brown alluvial stony silt); X = level of washed up sherds and other historic debris. Scale is provided by a human figure in Part A, a hat in Part B.

Messinia: Map 4



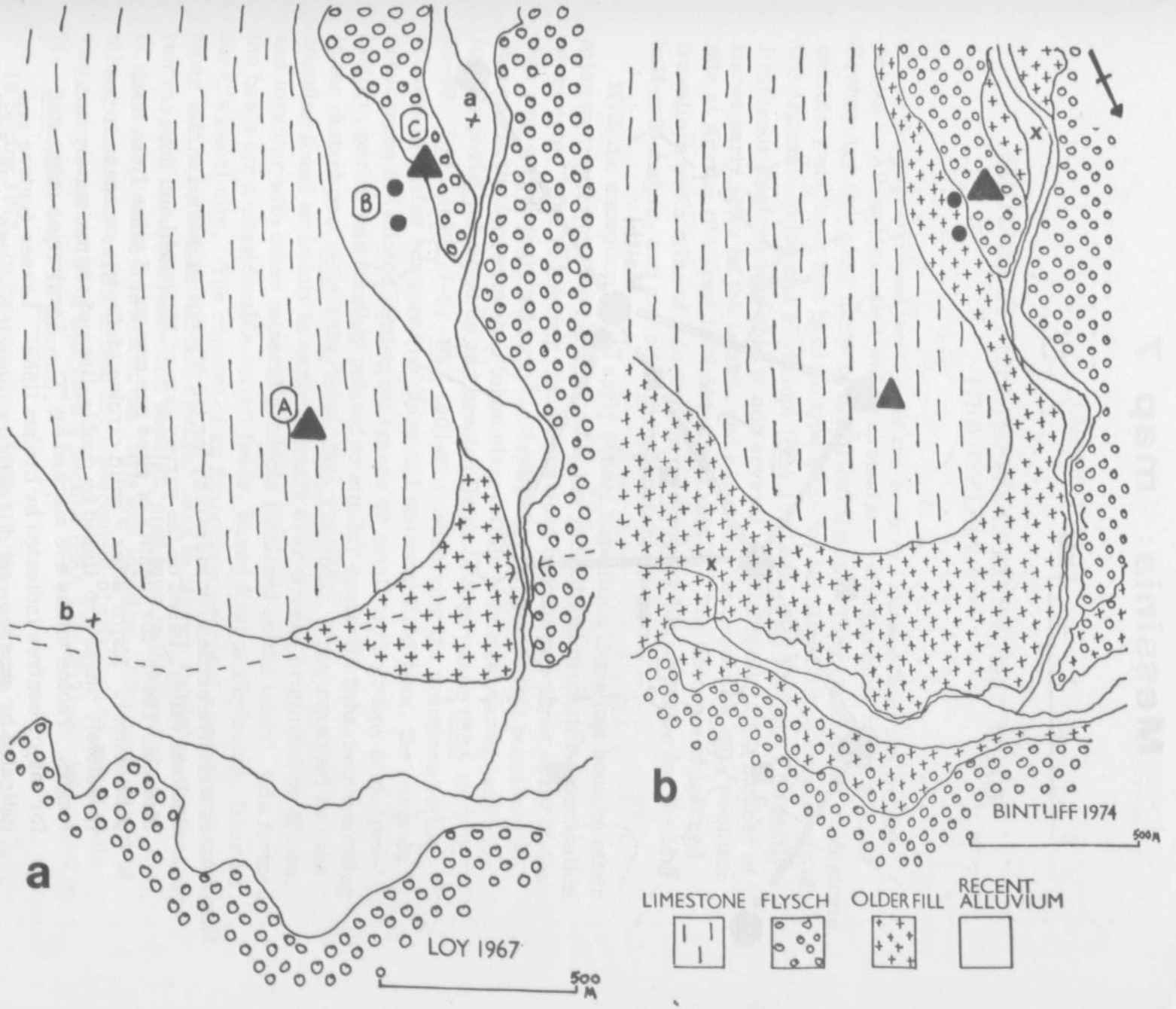
Map 4 Landscape Changes at the Akovitika site. From top to bottom: stage 1 - Bronze Age 'Palace' near Neogen soils and on the coast, probably by a bay; stage 2 - Classical temple in same general locality, still not far from the sea (which is now higher); stage 3 - modern situation, the infill of historical alluvium has silted up the bay and landlocked both sites, partly burying them in alluvium.

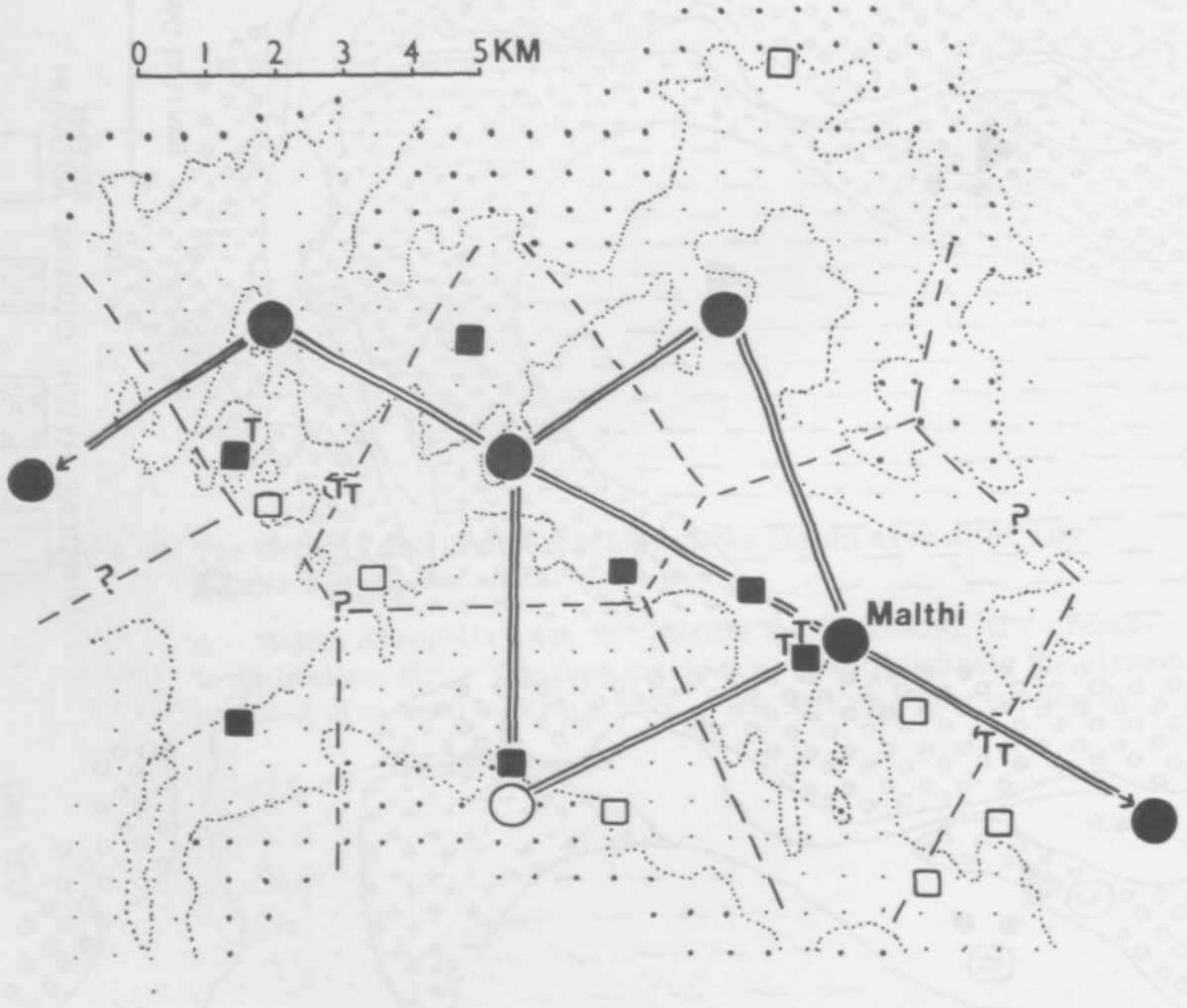


Map 5 Topography, modern settlements and prehistoric sites in the Soulima Valley. From McDonald and Hope-Simpson (AJA 1969, Vol. 73, p. 137).

Map 6 The Geology and Geomorphology of the Malthi area after Loy (a) and the present writer (b). Key:

A = Malthi Acropolis site; B = Malthi tholos tombs; C = prehistoric lowland site. Crosses marked 'a' and 'b' indicate the stream sections discussed by Loy (1967). The streams flow eastwards.


a
b
A
B
C
LOY 1967
500 M
b
BINTLIFF 1974
500 M
LIMESTONE
FLYSCH
OLDER FILL
RECENT ALLUVIUM



Map 7 A tentative settlement hierarchy for the Mycenaean period in the Soulima valley, based on the survey data of McDonald and Hope-Simpson (1969; for identity of sites see our map 5 taken from their publication). Major sites = solid circles (definite), or open circles (possible); these are linked by double-lines of approximately equal length. Tholos tombs are marked by 'T'. Territories suggested for major centres indicated by broken lines. Lesser centres are indicated by squares, solid if definite, open if possible. We have amalgamated two close sites into one, in one instance, and two major centres lie just off the mapped area.

CHAPTER VI

SETTLEMENT AND LAND USE IN PREHISTORIC MELOS (THE CYCLADES)

In the years around the turn of the century, a team from the British School at Athens travelled widely around the island, noting many sites of Bronze Age date, and more of historical times. They excavated a prehistoric cemetery and town that became type sites for the Bronze Age chronology of the Aegean: Pelos and Phylakopi (BSA 1896/99; JHS 1897-8). Recently Professor Renfrew was able to add several new findspots to the number of known early sites on the island, and especially an important Late Neolithic site at Agrilia (Renfrew 1972:511-2 and refs.). The accounts of learned travellers are a mine of information on everyday life on Melos for the last half-millennium, and are cited throughout this report.

With the exception of the early School Expedition there has been no other attempt to interpret the background to the ancient and prehistoric occupation of the isle. The BSA group came to various conclusions about early Melos that ring surprisingly modern.[1] Firstly they suggested that considerable changes in the landscape had taken place within historical times, whereby former ports had silted up and created fields in their place (BSA 1895/6, 65-69; BSA 1897/8:7-8; BSA 1904:85); observing the practices on the islands involving scattered holdings and seasonal field-huts, the common occurrence of isolated settlement traces or small tomb groups of the prehistoric period was feasibly related to similar economic behaviour operating in the distant past (BSA 1896/7:74; BSA 1904:85). They reasoned that the obsidian found so widely in early contexts over Greece originated on Melos, and together with other mineral products localised on the island, this formed the basis for a considerable export trade, based first at Phylakopi, later on the Classical city. The concept of an Emporium provided a ready explanation along with visible material and cultural links to Minoan and later, Mycenaean centres, for the appearance of a sophisticated town in the final phase of the Early Bronze Age and at the Phylakopi location. The combination of silting of harbour facilities and the replacement of obsidian by metal tools was seen as the cause of that town's decline (BSA 1896/7:71-2; BSA 1897/8: 71: BSA 1904:chap. 10 passim).[2]

In Spring 1973, in the company of Miss J. Harman, the author visited the isle, and to her are owed the references to all the previously known sites not

cited in the BSA survey and by Renfrew in 'The Emergence' (1972). During this stay three new findspots were located and we were shown a fourth of some importance. All prehistoric sites and important locations are marked on maps 1 to 4.

The purpose of my field study was to investigate the archaeological sites in terms of the natural environment of the island, to draw conclusions on the nature of settlement here in the past and to compare it to historical and present settlement patterns. If possible inferences could be drawn on the nature of the society behind the artefact clusters.

The physical characteristics of Melos had been carefully examined in the 1920's by Sonder (Sonder 1924). His geological map at 1:75,000 was the only published base for the main extent of each rock formation and for the very important tectonic features common over the island. Using this as a rough guide the writer proceeded to map from personal observation on the ground the distribution of the different rock types and soil groups. After a closer acquaintance with the unusual rocks of this volcanic isle, it became possible to check Sonder's brief study tour of the island and indeed give his picture more detail, especially as regards the immediate surroundings of sites. A soil study was accomplished from 'scratch'. In this task a notable debt is owed to a member of the IGSR (Dr. M. Phitikas), who provided contour maps that form the background to maps 2 to 4, at an original scale of 1:5,000. The soil and land use observation on them are completely the writer's responsibility. A later acquaintance with German geologists (Drs. Wetzenstein and Krumm) brought a closer knowledge concerning the tectonics of Melos and the process of soil development there.

Physical Geography

The isle is approximately rectangular, c. 20 km west-east, 10 km north-south, but into this shape in the centre intrudes a large bay - the Great Harbour, leaving but a 2 km isthmus to its south (see Figure 1). The bay is very large but has a narrow protective entrance c. $1\frac{1}{2}$ km wide, and still today can shelter a major fleet. The western half of the isle is called Chalakas, very mountainous and mostly wilderness; the eastern half is just 'Melos' and has been the centre of human occupation in all periods - a dissected low plateau with mountain isolates. A smaller island, Kimolos, lies to the NE of Melos and across a narrow strait.

The non-volcanic foundation of the isle is found in the south - schists and marble, overlain by a breccia and conglomerate cover of the same materials. In the same part of the island there follows crystalline limestone containing some marls. Then the island group became volcanic and by far the greatest part of the surface of the land is now made up of volcanic tuffs surrounding remnant lava peaks. The average thickness of this tuff is estimated as 200 m, and it contains marine deposits of some significance in certain areas - this

is because most of the tuff fell into the high ocean of Upper Pliocene times, when nearly all this igneous activity was concentrated. However eruptions continued on a lesser scale through the Pleistocene, indeed the lines of tectonic pressure that lie at the heart of this regional volcanism may still be affecting the development of the island landscape today, and fumaroles with sulphur fissures are active over many areas.

The geology of Melos was studied by Sauvage (1846), Ehrenburg (1889), Sonder (1924). More recently Wetzenstein (1969, 1972a and b) has dealt with specialist topics, and works exist by IGSR scientists e.g. Liatsikas (1955), and Karageorgiou (1972). Philippson (1897, and 1959 ed. Kirsten) summarises these accounts up to 1959. The available maps with geological detail are impossible to work with on a detailed level (Sonder, Wetzenstein). For these reasons it was necessary for the author to make an original large-scale plotting of relief by individual formation (see Figures 3 and 4).

The basic study is still Sonder's, and the only changes warranted in his analysis in the light of more recent research concern the extent of the rock groups he defined, and also in the interpretation of the sequence he revealed in the consecutive strata of the island. The redefinition of formation boundaries is mainly the writer's responsibility in the areas he particularly worked in, i.e. all of E. Melos and parts of Chalakas. A reinterpretation of the island's geological history can be gleaned from various general comments and conclusions in important reconsiderations of Aegean geology, chief of which is Aubouin, Brunn et al. (1963) (see Geology chapter).

The Cyclades belong to the 'Pelagonian Zone' that as far as high relief is concerned, was already a raised and active zone in comparison to surrounding areas in the Palaeozoic era, as a consequence of the Hercynian phase of mountain-building (orogeny). Although the succeeding Mesozoic era witnessed a general submergence of Greece under deep ocean, to give rise to much of the present-day limestone masses of the peninsula, the Pelagonian zone represented a sub-sea ridge with some peaks actually above water throughout this long period. In the final phase of the Mesozoic, the Cretaceous, the whole zone was newly raised up above the sea at the beginning of a new sequence of mountain-building events - the Alpine orogeny. In the complicated record of highly distorted and transported massifs for this time, geologists believe they can demonstrate a wave movement of emerging mountain ranges. This wave moves from east to west and is associated with the gravity sliding of enormous piles of hard rock and weathering debris in the same direction. After this prolonged period when Greece and the Aegean rose high above the ocean, a general subsidence ensued, but at an uneven pace. While the Alpine uplifts and the preceding pattern of underwater ridges and depressions follows a clear pattern of parallel zones running generally NW-SE through Greece, the succeeding tectonic events are only partly in this scheme and often associate areas with a quite different spatial pattern. Further it is to be noted that our island of Melos and its relative Thera belong to a peripheral area to the main

Pelagonian zone, and also share in the geological history of the zone nearest to the west - the Sub-Pelagonian Zone. During most of the final era, our own, the Cenozoic, Melos and the southern Cyclades formed part of a connected land mass linking up Crete, the S. Peloponnese, and the S. Aegean area (now open sea). At the same time the C. Cyclades sank into the ocean. Towards the end of the Cenozoic as we know it, from the Miocene on, there is a new phase of Aegean-wide subsidences, and Melos, Crete, the coastal Peloponnese and the former S. Aegean landmass sink down into an increasingly expanding Aegean sea. In parallel, the Central Aegean begins to rise to some extent from the waves. Neither part of the Cyclades ever again emerged on such a scale as in the Mesozoic, and only the highest areas remained to form the present island pattern. The Melos and Thera sector sees the emergence of the present island structures in the Pleistocene, but only gradually, and probably a sequence of alternate up-and-down movements is involved, so that whereas some of the Plio-Pleistocene eruptive rocks were apparently deposited sub-aerially over Melos, equally numerous traces can be found of Pleistocene marine deposits along the coastal hills at heights up to 60 m.[3] It is apparent from the literature that Cenozoic events are far less understood than the preceding eras, but this may well be a consequence of our shorter time-scale and a concentration on unimportant fluctuations in long-term trends. It has been suggested that the Melos-Thera sector, and the Aegean in general, is subsiding to the advantage of a widening belt of ocean, at the present time. (But see Geology chapter for the likelihood that in most of the Aegean, eustatic ocean rise far exceeds land subsidence for the Holocene.)

As regards the geological sequence of the island, the non-volcanic foundation is a remnant of the Palaeozoic crystalline massif, the breccia and conglomerate that overlies reflects Mesozoic subaerial and increasingly marine erosion and deposition. Associated closely with the subsidence of the island in the final Pliocene is the commencement of volcanic activity, so that tuffs and hard eruptive rocks interfinger with marine sediments (in fact nearly all the volcanism seems to have poured out as underwater eruptions.) After the main period of eruptions, final Pliocene to early Pleistocene, sporadic lava banks and the recent craters of Trachylas and Phyriplaka testify to continued if diminishing eruptions well into the period when man was probably occupying parts of Greece. On the coast and around several of the sunken basins of Melos, recent beds of carbonate shells are taken to be Pleistocene marine transgressional and lacustrine freshwater sediments respectively.

Soils, sites and crops (see Map Figure 3)

In absolute terms soil development is an extremely rare occurrence on Melos. The reasons for this are as follows:

1. The parent material, the rock exposures, are nearly always high in sand constituents and weather into particles of inactive volcanic glass. Weathering products are very loose and low in the active mineral components e.g. colloids.

2. This loose material is naturally easily removed by the dominant physical processes in weathering, and offers no support either physically or chemically - or water store - for plant growth that might reciprocally fix the soil constituents and allow soil maturity.

3. In any case, the generally sheer relief of the isle (as Philippson notes, 1959:202, the Cycladic islands have nearly all grown up as internally domed structures), coupled with the lack of vegetative cover, and in combination with scanty but seasonally tumultous rainfall, create highly unstable conditions for rock residues. Most of the stream systems have short young profiles, quickly precipitating eroded material into the ocean depths. Even the recent alluvial terraces, over most of Greece an oasis of fertility even amongst the barest hills, are being so rapidly removed that their normal cover of irrigated crops is commonly absent on Melos.

The relief problem is caused by the tectonic history of the island and the major proportion of mountain in its surface area, both lofty crags of hard eruptive flowrocks and mighty masses of soft sandy tuff that are drained by deep canyon-like torrents.

Exceptional, however, is the chemical nature of the basic Andesite/Dacite rock formation, and the structural advantages of the central basin complex.

The Andesite-Dacite Group: The only major rock formation on the island to contain significant fines for colloid production, and according to Professor Krumm (pers. comm.) probably a fine montmorillonite clay. The evidence that will be presented on the use of its soil in the Bronze Age is of interest due to its resultant 'heavy' tillage characteristics. Regrettably these eruptive rocks are very dense and extremely hard, slowly weathering (as can be seen by comparing the two sides of the Phylakopi stream - one A/D, the other tuff), and generally produce the many isolated sheer peaks of the isle and very little level land, very little in the way of weathering products. Structural factors save the situation - even the low overall precipitation suffices to remove most of the A/D erosion residues, but in closed or almost closed drainage areas or on structurally freakish upland terraces the small amounts available can accumulate and very stable clayey soil develop, (as in some fine samples collected by the writer from Kalogries). Notable areas of this soil have built up around Kastro and in various rarely visited parts of Chalakas, and it is only the structure of the isle that prevents the distribution of these rocks from largely determining the island's human settlement. Certainly A/D soils are very important for the past and present economy on islands of the same volcanic group - Aegina and Methana.[4]

Structure and the other rock groups

Actually none of the Melian rocks are devoid of minerals of value in plant nutrition, in fact most are rich in such constituents, as are volcanic soils over the world in general. But our rocks do not form developed soils - hence these elements are not available. The Rhyolite Group, or Liparite of Sonder (it is not clear in modern terms what exactly these rocks are), is especially loaded with potential plant food, despite that great proportion of quartz that makes it geologically and edaphologically acid - however the sand and glass nature of the weathering products from this group prevents this food becoming available and rock breakdown produces discrete glassy units pretty indestructible by physical weathering. The chemical weathering which could release the fertile elements within the glass matrix is lacking in the predominant areas of this group. We know that even on completely sandy soil plants can thrive given abundant water, which acts as the essential medium in all nutrient-carrying from soi' to plant - Melos is water starved.

Limestones, kaolin, bentonite and schists nowhere form individual extensive soil areas significant to settlement location, except for the schist band around the mountain of Profitis Elias in the west which gives rise to the Agia Marina spring and others - the only significant perennial and above ground water sources on the island.

The tuffs form by far the largest area of Melos, and have undergone various alteration effects since deposition. Upward movement of silica causes a gradual crystallisation into a very hard red rock of great barrenness, and this has seriously affected all the lower exposures of tuff - precisely where a good soil would be most desirable - by the torrent beds. By complex processes the finer parts of the tuff migrate, either into pockets of kaolin and bentonite, or out onto the surface where they are soon swept into the sea; in both cases we are left with an unstable coarse sand blanketing the landscape. The only mechanism whereby the essential water becomes available to this accumulation of rock residues, ruling out the unfeasible irrigation,[5] is by trapping of seasonal rainfall under protection from evaporation within undrained or poorly drained depressions, and here also we find the only place where fine and coarse tuff weathering deposits can gather undisturbed and in quantity. These depressions with a year round water store, and a good mixture of fine and coarse sediment, allow chemical processes to break down stubborn glass particles and free valuable minerals into the developing soils. Within the A/Dacite zones, semi-basin conditions with such features form remarkable isolated patches of fine clayey soil amid the brittle crags, and amongst the tuff zones there exists a notable series of faulted basins that stand out in productiveness from their barren plateau surroundings.

An important aid to Melian soils is the overlaying of the tuffs by marine deposits of a soft sediment nature, and of final Pliocene, early Pleistocene date. These sediments are actually at times lacustrine in origin (see above) especially the surface beds visible in the interior of the island e.g. around Kastro and the Pelos basins. Both types can be quite substantial as a contributory factor in the constitution of local soils; according to Sonder exposures may be 10-30 m thick (Sonder 1924:194). They are significant

around the south and west sides of the Bay, along the north coast to Phylakopi and Pollonia, and in the cluster of faulted basins in the NE part of the isle. They give excellent properties to local tuff soils, reminiscent of the rendsina soil group, (one especially associated with early farming in other areas the writer has studied - see Soil chapter) - these added properties are notably welcome in a land short of water, vegetation and active soil constituents, and include the capacity to retain moisture and humus for long periods, good colloidal powers, rich fines, plenty of useful calcium, high basicity. The association of early sites on Melos with these soft limestone exposures is paralleled on neighbouring Kimolos, where the key prehistoric and historic centre of Ellinika and a smaller prehistoric site (in the SW and NE parts of the isle respectively) lie on concentrations of these deposits. (For the Kimolos sites: Philippson 1959:185ff.; Renfrew 1972:512 and 524.)

As far as crops are concerned, vines and fodder plants are the only crops on the rhyolite, and vines are the major crop on the predominantly unstable tuff. The extreme toughness of this latter plant and the very unintensive pattern of its fields on Melos make it the only visible attempt to cultivate the vast bulk of the island, and its acid tolerance must help it survive. In ancient times Melos produced notable wine exports, though the present crop is 50% withered.[6] Olives are extremely rare in the centre and east and not much visible in the west though it appears from local informants that they were formerly much more extensive, and in the nineteenth century Ross reports that there were 100,000 wild olives to be tended in Chalakas (Ross, 1845:14; one must seriously question this 'report' and it cannot refer to C. and N. Chalakas). The olive needs plentiful calcium, shelter and some pretence at a firm soil - none of which factors are at all common over the island. Ross's comments seem to refer to the SW part of Chalakas, which was not visited for this study, and which the medieval monasteries showed a particular attention to. The non-volcanic rocks here are all lime-rich, and even if soil is thin it is probably fairly clayey, conditions suiting the olive. Some local traces of ancient but not prehistoric activity are known, and the monks always had a good eye for a labour-extensive export crop, hence the number of small and large monastic foundations in this part of the isle. Stands of olives in E. Melos are confined to the moist fertile basins, and within these the sheltered parts only e.g. the NW Chora basin, the Triovasalo basin, the Hotel basin by Adamas, upper Komia basin, Phylakopi basin, and also the stable plateau around ancient Melos (below Kastro). But on Melos the possible areas where cereals could thrive are few and far between, and the priority crop takes precedence here to the practical exclusion of the olive - especially since the grain is far better adapted to looser soils, a thinner soil, cutting winds and water shortage, and has a lower calcium requirement.[7]

Animal fodder is a widespread crop, sharing many of the adaptive features of cereals noted above, but adding to these a notable tolerance to acid and sandy conditions. This also reflects the herding emphasis on the isle, particularly the western part, a natural result of the great areas of mountain and uncultivable land. Caprovine exports from Melos are again famed in antiquity. (For ancient and recent caprovine importance see references in notes 6 and 7.) The island has a remarkable flourishing of lowly plants in spring, the only moist period for most of the groundsurface; in addition there

are extensive parts of the basin floors in tectonic depressions that are moist throughout the year and lying fallow; finally the Elias mountain always seems to attract a low cloud that encourages perennial growth of vegetation. Naturally sheep are rare in comparison to the less choosy, hardier and agile goats (young goats of Melos are famed in antiquity, Zschietzschmann 1931: 569). There are numerous movements of flocks around the island, from the higher to lower areas and from one area to another. For example flocks move in summer down into the lowland zones, grazing in winter around the great Elias peak and in the upland east of the Chora Plain.

Irrigated vegetables and fruit make such demands on soil and water that they are hardly seen at all on the island, though the arrival of the historical alluvium has somewhat improved matters, e.g. by Adamas.[8]

Well developed soils with a fine clayey texture, stable topography and available plant nutrients, were practically confined to: the Andesite-Dacite depressions around Plaka, and around Kalogries-Samari; the faulted basin group round Pelos and Ayiasmata, the faulted Chora basin and sunken Asprochorio and upper Komia districts (all tuff areas); the stable terraces above Palaeochori/Spathi, and the terrace-basin that forms the hinterland to Phylakopi, - tuff areas. All these locations are associated with early occupation (see Figures 1-4).

Alluvium and Tectonics

Despite the generally cliff coast and the highly steep inland character of the island, Melos is remarkable in comparison to the other Cyclades for its significant areas of low and level topography. Low is preferable to gentle, since the character of the low relief is in fact due to vertical faulting rather than to the progressive maturity of the drainage systems. In general it might be said that on Melos the major drainage features are tectonic in creation - and the rate of change of these tectonic forces exceeds the ability of local streams to create their own landscape.[9] The most recent major eruption on the island came from the Phyriplaka volcano, now dated by isotope methods to 300,000 B.P. This date was supplied by M. Phitikas of the IGSR, Athens. Doubt has been cast on its reliability, particularly in consideration of the extremely fresh appearance of the Phyriplaka crater. In fact a closer dating of 30,000 might seem more acceptable, especially in the light of the Thera eruption of shortly after this time! (Wetzenstein and Krumm, pers. comm.). Prof. G. Rapp, at the Ecology Conference, mentioned a last major Melian eruption of 30,000 bp or more (1972). There is no doubt that Melos is linked in to an 'Aegean arc' of earthquakes and volcanism, and frequently numerous centres in this arc (for map see e.g. Wetzenstein 1969) experience contemporary crustal disturbances. Although the Trachylas and Phyriplaka eruptions took place probably before human occupation of the Cyclades, it is likely that lesser activity - quakes and poisonous vapours, seriously affected the success of human communities on Melos as on Crete and Thera. Mainly contemporary to the major series of Upper Pliocene eruptions but possibly continuing into the early Pleistocene are to be set the related phenomena to igneous activity, earthquakes and substantial faultings in the surface formations. Thus were created the great Chora depression,

the Great Bay, the Pelos basin complex and many other small sinkages, the deep valleys around Plaka, the Limni depression, the Phylakopi valley system. These faultlines are believed to be still operative on the landscape, continuing to raise and depress adjacent zones on the island. In this process a fair consistency is observable in which areas have gone up or down. The main trend runs N-S and its effects can be seen in the three main levels of the Melian landscape: uplifted were hard eruptive masses, orientated N-S, e.g. Korakia, Dhemenagaki, Plaka, Trachylas, Phyriplaka, Phavas and Kalamavros. These are barren, sheer rock massifs, and except for grazing in the hot summer their only use is as at Plaka for defence. Downthrown were the large N-S running Chora depression, the Spathi and Phylakopi basins, and in the same line as these the Pelos basin complex. Along with smaller depressions usually tectonic in origin these areas form the only parts of the island where soil residues gather and develop - hence they mark the basis of local food production. Intermediate to these zones lies the great mass of the island, which is at present a series of sloping and heavily dissected tuff plateaux of only mediocre productiveness for man and animal.

The Great Bay fault and the Phylakopi bay sink reflect another system with a dominant SE trend, and one which is very important on the mainland as e.g. in the Plain of Argos, the Sparta Valley (see Geology chapter).[10]

The most obvious continuing effects of these faults are in coastal changes datable to the period of human occupation on the isle, and possible catastrophic sinkings in the Chora basin. But this brings us to the development of fluviatile sediments in the tectonic depressions and the torrent gorges within recent time.

The full explanation of landscape development on Melos in several key respects requires a series of tectonic and sediment core studies right across the island. Nevertheless certain points can be made with varying degrees of certainty and probability, others are worth stating for the sense they make of the archaeological material at our disposal.

In this study of the island it was possible to divide up the recent alluvial sediments into distinct phases closely comparable to those postulated by Vita-Finzi as the Older Pleistocene and Younger Holocene Depositions (see Geomorphology Chapter; Vita-Finzi 1969). The Older Fill was well characterised as a steep, massive alluvial/colluvial feature often preserved as a 'hanging terrace'. Within this was found, nested unconformably a smaller fresher, darker fill at present being incised - the historic fill. A detailed examination of the Ayiasmata basin, the upstream parts of the Phylakopi catchment, the two Pelos basins, the Langadha gorge and the NE Chora depression provided adequate data for defining these two depositions.

> The Older Fill was seen well expressed: in the N Chora basin in its E corner it was a massive fan with a nested historic fill fan inside it, and a little further south on the east side of the plain two small torrents had what could be hanging terrace remnants; in the Langadha gorge; in the A. Theodori gorge it again formed a high terrace with large fans at tributary mouths, and here also a nested historical fill was present as a fan and low river terrace; at the N end of the larger Pelos basin it was preserved as a hanging terrace, below which the historic fill

descended beside the incised streams and at a much gentler angle than the Older Fill into the basin centre; in the Ayiasmata basin again the two fills were found, but it seems likely that the basin was completely closed when the Older Fill was deposited, open during Younger Fill times. The 2nd Fill was well expressed: as noted with the Older Fill; by the Adamas plain streams; in the side basin to N of the main Chora coastal plain; at Klima valley; Emborio streams; Spathi main stream; Upper Komia and Tria Pigadia; Pollonia; Asprochorio. For the locations and suggested major exposures of Older and Younger Alluvium see maps.

Unfortunately evidence of Pleistocene human occupation on the Cyclades is hitherto lacking (though the geologists do not exclude the possibility of late Würm landbridges, and there are some suggestive finds recently from Kythnos (Honea, 1975, AJA Vol. 79, p. 277ff.)), still these Older 'Red Beds' would be the first place to look for contemporary artefacts.[11] The Second Deposition is visible for inspection down to several metres depth in the inland basins and the upper reaches of torrents, however by the coast the effect of relative sealevel rise and a possible land sinking (due to Aegean wide tectonics and local Melian faulting) have led to but a $\frac{1}{2}$ m or so of the fill incised in profile. Hence the artefacts which the writer found and carefully extracted from the recent fill cannot always be vouched for as contemporary with the commencement of that deposition. Still in several cases the Older Fill exposures were visible beneath the later deposition, and we are justified in assuming that deposition cannot have begun much earlier than the well-stratified objects obtained from the lowest exposures of the fill beds. A fair sample of potsherds were collected in this position from most of the 2nd Fill areas previously listed as very typical. Almost without exception they were of Late Roman and Early Byzantine date, and thus support the Vita-Finzi chronology and this author's dating of similar deposits in other areas of Greece. However there were also locations where a closer terminus post quem was available, providing support for a post-Classical date (see below).

In the coastal plain beside the prehistoric city of Phylakopi, the early excavators from the BSA pointed out the curious lack of a safe harbour, the absence of fortifications on the beach side of the city in contrast to those well attested for the other sides, and suggested that once the sea had come further inland and to the north of the city (BSA 1897/8:8). Only in the calmest weather will boats now enter the Phylakopi harbour. This was remarkably acute of the team given the very limited information at their disposal and the type of questions normally asked of a site at that time. The density of surface finds on the city hill is especially striking if we descend to the plain surface where no pottery at all is visible. A test pit beside the site into the plain alluvium shows Younger Fill for at least 2 m (open in 1973), and pottery and obsidian can be seen in its lower levels in the pit sides. The main stream that feeds the plain has a surprisingly large catchment, covering most of the NE of the island (calculated from the contour maps), and in travelling from one end to the other of the chief course the Younger Fill was observed by the writer to be substantial and well dated by pot inclusions. Figures for the depth of alluvium in the interior parts of the coastal plain were obtained from core details in the possession of the IGSR (pers. comm.

Dr. Karageorgiou), and they show a series of deep trenches crossing the plain, filled up to 14 m or so below the present plain surface with alluvial material before bedrock of tuff is reached. Since the plain is at the most only a few metres above present sea level, the possibility that much of this alluvium is post-Classical in date, even allowing for an intervening relative sea level rise of several metres, argues well for the existence in prehistoric times and probably early historic times of a shallow wind-protected inner harbour in the lower areas of the present plain, in contrast to the open beach now offering only seasonal anchorage for small boats.[12]

At Klima, a tiny coastal plain at the mouth of the ravine running past the Classical and Roman city of Melos, the BSA team again suggested that the sea had once filled the area of the plain and formed the ancient harbour. This time they dug down to seek proof.[13] The surface of the small plain is just above sea level now, and under $1\frac{1}{2}$-2 m of recent alluvium they excavated Late Roman and Early Byzantine buildings.[14] Below this marine deposits appeared, and pumping problems prevented further exploration. No Classical or Early Roman finds were made. It was shown that on either side of the sea entrance to this plain two ancient moles run out into the Great Bay, both only visible now underwater. They were seen as C or R harbour protections. But of great interest was the discovery of a large building between the harbour moles, and also now underwater. This was dated as late antique, probably early Byzantine. An additional point is the oft cited pattern of the city walls, which descend from the city on the plateau above, down into this ravine as if to enclose it (its full course is missing).[15] Now the visible alluvial fill is certainly 2nd Deposition, and the excavated data is sufficient to show how it had already turned sea into dry land at some date after the early Roman period. By the time of the construction of the large building now in the sea the fill seems to have completely blocked all the ancient harbour, and deposition continued for some time after the early Byzantine period. But by then the sea was reclaiming much it had lost, and presumably the upper layers of alluvium that once covered the harbour structure were eroded by transgressing ocean as the stones were submerged. In the cliffs beside the Klima Plain, ancient tombs are now partly submerged.

Some authors have indeed tried to explain the 2nd or Historic Deposition in terms of adjustment to sea level change, though the phase is just as well represented in the mountains as in coastal plains. A more compelling refutation is the evidence here on Melos for both phases, Older and Younger, in completely closed depressions unaffected by a marine base level e.g. the smaller Pelos basin, and in an upland basin like Ayiasmata whose only link to its lowland is by a lofty waterfall into the gorge below.

Where the Chora depression drains into the Great Bay there is a large saltpan at sea level. On its southern edge the low hills of rhyolite contain a fair amount of obsidian pieces and pottery fragments, Renfrew's site Stavros. But right by the marsh edge a large concentration of Mycenaean and Geometric sherds has been discovered by chance and was shown to the author by the IGSR geologist, Dr. Phitikas, in 1973. These could stem from a cemetery, including as they do a high proportion of very fine decorated pieces. Barely 100 m away and below this new site, right on the edge of the

saltpan a recent well boring brought to light, below $3\frac{1}{2}$ m of recent alluvium, Archaic and Classical finds, including a tomb (AD 1965:509). The present surface of the land at the well is just above sea level. If this is the depth of historic fill at the edges of this part of the Chora depression, then we might expect even greater amounts of fill in its centre, and the possibility arises that formerly the lower areas of the plain were an extension of the Great Bay, and that the new site was a cemetery for a coastal settlement using this inlet as a harbour. We will return to this site later (cf. Aliki in the site discussions). The suggestions (in BSA 1896/7:74 and BSA 1904:85) that a prehistoric village for the Pelos cemetery lay on the north slopes of the Chora depression but on the sea, are quite improbable if we consider that the northern Chora plain is now c. 30 m above sea level.

Near Lower Komia is the small bay of Tria Pigadia (NE coast). Here the BSA found substantial remains of a Late Roman settlement on the shore (BSA 1896/7:76). On the writer's inspection the well-preserved stone walls of the settlement were seen to be engulfed by c. $2\frac{1}{2}$ m of historic alluvial fill from the stream behind it, though the sea had eroded the fill into a steep little cliff the length of the inlet and parallel to the beach.[16]

At Emborio by the east shore of the Great Bay, numerous ancient finds have been recorded (e.g. Weil 1876:245-6), and Mycenaean pottery can be seen on the ground today. Here a fairly large and level coastal plain seems to be mostly historic alluvium with a reasonable depth of fill, and quite possibly in earlier times, before the recent deposition, an inlet of the bay provided here a good beaching point for access to Chalakas and the A. Marina springs above.[17]

It is generally accepted that the Aegean coasts have experienced a relative sea level rise of the order of 2-3 m since the Classical period, but it is also becoming clear that regional tectonics are involved as well as eustatic, world-wide sea level rise (cf. Geology Chapter). If we concentrate merely on the normal 2-3 m figure, then the associated alluvial evidence on Melos is in good agreement with data collected by Vita-Finzi and the present writer in many other areas of the Mediterranean. The Older Fill was followed by incision up till post-Classical times, and from the Roman to the Medieval period the historical fill was deposited into plains, estuaries and along all watercourses. This as we saw is well documented by stratified pottery and building remains, especially in the traces of harbour silting at Phylakopi, Klima, Tria Pigadia, Emborio and possibly Aliki. However during and subsequent to the recent deposition sea level was rising, and the sea reclaimed parts of the Klima harbour, Aliki. From the angle at which the second fill terrace descends into the sea at Tria Pigadia, and its present cliff form where the sea has eroded it, the original shore at height of deposition must have been some way out from the present beach. The beachrock evidence supports this, a common indication of recent shoreline retreat (Boekschoten 1963). Further evidence comes from the Great Bay, where it is clear that the Klima underwater building must have been founded on land raised above the sea during the historical deposition. On Sonder's map of the isle circled crosses in the Bay mark a number of underwater sites, some of which appear to be of historic date (see Figure 1). One he claims to have dredged up Medieval pottery from, and this site, at quite a depth under the bay and a good way out into it, poses problems

of the degree of recent coastal change. The writer has added on the map several known underwater sites, including finds from the bay near Aliki. That a few of these ruins are said to be up 7 m down, provided that they really are buried sites and of recent antiquity, seems in contradiction to the Klima situation - where the coastal change conforms merely to the Aegean average. (For the various underwater sites: Weil 1876:245-6; Sonder 1924:11; Zschietzschmann 1931-568; Wetzenstein 1972:145.) In addition at the (Melos) Ecology Conference (1972, unpub. papers) it was stated by a Mr. Martin, working with the island Mining Group, that in the vicinity of the Chora shore at 10 m depth a section was obtained of marine levels overlying probably riverine gravels. One would suspect if this report were confirmed that the terrestrial deposits might belong to Würm or early Holocene alluvium, from a time of much lower sea-level, unless the present author has seriously under-estimated the recent downfaulting within the Bay. The last possibility cannot be ruled out if we consider some of the supposed depths of historical underwater remains claimed in the references above. However we might take the Klima and Aliki sites as some control on the degree of sinkage involved, since both appear to be in situ.

Coastal submergence is general around the island, and we have seen the evidence of Tria Pigadia. At Phylakopi there was cleared a Mycenaean well shaft within the city (Atkinson and Hogarth in BSA 1904: chaps. 2 and 3). Domestic fill was located to a depth of 9 m, but from 6 m sea infiltration created pumping problems. Certainly in the Late Bronze Age the sea would had to have been rather lower to allow freshwater to fill the well.[18] It is still not very clear in what fashion the island today is being altered by tectonic forces. In the probably recently unstable Chora Plain, Older Fill terraces seem to exhibit deformation in varying slope angles, some sections possibly being faulted skywards from an original plainward slope.

Here it must be repeated that we lack a good study of recent tectonics on the island. As Dr. Phitikis pointed out (pers. comm.), in the long term history of Melos (geologically speaking), we have alternate large-scale land movements up and down, and because the Aegean as a whole shows a long-term downward trend, it does not mean that over the last few thousand years Melos has not experienced significant land uplifts as well. If we allow for the Aegean-wide eustatic effects best visible and measurable at Klima, we must also look for evidence of tectonic effects confined to Melos and due to its own active core. The sea front at Adamas, e.g. is visibly sinking downwards into the bay, and constant repairs are being made here to the sloping concrete wharf; traces of older versions can be seen below in the sea. (Though sediment compression below the sea-front may also be involved, especially considering the frequency and size of large craft mooring here.) At Klima and Spathi the coast falls sheer into the sea and in the cliff wall are visible remains of tombs of prehistoric to Roman date, now totally cut off from land or sea approach. The same holds for cliff tombs by Phylakopi. In all three cases German geologists have shown those parts of the coast to be particularly affected by local faulting, and that this faulting is most pronounced where the fault line reaches the sea. (A photo in Baou, 1964:21, shows Klima sea-cliff tombs cut off and partly submerged.)[19] The Great Bay was created by a massive downfaulting in the Aegean-wide SE trend,

and the suggested unparalleled sinkings of recent sites within the bay could be due more to the local continuing action of this fault than any process still dominant in the rest of Greece.

But the lateness of the Bay sinkings is surprising; however it is possible that we have some historical record of recent catastrophic tectonic activity in exactly this part of the isle. We have pointed out how remarkably uncharacteristic for the Melian landscape are the fertile moist depressions mainly to be found in the east of the isle. Of these the largest and most fruitful is that of Chora. The name comes from a small hamlet in the centre of the 'L' shaped plain - Palaeochora. In the Middle Ages there was a great town here, the largest by far on the island, and surrounded by fertile fields right up to the bay. Still when Tournefort visited it in 1700 its population numbered 5,000. But around 1735 there was a great disaster, and when later in the century other travellers describe the isle the population has been reduced to a few hundred impoverished and diseased citizens (for a full discussion see Appendix I to this chapter). Soon afterwards a new town comprising several closely adjacent hamlets (Plaka, Kastro, Triovasalo) was set up near the ancient city above Klima, and now all that remains of the great Chora town are three large churches and rubble piles. Disease dominates the 18th and 19th century reports of the disaster, but a record shortly after the actual catastrophe mentions an earthquake as the main cause, and curiously enough only Chora seems to have been struck; though some decades later other settlements on the isle were affected by the diseases that followed. It is also odd that so little is left of the town considering its reported population. Now even at its height travellers comment on the bad air and the coastal marshes that make the town unhealthy - but in their descriptions of the lower plain fine cultivated fields extend for a good half hour from the town to the Bay. On the writer's visit to the area in 1973 the marsh was found to extend up to the edge of the small hamlet that remains at the centre of the former town.

We would suggest that in the 18th century A.D. a violent reaction of the fault that earlier formed the Bay and the lower Chora plain, caused a sudden sinking of the plain between Chora and the sea, throwing down most of the buildings in the town and allowing the saltmarshes to encroach into the town outskirts. The combination of unburied victims and insanitary living conditions brought on plague, which gradually spread to other parts of the isle. Either at this time or in earlier unrecorded downthrusts along this fault parts of the Bay shores disappeared into the sea, taking earlier and/or contemporary habitations with them. Similar violent landscape changes may have affected other parts of the isle especially at the coasts, though the Klima evidence does suggest that some coastal areas remained relatively unaffected by purely local tectonics and reflect more general eustatic trends only.

It has been proposed that the surviving ruins of Phylakopi city really represent only a tiny fragment of the former settlement, which has largely vanished underwater. Some have gone so far as to reconstruct the city as extending to the Glaronisia islets a kilometre away e.g. Atkinson (BSA 1904: chap. 2), where the city is held once to have extended along a vanished promontory a mile out to sea. No underwater surveys have been conducted in this area, but various considerations should lead us to doubt these

suggestions. The most important is clear from the depth figures on Sonder's map - the intervening water to the Glaronisia is c. 30 m deep, and the loss of land to this depth in the last 3,000 years would constitute a major local upheaval far greater than that we have put forward for the Great Bay. And whereas the Bay may show traces of recent edge faulting, the surviving portion of Phylakopi city is quite remarkably well preserved and horizontal. A second point concerns the geology, for the Glaronisia are composed of Andesite-Dacite (not basalt as generally cited)[20] often in fine polygonal tubes. They appear once to have been connected to the mainland, but no geological parallel is found round Phylakopi, rather the same formation occurs on the mainland as a headland to the south-east of the islands and opposite them. It is clear that the same SE faulting that created the Great Bay also formed the North Westerly pointing bay of Phylakopi, and in the same trend runs the A/D line from the Glaronisia. There is little possibility that the Glaronisia were joined to the city region from the first Pliocene downfaulting that opened up the Phylakopi bay.

The sudden change in reports of Chora from a populous and well-built town to a small cluster of ruins fits better with earthquake levelling than gradual abandonment, and one could certainly bear in mind the renewed activity of Thera in 1707, and earthquake shocks in 1779/80 that interestingly affected both Melos and Crete (houses were destroyed in the latter island) (Sonnini 1801:251). There is good reason to suggest one or more parallel disasters to the prehistoric city of Phylakopi. The excavators noted several discontinuities that could be interpreted as due to destruction of the town by natural forces, especially earth movements, (BSA 1904: chap. 10). In particular two destructions, one at the end of the 2nd City, another early in the period of the 3rd City, would seem to have drastically altered the success of the community. They were discussed by Robin Barber in a lecture in 1972 (unpub. see now Barber 1974). He suggests that the late Middle Cycladic or 2nd City destruction at Phylakopi allowed a rival town - Akroteri on Thera, to assume a role of dominance in the Cyclades hitherto monopolised by Phylakopi. When Thera exploded, Phylakopi was also heavily damaged, probably a short time afterwards - as was Crete, Kea and Kastri. The Mycenaean dominance on Crete is paralleled by a 'takeover' at Phylakopi, both areas weakened by the after-effects of the caldera collapse and associated phenomena.

The overall effect of the alluvial depositions for settlement should next be considered. Firstly we have seen the obvious changes in harbour facilities, which may have led to a neglect of Phylakopi in preference to Pollonia, and a growing interest in Adamas instead of Klima. Possible ports by Aliki fell into disuse and Emborio lost much of its postulated harbour attractions. The date of the recent alluvium would be chiefly from Late Roman times well into early modern times, though shallow fill of a deltaic nature we expect to have been accumulating throughout the prehistoric period (see Geomorphology Chapter). Thus we cannot use the historic fill as a major factor in the movement of Melos city from Phylakopi to its later site, the Greco-Roman one at Kastro, though the BSA team thought silting was the key to the abandonment of Phylakopi (BSA 1897/8:11). One certainly cannot rule out, however, the growing delta fill as a possible hindrance to harbour sites in some

topographic and geomorphic circumstances. A radical shift of settlement location was in any case common for the PG and Geometric periods, irrespective of sediment history, all over the Aegean. Alluviation later created an expansion of the cultivable lowlands, and the fine lowlying soils thus built up at the coasts were a highly valuable addition to the smaller lowland zones hitherto available. Granted that some of this was subsequently lost to the sea e.g. by Aliki and around the Great Bay, yet much of it was deep enough to resist more recent coastal changes, and the Phylakopi plain, the Emborio plain - these are very fertile patches today. Just as important to note is the fine extent of 2nd Fill terraces beside practically every stream of the island. In much of Melos these form the main areas of agriculture, though as noted earlier, erosion is diminishing these exposures far swifter than over the rest of Greece.

But most significant of all is the position of the basin and depression complex. For whereas in nearly all of Greece the Holocene epoch up to the Roman period saw a progressive deterioration of alluvial areas, since the Older Fill was undergoing deep incision and progressive leaching, in internally or poorly drained depressions the continual moisture and chemical activity kept the sunken zones of Melos full of fertile soils. Continual fresh supplies of alluvium were provided to these depressions under the 'deltaic' riverine regime (see Geomorphology Chapter). It is likely that the moist and fruitful areas got smaller throughout this period within each basin, as it is clear from the hanging Older Fill terraces in the latter that the original basin floor was far higher and more extensive before incision began. When the Younger Fill arrived the basin floor rose again and widened, and now incision is once more drying out the edges of the fill. Still, in the pre-Roman period the isolation of these productive tracts was far more obvious amongst the poor half-soils all around, while the Older Fill along the valleys was succumbing to the normal pattern of impoverishment. Small wonder then that a list of inland prehistoric sites is practically a list of these sunken features. Similar internally drained depressions are to be found elsewhere in Greece, though generally they are caused by collapse amongst limestone karst zones. Here the rock constituents are nowhere near as advantageous to the resultant trapped soils, though considerable prehistoric interest in the Lake Copais depression shows that they were still appreciated.

The distinction between Older and Younger Fill on Melos is not very great. The reason for this lies in the source of sediment which went into these relict alluvial and colluvial formations. Normally different processes of weathering and transport prevailing in the two periods of deposition resulted in quite different sediment composition for the two Fills, but the raw material on Melos was in most cases the great banks of tuff, which is made up of particles that have already been well-sorted by the dispersal methods of igneous action. Analyses made for this writer by Dr. Vita-Finzi of samples from Older Fill terraces showed a significant similarity both to each other and to the norm for the Younger Fill, though details of appearance and weathering suggested their grouping in the Pleistocene category, as did topography. Thus many of the advantages peculiar to the Younger Fill and generally absent from the Older Fill in the rest of Greece, such as lightness of texture and well-sorted composition, would have been present in the Melian Older Fill along the

valleys and in the depressions over the island. On the negative side, much of the finer particle grade, normal for both fills is lacking. "All 3 (samples) are more sorted than most Red Beds I know ... I suspect they reflect a parent deposit inherently poor in clay .... Unlike most Red Beds these were reasonably well drained and easy to work" (pers. comm. 20.12.73).

We shall end this discussion by opposing the many who see the Melian environment as rapidly deteriorating throughout the period of human occupance and mainly due to Man's activities. Most of the island soils are barren from structural causes, while the sediment systems seem also to have led a fairly independent life. The best areas of land were so before Man's arrival and in most respects have continued to be so till the present, when admittedly large-scale opencast mining is ruining the agriculture. These good zones - the Pelos Basins, the Chora depression and so on have in fact been enhanced by the revivifying Younger Fill, and new areas of good land along the rivers and by the coasts have been added by the historic deposition.

The attitude criticised here seemed characteristic of opinion at the Melos Ecology Conference (1972). The present dangers for the island from human misuse are palpable but it is anachronistic to transfer present conditions of human ecology on Melos uncritically into the past history of the isle. The papers and comments of Profs. Renfrew, Rapp and Karageorgiou take as assumed a serious degeneration in the landscape as a consequence of Man, and speculate on causes - wars, shipbuilding, overgrazing, etc. Necessary to this scheme is an idealised and essentially static view of a virgin Melos before human colonisation, to which the island would revert if left to its own recovery. This 'Garden of Eden' Melos would apparently be clothed in forest, and have widespread well-developed soils.

A close examination of the place of Melos within the general constraints of its sector of the Aegean reveals a predictable scarcity of rainfall and intensity of evaporation, that combine with the naturally arid and infertile Melian soil to produce exactly the scrub-covered, rocky or sandy wastes that today characterise the island landscape. Hence the lively discussion at the Ecology Conference on how Melos came to lose its 'good soils' makes curious reading. At one point Prof. Rapp commented significantly that natural erosion is not very significant on Melos, and far less than elsewhere in Greece.

The far better watered and soiled Naxos supported woods in places (though naturally open, with smaller and hardier varieties than further west in Greece), till quite recent times, when the acts of deforestation are recorded (Dugit 1874:82-4, 303). Melos, however, greets every visitor with a treeless open wasteland, except perhaps in the rarely visited non-volcanic south-west of the isle. To judge from a map appended to Buondelmonti (1420) [but apparently later in date] such an appearance suits the isle from the earliest travellers, and exactly such a picture can be gleaned from the remarks of every visitor as he rides around the landscape: Fiedler (1841: 406, 417, 444); Olivier (1794:201, 204, 220); Leycester (1852:223); Ross (1845:5). The exceptions are exactly those parts of the island where we demonstrated particularly favourable conditions for moisture and fines retension.

Philippson (1959:204) notes that the Cyclades are so little forested in comparison to other areas of Greece, that H. P. Kontos (1930) gives no figure for them in his statistics of forestry in Greece. Such statistics in fact correlate very neatly with a cline of increasing precipitation from E-W and S-N over the Aegean, and with a similar trend in decreased summer heat (Anastassiades, 1949). For basically the same reasons Philippson also records (207) that the Cyclades have the lowest percentage of cultivated land (9, 7% cf. 12, 3 for Crete, 17, 2 for the Ionian isles). Sonder sums up the situation succinctly (1924:184): "Wenn die Insel stellenweise einen recht trockenen, oeden Eindruck macht, so mag das nicht so sehr an mangelnder Bodenkultur, oder geringer Fruchtbarkeit liegen, sonder mehr an der alljaehrlichen grossen sommerlichen Trockenheit". Leycester notes (1852: 223) that the temperature of the island is hotter even than the greater part of the other islands of the Cyclades.[21]

We have already seen outlined the basic factors inhibiting soil development on the island, and the considerable gain in good land unavailable to the ancient population due to the Historical Alluvium. As far as concerns those limited zones where we have confirmed the existence of developed soils and plant nourishment available in good quantity throughout the year, such as the Basin group and the Andesite/Dacite clays - without human cultivation these areas indeed would support substantial vegetation, but there is no evidence to suggest that human use has in any way diminished the fertility of these localities.

THE PREHISTORIC SITES OF THE ISLAND
(see maps 1 to 4)

Phylakopi, Agrilia, Stou Kaprou, Kapari

These sites are so close to each other that any discussion of their location is applicable to all. The earliest human traces on Melos come from the shield-like hill of Agrilia just above the Phylakopi plain, in the form of a Late Neolithic site of the Saliagos culture. Recently an obsidian point of that culture was also found on the site of the later city (pers. comm. from Mr. S. Diamant), and for reasons which we shall bring forward later we might look forward to more of this phase in the present re-excavations at Phylakopi (Preliminary Report, A.Reps. 1975, p. 23ff.). Early and Middle Bronze Age finds at Phylakopi show the sequence from a small hamlet to a substantial fortified town, that in the Late Bronze Age is 'taken over' by the mainland Mycenaeans (see p. 535 above). All around the city in the soft tuff were dug the graves of its inhabitants during all its phases - which disposes of the other two sites named. Arguments have already been presented that the presently attractive Phylakopi plain was little enticement to agriculture till Roman times, due to the existence in its lower areas of a shallow bay, whilst the higher parts share none of our good 'basin' soil conditions and were then as poor as the tuff slopes that today surround the alluvial plain. But we cannot follow Jane Renfrew, who has suggested that a lack of arable land prevented any extensive early settlement on the Cyclades (paper read at the Melos Ecology Conference, 1972, unpub.). Not only is the Pelos Basin complex just over half an hour only from Phylakopi, but between that and the city is to be found a large basin that has many of the features of the Pelos Basins, though it is drained through

the narrow gorge of the main Phylakopi stream. Here the soft tuff forms a large bowl with much gentle rolling land where soil has been able to form and mature to a notable extent, though not approaching the true basins in fertility and moistness. The whole area has the added advantage of numerous banks of marine beds, that obviously give much to soil quality here. The marine deposits begin only 5 minutes walk south of the site and above it on a low plateau. It seems highly probable that a characteristic complex of locational factors was selected for by the Saliagos people: a bay with certain properties discussed below, and the presence of light and fertile soils partly or totally derived from Plio-Pleistocene marls (cf. Saliagos, Anavoloussa, Mavrispilia - sites further discussed in the Mykonos Chapter). Agrilia, for example, possessed an extensive adjacent area of good land but its immediate surroundings had little to offer to the farmer. In fact the primary reason for the occupation of all these Saliagos sites is likely to be fishing. At this point a brief excursion into Melian fishing is called for.

Melos is renowned in the Aegean for its excellent all year round catches, and ancient, Medieval and recent records show this to have been so into antiquity (Buondelmonti, 1420; Tournefort, 1743:132; Fiedler, 1841:383; Zschietzschmann, 1931:585; Sonnini, 1801:238). With other key zones such as Antiparos/Paros, and Evvoia, it is the goal of many fishing expeditions from a wide area of the Aegean. In the SW Argolid study this author has put forward the hypothesis that the cultural and material links between the islands and the SE Mainland from the Mesolithic through to the EBA could be connected to movements of migratory fishermen towards certain key fishing areas for seasonally abundant catches. It was there suggested that the spread of Melian obsidian was evidence more for fishing territories than for interregional trade (see that chapter). Fishermen were interviewed at that time at Koilada by Frangthi, where much of this early evidence has been found, and since then surveys have been conducted by the author of fishing territories amongst fishermen on Aegina, at Myloi, Asine (Tolo), and of course Melos (see Economics chapter). The result was the establishment of a network of seasonal fishing movements whose influence may be detectable in cultural ties between certain recurrent zones throughout history and prehistory.

Fishermen from the Argolid regularly move for their catches from one end to the other of a territory from Leonidhi (S.E. Laconia) to Evvoia, less often to the Cyclades and sometimes to Crete; many of the larger boats spend up to half the year in far fishing grounds. Catches in winter around the mainland coasts are poor compared to the islands, but in summer some island fishermen come to mainland shores for seasonal fish runs. On Melos we get visiting fishing crews for months at a time, drawn from Aegina, Salamis, Piraeus, Spezzai, Evvoia and other Cycladic islands such as Paros and Naxos. These fishermen will be mainly based at Adamas or Pollonia depending on the time of year, or in the small bays around the island that are particularly frequented by the fish. These latter are of especial interest to us, as during two seasons of the year, spring and late autumn, there are major fish runs into the shores, the former for spawning, the latter for reasons still unknown to scientists. In these periods of several weeks' duration, truly massive hauls are made especially of tunny and sardines. On request a list was given to the author by local fishermen of these key fish run locations (see Figure 1):

Phylakopi Bay especially noted	-	(Neolithic, EBA, MBA, LBA finds)
Provata Bay	-	(probably EBA, Archaic and Roman)
Palaeochori and Spathi Bay	-	(EBA, Late Roman)
Samari Bay	-	(EBA, LR)
Viathi Bay	-	(close to Asprochorio with EBA, MBA finds).
Prasonisi Isles	-	(Dr. Phitikas reports an obsidian industry from here)
Great Bay	-	(Ancient Melos, Emborio, Aliki, Adamas finds cover all Bronze Age and possibly Neolithic periods, continuity to historic age especially at Klima - still a fishing hamlet).

In summer good catches are to be had all around the coasts and in the various bays of Melos, but in winter catches are more confined, and most of the fishing is done in the Great Bay and the straits between Pollonia and Kimolos, and also in the cited list of inlets during the fish runs. Hence our two towns - Ancient Melos and Phylakopi - are ideally placed for the best of the perennial fishing (Phylakopi Bay having its own good catches and Pollonia being around the next headland). In this context we might point to the evidence of the Phylakopi excavation with the famous fish frescoes, fishermen vase, another fresco possibly including nets, a terracotta boat (like a small caique) and the bronze fishhook finds; in the Greco-Roman city we have the marine life mosaic as a parallel (BSA 1904: chap. 10; BSA 1895/6:72ff.).

It is remarkable that of the vast number of small inlets all around the coasts of Melos, just those with prehistoric finds coincide with the fish run locations. Even more striking is the fact that, with the exception of the Prasonisi islets, the only fishing area cited in Chalakas is Samari Bay - which is also one of the few prehistoric sites we know of in W. Melos, with its cemetery perhaps at Kalogries nearby.

But we have even better confirmation at Phylakopi. The Saliagos culture, which is well represented in a large obsidian industry on the Agrilia hill and the stray find at the city, is known from its type-site by Antiparos as predominantly a fishing culture, especially interested in the tunny catch (Evans and Renfrew, 1968). One of the type fossils of the culture is a tanged point, interpreted as a fishing harpoon and of which many fine specimens can be seen on the Agrilia hill. But the Saliagos people also grew grain and kept animals. Phylakopi has all the facilities for a balanced economy - at its core the fishing, and the preference shown for this bay would be greater if our postulated inner harbour was available, then the fertile marine-enriched basin behind the site, further up the Pelos Basin complex. Sheep and goat often have to move pasture in Melos according to season, but grazing is good enough around Phylakopi for them to remain in this area all year, (according to local shepherds).

Agrilia does not suggest a large or necessarily permanent community, and it is not impossible that the same group who fished at Saliagos and

Mykonos spent part of the year on Melos, collecting obsidian at the same time.[22] Recent analyses have shown that most of the obsidian used in prehistory in the Aegean came from Melos and often from the Adamas source by the Great Bay (Renfrew et al. 1965; Aspinall, et al. 1972). In winter, when the fishermen may have come particularly, fishing is confined to the Bay and to the fish run inlets, and the mining or collection of obsidian would have been a natural step to visiting fishermen with a large requirement for sharp tools. Since both sources of obsidian (Adamas, and another source at Dhemenegaki in N.E. Melos) are comparatively remote from Phylakopi, we need not consider the oft-cited explanation for the Phylakopi location as an obsidian 'Emporium' (BSA 1897/8:11). It is probably because of the location of the Adamas source right by the shore of the abundantly fishy and sheltered Bay, and enabling easy accessibility and transport, that this source was on analysed samples slightly preferred, but a town founded on this 'industry' would have been more appropriately located on the site of the Classical city.

The occupation at Phylakopi city is still small-scale in the first phase of the EBA. In the excavator's reports it is clearly described as a number of scattered house units. The second EBA phase is not clearly represented on the site but the third phase sees the sudden construction of the First City. Till the latter event we might suggest that the site was only a seasonal fishing station, while at other times of the year there might exist seasonal farming bases up by Pelos (where an EBA cemetery was dug - and the city site lacks burials until EBA3 and the First City) and the other isolated fertile patches of the NE part of the island.

Renfrew (1972:186) believes that the EBA3 phase of the site, the First city, is as significant almost as the MBA extent of the community, and has the same built-up agglomeration of housing. This apparently runs contrary to the excavation reports, though Prof. Renfrew may have additional data from his study of Mackenzie's notebooks. The poverty of occupational traces led Mackenzie to postulate perishable huts for the (EBAI) Grotta-Pelos Phase of occupation; Keros-Syros (EBA2) is even scantier; we have only scattered houses for Phylakopi First City; (see BSA 1904: chaps. 2 and 10; Doumas 1972; Barber 1974). The argument is not insignificant, for the earlier Prof. Renfrew can place a Cycladic town and associated higher culture, the more likely is his hypothesis of local foci of civilisation. A commencement of true town life on Melos in the MBA with the Second City, which the present writer would favour, falls well into line with a whole complex of features found in that city that suggest strong Minoan influence, and could indicate the diffusion of town organisation from a long-established 'urban' agglomeration such as Knossos. However it is well to note that a town at Phylakopi even in EBA3 would still be antedated by comparable complexes in the eastern Aegean isles, which are closely linked to proto-urbanisation on the mainland of Asia Minor (for further discussion see Appendix 2 to this chapter).

That Agrilia is possibly a specialised fishing base is further suggested by the absence of pottery and the concentration of tool type on the production of typical points of Saliagos form; the same is found at the Vouni site on Antiparos (Evans and Renfrew, 1968). The undeniable nautical emphasis of Saliagos and Early Cycladic sites reminds us that in an age before roads and

sprung vehicles, travel by sea was far swifter and cheaper on energy than land, and a culture with a notable concentration on fishing would have thought nothing of exploiting not only all the bays and beaches of the island, but those of neighbouring isles for many miles around. It is a fact that the wide range of modern fishing boats is no greater than in the days before the petrol engine, and we have the significant evidence of the Cycladic boat pictures and the Thera fresco to illustrate the scale of vessel Bronze Age shipwrights were turning out (Casson, 1971; Vermeule, 1964; Marinatos, 1973; and see Economics of Settlement chapter).

Case has pointed out how difficult colonisation can be in practical terms (Antiquity 1969), in a consideration of the channel crossing of the earliest Neolithic colonisers of S. England. We have an identical problem with the Cyclades and the appearance of the first Neolithic people. How does one move home in one season and yet maintain a secure economic base? This is one important reason why the Saliagos folk are to the writer's mind chiefly fishermen. The professional fisherman follows his prey, and if one ground fails he knows a score of others that will give a good harvest. And this harvest requires no preparation; it is short work to serve up fresh fish. Let us imagine then, that as fishermen got to know the different beaches and islets of the Cyclades, they gradually recognised the most reliable of the localities and returned frequently to these places. If they came in winter, as our tunny boats come from the Mainland through the islands, they might plant a crop and stay around the area until it ripened. Another well-attested practice of fisherfolk is to take the flocks on board and let them roam around on their own on some unoccupied island, free from predators and unable to escape. Even today most of the islands of the Aegean that have no permanent occupation are visited by seasonal shepherds and fishermen. It is this kind of extensive and low-risk settlement expansion that would seem to be most probable in the Aegean, and best fits the nature of the archaeological evidence. The growth of a strong fishing fleet could be behind growing contacts with Crete and the Mainland, and already in the EBA, Cycladic cultures are very close to those known in the sites of Evvoia, the Argolid and Attica. Space does not permit enumeration of relevant cultural links between the S. Cyclades, the Saronic Gulf, and the South-East Mainland, during the Late Neolithic and Early to Middle Bronze Ages, but there are too many to explain in any terms but very frequent movements of people, objects and ideas over this zone in particular (cf. Renfrew 1972, Jacobsen 1969, Caskey 1964 and 1966).

The coincidence of Late Roman finds on many of our prehistoric Melian fishing bases is echoed in distribution data from the Argolid survey, and though partly explainable through intensive port activity in that period concerned with mining and trading, sometimes the sites are devoid of obvious mining or trading advantages in the immediate hinterland, and the possibility arises that for reasons unknown the Late Roman and early Byzantine phases saw a lot of interest in fishing. The same picture is given from Catling's map of the period on Cyprus (1970) (see Economics chapter).

Another advantageous factor in the location of Phylakopi is the abundant freshwater source not far below the ground. Throughout his field studies over Greece the writer has never found water sources at all determining of

settlement by themselves, and one need only consider modern Melos up at Kastro and Trypiti where practically all water comes from cisterns - the same area as ancient Melos. The situation as it is today, where the only significant springs are at Agia Marina below the Elias mountain and the only group of wells by Adamas and Aliki (following local information and Aschenbrenner at the Melos Conference) is matched by the travellers' reports. [Cf. Leycester (1852:206); Fiedler (1841:413, 420); Sonder (1925:196); though a small source is known in Kastro its use is mainly purgative, it being a hot variety (cf. Sonnini 1801: 250; Fiedler 1841:370; Tournefort 1743: 125)].

Karageorgiou has drawn attention to the existence of a plentiful supply of groundwater in the lower Phylakopi catchment (1972) and connects this to the prosperity of the prehistoric city. It was doubtless to tap this supply that the 3rd City well was established. Certainly it was one of the factors which must have determined the choice of location for the town, though equally certainly the site would have been occupied in any case for the combination of the sheltered harbour, the fishing and the adjacent arable land. Indeed the other fishing bays which have prehistoric occupation lack this supply of freshwater. We must still consider the prime advantages of the location its port and fishing facilities and the presence nearby of a major part of the best cereal land on the island. The site of ancient Melos has also a good extent of fertile land and is not too remote from the same basin complex which formed the 'breadbasket' of Phylakopi, and possessed an inner and outer harbour with good fishing potential. It is also more defensible. As is noted below (page 546), this site was occupied in any case perhaps as early as Phylakopi, so the change in settlement that saw a new town, replacing Phylakopi, and below Kastro is rather a change in emphasis. The earliest graves at Klima are Geometric (Zschietzschmann 1931:574) and this is held to be the period of the new city's foundation amid the ruins of an earlier smaller community. There may be some Geometric material from the neighbourhood of Phylakopi (BSA collection and information from Melos Phylax) and Hellenic graves (Classical?) were long known around the prehistoric city (Ross 1845:13), confirmed by recent discoveries (Belibanaki 1964:18-9). However there still remains an hiatus, for the Phylakopi settlement is abandoned after LH3C (Barber 1974, p. 5).

Finally it should be noted that the excavators' description of the bedrock of Phylakopi - limestone, is incorrect - it is tuff and pumice (Atkinson, BSA 1904:chap. 2). At least since the Historic Fill the poor harbour facilities of the bay have encouraged the rise in the importance of neighbouring Pollonia (already a 'strong town' in 1420). Fishing is still very good in the bay.[23]

Pelos and Ayiasmata

The Pelos prehistoric cemetery sits on the ridge between the two sunken depressions of Archilimio and Trogallas; the prehistoric finds at Ayiasmata probably come from the upper sides of its eponymous basin. The basin of Ayiasmata is a clear topographical feature and its slopes have frequent scatters of obsidian flakes. Zapheiropoulou (1969) associates the famous house model with a nearby E. Cycladic cist grave, and notes earlier reports of

other graves containing pottery and obsidian. As can be seen from maps 2 and 3 the situation of both sites is exactly as described above in our discussion of the basin complex - sunken basins with poor or no external drainage lines - highly fertile soils at all times. The Pelos pair have marl beds as well around the edges, clear from surface observation and from a preliminary analysis of soil samples collected during the study. All three depressions have excellent wind protection, and farmers working these fields would also be immediately adjacent to the fertile Upper Komia semi-basin, and the semi-basin behind Phylakopi plain. The Pelos cemetery had c. 20 graves, some with up to half a dozen bodies; yet in a few centuries two or three families could easily have produced this number of dead (BSA 1896/7 73ff.).

It is important to note that nearly all recorded prehistoric sites on the Cyclades consist of small pottery and obsidian scatters, or, even more frequently little groups of cist graves. The total number of burials is usually quite limited with the latter, and does not give any idea of population cover. The most appropriate method of exploitation of isolated patches of arable land in traditional Greece is by the 'metochi' or 'kalyvia' system, where a community or the individual farmer moves from one temporary farming base to another throughout the year, and each peasant has fields in the different areas of high productivity within his district, and a field house by one or more holdings. We could also include the seasonal fishing stations in this cycle as many farmers own boats or a share in a boat and nets. We might then see these prehistoric tomb groups and artefact scatters as representing family cemeteries and field huts beside the holdings especially associated with each kin group, rather than marking permanent settlements as yet undiscovered. It follows then that an intensive search of the surroundings of the best land on the islands should reveal many discrete clusters of family tombs and activity foci, with little trace of living accommodation - the farmers could as today have lived in temporary flimsy shelters and occasional isolated houses by each of their plots.

H. Pandeleimon and Langadha

The former site on a plateau east of the Chora depression is a good example of the above discussed location - a fairly small area of reasonable quality land amid much poorer soil has a few associated graves. The present tillers of this patch have other holdings in various parts of the island, and small field houses there as well.[24] The land is not all that good, but a terrace plateau exists by the site that has escaped erosion and preserved its fines washed on to it from surrounding hills and accumulated in situ - a good depth of soil has thus matured here, though the total area of the pocket and its fertility seem insufficient even for one permanent holding. One would suspect that as today the early farmers who marked their holdings with the graves of their ancestors also worked holdings elsewhere e.g. in the Chora depression below. Interestingly the site has a chapel that was at one time a metochi of the Patmos monastery - i.e. monks and their tenants who farmed this smallholding sent dues to Patmos. These country chapels, which crop

up beside every plot of cultivable land on Melos, were once centres of burial and worship for both temporary and seasonal farms nearby (over 200 are recorded by Baou [1964] over the isle).

As for Langadha, this site is found just above the Chora basin floor. The original pre-2nd Deposition form of the adjacent Chora depression to the west is difficult to estimate, but it seems certain that there existed large areas of moist developed soils in the lower parts of the Older Fill. At Langadha Early and Late Bronze Age burials are recorded, and a strange mound with a claimed Roman structure on top. The burials were found in the narrow band of tuff of intermediate height between the sheer cliff edge of the Chora fault and the main depression of the Chora Plain (A. Deltion 1965:510 - ref. not in Renfrew's Gazetteer, 1972).

Asprochorio

Tombs of E-MBA date in the far North-East of the island. This was at first a problem site, since the whole area is heavily transformed by recent opencast mining for kaolin. But examination on the ground and the details of topography allow us to reconstruct the locality as two small connected basins, previously with all the usual agricultural advantages of such features in terms of soil and water, wind protection etc. An additional factor here is certainly the proximity (10 min. away) of the wide and shallow Voudia bay - noted as a very good fishing zone by local fishermen. Wetzenstein (1969: 40, 53) notes that marine sediments overlie much of the surface of the slopes around Asprochorio, and weathering of this and underlying bentonite deposits certainly account, together with the basin form, for the fine areas of developed soil preserved between quarries.

Phiropotamos

The exact source of the EBA finds in a locality north of Ancient Melos, probably from a tomb, is uncertain. The whole valley running from Kastro down to a small inlet is known as Phiropotamos (from the stream), and though the lower parts of this valley are of little value, closer to Kastro we get into the fine farming land of ancient and modern Melos town. The inlet is not noted for either its fishing or harbour facilities, though during field study a boat was seen making a catch here and there exists a small group of boat-sheds on the shore.

Korphos

A rich Archaic and Classical site (see Fig. 1), set in an upland basin north of the Aliki/Aerodrome site (west Chora Depression). The usual good soil conditions in such a feature explain the finds, amid the sandy wastes running from Chora to Adamas (excluding the historic fill) [Zapheiropoulou in Deltion 1967:4650. We might predict prehistoric occupation traces to be found here.

Ancient Melos

At the same time we are looking at the land immediately around the nearby group of present settlements that comprise modern Melos town, i.e. Triovasalo, Trypiti, Plaka, Kastro, and Klima below. The long term interest in this area of upland relates to the numerous pockets of good arable land. Immediately below the modern villages there is a long level plateau of A/Dacite, alternately barren crags and moist depressions, and generally the latter contain a dark, rich clay that is well cultivated today. One of these crags rises above the bay and was the ancient acropolis of Melos, while remains of the ancient town can be found down the steep Klima valley and amid this plateau that runs north of the acropolis. At the north end of the plateau, just before the steep drop into the infertile Phiropotamos gorge, there is a semi-basin where tuffs have accumulated finer residues amid beds of seashells (of late Pliocene or Pleistocene date) - here also flat moist fields of high productiveness are found, and in the vicinity may lie the EBA site of Areti (and probably also Phiropotamos, see above). Renfrew (1972:512) is uncertain if his site of Areti is the same as that of Mackenzie; but it is clear that both locations are on this almost level series of natural terraces in Andesite-Dacite and marine tuff of notable fertility. The finds are of occupation with coarse pottery and plentiful obsidian - probably EBA but possibly Neolithic. Above the acropolis and the lower plateau, and between the recent villages that comprise modern Melos, lie a group of sunken depressions with a combination of soils. Round Trypiti much is A/Dacite, but by Triovasalo we find tuff associated with great masses of marine beds.

The area of good soil in this district is then quite extensive, though it is an hour on foot to the Pelos and Chora Basins, accessibility to which cannot be added to the priorities exhibited by the location. Around the acropolis of the ancient city finds of all Bronze Age periods have been made, and after the abandonment of Phylakopi, probably in the Dark Ages, the new city began up here on a site already long favoured for settlement. The Klima harbour would presumably have been a significant factor in all early periods, giving easy exit to the Great Bay for fishing and commerce. The defence value of the acropolis is hardly great owing to its tiny proportions, nor does it rise very high above the A/D plateau. It is now crowned by an Elias chapel and the goal of yearly processions, and as elsewhere we might suggest that a religious centre to the settlement on a striking natural feature was as important as strategic considerations. In fact the hillock is generally interpreted as showing remains of a temple (Fiedler 1841:371; Ross 1845:6). In any case the location of the settlement as a whole seems attributable to the abundant arable land of unuaual quality, though the reasons why this settlement became the most important on the island are more complicated. Klima, below, provided the advantageous combination of a harbour on the Great Bay, defence (the Klima exit controls the narrow entry to the Great Harbour and here a small fleet could hold a large one at bay), and fishing. But with its

silting up Adamas grew to importance and this is not easily reached from the city.[25] It has been suggested however that at the same time as the Klima facilities were falling into disuse, the main island centre switched to Palaeochora, close to Adamas over level ground (the ancient city was separated from Adamas by difficult steep gorges), and amply surrounded (at least in the late Middle Ages) by fertile land. Apparently Klima and the ancient city were more or less abandoned after the early Byzantine period (Tselas 1970:10) as we have no later remains (e.g. religious monuments) there till much later. However there is no evidence at that time in Chora, and we must wait till Buondelmonti (1420) for proof of its existence.[26] Only later, when part of the Chora Plain disappeared under sea and marsh and diseases became virulent in the Chora depression, was the capital moved back to beside the ancient city, to avoid plague and rediscover a site close to equivalent large amounts of good arable land. It is improbable that, as some have claimed, this move back to Kastro was due merely to fear of pirates. Palaeochora flourished in its exposed lowland from the late Middle Ages up to the 18th century A.D. when as we know natural disaster struck. Far from being frightened of pirates the Melians welcomed them at a great Cycladic fair, and in any case the pirate threat had been far stronger before the disaster than it was afterwards under Turkish rule.[27]

Palaeochorio, Spathi

The locality by the south-east coast consists of a large tuff basin ending in a sheer and spectacular cliff above a broad bay. The innermost parts of the basin are areas of fairly level plateau land where a number of farms can be found, and a moderately stable soil developed, but the major part of the basin is deeply dissected fairly infertile and unstable tuff. The bay is a favourite fishing spot, especially for the seasonal fish runs. Cut into the hard tuff (crystallised by silification) around the edges of the basin are to be found numerous EBA to MBA tombs, and a large Late Roman site sits atop the cliff. The sheer cliff is apparently due to a strong E-W fault, whose action in the recent past may have thrown down a large part of the Roman site and left many a rock-hewn tomb quite inaccessible.[28] Probably already in Ross (1845:13) we have a record of tombs discovered in this basin. On the writer's visit in 1973 several unexcavated tombs of Bronze Age date were clearly visible in the upper basin, to the east side, while on the plateau behind the basin to the north-west were noted a good number of Cycladic sherds. (These finds are now in the Plaka Museum). We were told by a family living there that several other graves had been discovered over the years, including metal finds. Although a few families lived in the locality all the year till recently, the main use of the area is now seasonal. The better upper basin soils are farmed from field huts, by people from the mainly herding hamlet of A. Theodori in the hills behind the basin, while the exposed beach is visited for seasonal fishing. Fishermen from outside of Melos come to the bay, and also local fishermen from other areas of Melos set up seasonal bases by the shore during the times of good catches (e.g. the fish runs). Similar patterns probably operated in the past.

Aerodrome site and Aliki

These two locations were discussed earlier in their evidence for landscape change in the Lower Chora basin. Aliki was the alluvial find, the new site or 'Aerodrome' site probably a cemetery of Mycenaean and Geometric date. If we exclude the Aliki alluvial depression with its saltpan, the slowly rising hinterland of the Aerodrome site consists of sandy rhyolite that nowhere forms a decent soil. Nearly all this low hilland is scrub with rare clumps of acid-loving conifers. In short there is nothing of arable value in sight. Two possibilities of interpretation exist: either the lower Chora plain was in prehistoric and early historic times a fertile moist depression as the upper plain is today, or else it was an inlet of the sea and offered harbour facilities to those exploiting the upper plain. While we must admit that there are uncertainties about the recent tectonics of the island, providing there was no recent sinkage in the Aliki area of more than c. 10 m, the alluvial evidence of the Aliki finds (and these are on the edge of the depression) argues in favour of the sea theory before the arrival of the Medieval fill. In the side-plain just north of the Aliki area a recent boring showed at least 8 m of recent sediment before tuffic bedrock was reached. (Information from engineering geologists on the site of borings for a new factory.) We may expect a far greater depth in the great plain. The problem is really what these sediments consist of, and whether they contain marine muds below the known upper levels of 2nd Deposition alluvium (see Martin's report, above). Much archaeological evidence may well lie buried on the edges of the saltpan, as with the Aliki site.

Kalogries and Samari

In Chalakas, with the exception of the Emborio finds and nearby A. Spyridon (mainly Mycenaean) - which are discussed below - a stray EBA find from Triades and probable prehistoric material from Bourlidia, two locations which I was unable to visit, we have a vast area of rugged infertile country with hardly a permanent occupant to be seen, and only remote Kalogries with its companion sites to give us an idea of settlement and activities here in prehistoric times. Indeed some confusion exists about the sites of Chalakas. At Kalogries there are a small number of Grotta-Pelos (EBA 1) graves, at Samari an Early Cycladic settlement; at Angathia there is clearly a Greco-Roman village/villa but possibly (in this writer's view very likely) prehistoric remains (Renfrew 1972, Gazetteer); at Triades recent unpublished finds, probably from an Early Cycladic grave; at Bourlidia the BSA team noted Late Roman material, obsidian and prehistoric walls (not mentioned in the Renfrew Gazetteer, but cf. BSA 1896/7:80): this bay is south of Samari Bay. Renfrew questions prehistoric finds from Angathia on the reasonable grounds that nearby Kalogries is probably being referred to, though the BSA description of Angathia 'in the southern horn of the island' is correct - the western horn of the Melos crescent being decidedly more southerly at both ends. The fertile basin of Angathia and plentiful obsidian finds around it are a good argument for prehistoric occupation here, quite possibly in some sort of seasonal relationship to the coastal Samari site, as with Phylakopi and Pelos.

So deserted is the whole of western Melos that despite the relatively small size of the whole island, it is almost impossible to visit parts of the west except by hired car and on foot (the latter at the inevitable point where the car meets impassable obstacles). When one reaches the NW part of Chalakas where the three sites of Kalogries, Samari and Angathia are found, the wilderness appears so depressing and unrelieved that the only conceivable activity would seem the herding and fishing potential of these sites. The appearance of this area is of plateau land, consisting of undulations of bare rock and intervening sandy glass waste - barely a cultivated field is to be seen. It is populated by numerous flocks, especially in the spring, when some vegetation is to be seen in every corner of the isle. The impression of infertility is actually false. Acting on the advice of my guide to the prehistoric locations, a local man who had farmed in this area some years ago, a probe was made through the glassy sand by the sites of Kalogories and Samari. Beneath the grey sand blanketing the area I discovered a rich moist clay. He also pointed out numerous deserted threshing-floors in the neighbourhood. Most of the NW of Chalakas is tuff, but there are extensive zones of A/Dacite, and in a number of depressions this weathers into the good clay thus revealed. Owing to the long neglect of the fields here, sandy tuff had drifted over these depressions.

The site of Angathia, in contrast, is a low rise above a tuff/Andesite basin that is still cultivated by resident farmers and is an oasis of damp fertility amongst the surrounding desert. Only one house is now occupied at Angathia, several years ago there were about 5 families, a generation ago 12 families - some of which were engaged in fishing. Kalogries is only 15 min. from Angathia towards the sea and is definitely EBA - but a small cemetery by an equally small depression filled with well-developed A/D soil. The main settlement for both this cemetery and, we may suspect, the hamlet at Angathia, is the EBA site of Samari - a further 15 min. towards the sea and just above a very deep bay. We have already noted that of all Chalakas only this bay is renowned for its fishing - and this is very striking when one considers the unnumerable little bays and inlets found around Melos. The following details of the fishing in this bay were obtained from several informants. It is visited seasonally by Melian and other 'foreign' fishermen - the latter from the other islands and parts of the Mainland already cited. Summer is the main time for the stay of the foreigners in this bay, and they come in both large and small craft. The small boats are drawn up on to the beach, the larger boats anchor offshore. In a good season the foreigners come for months at a time, and both buy provisions from the local people and bring a fair amount with them. They use the bay for the night when fishing adjacent waters, and during the fish runs much of their activity is actually in the bay.

This site is a good example of a viable location for a mixed economy, with strong possibilities of the congruence of people from distant areas and the resultant chances of exchange of materials and ideas. The very remoteness of these three sites from other fertile zones and in particular from the NE of the isle becomes much less if we visualize the prehistoric occupants here with a small fishing fleet, exploiting all the other fertile areas around and on Melos as well as their own. Indeed the three sites may well mark a temporary base for a community more permanently based in another part of the island

or some fishermen may have lived around Angathia in winter when fishing was little profitable, moving to Samari in the peak season.[29]

Profitis Elias

This enormous conical mountain in the centre of W. Melos dominates the whole island at a height of about 2000 ft. Its upper slopes are completely barren and nearly always shrouded in mist, so any notable form of exploitation except for goat herding, in summer, seems out of the question. The writer climbed it in the hope of finding traces of a sanctuary below the modern Elias chapel. The peak is surrounded by surface pottery but it is severely corroded by the moisture so that no shape or decoration is preserved, and could well be modern, left by the yearly pilgrimage from all the inhabited parts of the island. However in the wet earth in cave-like hollows in the summit rock, a scatter of decorated pieces came to light - two were faded Black Glaze, either Geometric or Classical, one piece was definitely Late Roman, and several curious primitive earthenware lugs were found, and a fragment of a white marble figurine or bowl. A shrine at least in historic times seems certain on this dramatic peak, and one might suspect a prehistoric cult activity, on analogy from elsewhere (see Ritual Chapter).

Agios Spyridon

We have already cited the Mycenaean and other finds by the Emborio shore, and the possible vanished harbour inlet.[30] Above Emborio rises a prominent peak, and on the flat summit have been found abundant pieces of Mycenaean pottery. On the ground one is struck by the large number of fine decorated drinking cups represented among the sherd scatter, and the same holds for the samples from here in the sherd collection at the British School in Athens. The platform also exhibits a series of strange and apparently artificial cuttings in its surface that conceivably conform to circles, squares and rectangles. The most suitable explanation is the identification of the site as a Mycenaean peak sanctuary, such as are beginning to be detected on the mainland, having been long known in Minoan culture on Crete and from Minoan-Mycenaean art (see Ritual Chapter). The frequent goblets may have been used as libation cups - a use often suggested for them in palace contexts of a ritual nature. In the Agiofarango Gorge, site E18 has been identified as a Minoan peak sanctuary - conical artificial cuttings in the bedrock are suggested as recipients of libations by Branigan (1974; cf. Agiofarango Chapter). The Spyridon surface cuttings obviously require more systematic examination than a brief visit afforded and the recorded impression is hardly scientific. The possibility that the finds might belong to burials, associated with an as yet undiscovered Bronze Age community exploiting the water and fields of the Marina Monastery above, is also well worth investigation. That location itself is obviously agricultural, and is today occupied by a prominent chapel revered and visited from all over Melos.

Finally, there are claimed early wall remains at both Adamas and Dhemenegaki obsidian sources, supposedly associated with Bronze Age mining (BSA 1904:245). Neither site demonstrates such today, nor is their locality likely to encourage farming or herding. At Provata the BSA team noted obsidian and primitive pottery (BSA 1896/7:80), a site not mentioned by

Renfrew in his Gazetteer. This bay is a key fishing ground, and there seems to be a good extent of arable land in the vicinity (including marls particularly favoured by early farmers). The report is almost certainly correct and the approximate location was rediscovered by the writer. Archaic and Roman material is also known from here.

SOCIETY AND RELIGION

We need not stress the small number of prehistoric sites; one would be rash to use them as indicative of population size and fluctuations in occupation.[31] It seems highly probable that whenever Melos is intensively surveyed, many additional sites will be discovered. Whilst one cannot talk about total distribution one may at least comment on site locations wherever chance finds are known, and if the analysis begins to form a good pattern, then given the fairly random nature in which our sites have cropped up, it is reasonable to set up locational preferences as has been done. In Melos sites are dominated by the availability of good arable land and by notable fishing resources (cf. charts and tables in the Soil Chapter and thesis Appx. A; also figure 4).

We raised earlier the question of permanency of prehistoric settlement and the exact relationship each site might play in the yearly life of the community at that time. Many of our finds seem to represent small tomb groups by good arable patches, and at least some of those associated holdings seem more appropriate as part-holdings, i.e. the family working these fields had other land elsewhere (e.g. H. Pandeleimon). We say 'family' because the total graves will presumably reflect burial over some time, and on usual known numbers per cluster this cannot represent more than a family or two. If we suppose a series of locations visited by a particular group of prehistoric farmers at regular intervals, then it follows that any one of these holdings can be the permanent residence of the families concerned. Alternatively, the main house can be in a nucleation such as Phylakopi or modern Melos town. The isolated houses which occur in vague association with Early Cycladic small cemeteries (Doumas 1972) fit well with this idea of the family holding, though naturally it is uncertain if this house was the main residence of the people tilling the adjacent land. As the City of Phylakopi grows in size, by drawing in a previously dispersed population, it is clear that the new distance from fields would necessitate temporary field huts, but it would obviously be a reflection on the strength of ties to town or country as to whether the farmer buried his relations by the City or still amidst the fields. The large Phylakopi necropolis clearly shows a new 'urban' emphasis closely paralleled in the cemetery of modern Melos town (for further discussion see Appx. 2 to this chapter).

In both the case of the Minoan tholoi (cf. Agiofarango Chapter) and ') and that of the prehistoric tomb groups on Melos, much of interest can be learnt from the recent system of landholding and burial on the latter island. We are fortunate in Melos to have a local historian of great industry, Z. A. Baou. In an extensive work on the churches and chapels of the island he has assembled every detail concerning their history and development (1964). He divides these buildings into groups: (a) monasteries and their dependent foundations (2) private chapels, mainly small - over 200 known (3) public churches - 2 known.

These private chapels are spread fairly evenly over the island except for an understandable thinning out in Chalakas; from Baou's descriptions, their recorded history, and the present writer's observations, they tend to occupy discrete and locally unusual patches of good arable land. What is particularly interesting about them is that they were built in most cases by the families who owned and tilled that patch of land, and these families used the chapel precincts as a burial ground. Only late in the 19th century A.D. did the practice of communal cemeteries return to Melos. Normally a family owned plots in several parts of the island, and while some lived permanently by one holding, others lived in Melos town. But burials frequently took place at a seasonal base and were in family graveyards. Memorial services for the family dead were regular features at all these chapels, however remote. A problem that had arisen in the prehistoric Cretan tombs was the long period of use - surely a single line of inheritance was rarely going to remain the same over hundreds of years - families would die out in, say, the male line, or would move out of the area. The solution in recent Melos was complete identification of tomb and land holding - if you buy or take over the use of the land the tombs and the chapel are in the bill of sale.[32]

Memorial services as we know them from recent Melos and as we have suggested for the Cretan tombs (cf. Agiofarango Chapter) are likely to be family affairs, and this whole pattern of behaviour tends towards fission in society. It naturally follows that society may institute communal practices that bring the remote holdings and the scattered interests of its members into communal awareness. One of the ways in which this is done is by a great series of traditional celebrations involving a large part of the local community. In traditional Greece every church however small and distant has a 'birthday', and on that day, once a year, a considerable number of pilgrims with a priest, gathered from all over the region, will process with the icons to that church and hold there a feast and ritual watch. And it should be noted that nearly all these churches on Melos are private. A. Anagyroi near Pelos can get as many as 500 pilgrims on its name-day, including many from the neighbouring island of Kimolos.[33] As with other regions studied by the author, there are also special days when peak sanctuaries are processed to and here the comments above on the Profitis Elias and A. Spyridon sites come into focus. The acropolis of the classical city is likely to have been such a communal ritual centre in historic, and, possibly, prehistoric times, and is such at the present time.

Finally, we have suggested that the developed monastery system in Greece is a reasonable parallel to what we can infer about the operation of the LBA palace system (see Ritual Chapter), and in this respect Baou's work supplies many interesting details of the sophisticated functioning of large landholders both secular and clerical (cf. Tournefort 1743:120, and Appendix 3 to this chapter).

APPENDIX ONE

THE PALAEOCHORA CATASTROPHE

Baou (1964:443) cites various pre-disaster authors on the prosperity of the isle and of Chora city. Already in the work of Buondelmonti (1420:194) we find such a report, and the isle is still flourishing in the 1616 report of Sarley. The fullest details of the city at its peak can be found in Tournefort (1743: 116ff.). A figure of 5,000 inhabitants for the town during these years is often repeated, but sometimes this is interpreted as a poll tax account of the adult males of the whole island, whereby a total of 20,000 for the Melos population is derived. This reasoning is to be found e.g. in Savary (1788:359) and recent guides to the island. Baou questions the larger figure, but himself produces evidence from the Patmos records for a population in Chora of several thousands (1964:472). Savary reports a discussion with the famous French consul, Brest, who assured him that in his youth Melos was fertile and had more than 20,000 inhabitants (1788:358). The present island population is around 5,000. Certainly the vast areas of potential arable land on the isle, especially in Chalakas, that are now fallen from cultivation or merely grazed, may once have very considerably augmented the harvest and the population supported from Melian resources. If we also consider how the history of the Cyclades shows a recurring pattern of one or two dominant towns concentrating trade and smallscale industry, and with a remarkably high population, e.g. Ermoupolis, Hydra, and note that pre-disaster Chora was the site of a great Cycladic fair - it is not impossible that a figure of the order of 20,000 represents the actual population of Melos in its greatest period around 1700 A.D. But to confuse matters, De Thevenot (1727:342) claims that on his visit Chora had 2,500 inhabitants, Kastro 500. Belloch, on evidence very suspect today, put the minimum for Ancient Melos at 3,000 inhabitants (Ehrenburg 1889:95).

For a general discussion of the Chora catastrophe see Ehrenburg (1889: 92) and Baou (1964:443). With the exception of the J. Schmidt/Smith report (1881) which apparently records a find of contemporary documents mentioning the earthquake destruction of the city, all the post-disaster travellers attribute the subsequent abandonment of Chora to an epidemic. There seems little doubt from their detailed descriptions that the population of the city was decimated by disease of a very virulent nature, and that the locality of the city continued to be highly infectious for over a hundred years. Baou has examined the records of the Patmos Monastery of St. John, that owned a considerable part of Melos at that time, and claims that Chora was abandoned as late as 1800 and as a consequence of disease alone.

Our latest pre-disaster record is De Thevenot (1727), for in the works of Savary, Sonnini and Choiseul-Gouffier the city is already in ruins and a tiny remnant of its former population live on there in a very sick condition (books

published respectively in 1788, 1801 and 1782). We know that the actual visits recorded by these travellers took place many years previous to these publication dates e.g. Sonnini visited Melos in 1788. Baou's letters to Patmos however suggest little change in the fortunes of Chora at least till about 1755, from its healthy and flourishing condition in the full description of Tournefort (visit c. 1700, published 1743). But Baou cites some travellers who use a round date of about 1800 A.D. for the disaster, without considering the clear evidence from those sources closer to the event which we have cited above. If we carefully examine the different accounts of the travellers some support may be obtained for the timing of a destruction involving both tectonics and disease.

It seems certain that the epidemic was at first confined to the Chora Plain: in 1776 when Choiseul-Gouffier came to Melos he blames the diseases on noxious vapours arising amid the city, but adds that two or three distant villages on the island are yet to be notably affected by the epidemic (1782:11); the fact that the survivors moved the town location to Kastro argues strongly that the area was free from the diseases of Chora (confirmed by several travellers e.g. Olivier 1794:220). Also Kimolos was apparently unaffected, for in Sonnini we hear that the Melos Patriarch fled to Kimolos "where the air is pure" (1801:228); Agia Marina in Chalakas is described as a healthy spot in Olivier (1794:206). However, in favour of the apparently contemporary account of earthquake destruction is the sudden contrast between the well-built city and the small cluster of ruins in pre- and post-disaster writers; further we have other records of tectonic disturbances in this part of the Aegean during the 18th century, and the suggestion that Phylakopi suffered more than once a serious earthquake destruction (see above p. 535). It is worth comparing the evidence existing in particular travellers for a notable landscape change in the Chora Plain during the 18th century A.D. Compare the Tournefort description of about 1700 (1743:116ff.), where excellent cultivated fields extend for a good half hour from Chora town to the Great Bay, with the following: [this writer's capitals] 1. "now only about 700 people the whole isle, the empty valleys are fallow, THE FERTILE VALLEYS CHANGED INTO MARSH. In 50 years Milo has completely changed its face... WATER IS NO LONGER DRAINED OFF BUT REMAINS STAGNANT IN THE VALLEYS. ...MARSHES HAVE MULTIPLIED" (Savary 1788:359-60). 2. "Zephyria (Chora)...built at the end of a plain where A STAGNANT STREAM IS SPREAD IN WINTER BUT WHICH BECOMES A WASTE OF SALT AND PESTILENCE IN SUMMER" (Bent 1885:69). 3. "and east of Melos harbour is an area of ILL-DRAINED ALLUVIAL LAND...The hills of the western half of the island and THE SWAMPY LAND EAST OF THE HARBOUR have confined the greater part of the population to the promontory north-east of Milos Bay...Agriculture...In the east, THE MALARIAL SWAMPS ARE AVOIDED" (Naval Intelligence Handbook, Greece, vol. 3, 1944, pp. 464-6). The present marshes from the centre of the former city to the shore agree with these post-disaster descriptions.

We hold therefore, that a preliminary earthquake destroyed the city, and both subsequent disease due to inadequate burial of the dead and the collapse of sanitary conditions, and the sinking of land around the city - creating a perennial swamp for malarial pests and burying former cultivated land, forced the survivors to refound the island capital in the vicinity of Ancient Melos at Kastro.

APPENDIX TWO

THE BEGINNINGS OF TOWN LIFE ON MELOS

There is a fairly recognisable pattern to the settlement and cemetery material of the Early Bronze Age Cyclades (Scholes, 1956; Doumas, 1972; Renfrew, 1972). Most finds belong to small cemeteries (normally only 10-15 burials, and at least in the first phase none more than 50). In the EBA 1 and 2 phases architecture is confined to the occasional house, considered as solitary, or a few rough huts (e.g. Phylakopi), and there is little or no association of settlement and cemetery. Hence Doumas believes the people concerned to have been nomads. Nonetheless sites are numerous over the isles and the artefacts and associated art demonstrates widespread community of culture. At the end of EBA 2, there is a gradual trend to more nucleated settlements, which may be fortified and less accessible than before. The new type of site is exceptional, however, until the opening of the Middle Bronze Age, when it becomes characteristic for most of the islands with known settlement remains of that date. Also from EBA 3 in the islands we begin to find a consistent association of largish communal cemeteries with these enlarged communities.

Melos is quite typical for this pattern. Up till EC3 (Early Cycladic = Early Bronze Age), we have small tomb groups divorced from settlement traces, and settlements suggesting small and possibly seasonal habitations (Phylakopi, Pelos, Ayiasmata, Kalogries-Samari, Pandeleimon, Asprochorio). The First City is at least a more substantial village and is succeeded by a planned and soon fortified town. Whereas significantly the BSA team found no EC 1 and 2 burials amongst the associated large necropolis (BSA 1904) the First City has its cemetery in the adjacent rock outcrops. But through the life of the City, small sites with burial groups and settlement traces continue over the island, though they pale into insignificance compared to the town and the great complex of tombs concentrated at Phylakopi.

In 1956 Scholes pointed out certain relevant facts: in the late EBA and the MBA of the islands, there are less sites than before, but many of these sites are larger than was previously the norm, 'towns' often fortified and showing wide external links to Crete and the Mainland. The first cases are the EC 3 sites of Chalandriani on Syros (actually transitional EC 2/3), Paroikia (Paros); more numerous are the Middle Cycladic sites of this nature, e.g. Phylakopi, Akroteri (Thera,) Delos, A. Irini (Kea), with continued growth at the EC 3 centres. Scholes suggested that a synoecism took place on each island, partly due to the insecurity of the period in general throughout the Aegean. These new towns seem certainly to have assumed the role of a modern island centre - they are close to the sea and have apparently a strong maritime function for trade and fishing, but also tend to be adjacent to a good

extent of arable land. If we use modern examples in comparison, the population would have remained basically agricultural, travelling out to quite distant field plots (where they probably used temporary shelters) as well as those concentrated near to the town, and taking part in seasonal fishing and small-scale manufacturing.[34] Permanent specialists would be quite rare in either artisanship or social, political and ritual roles though the greatly increased communication of ideas and circulation of novel or exotic objects in these centres could have led to a greater and more widespread efficiency of craft manufacture.

That nucleation did not have to result in contraction of the land in cultivation might be argued from the contemporary sites in other parts of Melos - even if some of these were in fact seasonal farmsteads for inhabitants of the City (as with modern Melos town). In my study of prehistoric settlement in the S.W. Argolid I suggest that the Middle Bronze Age population of that area continued to farm all the land previously cultivated from numerous small farmsteads in the EBA, but from a limited number of regularly spaced and probably nucleated settlement foci. These latter are often in Mainland Greece on or by modern large villages, while on the islands many of the MC and LC towns were again to be the island centre in historic times and sometimes to the present day.

Why this change occurred in the islands is hardly explained by noting that it is almost certainly related to proto-urbanisation on Crete, the Mainland and in the E. Aegean and the Troad, and at an earlier period. It should surely be quite functional and advantageous and since it is a recurrent feature of Greek rural settlement history the reasons might not be far to seek. Scholes cites the need for collective defence, and there are grounds for supposing that the period EBA 3/early MBA saw widespread unrest in the Aegean area. But what of similar 'urban' experiments on Crete and in the E. Aegean islands? It can be claimed that unrest was already prompting defences at EBA 2 Lerna, and at Troy, Poliochni, Thermi and Emborio town life is even earlier in the EBA accompanied by defensive constructions. But as Renfrew notes (1972), defence presupposes something worth defending, and it could be claimed that prior to the towns there was little in the way of concentrated wealth and human labour resources requiring elaborate protection.

At Chalandriani we have an EC 2/3 defended acropolis associated with a very large cemetery and traces of specialised craft activity, but neither here not at Phylakopi does the evidence support the suggestion that such centres were fundamentally concerned with industry for a wide market or even the servicing of local peasantry with articles manufactured locally or imported. We have argued that these townspeople were primarily farmers, fishers and herders, moving daily out into near and distant fields, pastures and fishing grounds, and spending regular periods or even whole seasons in the more distant of these activity areas. There would have been some specialists, but much of the craftsmanship going on in the town, even for export, is likely to have been a part-time activity amongst the general population, as was customary in traditional Greece in rural areas. The tendency for nucleation in these towns was clearly disadvantageous as far as ease of movement to activity areas over Melos and neighbouring isles, but had obvious social and

economic advantages: the organisation of the populace for communal projects and socio-political functions was far easier, and it is certainly likely that the increased shared knowledge and the concentrated availability of craft expertise and facilities made life in the centre more interesting and diversified for the peasant farmer with time on his hands. And there are, indeed, further factors to consider.

It has often been suggested that urbanisation even at this lowly scale, (and the term is surely a slight misnomer for the large villages commonly called towns or even cities in Cycladic, Minoan and Mycenaean civilisations), must in some way be due to a sudden rise in food production - that outstrips a previous equilibrium between food supplies and the farming population. The new surplus it is claimed allows the rise of a specialist craftsman and administrative class, who do not directly produce food, or alternatively, the surplus food is exported in return for semi-essential materials not locally available (e.g. metals) or non-essential prestige goods. We have seen reason to doubt the first suggestion, a non-producing class, but we might consider the second factor - increased local production for export in return for exotic finery and raw materials. Professor Renfrew's stress (1972) on his 'Mediterranean Triad' that encourages interregional exchange - cereals, olive and the vine, may be very relevant on Melos, where the olive is very rare due to natural conditions and competition with cereals. The vine, as we shall see below, may be a significant element in a consideration of Melian prehistoric exports, even if it adds very little of value to diet on the island. Certainly the wide links demonstrated by the culture of Phylakopi, the large fishing fleet we would postulate for prehistoric Melos, and the requirements of the island in non-locally available copper, tin, marble etc., could be taken as factors favouring an export industry. Yet a short list of necessary imports reveals how little commerce is demanded to explain the presence and quantities of alien materials found in the City. Little metal was recovered from Phylakopi, and marble is also a rare find - the latter material could conceivably have been mined by Melian sailors in neighbouring isles. Perhaps far more important than these traditional items supposedly characterising early commerce, is the very low production of olive oil on Melos, a valuable source of food, warmth and light - we might postulate a significant import from adjacent islands if not over greater distances.

The potential and recorded past exports of Melos are: pottery, pumice, alum, silver, millstones, obsidian, salt, gypsum, honey, wine, salted fish.

Although the island is rich in minerals, many of these were of little or no value in prehistory, e.g. Bentonite, Baryte, Kaolin (pure), Manganese. Gypsum is fairly widespread in Greece and is unlikely to have been much traded, alum is rare but hardly essential. Pumice is rare and Renfrew has suggested some prehistoric commerce (Renfrew, 1971), though presumably Melos had competitors in other islands of the Aegean volcanic arc e.g. Thera. Millstones figure prominently in all the travellers as a major product of the island, and though classical sources seem to be silent, imports from the Cyclades to the Mainland have often been claimed for prehistoric sites e.g. Agios Kosmas. Yet these are bulky items and we must await proof that island sources contributed very significantly to local needs beyond the

Cyclades. Obsidian, as noted above, was very widely used and has been shown to be almost exclusively of Melian origin. However, comparative frequencies on archaeological sites suggest that its greatest use predates the Phylakopi City. Silver - small deposits were worked on the island in the last century, but reports suggest that the sources were almost inaccessible and of very poor quality for prehistoric extraction techniques. The salt trade is little investigated and is a complex problem, but present opinion ascribes only limited importance to commerce in salt in the prehistoric E. Mediterranean.[35]

There is evidence that potters' clay was mined in antiquity and till recently on Melos (cf. Fiedler, 1841, Book 2, passim), and long before attention centred on Phylakopi the possibility of Melian pottery exports had been raised. As with Aegina, both in prehistory and recorded antiquity there may have been a flourishing pottery manufacture that included numerous exported pieces. Conze (1862, Melische Tongefaesse), suggested a wide spread of Melian pots in the Oriental Style; Jacobsthal argued a similar export of 6th and 5th century B.C. terracottas (1931, Die Melischen Reliefs). Barber (1972; 1974:51) suggests that Melos may have been a major source of origin for the Matt-Painted and other styles of the late EBA and MBA of Greece. At Knossos imports from the Cyclades in Middle Minoan times may include Melian vessels (Barber, 1972), and Rubensohn (1917:67, 85) claims that Melian pottery was reaching Paros in the MBA and also during the Orientalizing Period. Renfrew (1972, Ch. 12) mentions further Middle Cycladic wares probably of Melian origin at Lerna 5, Thera and Naxos. Obviously very favourable clays and additional advantages such as the painter's earth found on Melos and Kimolos are basic to a strong local industry, but a successful export trade reflects something more. Here we might raise the question of the importance of a large fishing fleet and the possible contents of the pots exported. Certainly both Melos and Aegina are key fishing grounds and fishing bases, and the movements of migrant fishermen may frequently have encouraged inter-regional exchange. Further, Melos seem to have produced enough surplus wine and honey in antiquity and recent times to have secured a wide market, and quite possibly some of the fine pottery sent out from the island contained one of these foodstuffs.

The export of wine seems particularly significant. Barber has pointed out (1972) that the Middle Cycladic island cultures are more individualistic in general than previously but at the same time exhibit signs of more widespread cultural contacts. Links between the different islands may ultimately be tied in to the economic viability of each isle, which rests on its geology. Emerson (1829:196) suggests that Melos is barely self-sufficient in grain and olive-oil, but is a wine exporter; Bursian (1872:479) notes that the olive oil produced on Melos scarcely feeds the island population, On the other hand, Naxos has always played a central role in Cycladic history owing to its unparalleled expanses of good arable land, derived from major exposures of non-volcanic rocks. In fact Melos and Thera stand apart within the Cyclades because of the predominance on both of problematical volcanic soils, and on both but a small proportion of the total surface is suitable for mixed subsistence farming. A much larger proportion can be exploited with the vine. Bent (1885: 104-150) found Thera one vast vineyard, although only enough cereals were

grown to feed one quarter of the population, and in drought years even drinking water had to be brought from neighbouring isles. There would seem to be clear limits to the population supportable by both Melos and Thera on a subsistence basis, unless a substantial exchange is being carried on for wine exports that would justify the cultivation of vines on the very extensive poorer soils. Eileen Power (1941) made a clear distinction between crops and herd products that can be intensively raised for a dense local market and those which require a far wider distribution zone. In the latter group she places wine and wool. She argues that any large-scale production of either of these presupposes interregional exchange, since certain areas are pre-eminent for production, but local specialisation rapidly outstrips the capacity of local consumption. We might hypothesize then, that a full exploitation of the farming potential of these islands meant a decisive move from a satisfactory balance between island population and a self-sufficient agricultural economy, to a necessary interdependence with other parts of the Aegean. Possibly some kind of threshold to local population increase during the EBA on these islands was thus overcome, and this change of emphasis perhaps can be connected to the rise of town life. A corollary to this line of thought is that a sudden disequilibrium might be far more severe to such an interdepent economy than with more balanced systems (e.g. earthquakes, eruptions, war) and the evidence for such pressures in the early Aegean may be sufficient to account for the considerable variation in prosperity and population that apparently characterises the history and prehistory of Melos and Thera in contrast to the far less striking vicissitudes of Naxos.

Another factor in this argument is the link we have suggested between a strong fishing industry and the development of a merchant fleet. Migrant fishermen who also exchange their home products abroad may corner the carriage of foreign goods to their own home and other markets. Virtual monopolisation of merchant shipping in the Aegean characterised recent centuries, with particular islands of the Cyclades dominating in turn; even small islands such as Hydra and Spezzai were transporting goods to Cairo and London (cf. Bent, 1885). Archaeologically, this widespread shipping is not as recent a thing as we used to believe, if we consider the large craft and suspected trips to the African coast represented by the EBA 'frying-pan' ships and the Thera fresco (Vermeule, 1964: Fig. 10; Marinatos, 1973). Some would even argue that the latter painting be taken as evidence for Late Cycladic Thera acting as a major shipping base for the Aegean, involved in the transport of goods and men into other parts of the E. Mediterranean. Barber has suggested (1972; 1974:52) that Akroteri on Thera replaced Phylakopi in something like this role; if this were so, then such activities, though probably on a more limited scale, may be held to account for some of the features of the 2nd and 3rd City. More recently, Melian sailors were a numerous part of the island population and monopolised navigation skill in Aegean waters (Fiedler, 1841:371; Bent, 1885:60; Emerson, 1829:233; Ross, 1845:20; Leycester, 1852:224; other sources suggest that Melian pilots were already famous by the 16th century A.D.).

The export rise we have hypothesized may perhaps go hand in hand with a more extensive cultivation and a higher island population on Melos, with significant imports of foodstuffs in which the island is poor. Was olive oil

contained in the imported pottery of Cretan and Mainland origin that increases in quantity throughout the 2nd and 3rd City? These changes could have formed one major element in the rise of an island centre such as Phylakopi, would not demand the growth of a specialist industrial class, but rather an increase in the agricultural area and its peasant workforce; the development of pottery exports, the shipping in and out of wine and olive oil, we see as a simple extension of a strong Melian fishing fleet; the processing of the wine and the increased output of pottery we maintain is likely to have been largely in the hands of part-time labour that was also still tied to farming, herding and fishing in and around the island. The synoecism on each Cycladic island surely favoured an awareness of island community identity unrealised hitherto, expressed in distinctive island decorative styles; at the same time the new directional trade brought in objects and influences from Crete and later the Mainland. There is no doubt that the first excavators at Phylakopi were correct in assigning details of the City art and architecture to Minoan stimuli: Melian copies of Kamares Ware, flower and fish frescoes, the pillar room (perhaps a close parallel to Minoan pillar-basements with cult associations). One might even be tempted to compare the zigzag façade of the City external wall to the outer design typical for the Minoan palace (cf. Graham, 1969). Note also the 2nd City potmarks and their Linear A parallels, to which we can now add the discovery in the recent excavations of a Linear A tablet from levels contemporary to LM 1A. (Early excavations: BSA, 1904: Chs. 4 and 10; recent excavations: A.Reps. 1975:23ff.)

However, frequently the result of greater interdependence is absorption, peaceful or otherwise. While Phylakopi is often seen as a Cretan colony this is a view that is hard to reconcile with strong evidence for continuity and individuality in the island culture. But the story of Mycenaean influences on Phylakopi is more convincingly that of a final forceful takeover after a very successful swamping of local trade by Mainland products and a likely collapse of Melian agriculture (especially the wine exports?) as a consequence of the Thera catastrophe. The alien Megaron with its exclusively Mainland tableware is constructed with disregard for previous habitations on a rise in the centre of the City.

A final source of evidence for wide links emanating from Phylakopi, perhaps relating to its shipping contacts, stems from Catling and his co-workers' analysis of pottery samples from the City (1965). Groups A, B, F and H were recognised (A is Mycenaean from the Peloponnese, B is Minoan) and it was suggested that Melos had an important role in commerce, especially as a chief port on the route to the Eastern Aegean.

Territories in Eastern Melos: Within this part of the island we can point to three unparalleled foci of prehistoric and historic settlement, coinciding naturally with equally unparalleled expanses of fertile soils. Firstly there is the large semi-basin that forms the interland to Phylakopi (cf. Figures 2-4), and adjoining it the Pelos basin group. This sector formed the main agricultural support for prehistoric Phylakopi and at least the Semi-basin must have been the main farming zone for medieval and recent Pollonia. The second sector is the fertile basin and plateau area around the close villages that comprise Melos town; here also lay ancient Melos town, and several prehistoric

sites one of which may be of some importance. Thirdly we have the Chora basin, as with the first sector adjoining and/or including the Pelos basin group; in its heart lay medieval Zephyria, on the site of presentday Palaeochora village. Several prehistoric sites here again include one important example (Langadha).

Given the distance separating the inner parts of each zone from each other we might argue that in every period there must have existed three distinct exploitation centres. Whilst there is clearly some archaeological and historical support for this, the situation is confused by various factors. Firstly, as might be expected, the island seems on present evidence to have only possessed one major centre at a time, i.e. Phylakopi in the Bronze Age, Ancient Melos in the Greco-Roman period, and alternatively Kastro (Ancient Melos) and Zephyria in the Byzantine and Modern period. Secondly, to what extent can we circumscribe the 'territory' exploitable from a given centre, especially when we have argued that seasonal farming bases probably characterised prehistoric and ancient Melos as at the present time. Although research into human territoriality is poorly understood, various empirical observations have led some workers to postulate a figure of a one hour radius territory for a farming community (Higgs and Vita-Finzi 1970). In Figures 5 and 6 we have approximately delimited one hour boundaries (in walking-time) for several known centres. Interestingly the one hour boundary from Ancient and modern Melos coincides with that of Phylakopi, to the east, and with that of Zephyria, to the south. Phylakopi and Zephyria/Langadha apparently 'share' the important Pelos basin group. But with Pollonia, Melos and Zephyria, we find an apparent 'gap' between the Pollonia and Melos boundaries, though now Zephyria and Pollonia have a common boundary that secures the Pelos basins for Zephyria alone. These relationships are fairly satisfactory in terms of our estimate of the relative importance of each centre. We cannot doubt but that Phylakopi City controlled the exploitation of the Pelos basins, although the latter were almost equally accessible from the Chora Basin and its prehistoric population. However Phylakopi could not with ease have intensively exploited the land of the other two sectors, where indeed there are suggestions at least in the Middle and Late Bronze Ages of significant if minor settlements. In the Greco-Roman period we should clearly seek for local communities of minor status in the Phylakopi and Zephyria sectors, since Ancient Melos has easy access only for its own fertile sector; as yet such smaller foci are not positively recognised amongst the numerous contemporary sites in these complementary sectors. The situation is somewhat clearer for medieval and later time, for it seems likely that for most of this period Kastro, Zephyria and Pollonia co-existed as settlements of varying importance. Indeed, the clear demarcation visible in Figure 6 is in itself an argument for parallel coexistence despite apparent discontinuities at particular localities. Note that Zephyria is known to be a greater centre for most of this period than Pollonia; the more remote position of Pollonia in comparison to Phylakopi leaves the Pelos basin group entirely within Zephyria 'territory'. Finally, it is notable that the area at the border of Melos and Pollonia, an apparent 'gap' in exploitative coverage in Medieval and Modern times, is of poor overall fertility (cf. Figures 2-4).

Despite the plausibility of this analysis we should point out that the experience of this author in many areas of Greece argues for a smaller area of territory than a radius of one hour, in moderately to very fertile localities and in the case of centres of village/town status. A radius of half or even quarter of an hour is frequent, at which point we enter the territory of adjacent foci (see Socio-Political Chapter). Applying an inner territory along these lines, of about half an hour, we find (Figs. 5, 6) that this boundary effectively delimits the areas of very fertile land that immediately surround each focus of settlement in each of our three sectors. These are: the small semi-basins by Pollonia, the large semi-basin by Phylakopi, the upland basins and plateau by Melos/Kastro, the moistest and most fertile part of the Chora Basin by Zephyria/Langadha. As an alternative to the one-hour maximum territory proposed earlier, which assumes daily movement to all the fields within this radius from the focus, we might suggest daily movement up to the half-hour radius, with less frequent and particularly seasonal movement from the foci into the larger radius. This allows for exploitation being chiefly controlled from each focus within the one hour, but argues that only the innermost portion of this territory was intensively cultivated on a daily basis. The less intensive use of the outer portion of the territory may have encouraged a degree of permanent farmstead settlement in this zone. Indeed this second, modified model of territoriality is closely comparable to that operating on the island today, on the basis of this writer's interviews on the island; the common use of motor transport in this part of Melos has, however, enlarged the outer territories of Kastro, Zephyria/Chora and Pollonia, so that they greatly overlap in the most desirable field areas.

APPENDIX THREE

THE MONASTERY ECONOMY ON MELOS

Our chief authority on this subject is Baou (1964), though the account of Tournefort (1743:120) is most informative, with a lengthy discourse on the wealth and multiplicity of Melian monastic foundations. Close parallels may be found on the other Cyclades (cf. Dugit, 1874, for the wealth and influence of the Naxos church, and Bent, 1885, for Cycladic monasteries in their twilight phase). A potentially fascinating source of data are the records of the great St. John Monastery on Patmos, which owned a considerable part of the Cycladic land area; in its extensive agricultural 'empire' whose dependent farms were closely monitored by the Patmos bureaucracy, and in its monumental fortifications, we are reminded forcibly of the Mycenaean Palace economy and its high-walled nerve-centres.

We will briefly cite some of the more notable details of Melos monasteries and monastic dependencies in the work of Baou (1964):

1. (p. 83) On the dissolution of the Agia Marina monastery in 1833, records show that in the previous year about 1600 acres of its lands had been in cereal cultivation in one holding group, about 1020 acres in another, whilst a further 800 acres was farmed in the neighbourhood of the monastery. The cultivation was by tenants who received little return from the Church.

2. (p. 99) At the same date the St. George monastery had 1140 acres of its lands in cultivation, with more abandoned by this time. Stock lists show surprising numbers of oxen and cows, requiring special cultivation of fodder crops.

3. (p. 512) A picture from an earlier period, for the Eleni monastery, is illuminating. It possessed monks' cells, a church, houses, a windmill, olive-press, a garden, vineyards, fields, stock, a store of 15 wine barrels and 5 wheat barrels. This foundation was actually a metochi, a local branch of a larger monastery, to which it would have sent part of its produce. Also listed are its riches in precious metal, and we are reminded that the monasteries acted as the major centres of everyday craft and fine art production.

4. (p. 477) The possessions of the Christos Soter monastery. It was one of the richest metochi of the Patmos monastery and one of the wealthiest Melian monasteries. It owned subsidiary metochi and discrete landholdings almost everywhere on Melos: a long list of these covers every corner of the island, and includes innumerable holdings of cereal, olive and vine land, gardens. At the monastery itself were stored at least 30 barrels of wine. From Patmos sources it is clear that nearly all

this land was leased out by the Soter foundation to dependent peasant farmers.

5. (p. 229) A neat example of monastic efficiency is seen at the small chapel of St. George in Trachylas. This area is unpromising rhyolite soil and is fit only for extensive vine growing and grazing. Only an interdependent community could make a lasting base here. This monastic foundation was probably a direct metochi of the Patmos monastery, and a small number of monks lived here. Every year a boat put into the nearby cove of Phiropotamos and took away the wine harvest. Possibly cereals and olive oil were supplied to the metochi in the same way, or, more likely, were supplied by Patmos possessions in other parts of Melos. We are reminded of an abandoned monastery cited by Ehrenburg (1889:95) on the tiny island of St. George, lying between Melos and Kimolos; though but a tiny islet, the soil is apparently fertile marine carbonates, and the full use of the environment by the monastery economy is yet again well demonstrated.

NOTES

1. The numerous publications of the BSA team over a decade exhibit a breadth of knowledge and interests sadly lacking in most modern archaeological literature - important contributions are to be found on many aspects of the island's history and sociology, and detailed reports of excavations exist side by side with accounts of excursions in every part of the isle with the aim of recovering a picture of the total settlement history. The team is in many respects a remarkable forerunner of the interdisciplinary expeditions that have revolutionised Greek and Near Eastern archaeology in the last two decades.

2. Further, emboldened by unusual success in locating many sites of varied ages over the island, an attempt was made to link these together in some pattern of colonisation, quite unjustifiably in view of the problems of sampling and chronology involved (BSA 1896/7:85-7).

3. Although these high marine beds could be early Pleistocene raised sea-levels.

4. Aegina: a visit made by the writer in 1973 to the centre of the island resulted in the recognition of a good correlation between the apparently impoverished and mountainous location of the Medieval town and extensive well-developed Andesite-Dacite soils.
Methana: data from a Methana anthropologist, H. Forbes (pers. comm.) suggests to the author that there is an important link between ancient and modern settlement preferences on that peninsula and the distribution of A/D soils.

5. Not feasible owing to the practical absence of freshwater sources on the island, the low rainfall and general permeability of the sandy soils characteristic of the landscape. For the water question see below.

6. Vines and sandy, acid soils of Melos; modern, recent and ancient notable export from the island; areas where only or especially vines grown on the island also favoured thus in the past. References: Zschietzschmann (1931); Emerson (1829:189); Tournefort (1743:125); Fiedler (1841:406); De Thevenot (1727:341); Baou (1964:229 and passim); Ross (1845:13); Bursian (1872:passim); Bent (1885:Chapters on Melos and Thera); Ehrenburg (1889:96); Leycester (1852:219, 222); in addition various conversations with local farmers aided the analysis.

7. Again the present infrequency of the olive and the limited areas where it is to be found on the island compare well to ecological prediction and the comments of the travellers over the last few centuries, and olive oil has a very low production in all records (as on similarly endowed Thera). References: Ehrenburg (1889:96); Emerson (1829:189ff.); Savary (1788:358); Leycester (1852:223). Professor Renfrew has proposed that the arrival of olive cultivation allowed settlement expansion into different soil and terrain, since the olive and cereals are generally non-competitive (Renfrew 1972:481-2). In this writer's experience poor clusters of olives may be found on rocky slopes, but a good yield comes only from a reasonable soil, and here the olive is in direct competition with cereals. Actually in Greece one hardly ever finds olive groves without cereals growing beneath the trees - and this is common sense, for the olive only produces in quantity in alternate years and gives a really good crop once every five or seven years. If the cereals are poor one year there may also be the olive harvest, and in any case it was normal both in traditional as in ancient Greece for cereal fields to be on an alternate fallow system. Certainly the arrival of olive-growing in prehistoric Greece would have produced an overall increased yield from land already in cultivation.

8. Larger areas could certainly be used for wet culture but this would remove a major part of the cereal fields of the isle e.g. the basin complexes. For scarcity of fruit trees, cf. Leycester (1852:223), Ehrenburg (1889:96). On the recent alluvium see below.

9. A clear proof of this lies in the frequent association of valleys and basins with zones of silification of the tuff, also where there is localised continuing igneous activity near the surface and often evidence for recent faulting, e.g. the valleys between Adamas and Kastro, the cliff at Spathi (Wetzenstein 1969:10ff. and pers. comm.).

10. Cf. tectonic features marked on the map of Sonder (1924), and the discussion in Sonder and in Wetzenstein (1969) of faults and lines of igneous activity. The important fault lines are:
NW-SE Characteristic of the 'ridge and furrow' system already present in the Mesozoic throughout Greece and therefore often called an orogenic or Alpine tectonic.
N-S This would seem to be a very long-lived local line of tectonic pressure; indeed a cross-section of the isle recently undertaken by the IGSR reveals that the earliest deposits on Melos, the crystalline schists and marbles, are notably block-faulted along this line. Thus the hard eruptive masses noted above would appear to have come to the surface

along already preferred lines of rock weakness and pressure. Proof of this is the lack of evidence for upwarped formations of pre-Pliocene date where igneous flows have forced their way to the surface.
NNE-SSW This recent line is partly diagonally opposed to the NW-SE line, and this crossing of forces is also characteristic for the related sub-Pelagonian volcanic area of the Argolid peninsula (Bannert and Bender 1968).

11. A recent symposium, 'Evolution in the Aegean' (Opera Botanica 30, 1971, Ed. A. Strid) critically examines the case for Pleistocene landbridges in the Aegean island realm. The conclusion is that such bridges are likely and indeed demanded by faunal study during the Early and Middle Pleistocene, but improbable at least for the central Aegean during the Riss-Würm and Würm epochs. In particular the extreme low sea-level of the Riss glaciation would have enabled colonisation from both Greek and Turkish Mainlands to the islands, though with greater ease from the former.

12. One would nonetheless think it unlikely that the people of Phylakopi left the bay side of their town quite undefended; Professor Renfrew has made a good case for Bronze Age piracy as a major factor behind the fortifications of the mature and final Early Bronze Age (1972:262) and the slightly earlier walls of coastal Lerna would seem to cover sea approaches. However a narrow bay might be harder to take by surprise attack than an approach from the landward side, and in a similar case it is likely that the harbour of Classical Melos, though probably outside the main town defences, appeared too difficult to force for the attacking Athenian fleet, who disembarked troops further along the coast for a land attack on the town (Thucydides, Bk.4:114).

13. They were not the first to realize the changed nature of the landscape here: Ross (1845:9) clearly identifies Klima as the ancient harbour. For the BSA early excavations see BSA 1895/6:65-8.

14. The rather limited depth of historic alluvium is probably explainable from the small catchment of the Klima gorge, compared with that of the Phylakopi stream. However at Tria Pigadia (see further below) there is a deep coastal fill of historic date despite a fairly small catchment to the torrent responsible; here, though, we have a feature more reminiscent of an alluvial fan at a break of slope rather than a nascent coastal floodplain as at Klima.

15. For the evidence of the line of fortifications the best plan is still in Leycester (1852); however the existence of the spectacular Roman Catacombs in the sides of the Klima ravine, and the traces of walls and towers about halfway down the gorge side, give strong reason for supposing that the lower parts of Klima lay outside the city walls. Still the latter would seem to surround and descend into the gorge in such a way that the postulated harbour was defended on all sides except the open bay. Presumably a fortified boom was rigged up across the narrow harbour entrance. The suggested wall line of Leycester (1852:211) would be contrary to Roman practice of extramural burial.

16. At the abrupt break of slope where the torrent meets the bay, a pronounced fan of historic alluvium passes at a steep angle above the Roman structures; the fill is rather more unsorted than is usual with the 2nd Deposition, though this relates to topographical circumstances (see note 14 above). The torrent has over the last few centuries incised its fan down to sea-level, while the transgressing sea has removed much of the fan tongue, leaving a sharp little cliff of fill with the Roman site in cross-section exposed at its face, immediately behind the present beach.

17. There is also confirmatory evidence for the alluvial sequence from other parts of the Cyclades - cf. Scholes (BSA 1956:11,12) and Kondoleon (AE 1964).

18. Scholes (1956:12) notes Bent's visit to the Ellinika site on Kimolos (Bent 1885:55-6) but misquotes his remarks. The Roman (?) tombs are not necessarily underwater in situ structures, as Bent himself points out. Still a sea rise here seems probable.

19. However, all these steep cliffs washed by the sea are very prone to erosion, and coupled with eustatic rise this could conceivably explain these now inaccessible and partly submerged tombs.

20. As recently as in the summary of the (Melos) Ecology Conference (1972, unpublished). The Andesite-Dacite headland on Melos that is continued as the Glaronisia is marked on Sonder's map but is missing on that of Wetzenstein (1969). The error of the latter was indicated to the writer by Dr. Phitikas.

21. The largely treeless coastlands and islands of the South Aegean are for the most part naturally thus; extensive deforestation elsewhere in Greece is predominantly a phenomenon of the last century or so. For the evidence for this unorthodox conclusion see Vegetation Chapter.

22. The importance of the Agrilia height lay in its vantage over the shallow waters of the bay and adjacent ocean, whence the movements of shoals and the operation of the catch could be monitored. Mavrispilia is a hill site of the Saliagos culture similarly placed on Mykonos, while lowlying Saliagos itself may have prompted its Neolithic occupants to build a stone fish-watching tower (interpreted by the excavators as a defence-work, despite its period and structural flimsiness) (see Mykonos Chapter).

23. For a detailed discussion of the background to the rise of town life on Melos see Appendix 2 to this chapter.

24. At least two different farmers have a share in this fertile patch, one of whom is generally resident by it. But both have holdings elsewhere, e.g. down in the main Chora plain, away at Viathi, also at Triovasalo, and both spend some of the time in Melos town. There is also plentiful grazing around the arable 'island' here.

25. The journey from Adamas to Kastro takes up to an hour on foot or donkey (cf. also Emerson, 1829:232). Whereas Klima is sufficient even silted up for a small fishing fleet, larger numbers and especially the great

ships that began to come to Melos in the last few centuries had to drop anchor deeper into the bay. The best place is the sheltered Adamas inlet.

26. As was pointed out above, the silting of Klima was part of a Mediterranean-wide alluviation process, and almost certainly contemporaneously the Chora Plain was also being heavily alluviated; in the latter area, the resultant problems of flooding and insect infestation may well have hindered effective cultivation and localised settlement until the decline or cessation of this Historical Alluviation in the late Middle Ages. The arable land around Kastro remained well-drained and healthy throughout this alluviation period, and we might therefore suspect, despite the absence of finds for this time, that early Byzantine Melos continued to centre upon a town on the site of the ancient and modern island capital. The suggested improvement in the Chora Plain environment, and the revival of island commerce, then led to a shift in interest to a new town and port site. Adamas is now a community in its own right, but this is a foundation by Cretan refugees at the end of the last century; before that the waterfront was largely occupied by storage sheds for the port.

27. The pirate threat seems to have varied very much in time and place over the Aegean. At various times the Cyclades were menaced by, and entertained, pirate fleets. We hear for example that in 1638 Kimolos town was burnt by pirates (De Thevenot, 1727:343), but in Choiseul-Gouffier (1782:8) it is a winter quarters for them. Of Melos we hear already in antiquity that Athens wanted to charge the Melians a fine of 10 talents for harbouring pirates (Bursian, 1872:499), though in 1317 pirates took 700 prisoners for slaves from the island (Dugit, 1874:192). Bent states (1885:60) that the pilots of Kastro were widely employed by French corsairs in the preceding century, and the central fair of the archipelago held there was particularly important for the disposal of their booty.

28. The fault-line at the cliff is naturally followed by the line of highly silicified tuff, producing startling red cliff exposures above the beach. However continuous recent rock falls could also be responsible for the loss of archaeological remains at the cliff-edge.

29. The BSA team were surprised by their discovery of sites of all periods in Chalakas, and accounted for them as hunting and mining bases from the arable eastern half of the island. However they noted that some places appeared worthy of the farmer's effort, particularly the Angathia and Agia Eleni districts (BSA 1896/7:71,81). The latter valley terminates in the Triades Bay, while Bourlidia seems to belong in the Andesite/Dacite soil zone of Kalogries/Angathia; we might suspect, therefore, that all our sites in this region fall into the more fertile zone they singled out. Indeed Sonder shows concentrations of A/Dacite in all these localities, which we have confirmed for the areas we visited.

30. Fiedler (1841:413): the Agia Marina Monastery above Emborio is very acceptable for a settlement with its springs, good land and healthy air, but there is no favourable anchorage in this part of the Bay.

31. Prof. Renfrew should perhaps be taken to task for trying to do this, especially on sites where EBA 1 and 3 are recorded but not so far EBA 2. How many Cycladic sites have been fully excavated?

32. It is not being suggested here that prehistoric communities had a land market as such; from what we know of peasant groups in general, rights over land are held by the community as a whole, and where inheritance fails to provide continuity of cultivation, the community normally passes on the right to till the land in question to any of its members needing or desiring to take over.

33. For a description of several of these ritual processions and festivities see Baou (1964): the Anagyroi festival, p. 249; St. John of Iron, p. 105; Phanourios at Rivari, p. 195; Georgios in Trachylas, p. 229. For a wider discussion of integrative rituals with a spatial emphasis in traditional and prehistoric Greece, see Ritual Chapter.

34. There are numerous hints and positive statements concerning dispersed settlement and seasonal farming on Melos. Isokrates (12:89) records that the ancient Athenians destroyed not only the City of Melos but several other smaller settlements. Greco-Roman sites on Melos include many small groups of tombs and sherd scatters in places beyond the immediate vicinity of suggested settlement foci (see below), for example the A. Kiriake cemetery (Ross, 1845:13), and the Phylakopi small catacomb (Tselas, 1970:5). From Buondelmonti (1420) we hear that there was a revolt of the Zephyria/Chora slave population, who took advantage of the absence of all the citizens amongst their fields, to take over the city - clearly the citizen farmers were not just at work in the surrounding Chora Plain. Fiedler (1841:399) describes farmhouses in Chalakas; Leycester (1852:206-7) notes the use by shepherds and the occasional farmer, of outlying islands of the Melos group. Ehrenburg (1889:94) says: "besides Adamas and the Plaka village-town, the isle is covered only by a mass of scattered huts - of really primitive construction"; these are almost certainly largely seasonal field bases. He also notes (95) settlement traces on the Akradia isles, St. George isle, Prasonisi and Polivos, (tiny members of the Melos group), with some occupation still in his time. Sonder, in 1924, tells us (p. 185): "Heute wird fast die ganze Insel von diesem exzentrisch gelegen Siedelungs-Zentrum aus bewirtschaftet [Plaka/Kastro], indem sich die Bewohner in den geeigneten Jahreszeiten für einige Monate auf ihre Landereien begeben. Nur wenige Familien wohnen dauernd auf ihrem Landbesitz auf der Insel".

35. References. Pumice and Obsidian: Renfrew (1971). Alum: Leycester (1852:218), Olivier (1794:216). Silver: Sonder and Friedlaender (1924: 9), Sonder (1924:187). Millstones: Sonnini (1801:237), Leycester (1852:204 - note the proximity of this source to a prehistoric obsidian source), Fiedler (1841:420ff.), De Thevenot (1727:341). Salt: present industry already established in Tournefort (1743:124). Gypsum: Leycester (1852:220), Fiedler (1841:428). General discussion of products past and present of the island in Zschietzschmann (1931), Bursian (1872), Fiedler (1841).

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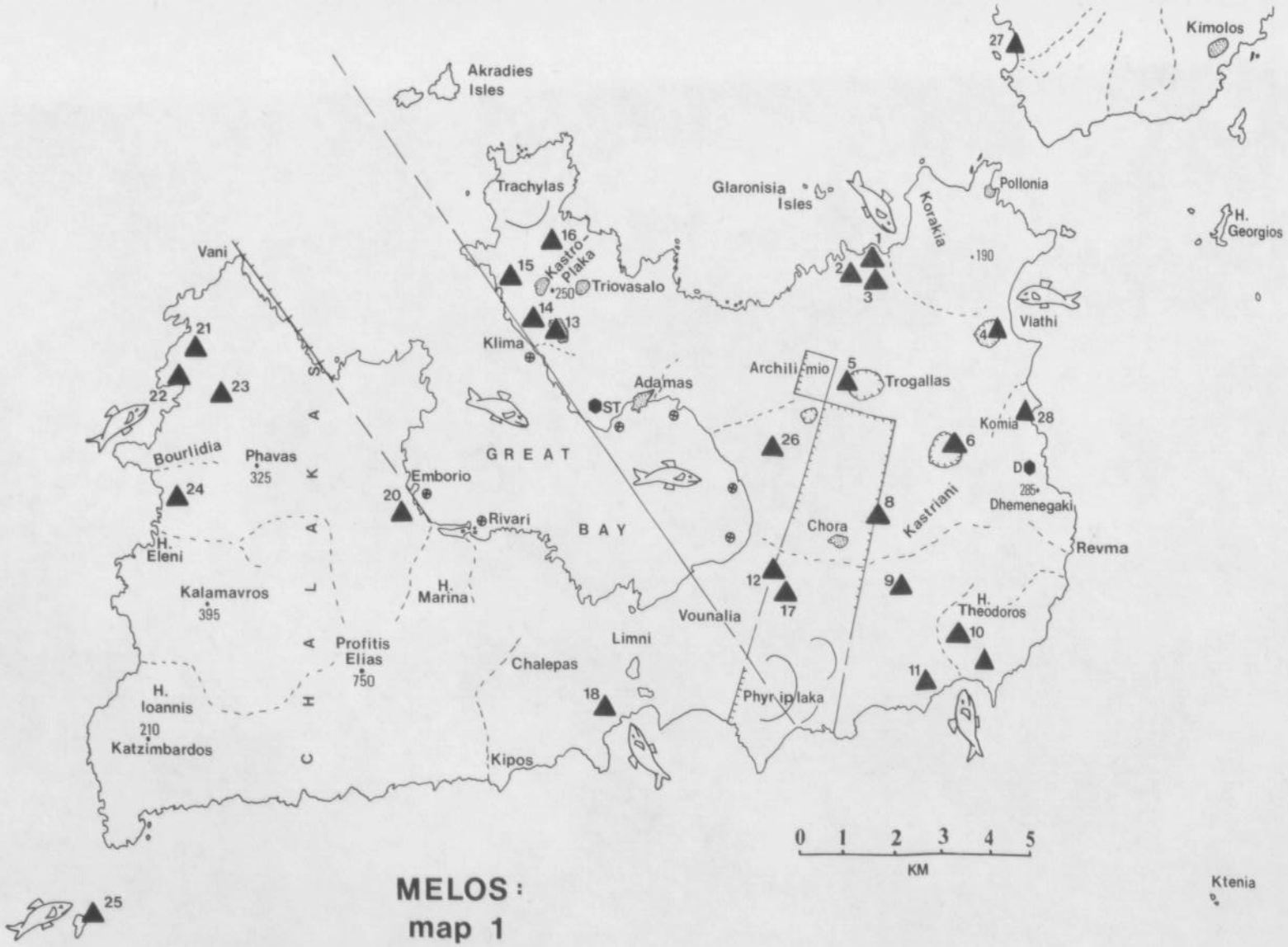
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Fig. 1 Modern settlements and ancient and prehistoric sites. Heights in metres. The fish symbol indicates the location of seasonal fish-run catches of major importance. Circled crosses mark underwater sites; archaeological sites marked by triangles. Key:-

1 = Phylakopi
2 = Agrilia
3 = Kapari, Stou Kaprou
4 = Asprochorio
5 = Pelos
6 = Ayiasmata
8 = Langadha
9 = H. Pandeleimon
10-11 = Palaeochoro sites
12 = Aliki
13 = Ancient Melos
14 = Tramythia
15 = Areti
16 = Phiropotamos
17 = Stavros
18 = Provata
20 = A. Spyridon
21 = Kalogries
22 = Samari
23 = Angathia
24 = Triadha
25 = Prasonisi
26 = Korphos
27 = Helliniko-Andreas
28 = Tria Pigadia

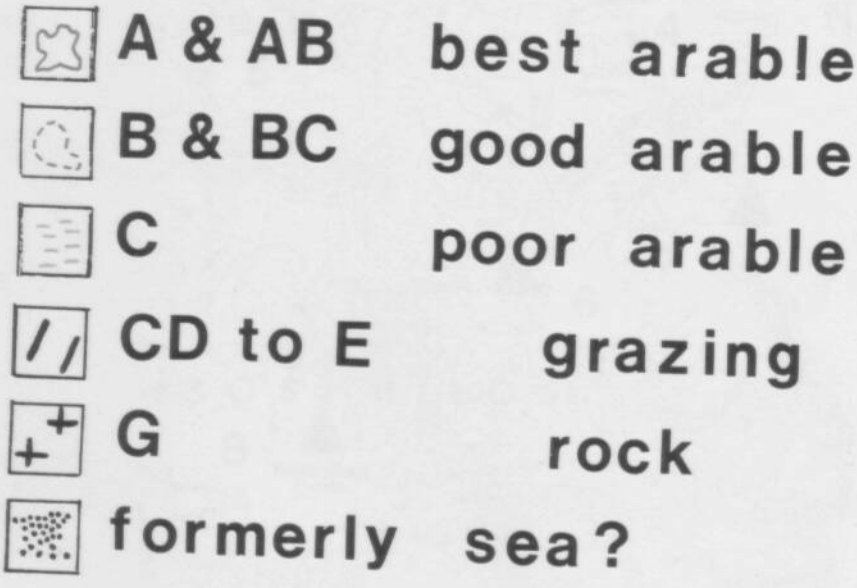

Kimolos
27
Akradies Isles
Trachylas
Glaronisia Isles
Pollonia
Korakia
H. Georgios
190
Vani
16
Kastro Plaka
15
250
Triovasalo
1
2
3
14
13
Klima
Viathi
4
21
22
23
Archili mio
5
Trogallas
Adamas
ST
Komia
28
26
6
Bourlidia
Phavas
325
GREAT
BAY
Emborio
24
20
Rivari
D
285
Dhemenegaki
Chora
8
Kastriani
Revma
H. Eleni
Kalamavros
395
H. Marina
12
17
9
H. Theodoros
10
Vounalia
Limni
Profitis Elias
750
Chalepas
11
18
Phyr ip laka
H. Ioannis
210
Katzimbardos
Kipos
25
0 1 2 3 4 5
KM
Ktenia

MELOS :
map 1

MELOS : 3A

Land Use Potential

SITES NUMBERED AS IN FIGURE 2




3A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
1 km

Melos: 3B

Soils

SITES NUMBERED AS IN FIGURE 2

TUFF: developed soils

undeveloped soils

rock

ANDESITE-DACITE

developed soils

undeveloped soils

rock

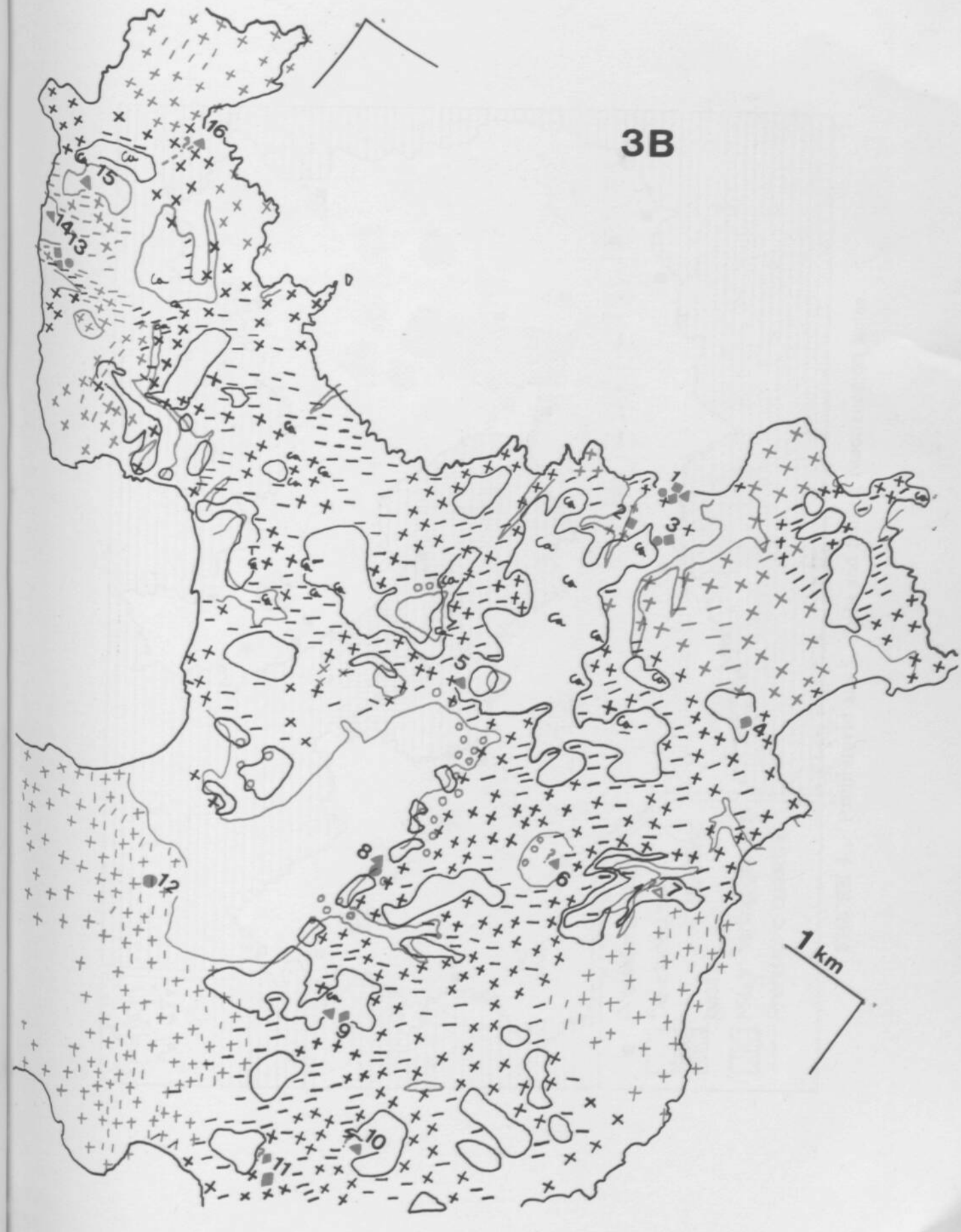
RHYOLITE: undeveloped soils

rock

Older Fill

Younger Fill

+Ca with marine beds


3B
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
1 km

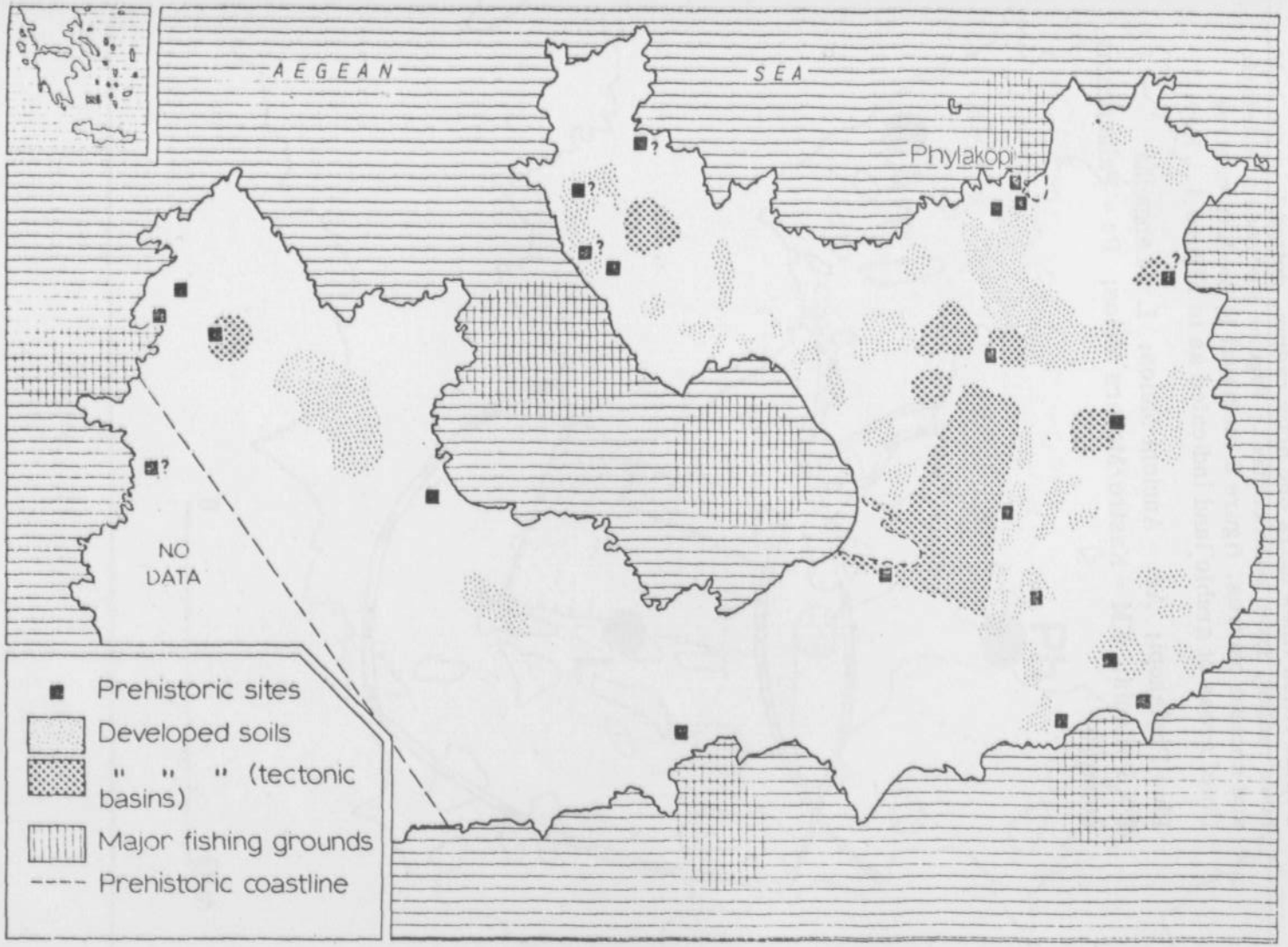


FIGURE 4: Prehistoric sites, soils and fishing resources on Melos.

Figs. 5 & 6 Hypothetical territories of major settlement foci on Melos. Double filled lines mark one hour radius, dotted line the half hour radius, from each centre. Figure 5 covers prehistoric and ancient centres, figure 6 medieval to modern centres. Chief areas of arable land indicated as in Figure 4. Key:-

Ph = Phylakopi; Am = Ancient Melos; L = Langadha
P = Pollonia; KM = Kastro/Modern Melos; Pc = Palaeochora/ Zephyria

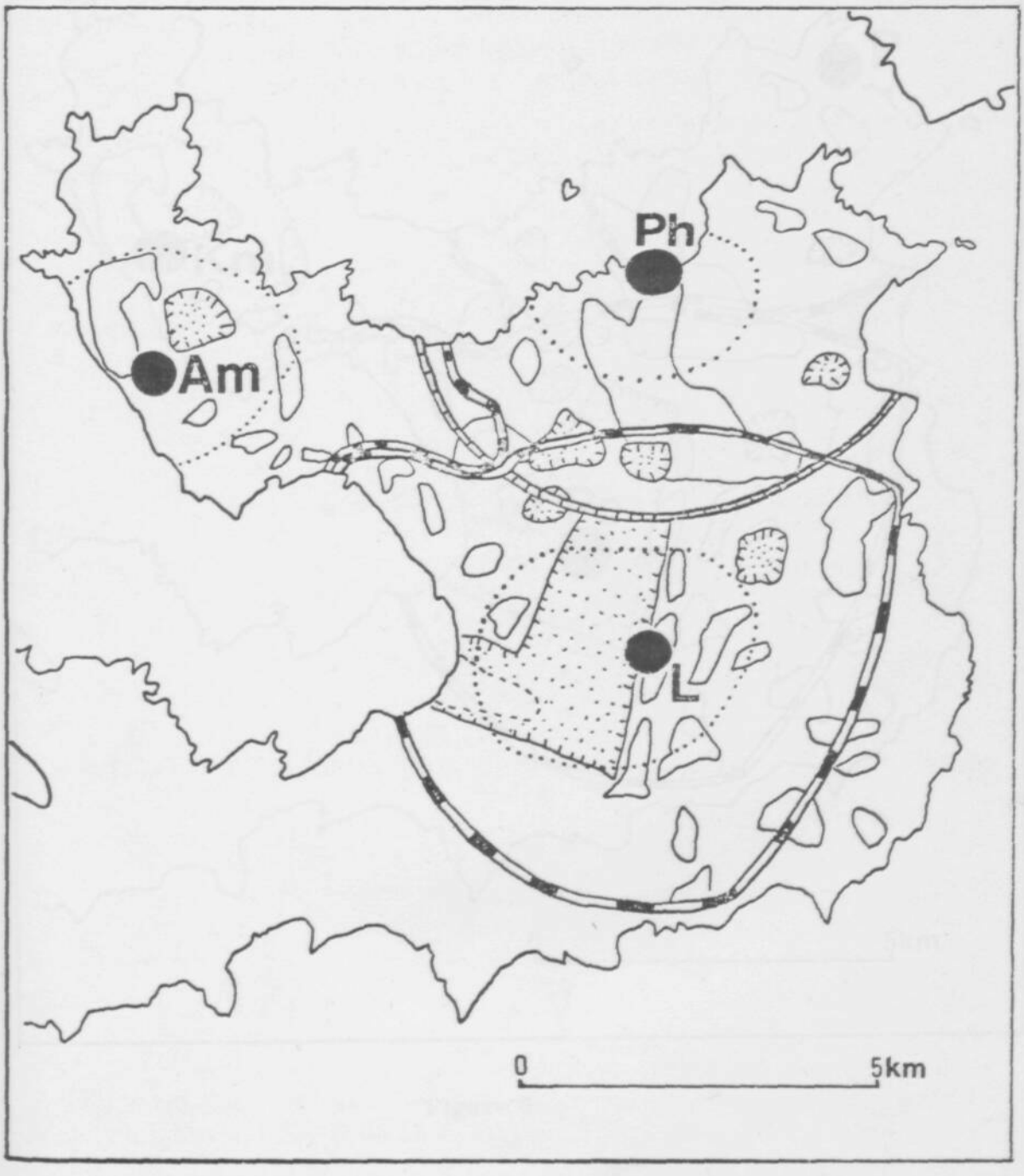


Figure 5

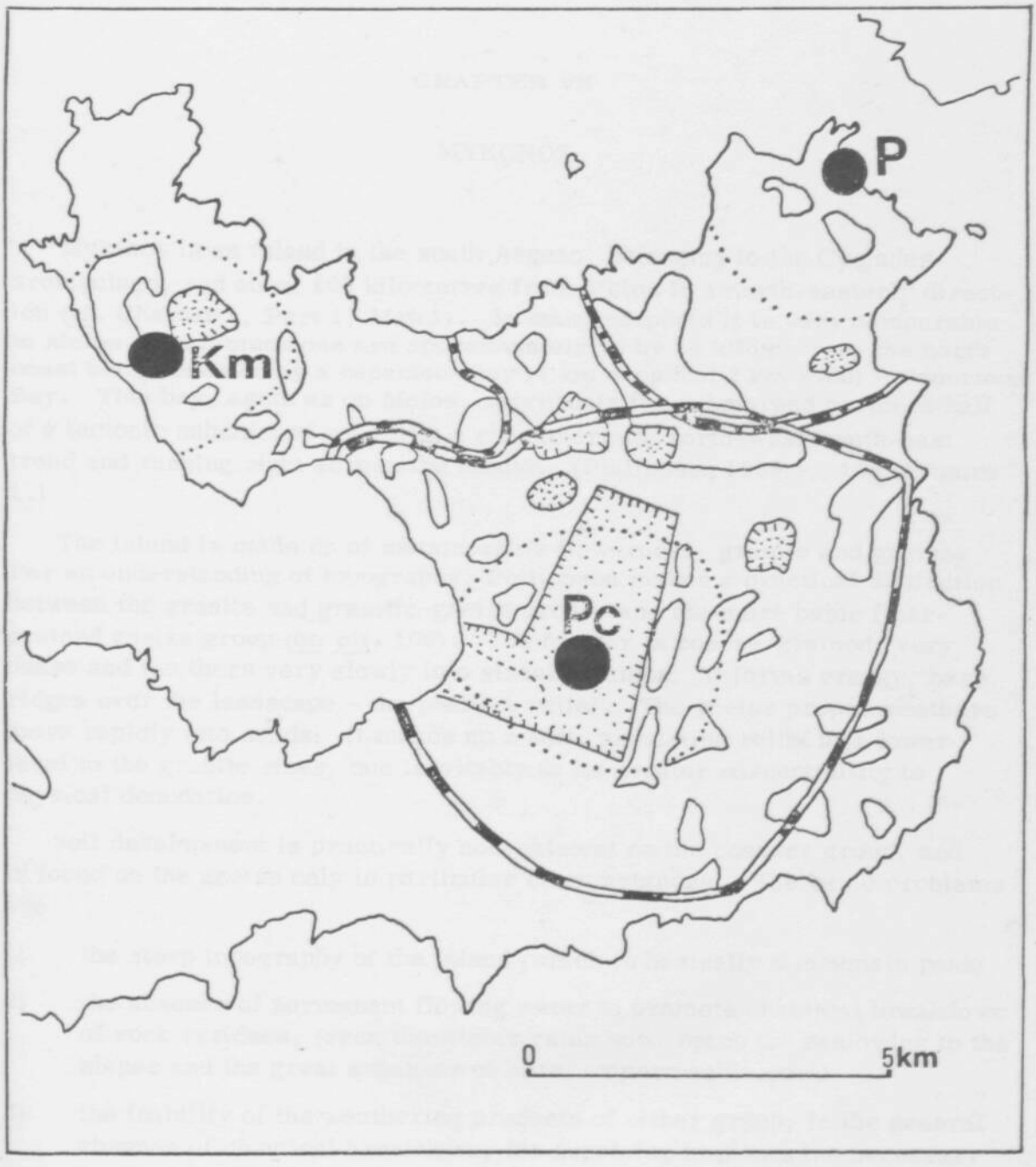


Figure 6

CHAPTER VII

MYKONOS

Mykonos is an island in the south Aegean, belonging to the Cyclades archipelago, and about 100 kilometres from Melos in a north-easterly direction (cf. Chapter 1, Part 1, Map 1). In many respects it is very comparable to Melos. Its dimensions are approximately 10 by 14 kilometres, the north coast being indented by a capacious bay (4 km deep and 2 km wide) - Panormos Bay. This bay, again as on Melos, represents the submerged northern half of a tectonic subsidence zone with a characteristic north-west/south-east trend and running right across the island. (Philippson 1959:4; 105) (Figure 1.)

The island is made up of metamorphic flow-rocks, granite and gneiss. For an understanding of topography, Philippson makes a practical distinction between the granite and granitic-gneiss group, and the more basic finer-grained gneiss group (op.cit. 106). The former is coarse-grained, very dense and weathers very slowly into sizeable lumps: it forms craggy, bare ridges over the landscape - the positive relief. The gneiss proper weathers more rapidly into sands: it makes up a soft, undulating relief at a lower level to the granite rises, due inevitably to its greater susceptibility to physical denudation.

Soil development is practically non-existent on the coarser group, and is found on the gneiss only in particular circumstances. The basic problems are

1) the steep topography of the island (which is basically a mountain peak)

2) the absence of permanent flowing water to promote chemical breakdown of rock residues, (even the winter rains soon reach the sea owing to the slopes and the great expanses of bare, impermeable rock)

3) the inability of the weathering products of either group, in the general absence of chemical breakdown, for supplying to plants the necessary nutrients and supporting skeletons (though such nutrients are abundant in the rocks, especially the more basic gneiss, they are locked in the rock matrix, cf. Melos Chapter).

The exceptional circumstances are provided by tectonics and the geological structure of the island. Just as on Melos, various localities on Mykonos are so structured so as to allow rock residues to collect in a relatively stable catchment centre, where a favourable environment of ponded drainage water encourages important transformations in weathering products transported there or accumulated in situ from underlying formations.

In the first place, long term tectonic trends have created plateaux surfaces and zones of depressions. Secondly, areas where the softer gneiss

predominates have weathered faster than the granite, and here numerous sunken shallow basins occur. In the latter situation the resultant soil is doubly valuable owing to the superior nutrient content in the gneiss.

In Figure 2, three zones are isolated, in which a reasonable soil has developed as a result of the above processes. East of Mykonos town, but separated from it by a steep and rocky slope, is a high plateau running north-south. Its horizontal to slightly concave surface is fairly fertile as a result of the first process, and this is the arable land that must always have been associated with the community living below by the port.

North-east of this plateau a deep hollow is found, in the shelter of the Mavrispilia hills. It is poorly drained, and even in mid-summer surface water can be seen in the depression centre. Between rocky granitic ridges islands of gneiss form a well-cultivated soil. This zone seems to have arisen from a combination of both processes.

Finally, the most extensive area of arable land on the island is found to the east and south of the village of Ano Meria (Philippson 1959: 108). Here a basically concave basin is formed of accumulated gneiss hollows with intervening granitic rises. The whole is bordered by a 'circuit wall' of enclosing granite and sandstone hills. This is the centre of the island's agriculture. On the north-west rim of this basin, and beside the Ano Meria village a small but steep hill marks the location of an important prehistoric and historic settlement - Palaiokastro.

The remainder of the island is composed predominantly of bare granite, with only here and there a small patch of half-formed soil (op. cit. 108: "Uberall nacktes oder von dünner Verwitterungskrume kaum verhülltes Gestein"). The limited expanses of other rock formations nowhere create important farming areas, though terraces of recent marine carbonates or 'poros' occurring over a small zone of the Anavolousa promontory were probably significant to the prehistoric people who left their implements and their dead on the promontory (see below). The Mavrispilia site (number 1) occupies a ridge of Pliocene sandstone of no agricultrual or even pastoral potential. Finally, in the natural hollows of the gneiss and the very rare torrent beds, a limited amount of recent alluvium is found. Though likely to be historic in date, it would have been preceded in the depressions by a mature soil, and only in the stream beds will the Historical Deposition (cf. Geomorphology Chapter) have produced an abrupt change in the type of deposit present. In fact during the author's tour of the island, the only alluvial deposit observed that might be of consequence in recent landscape changes consisted of the silted up mouth of a stream entering the Panormos Bay in its south-west corner.

As far as arable farming is concerned, it will be clear from Figure 2, that the Palaiokastro site (number 2) is the only one immediately accessible to a sizable acreage of developed soil.

PALAIOKASTRO AND ANO MERIA (Numbers 2 & 3)

The site of Palaiokastro is a steep hillock of bare rock, whose summit is encircled by a stone wall of recent, Medieval and probably ancient construction.

Occupation may have commenced perhaps as early as the Early Cycladic period (Bakalakis 1964: 558; Renfrew 1972: 524), certainly Middle Cycladic is commonly represented in the pottery finds, some Proto-Geometric and Geometric, plentiful Archaic, Classical and Hellenistic, while in the Medieval period it served as a fort to protect the surrounding countryside (Bakalakis op. cit. 558; Scholes 1956; see also AD Vol. 26, 1971 (Chron.) p. 463ff.) It is the only Middle Cycladic site on Myconos, and we lack any evidence for the succeeding Late Cycladic phase.

The location is generally identified with the other Classical city on Mykonos in ancient references (Ancient Mykonos city itself probably underlying the modern town). In the third century B.C. the more important centre of Mykonos proper absorbed the other city, though one might strongly suspect that the latter continued as a prosperous farming community with subordinate political status (Philippson op. cit. 109).

The hillock sits astride the rocky rim of the fertile Ano Meria basin, but also overlooks the broad Panormos Bay far below to the north-west. While its immediate advantages are defensive, there is little doubt that the prime value of the site are the land resources that it commands, and this is borne out by the adjacent village of Ano Meria. The latter is about as populous as Mykonos town, and the two centres have traditionally served complementary functions. While Mykonos had in recent times a population almost exclusively employed at sea as fishermen and inter-island traders, Ano Meria was the focus of the farming community (Philippson op. cit. 109). However, as we see on Figure 2, Mykonos is associated with a distinct arable heartland, even if its production is insufficient to cater for modern and probably ancient Mykonos town.

Further indication of the key value of this location is provided by two religious foundations, a nunnery immediately below the prehistoric site, and a monastery on the edge of the Ano Meria village. The landed wealth of the monastery is even today a prominent feature of the island economy.

The two foci of the Classical period are therefore natural responses to the landscape, for between the Mykonos plateau and the Ano Meria basin the traveller crosses a wide area of almost 100% bare rock. That synoecism was probably inevitable may be stated on the grounds that Ano Meria had only inadequate port facilities in Panormos Bay, Mykonos inadequate cereal lands on its plateau.

In the probably only temporary absence of other Middle Cycladic sites on the island, one might speculate on the importance of this location in that period. Scholes' characterisation (1956) of the MC epoch as one in which a definite nucleation of population took place in the Cycladic isles (cf. Melos Chapter), and each island centred upon a town (often fortified) located in close proximity to extensive fields and port facilities, does seem to fit the general character of this site. As on Melos, the best harbour was neglected in favour of the best land and good fishing resources (see below and cf. Melos Chapter). Parts of the defensive wall could be prehistoric, and the later use of the site in the Dark Ages (PG and G pottery) and the equally insecure Medieval period adds confirmation to the suggestion that we see here a natural focus of settlement in dangerous as in peaceful times.

MAVRISPILIA (Location 1)

Looking down onto the Panormos Bay from the walled summit of Palaiokastro a dark ridge of Pliocene sandstone dominates the west and south-west side of the inlet (Figure 3). It is interrupted by a small beach facing east, and along the ridgetop above the south of this beach, a locality called Mavrispilia, have been found numerous obsidian artefacts and occasional minute fragments of coarse handmade pottery (Renfrew and Belmont 1964: 395-7). Colin Renfrew has compared the pottery and the obsidian industry to other sites of his Late Neolithic Saliagos Culture, though one potsherd could belong to his Early Cycladic 1 or Grotta-Pelos Culture. The tools are typical Saliagos, an assemblage dominated by the tanged and shouldered point (Figure 3, point-types A to D).

The ridge is bare rock quite devoid of soil, and must always have been so. The arid environment, the extreme sandiness and porosity of the rock, the exposed position of the ridge to biting northerly winds, the steepness of its slopes (that begin right at the top of the ridge), all combine to produce its stark aspect. Accessibilty is difficult or even dangerous except up the axis of the ridge from Phtelia beach, the sandy southern shore of Panormos.

In their discussion of the site, Renfrew and Belmont (Idem 395) point out the defensive attractions of the location, the adjacent sheltered Bay of Panormos, but also the absence of a water supply except below the bed of the torrent north of the site. Erosion is held to account for the lack of house remains.

What they do not mention is that in summer and probably throughout the winter as well, the violence of the wind on the ridge is quite devasting, sufficient to preclude any permanent occupation up here during those months, Panormos Bay is orientated directly into the prevalent northerly winds, which dominate those seasons, and the wind is funneled down the Bay stirring up long breakers and lifting fragments of beach sand onto the Phtelia shore. The Bay is in fact not at all sheltered, as both Philippson and the Admiralty Handbook had noted (Philippson op. cit. 105-6: "die Bucht Panormos, ...die gegen den N-Wind schutzlos ist"; Admiralty Handbook, Greece, Vol. 3, 1945, 440: "the deep bay of Panormos which is completely exposed to the north, and appears to be little used").

However the little beach north of the site is very calm water even if quite a scramble from the ridge-top. Phtelia beach to the south and its plain are almost entirely made up of old and new sand dunes, with the above-noted exception of a recent alluvial deposit in the west shore zone. If this alluvium, which is quite possibly a post-Classical formation, conceals a further inlet of the Bay of prehistoric date, then ships could have sheltered securely both here and in the Mavrispilia inlet, at all times of the year. Scholes suggests that much of Phtelia beach is very recent and once the Bay was far deeper inland (Scholes 1956). It should be pointed out though that a large ridge of cemented sand dunes runs the length of the Phtelia plain and beach, and disappears beneath the waves for some distance. Such a feature may well be a formation from the dry late Würm period, when sea levels were at least 100 m lower than today (Butzer 1972:306-9 - 'regressional aeolianites' descending underwater of late Würm date), and this would argue strongly for little change in the dune nature of the plain, and probably a less extensive Bay in antiquity

(with the possible exception of the south-west corner), if we allow for a recent eustatic rise of sea-level.

Turning to the arable land available to occupants of the Mavrispilia site, the zone of basin soil noted on Figure 2 is some distance from the ridge and only reached with any ease via a long detour to Phtelia beach. A low terrace of recent alluvium accompanies the small torrent bed north of the site but is of a characteristic post-Classical type.

The real key to the location is to be sought in the fishing resources of the Bay, and these are discussed below.

MYKONOS TOWN AND ANAVOLOUSA

The ancient and modern town of Mykonos (Number 6) lies at the foot of a steep rocky slope that ascends to the arable plateau to its east (see AD, vol. 26, 1971, p.463 ff.). It faces, on the west, a long but narrow inlet of the sea, that begins in the north at the Stephanos promontory and runs down due south to the sand isthmus that connects the Anavolousa peninsula to the main island. The north part of the inlet is Tourla Bay, the centre is occupied by the inner harbour of the town, and the south is taken up by Korphos Bay. The whole complex is sheltered by the Stephanos promontory and the island of A. Georgios at the north end of Anavolousa, and formed the inner and outer harbour of Ancient Mykonos. A continuation of this axial indentation in the island is found across the sand isthmus as the Bay of Ornos. Figure 4 shows the main areas of shallow water in the Myconos island group, and it will be noted how they are particularly protected as anchorages around Mykonos town.

The hills that rise around this long Bay and the Anavolousa peninsula are almost bare granite with hardly a trace of soil, with the exception of the limited terrace of recent marine sands and marls that winds around the lower levels of the east and north coast of Anovolousa. Even this relatively cultivable oasis is hardly enough for more than a family or two to subsist on with dry-farmed cereals. For any larger unit of society the high plateau and the resources of Ano Meria would be necessary to call upon.

But owing to the insecurity of the Panormos anchorage, the absence of any other large and sheltered bays on the island, and the immediate proximity of excellent fishing grounds, Mykonos was able to develop as a town almost solely occupied with marine activities, fishing and inter-island commerce. The inhabitants formerly owned a large fleet of sailing ships for these activities (Philippson op. cit. 109), but even today the harbour, Tourla and Ornos Bays are full of small and medium-sized craft.

The prehistoric site of Anavolousa (Renfrew and Belmont 1964: 396-7) lies along a low ridge on the north coast of the peninsula of the same name (location 5), facing the little island of A. Georgios. It consists of coarse pottery fragments and an obsidian industry of a fairly general character. Though suspected to be of Early Cycladic date, it is not impossible that the remains are Neolithic, since the assemblage is lacking in distinctive types. Renfrew and Belmont point to the outcropping of marble (of an inferior quality) along the ridge behind the site, and this is the only occurrence of the stone on Mykonos. Marble of island sources certainly travelled widely over

southern Greece in the Bronze Age, whether by trade and prestige chains (as Renfrew among others has suggested), or the parallel movement of people engaged in more mundane subsistence activities (as the present writer has proposed, cf. Argolid and Melos Chapters).

It should also be noted, however, that the location is beside the marine terraces with their potential for agriculture (and an adjacent threshing floor serves to emphasize this possibility); close to the site there is also a spring, which is the only one mentioned on the island by Philippson (Philippson op. cit. 108); finally the shallows behind the A. Georgios island, and the nearby sheltered shallows of the Korphos Bay, are ideal for small craft, and for fishing.

Once again it seems probable that fishing was an element of importance at this location. Before turning to that resource, it is necessary to mention two chamber tombs of the Early Cycladic 2 or Keros-Syros culture, which are dug into the 'poros' terrace just north of the Anavolousa sand isthmus (Bakalakis 1964: 555; Renfrew 1972: 414). They could just conceivably belong to the Anavolousa site, or perhaps to a settlement yet to be discovered on the shore of Korphos Bay - which they face onto. The Bay is another harbour and fishing location, the marine terrace runs through the tomb area. It is actually not clear whether the sand isthmus separating Korphos and Ornos Bays was present in prehistoric times. While composed chiefly of recent sands (Philippson op. cit. 106), there does exist a small central ridge of older, cemented sands, perhaps comparable to the similar formation down the Phtelia sand beach (Philippson op. cit. 106), and this might support the existence of the sand barrier throughout the Holocene. An open pit through the recent sands showed almost $2\frac{1}{2}$ m of sand with a thin pebbly layer near the top; this might add to the case for a long-standing barrier at this point.

FISHING IN THE MYKONOS ISLAND GROUP

Discussions with local and visiting fishermen gave the following consistent picture: (Figure 5)

Myconos and its neighbouring isles are rich in fishery resources, and for this reason there are a good number of professional fishers resident on the isle and also a good number of visiting crews throughout the year. Particularly mentioned were visiting fishermen from Kalauria, Salamis, Chalcis and Eretria (cf. general fishing map for Economics of Settlement Chapter). While the writer was in Ornos Bay in July, three large craft from Eretria were anchored there. Members of the crew stated that they fish here for about a month, but also visit other islands in the Cyclades, e.g. Melos.

While good catches may be made all round the coasts of the Mykonos-Delos group, a few locations were especially singled out as being key resources - notably during the spring and autumn fish runs (Maiatika and Manalia; cf. Economics Chapter). Panormos/Phtelia Bay was noted as very good for the Maiatika; Korphos Bay good for both Maiatika and Manalia; Delos was good in both periods, but was especially notable for its May tunny catch; A. Georgios was good in the Maiatika but was worth fishing around at all times of the year. Tunny were a major catch in the fish run periods.

The reasons for preferential fishing in these spots seem fairly clear. Quite apart form the exceptional place of the Cyclades for good catches, especially of migratory fish, amongst Greek waters (cf. Economics Chapter), the Mykonos island group offers a number of shallow shelves, some of which are sandy (Panormos and Korphos) and hence ideal for the spring spawning runs, some of which are shallow passages of sheltered water (A. Georgios shallows) through which the fish course during the runs or in which the fish shelter in the windy summer and winter periods. According to Philippson, since Mykonos is a submerged mountain, most of its coast descends rapidly to some depth, and only the locations on Figure 4 are suitable for inshore fishing and for the runs (Philippson op. cit.108: "Die Insel Mykonos ist, abgesehen von der Halbinsel Anavolusa, ein einheitlicher Gebirgsklotz....Steil fällt der Klotz nach allen Seiten zum Meer ab, das nahe am Ufer 60-80 m Tiefe besitzt.")

Given the poverty or lack of arable resources in the immediate neighbourhood of Mavrispilia, and Anavolousa (including both sites on the latter peninsula), the local abundance of marine food is hardly coincidental. Defensive considerations and the mining of marble seem much less satisfactory explanations of these settlement or activity areas. Anavolousa is especially adjacent to a shelf of excellent all-year fishing (round A. Georgios islet) and nearby is the Bay of Korphos with its sandy beach and seasonal catches. The low-grade marble may certainly have been collected at the same time, and the limited poros terrace sown with cereals. Regrettably the lack of distinctive tool types prevents confirmation.

However, in the case of Mavrispilia, the obsidian industry presents adequate confirmation of a fishing interpretation for that site. The recognition by Renfrew that the type-site of his Late Neolithic Saliagos Culture was a fishing village, with a predominant interest in seasonal tunny catches, and a predominant tool type being an obsidian point interpreted as a fishing-leister (Evans and Renfrew 1968: 79), led the writer to gather evidence for an identical interpretation of the Saliagos site at Agrilia on Melos (cf. Melos Chapter). Mavrispilia has an obsidian assemblage in which the only frequent recurrent type is the same tanged and shouldered point (Figure 3) (Renfrew and Belmont 1964: 396 - "Undoubtedly the most remarkable aspect of the industry, and indeed the chief interest of the site, is the fine series of flate-flaked arrowheads....The arrowhead is the only commonly recurring type.")
In addition the hill overlooks a Bay well-known and visited for its May fish run catches (in which migratory fish such as tunny feature prominently), and close to the site a sheltered beach provides a base for the boats. On Melos the Phylakopi Bay by Agrilia was again open to the gusty northerlies, while a side inlet was clearly chosen for the anchorage or roadstead. It was pointed out earlier (cf. Argolid Chapter) that the migratory fish are watched for from headlands or artificial towers, and here the Mavrispilia ridge is similar to Agrilia in its view over the surrounding waters. It is also no coincidence that the ridge is virtually unoccupiable EXCEPT in the still seasons of spring and autumn.

DELOS

The Early Cycladic 2 or Keros-Syros settlement on the hill of Kynthos on the island of Delos, (only 3 km separate the Anavolousa promontory from

Delos), and the subsequent Middle and Late Cycladic settlements on the isle (Renfrew 1972: 514; Scholes 1956), seem somewhat surprising when we consider that it has an area of only 4 sq. km. In addition almost all the island is composed of granite, with but a small patch of gneiss in the north-west. The neighbouring and larger isle of Rhinia is but a kilometre to the east, and significantly all the northern half of this, and that part immediately adjacent to the area of the prehistoric and historic communities on Delos, is made up of gneiss (Philippson op. cit. 111). One might point therefore to a limited area of workable (if not very fertile) arable lands associated with these sites (Figure 5).

Before the recent tourist boom on Delos, both Delos and Rhinia were inhabited seasonally by farmers, shepherds and fishermen from Mykonos (Idem 111; Admiralty 1945: 442). This extensive approach to poorer resource zones has been commented on earlier (cf. Economics of Settlement Chapter). Owing to the limited food resources it is possible that occupation at these prehistoric sites was also seasonal, with winter and spring activity on the scanty cereal fields, summer visits by herders with their goats, and spring and perhaps autumn gatherings of fishermen for the bountiful fish runs.

During the Late Cycladic, amid the remains of Mycenaean settlement on Delos, there is some evidence for a Mycenaean sanctuary (Hope-Simpson 1965: 180) in the area of the famous Classical and Hellenistic sanctuary. This is not the only possible element of continuity between Mycenaean ritual sites and later Greek sanctuaries - though this field is an area of passionate debate (cf. Ritual Chapter and Vermeule, 1964: 287-8). There is an interesting historic claim, that the Athenians of the Classical period continued to send a sacred boat to the Delian religious festival that had been used by their legendary king Theseus on his return from slaying the Minotaur on Crete. If this ruler has any historic background, he is generally believed to be a prince of Mainland Mycenaean stock who took part in a successful raid on Crete, about the end of the 15th century b.c. Interestingly there is a deliberate series of political takeovers by Mainland Mycenaeans (e.g. at Phylakopi on Melos, Knossos on Crete) and it would not be improbable that Delos came into the sphere of these events. Whether its possible sanctuary was already of regional significance in Mycenaean times, as might be suggested by the Theseus legend, is quite unknown, for the Athenians could well have been backdating their dominant historic role in the festival to provide legendary justification. Nonetheless, Mycenaean finds begin on Delos in the first Late Helladic period, that is around the probable date of the Mycenaean expansion through the Aegean.

The island was certainly during the suceeding Dark Ages already a centre for a wide area of the Aegean, and at the five-yearly Greater Delian Festival, and the annual Lesser Delia, ships from all over the Aegean arrived to represent their states at the religious rites. The states involved were all of related origin as the Ionian group of the complex Greek peoples. In these gatherings ceremonial integrative activity is obviously a prominent factor, the renewal of very old ties between particular related communities. When Athens wished to dominate the other coastal towns of the Aegean, she began very cleverly to assert her pre-eminence over the Ionians by a takeover of the Delian Religious Festival. This process of secularisation of a widespread

community united by religio-cultural behaviour has been given its due emphasis in earlier chapters (cf. Socio-Political and Ritual Chapters).

Although the historical development of Delos is of intrinsic interest as a model of social processes, it might be of some importance that activity on the island, before the sanctuary encouraged the settlement of service staff, was probably mostly seasonal visitations from other islands. In particular, the gathering of fishing crews from different parts of the Aegean for the May fish run and the tunny kill, if we may speculate somewhat, could have formed a first stage in the growth of a regional meeting-place for religious purposes or for exchange of goods. Delos from the Dark Ages on served both, for its fair was as well known as its ceremonies, while by the Hellenistic and Roman period the economic side dominated completely. The Kalaurian Confederacy is closely comparable to the Delian, in representing a phase of religious communities covering a larger area than any secular organisation. Again it comprised a number of coastal settlements that even today send fishing crews to identical waters (cf. Argos and Economics Chapters).

OTHER PREHISTORIC SITES ON MYKONOS

The author was unable to visit two sites published by Bakalakis (Bakalakis 1964: 556; Renfrew 1972: 514) (Numbers 4 and 7), which are probably Early Cycladic settlements.

The Bouka site (7) north of Myconos town, is definitely by the shore of Tourla Bay, and backed by fairly infertile granite slopes. One might tentatively suggest a small marine community or activity area (a function a small hamlet in the neighbourhood now serves).

The site Dhiavouni (location 4) on the south-east coast of the island, sits on a promontory between two bays. These inlets are not secure anchorages (Philippson op. cit. 106), though the promontory encloses a smaller bay of unknown attractions. Probably marine factors are important here also.

THE CHURCH ON MYKONOS (Based on verbal discussions with an inhabitant of the convent and a theology student cataloguing the island's churches)

In the context of our investigations into the Monastery Economy (cf. Ritual Chapter), the rich Tourliani Moni beside Ano Meria is a typical successful foundation. Till confiscation proceedings in the last century, this monastery owned all the fertile Ano Meria land, the peasant farmers being its tenants. Even today the monastery is rich in land, houses, warehouses and lets out its property to local people and tourists alike. The convent below Palaiokastro is a more recent and less well-endowed foundation, though doubtless still maintained by its tenant farmers.

Mykonos is studded with little white chapels; 365 are claimed by the Greek Tourist Office (Greek National Tourist Organisation, Mykonos pamphlet, 1972) - one for every day of the year. This is more than an idle claim, for the annual festival of each chapel is a significant occasion for its surrounding farmers. Though Mykonos town and Ano Meria are inhabited by a good many farmers, part or full time, much of the fieldwork is done from field-huts by

the family holdings, and a high proportion of the farming population live in dispersed farmsteads amongst their fields, as on Melos. The chapels served formerly as burial centres for family groups, and ancestral shrines, and communal integration rituals were tied into these bright spots over the dark landscape (cf. Melos Chapter).

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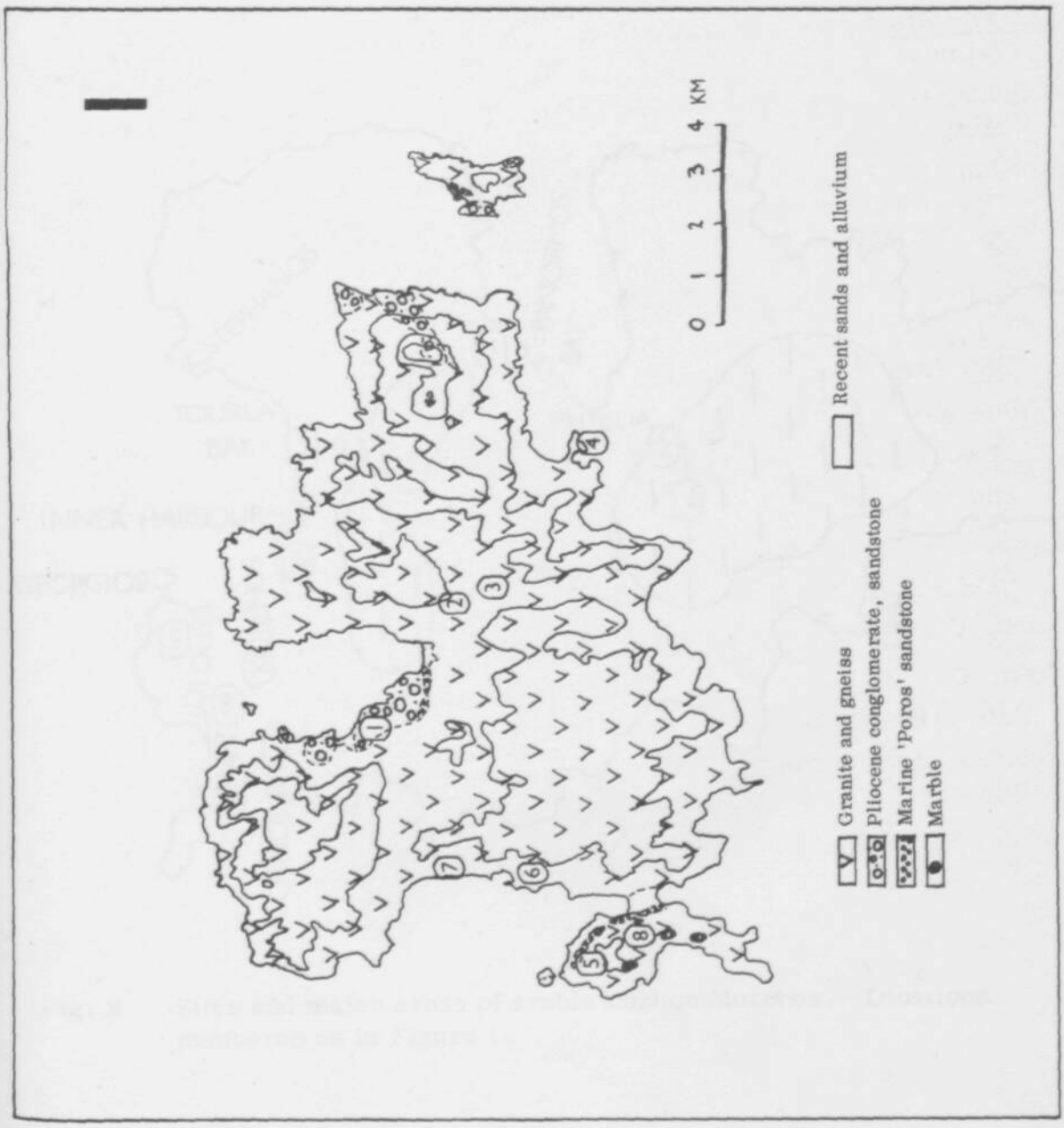


Fig. 1 Geology of Mykonos. Sites -

1 = Mavrispilia
2 = Palaiokastro and Convent
3 = Ano Meria and Moni Tourliani
4 = Dhiavouni
5 = Anavoloussa
6 = Mykonos town
7 = Bouka
8 = Isthmus chamber tombs

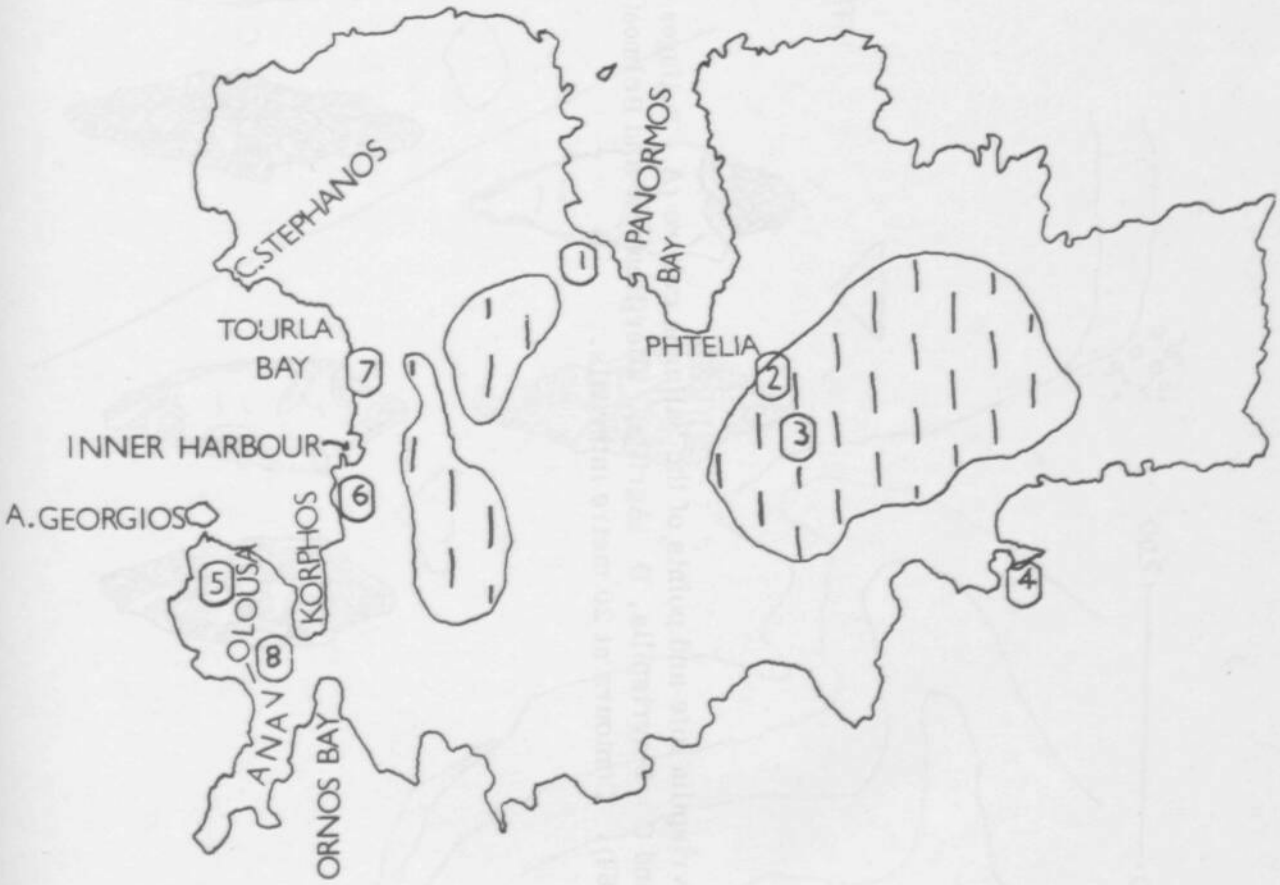


Fig. 2 Sites and major areas of arable land on Mukonos. Locations numbered as in Figure 1.

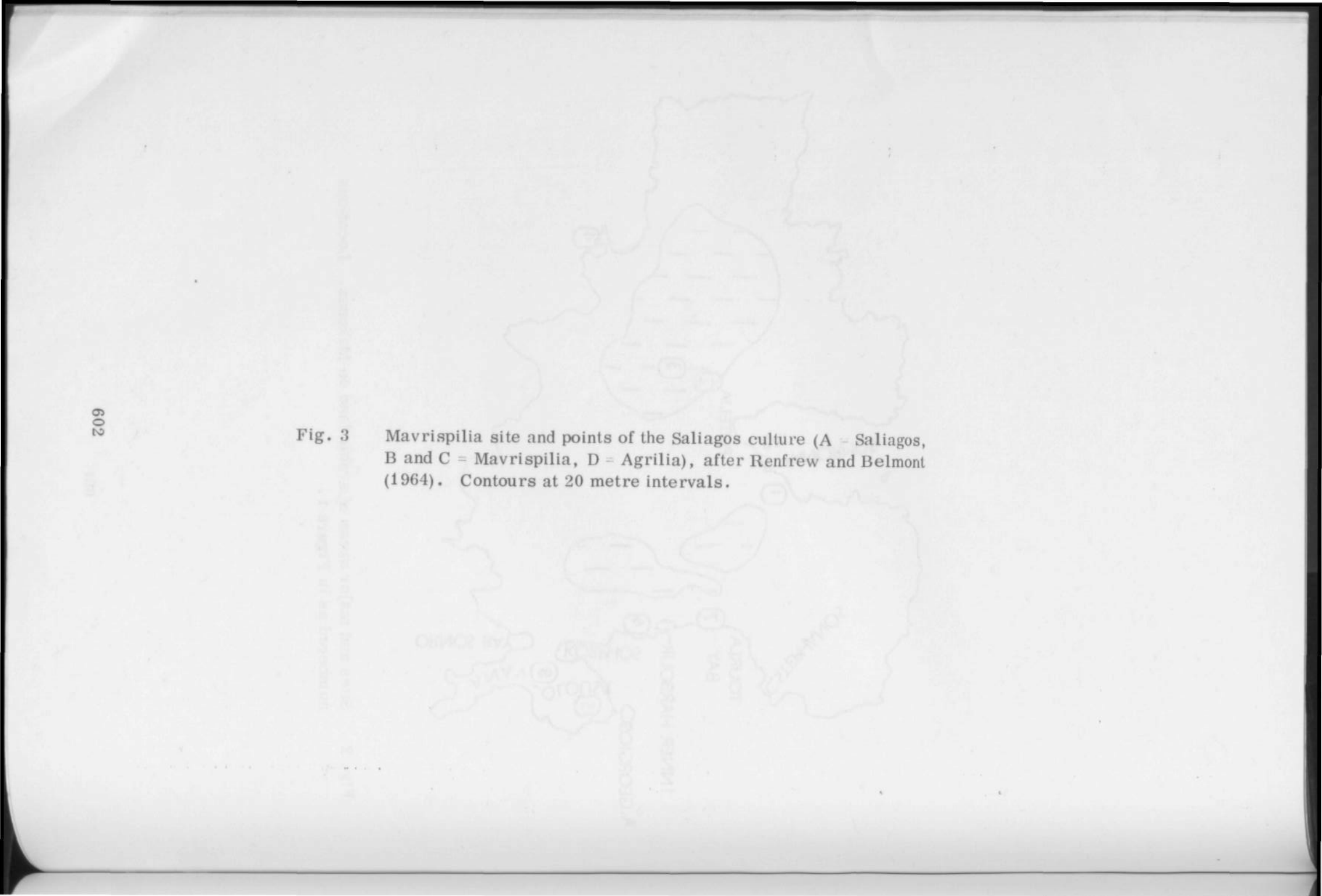
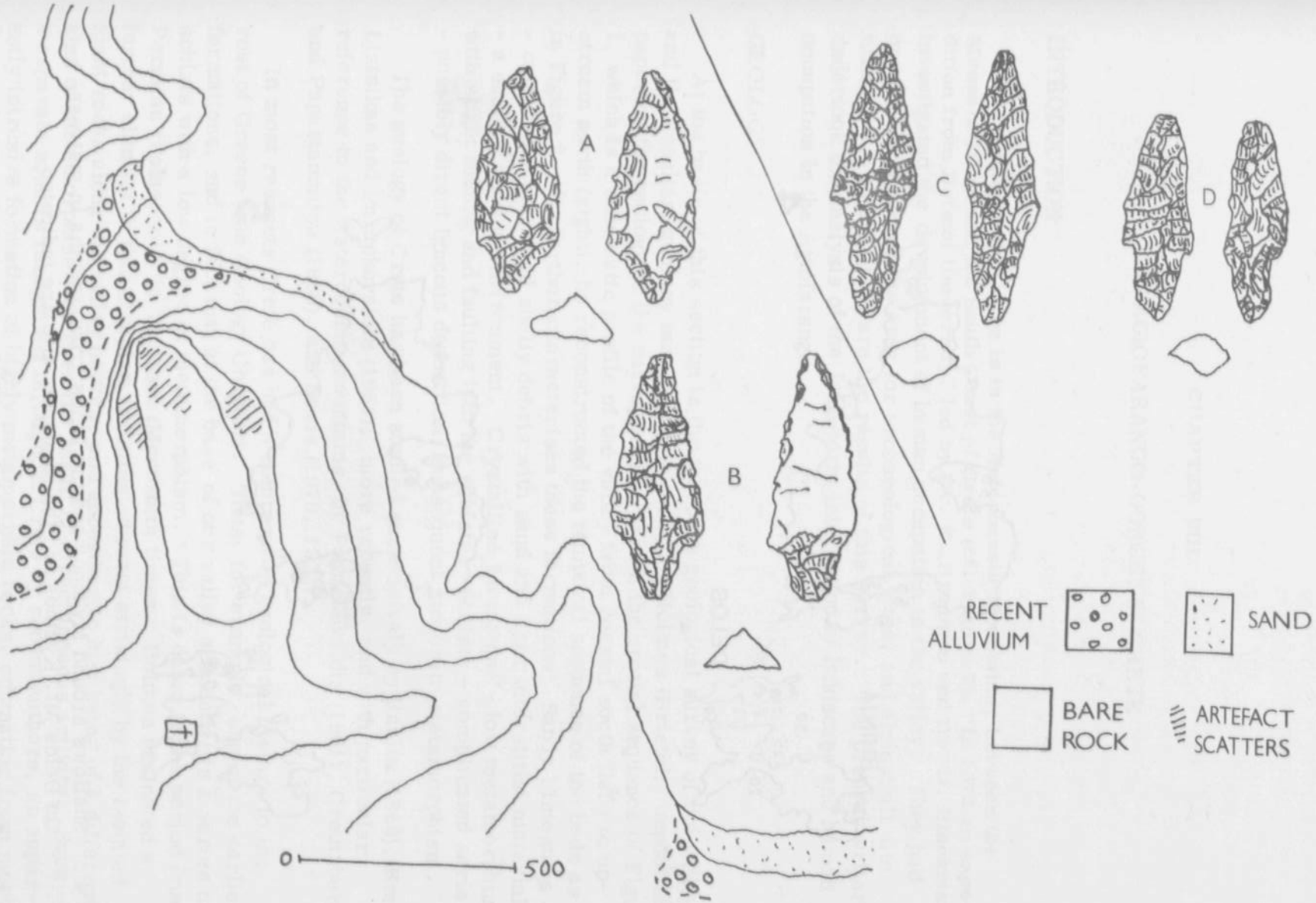


Fig. 3 Mavrispilia site and points of the Saliagos culture (A = Saliagos, B and C = Mavrispilia, D = Agrilia), after Renfrew and Belmont (1964). Contours at 20 metre intervals.


A
B
C
D
RECENT ALLUVIUM
SAND
BARE ROCK
ARTEFACT SCATTERS
0
500

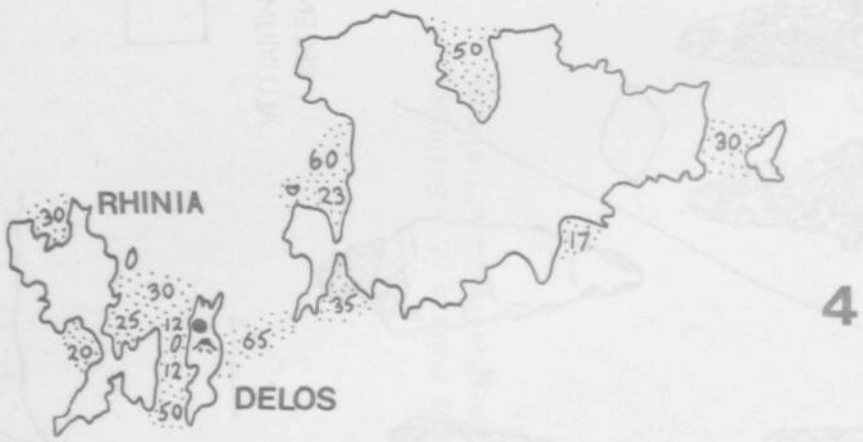




Fig. 4 Shallows around Mykonos and the Delos group (depths in metres). On Delos Mt. Kynthos and the sanctuary site are indicated.

Fig. 5 Major fishing grounds in the Mykonos/Delos group (fish symbols) with associated prehistoric sites.

CHAPTER VIII

THE AGIOFARANGO GORGE, S. CRETE

INTRODUCTION

The Agiofarango Gorge is in the Asteroussia Mountains, between the Messara Plain and the South Coast of Crete (cf. Figure 7). In 1972 an expedition from Bristol University, led by Dr. K. Branigan and Dr. D. Blackman, investigated the development of human occupation in the valley. They had previously surveyed the area for archaeological sites, and almost all sites examined in this chapter are the results of this survey. The present writer undertook the analysis of the long-term interaction of landscape and human occupation in the Agiofarango.

GEOLOGY

At the basis of this section is the thorough geological survey of the valley, and the resultant geology map, undertaken by D. Holmes (Bristol: unpublished paper on the geology of the survey area). From the spatial sequence of Figure 1, which is a schematic profile of the valley from coastal south (left) to upstream north (right), he reconstructed the temporal sequence of the beds as in Figure 2. He further characterises these formations: Sandy Limestone - calcareous cemented shelly debris with sand and finer interstitial material - a shallow marine environment. Crystalline Limestone - low metamorphism with slight folding and faulting into the schists. Schists - complicated series - possibly direct igneous deposition, subsequent moderate metamorphism.

The geology of Crete has been studied successively by Raulin (1869), Renz, Liatsikas and Paraskevaidis (1954); more recently, and with particular reference to the Asteroussia mountains, by Paraskevaidis (1961), Creutzburg and Papastamatiou (1966), and Davis (1970, 1972).

In most respects Crete has had a comparable geological history to the rest of Greece (see Geology Chapter). Thus, for example, one of the earliest formations, and in fact that at the base of our valley sequence, is a series of schists with a low degree of metamorphism. This is dated to the period from Permian (Palaeozoic) to Triassic (Mesozoic) times. Holmes has noted a further element in this complex, manifested most strikingly by the isolated giant rocks along the valley bottom, and according to him being of a different kind of metamorphism, or even the result of direct igneous activity. Such a separate zone is recognised throughout Crete by recent authors, an apparently intrusive formation of highly metamorphic rocks, emanating from much deeper layers of the crust. The appearance of this latter series may be considerably later, and is very probably to be associated with the tectonic

upheavals of the later Mesozoic era, when lines of tectonic pressure saw frequent emission of flow rocks. A close parallel is found in the valley bottom eruptives of the Argolid area (cf. S.W. Argolid Chapter). East of the gorge, Paraskevaidis (1961) has described both eruptives and metamorphisation within the upper part of the Tertiary Flysch.

Following the basal schists in time were two major limestone formations, the crystalline group identified by Holmes chiefly at the southern end of the valley, but also present at the northern end (cf. the distribution of Group D on the Soil Map; Figure 9). Holmes pointed to the apparent unconformity between the schists and the hard limestone, a situation general for Crete. The northern limestone formation belongs to the central Asteroussia mountain ridges, all composed of this same rock, but there is actually a significant difference between this zone and that found in the south gorge area. As will be remembered from the Geology Chapter, the Mesozoic period saw most of Greece under the ocean, in a system of submerged ridges and furrows. The Cretan ranges, orientated east-west, are the continuation of the Mainland axes of the Tripolitsa and Olonos-Pindos zones, curving round to connect up to the Anatolian mountain arc. The Tripolitsa limestone is represented by the northern formation in our valley, the Olonos-Pindos by the southern. Both were deposited under the ocean at roughly the same time, the Mesozoic (Jurassic on) and early Tertiary. But whereas the O-P, in its Asteroussia manifestation known as the Ethia series, was laid down in approximately its present geographical area, the Tripolitsa limestone was deposited far to the north, and only as a result of the violent and spectacular post-orogenic activity in Greece was a great massif overthrust to the south, as far as our valley. As a result of this, a subsequent formation to the east of the gorge, an early Tertiary flysch, is often found overlain by the Ethia limestone, of earlier age.

This flysch represents weathering debris from a dry land mass to the north, and is of Palaeocene and Eocene date; none is found in the gorge. At the same time, or shortly after, the two hard limestone formations were being raised up above the sea in an orogeny. However the Cretan land mass was soon to be almost completely submerged in the post-orogenic sinkings of the middle Tertiary. Thus in our valley, a soft limestone series represents the Miocene post-orogenic submergence, a shallow sea series. But although the peak of the Tertiary oceanic transgression in Crete was during the Pliocene, when only the high mountains were above the waves, the valley, as the rest of Asteroussia, was undergoing a relative uplift, so that it lacks evidence of Pliocene sediments. The great series of such sediments at this time is well represented from the north edge of the Messara Plain right across to Heraklion on the northern coast of the isle.

Finally the waters withdrew, at the end of the Pliocene, and Crete has been dry land ever since. Of the Quaternary period, our valley exhibits only a Holocene alluvial terrace of no great height or age, and the Kiriake alluvial fan.

As Nevros and Zvorykin (1939) note - the highest points of the isle of Crete lie near the south coast, hence the fall to the sea here is abrupt and steep; although the overall rainfall allows the land surface to contain a significant

amount of water in the moist part of the year, the relief of the isle is at most places so furrowed that this water rather furthers the denudation processes than the formation of typical soil profiles. From the analyses of these authors of soils and parent materials in Crete it can be seen that of the three main rock groups, under ideal conditions, the hard limestone is a very poor soil producer, the soft limestones and schists of good potential. As they added, and as both Liatsikas (1935) comment for Greece as a whole, the uneven spread of the rainfall and the high evaporation, together with the abrupt relief cited above, work against the actual formation of deep and well differentiated soil profiles, even fromrocks with favourable mineral combinations (suitable bases and clays). In such a situation, the soils formed bear close resemblance and even identity to parent materials. The decisive influence in Greece of the content and relief of the rock formations, and of local climate, are factors which rank foremost in all these writers' descriptions of the present landscape.

A typical section of the valley is given in Figure 3, to illustrate its structure. Schematically, with the exception of the great gorge of hard limestone at the coast, our valley present very little longitudinal diversity of rock formation, and the dominant trend is in clear-cut vertical differences. Between sheer to steep cliffs of marly limestone to east and west, the valley is further cut deep into older schists. At the junction of the two, however, there is usually a notable 'step' or plateau at heights of about 30-100 feet above the present riverbed, of schist with often a highly significant lens of marly limestone overlying it, and giving the appearance in cross-section down the valley of a continuous range of hillocks between, and running parallel to, the valley floor and enclosing white marl cliffs. Finally the bed of the river is accompanied by a marked alluvial terrace of 2-4 metres average height, often greater where overlain by colluvia and simple gravity slump from above and behind.

There are clear traces of the dynamism of the present landscape, and by inference of the past one, in processes where Man's interference is probably not the main factor - most significantly in the action of water. More recent events are discussed under Geomorphology. Fluvial forces long ago cut through the massive beds of soft limestone to form a land surface on the schists. The latter were more resistant but in time a river system incised its way into these to form the present bed. But the heavy seasonal rainfall is conditioned in its surface expression by the permeability of the rocks concerned, and this factor alsc conditions the type of erosional surfaces that a farmer is faced with. As Chalikiopoulos observed (1903:101), "how very much denudation is aided by the impermeability of the ground, can be seen from the bewildering mass of runoff channels in the schists in contrast to the slight incisions in the permeable limestone plateau". On the high plateau bordering the valley, in both soft and hard limestone, subterranean drainage permits fairly even surfaces, though soils weathering from these formations at this height are naturally water-starved. The crucial mixture of shallow marl over schist, that characterises the 'Step', is produced as he further explains "Very steep are the denudation steps that everywhere distinguish the edge of the plateau, where the schists are being revealed mostly through the splitting apart by pressure of the limestone cover. Their swifter removal causes a downward collapse of the

undermined limestone, in which its stone walls stride back without any softening of the slope. The limestone 'isles', found everywhere on the plateau slopes covering the schist scarps, are witnesses to this process" (p. 105). These striking white islands, surrounded by fertile mixed soils, were chosen by the Minoans for what appear to be the local farmers' peak sanctuaries.

At the bottom of the valley, deep into the schists, there are other erosional remnants, this time of giant boulders of exceptionally hard schist left towering above their more weatherable neighbours. Impressive in size and bright red, green or purple, there exists a series of them, north and south of the Kiriake tombs (W6), beside the present bed. (For the location of numbered sites see Figures 11-13.) They offered secure foundations, eye-catching prominence and perhaps objects of veneration to the Minoans who used some of them for mortuary houses, and the Classical Greeks and Romans who built a strange shaft, a tomb and a temple within and beside the great 'red rock' (W5 etc.). As was pointed out they represent recent strong metamorphic activity.

Despite the difficulties of retaining moisture on the surface of the pure soft and hard limestones, their great massives above the schist act as invaluable storage reservoirs throughout the year, as the rainwater slowly filters down to the impermeable schist. When it reaches this level, it runs along the unconformity and appears as a spring line at the exposed junction of the two formations in the valley side. Chalikiopoulos notes that these situations are the basis for all the permanent springs in Sitia, and form the focus for large settlements. In a crucial afterthought he adds that this only holds for those springs coinciding with extensive arable land (p. 122). In our valley this spring line gives a source beside the deserted village of Gavaliana (W1), a weak but constant one beside the deserted village of Yialomonochoro (E16), (both up in the main north-east tributary valley), and a very copious source at the chapel of Agia Kiriake (E5 etc.) in the upper part of the main valley. There are wells at Moni Odigitria (upper north-west tributary valley), and by the Agios Andoni chapel in the coastal gorge (by E22), and the odd trickle of water in parts of the main valley bed e.g. below the W11 sites. The natural attraction of these permanent sources for human settlement is reinforced, as shall be seen, in the case of the first two springs, by a coincident concentration of level and fertile, moist land in their vicinity.

Since the bare schists exhibit well-developed denudation of both surface and incised form, and being impermeable vastly increase the efficiency of water erosion, their surfaces are loose and scree-like. They also disintegrate into small fragments of stone amongst which very little weathered earth can accumulate - the fines are washed out, and due to the steep relief rarely deposited again in the valley, leaving infertile quartz. However this imbalance of qualities - the limestone lacking the surface waters of the schists, the schists lacking the retention of the fines found in the subterranean-drained limestone - becomes an ideal cooperation on the 'Step' where the slumped lens of marl acts as a powerful agent in retaining the water and the fines available due to the directly underlying schist plateau. This situation is a central determinant in the past location of settlement in the valley, and saw the main concentration of human exploitation from the first occupation till Man's recent abandonment.

PEDOLOGY

From intensive field data the author has compiled a soil map and a land use potential map (Figures 9 and 10). They should be considered together, and their relationship to the known sites in the valley can be seen by comparing each with the cumulative site maps prepared at the same scale. The site maps are discussed below.

The Land Use Potential map: the total landscape is evaluated in terms of the potential for food production. The difference between this and a land use map is the assumption in the former case that the land is all being extensively exploited, i.e. the map represents what the valley can offer to industrious farmers and shepherds. There are 6 grades represented in our area, lettered A to G:

A = best arable
B = second best arable
C = poor arable (usually scattered olive/carob land)
D = good grazing
E = poor grazing
G = bare rock

It is assumed that the best land will be used for arable, then as soil and water resources decrease less demanding use of the land is found, extensive tree dry-culture then finally grazing of sheep and goats. The lower the grade the poorer the land, the lower the food yields.

The Soil Map: the letters indicate the content of the soil, the numbers the mode of origin of the soil. Since there is no normal profile development or depth of subsoil, the soil types distinguished are really only tendencies to recognised soil types found under better conditions elsewhere in Greece.

THE B GROUP: soil and loose weathering products derived from the pure soft marly limestone; tendency to Rendsina soil.

THE C GROUP: similar from the pure schists; tendency to dry-Mediterranean forest soil.

THE D GROUP: similar from the crystalline limestone; tendency to Terra Rossa soil.

THE F GROUP: soil derived from schisty-limestone.

THE A GROUP: derives from a mixture of the erosion products of underlying schist and overlying residual or transported marly-limestone; mixture of B and C.

THE E GROUP: eroded hard limestone products deposited on the weathering products of schists; mixture of C and D.

The number '1' denotes a soil derived from elsewhere, that is relatively stable in its present location. '2' denotes areas of in situ weathering that are unstable, i.e. the weathering products are being quickly removed. '3' denotes the extent of in situ weathering products that are relatively stable.

In fact it is obvious from the soil map that only tiny areas of the valley exhibit deposits of groups D, E and F, nor are those patches of importance economically. In the following discussion therefore, only A, B, and C receive attention. The general properties of these three soils, the weathering products of soft limestone and schist, have already been discussed in the Soil Chapter (q.v.).

Samples were collected by the writer from the main groups recognised, so as to include all the land types significant for cultivation. Thus the pure schist, the soft limestone, the Agia Kiriake soil, the alluvial terrace and the Step mixed soil were sampled. In every case the sample was taken from an area where, due to shelter or slope factors, some measure of stability had been achieved, allowing soil development. However it is true to say, as Alan Doe has noted, that in no part of the valley (with the possible interesting exception of the A. Kiriake patch) are we dealing with anything but shallow and embryonic soils (Doe 1973).

These samples were analysed for the author by A. Doe and D. Holmes, and the results appear below.

SOIL SAMPLES FROM AGIOFARANGO VALLEY

(cf. Soil Map for distribution)

Soil Type	pH	Organic Matter	CEC	$MgCO_3$	$CaCO_3$	Description
A1	7.75	3.569	38.4	2.6	37.7	Marl lens thin over schist
B1	7.86	2.69	24.8	2.0	60.5	Marl pure, top plateau
C1	7.69	1.82	32.0	.15	1.0	Schist in situ
(KF)	7.78	.312	22.4	.84	43.4	Agia Kiriake, by spring
T1	7.54	1.506	34.5	.70	5.2	Recent river terrace

CEC signifies Cation Exchange Capacity, which is an indication of the amount of plant nutrients of mineral form in the soil.

Comments

(1) The advantages of the A1 soil are clear in humus and plant nutrients. This soil occupies large areas of the well watered Step.

(2) The high humus count for the pure soft limestone reflect the well-known capacity of rendsinas to retain organic nutrients, hence its other name - humus carbonate soil.

(3) The other 3 samples all show a high potential from the inorganic nutrients and if conditions allowed stable development fertile soils could arise. The schist, especially in its present climate, discourages such a development, but the terrace and the Kiriake deposits - both of an alluvial mixed nature - could with careful husbandry develop extremely productive soils capable of intensive irrigation cropping. We know in fact that till recently Kiriake was under such a regime, but neglect has allowed the torrents that flow through it, and the two spring outlets arising within it, to

remove all the fines and tilth accumulated over perhaps thousands of years. Sections of the alluvial terrace below the monastery are still worked and appear very fertile; the sample was from one long abandoned.

Our groups and their analyses can be compared with various authorities (Soil Chapter) and finds a good agreement. It is abundantly clear if one considers the distribution of stable soil in our valley, how important the A group is, its extent reinforcing its agricultural advantages. Soil developed from the schist is very rare, while pure rendsina from the soft limestone is common but confined to the very arid, highly exposed plateau tops and a smaller 'step' just below the valley rim. It is suggested on the Land Potential map, that the land highly suitable for arable farming includes the stable areas of the A group, the river terraces and the Kiriake patch; the latter two are suitable for irrigation cropping. Less favourable are the stable zones of the pure rendsina and the schist (brown forest) soil - the shallow subsoil and erosion only just kept in check require extensive and low demanding crops, widely spaced dry tree crops and cereals or fodder crops with a long fallow and only shallow working of the soil.

On the predominant expanses of unstable 'soil' even these crops are not worth the effort of cultivation, and the natural vegetation (concentrated in winter and spring, sparse in the dry months) is exploited by flocks of sheep and goat. Owing to this seasonal inequality of grazing resources most of these flocks must leave the valley for the high pastures of Mts. Idha and Kofinas during the summer months.

GEOMORPHOLOGY

We have already discussed various features of the water regime in the valley. This section is concerned exclusively with the alluvial terraces bordering the present bed.

As Alan Doe has shown (1973) there exists a reasonable correlation along the river in the nature of these bedded stream deposits, suggesting a significant degree of synchronism in their period of deposition. Since these terraces offer in total a considerable area of highly fertile land, immediately above the bed and hece manifestly irrigable, and in addition containing in the subsurface layers much alluvial material of excellent cultivation quality, their presence in the valley is a great boost to the agricultural potential. Compare the high CEC count for this terrace in the analyses.

Mr. Doe has proposed that Vita-Finzi's dating of such deposits (1969) is incorrect, at least for our valley, and that instead of a commencement of alluvial fill in Late Roman times these deposits were already being laid down in the Early Minoan period. Furthermore, while Vita-Finzi claims that in nearly all areas of the Mediterranean only in the last few centuries did the alluviation give way to renewed stream incision, Mr. Doe suggests that for our valley it ceased in Roman times. An exceedingly consistent picture is emerging throughout the Mediterranean on the timing of the major Quaternary alluvial fills, and it would indeed be very surprising if the Agiofarango Gorge were quite aberrant from this scheme (see Geomorphology Chapter).

A provisional answer lies in the short time at our disposal for accumulating dating evidence in the river sections. Although both Alan Doe and this writer collected stratified wheel-made sherds from the base of the terrace up, the only diagnostic pieces were Second Byzantine sherds from an upper level in a tributary stream (see Mr. Doe's report). Since these were, according to the latter, found 1.5 m down from the top of the section, and are now exposed by the renewed stream incision, further overlie similar deposits, we might conclude that deposition began some time before their date (medieval) and continued till fairly recently. Furthermore, the W5 and W10 Hellenistic building complex appears to be partially buried in the recent alluvial terrace. Clearly here the construction and use of this complex is inconceivable with the torrent depositing sediment in the same area, and we can argue that the alluvium is at least post late-Hellenistic in date. Its cessation cannot be very recent as the stream has since downcut more than a metre at this point. This data is quite consistent with the recognised Vita-Finzi scheme. But in the absence of any other datable sections interpretation quite naturally has concentrated on the exposed alluvial levels visible for several metres length at the spring of Agia Kiriake, where archaeological floors and wall lines lie sandwiched between transported deposits (E7). Minoan Bronze Age levels and Greco-Roman levels occur within the fill, Roman material above it.

It can be demonstrated, however, that this section was not in fact formed by the river, nor can its levels be correlated with those in the true river terraces existing upstream and downstream of it. As a sketch diagram shows (Figure 4), this uniquely fertile little patch (the tiny area marked A and A/B in the Land Use map) is a classic alluvial fan, created by three or four converging streams that flow with striking steepness down a narrow ravine behind and to east of the spring. Just before reaching the area watered by the two spring outlets these torrents coalesce, and should form a notable flow in winter. The clear parabolic profile of the fan radiates out from this convergence, since as soon as the abrupt break of slope at the rock pediment here makes itself manifest, these streams are naturally forced to drop a considerable part of their sediment load. The whole fan is now being heavily gullied in winter, and the surface removed <u>en masse</u> by the permanently flowing spring outlets. The curious fact that Roman sherds are found in a level of fill above the Classical walls, then several feet above scattered on the surface of the fan mixed with much 'Byzantine' to modern ware, can be explained by considerable truncation of the upper levels by the apex. The later deposits, which might correspond to the alluvium associated above and below the Medieval sherds in the tributary stream section discussed earlier, have very likely been removed by a unique combination of spring and torrent. If we examine Mr. Doe's section drawing of the E7 alluvial levels (Figure 18 in his dissertation), Roman material was apparently found within the alluvium and overlying the Hellenistic wall level, and also occurs at the same buried level in the adjacent E6 section.

The accumulated deposits at Agia Kiriake that overlie the Hellenistic floors here, therefore, are not inconsistent with the dating of the Second Deposition in Vita-Finzi's scheme, but neither do they confirm it. A further problem arises if we consider those deposits that exist between the Classical-Hellenistic walls and the underlying rock and gravel termed 'the

Fines' by Mr. Doe. This material, as can be seen in his scale diagram, is not very deep, and is claimed to represent deposition by the main river between Early Minoan times and the Classical period. In fact it seems far more probable that these fines were formed also by fan deposition from behind, though obviously at a very slow rate. Now it must be stressed that in the Vita-Finzi model, throughout the long period of stream downcutting that extends from the early Holocene down to the Roman period, the Mediterranean valleys did not cease to carry a sediment load. The difference between this phase and the subsequent period when alluvium began to fill up the river beds (and we have now returned to a downcutting phase), lies in the relationship between available sediment and the transporting power of the drainage systems. At a critical point a steam saturated with sediment lacks the energy to continue transportation and begins to deposit; this seems to have occurred in the Hellenistic to Roman period. However Man appears to have learnt very early that alluvial sediment was exceptionally fertile and worth conserving. Terrace walls probably of Early Minoan date were found preventing slope downwash at Megali Skoinoi (E10-11), and developed waterworks are a familiar feature of the civilisation of Middle and Late Minoan Crete. The patch of ground immediately below the perennial and abundant springs of Kiriake is clearly an ideal site for concentrated irrigation agriculture. Not surprisingly we have evidence for occupation here from the Early Minoan period right up to the abandonment of a vegetable patch here within living memory, and a necessary step for such cultivation would be the prevention of soil and fines erosion, combined with measures to retain and capture the sediment carried down across the fan in winter. The existence of walls astride the fan in the Classical period is an indication that such measures were in operation then, and a complicated system of terraces and drainage channels is associated with the recently abandoned farm-complex on the fan remnants and overlying the E6 and 7 sections.

It seems perfectly feasible to view this anomalous accumulation of alluvium of pre-Classical date, as the work of human ingenuity and not of natural processes. Since this explanation could also hold for subsequent accumulation, the evidence from this carefully tended fan deposit cannot be used either to prove or disprove Vita-Finzi, or to give a date for the river terrace series proper. Only a systematic collection of sherds all along the valley can solve this problem locally, but in the absence of such evidence of an unambiguous nature we shall assume that the river terraces in the Agiofarango were deposited synchronously with those others throughout Greece and the Mediterranean dated securely to late Classical through to early modern times (see Geomorphology Chapter).[1]

EROSION AND NATURAL VEGETATION

Deforestation is usually considered to be the major factor in a supposed degeneration of the Greek landscape, effected by human clearance and subsequent grazing prohibiting forest recovery. Let us consider the Soil Map (Figure 9). The greater part of those areas designated as unstable could never in the last 10,000 years have supported a substantial vegetation cover, owing to precipitous relief, scree-like surfaces and seasonal aridity. The stable soil of the pure soft limestone, on the upper slopes of the valley and

all along the plateau on either side, is too shallow and somewhat exposed for anything but lowly scrub and wet season grasses. Even the Step is a shallow and somewhat exposed soil zone, but the summer moistness and comparative cohesion of the surface horizon would allow tree development in the natural state, as would the moist and sheltered valley bottom areas. It seems certain that the first settlers in our valley to leave sites and artefacts, the Early Minoans, concentrated their efforts on farming the Step soils (cf. Period and Site Discussion), and should have effected their clearance rapidly. A similar preference characterises all later periods represented in our valley.

These conclusions are paralleled by similar studies in Crete and on the Mainland. Peter Warren summarises a vegetation study made around his Early Bronze Age site at Myrtos: "the work of Dr. Rackham....also makes it probable that evergreen forest cover may never have been extensive for climatic reasons, not for the reason usually argued for the European Mediterranean, namely human exploitation". Myrtos is on the South coast of Crete in a closely comparable environment to the Agiofarango (Warren 1972: 263-5). The researches of French geographers on the natural environment around the palace of Mallia, on the north coast of Crete, led to a clear statement to the same effect (quoted in an appendix to this report) (Et. Crèt. 1963). In fact large areas of woodland in the Cretan uplands, barren now and capable of regeneration, seem to reflect an unparalleled spate of clearances in the last century and the early years of this century. (Evidence for this recent clearance abounds in the 19th and early 20th century travellers to Greece, cf. Vegetational History Chapter). Significantly, this recent deforestation has not had any noticeable effect on terrace formation in the valleys, and drainage courses are still adjusting their beds to a decreased sediment load, by cutting through older alluvium. This strengthens our climatic interpretation for the recent alluvium.

A first visit to the Agiofarango valley, with its deserted and scrub-covered slopes, its thin dry soils and dead river, overwhelms one with the feeling that things must have been better when the Minoans and Romans sat densely upon the land, and that accumulated misuse has ultimately forced Man to pull out his destructive presence. After several weeks' patient analysis of the potential fertility of the valley, what it offers now to industrious farmers is as great if not greater than it gave to these earlier settlers. The social changes that are depopulating all the Greek countryside are discussed in a later section.

SITE ANALYSIS (See Soil, Land Use Maps, and period by period Maps with key soils indicated, Figures 9-13)

Palaeolithic to Neolithic

No material of these periods was found in the valley, with the exception of some Sub-Neolithic from the W6 tholos excavation.

The Minoan Bronze Age

(See chart of Site Chronology for date and nature of finds, p. 367, and see Site Map Figure 11 for locations; chief cultivable areas indicated by dashed line.)

It is with the Early Minoan period that the valley sees its first significant settlement, and since the tholoi carry on receiving burials into Late Minoan times we will consider all the Minoan sites together.

CHRONOLOGY OF THE MINOAN SITES IN THE AGIOFARANGO VALLEY

Site Number	Chronology on finds	Comments
	BURIALS	
E27	MM to LM	3 tholoi NE of the survey area
W2	None	Suggested tholos, very unlikely
E17	Date unknown	Minoan tholos
E29	None	Suggested tholos, very unlikely
E10	EM to LM; EM to MM	2 tholoi
E9	EM to MM	Tholos
W6	EM to MM; unfin. EM?	3 tholoi
W8	MM to LM; MM to LM	2 tholoi
W11 A	Date unknown	Minoan tholos
E22	MM, possibly also later and earlier	Tholos
	DOMESTIC	
E24	EM to MM	Settlement
E18	EM, MM, LM	Possibly settlement EM on, later use as peak sanctuary
OW2	EM?, MM	Settlement
E11	EM to MM	Settlement
E14	EM	Finds associated with terrace walls etc.
OW3	Minoan?	Dubious ancient sherds
E12	EM? MM to LM	EM finds may relate to settlement, later material to a peak sanctuary
E13	EM to MM	Settlement
E8	EM?	Settlement
E5-7	EM to MM, LM?	Settlement
E1	Minoan?	Settlement?
W7	MM and 'Minoan'	Settlement?
W9	Minoan?	Settlement?
E20	MM, possible LM	Settlement
	SHRINES, OSSUARIES	
E18	EM, MM, LM	Peak sanctuary possibly associated with M and LM finds
OW1	Minoan	Peak sanctuary
E12	EM? MM to LM	Peak sanctuary possibly associated with M and LM finds
E4	Minoan	Ossuary? associated with W6 tholoi?
E4 A	MM, pos. MM/LM sherd	Peak sanctuary; or possibly ossuary
W11 B	EM, MM and 'Minoan'	Possibly ossuary(ies) replaced by peak shrine

(E1) Steep slopes of soft limestone surround; there is a little soil behind it and possible old terrace here. Modern fold and caprovine droppings plentiful here and in shallow rock shelters just below. About 25 yards to south in bare rock a small cavity covered with blocks: fire hollow, store? Site is on long ridge of similar barren, open nature running to the north-east. Position would get plenty of sun throughout the day. Access to nearest water would be down the nearest moderate descent through the E8 site to Kiriake. Site is very probably a fold site in every period of use (reuse R?, BYZ).

(E4) We suggest that this and E4a downstream be connected to the two tholos groups opposite them across the river, respectively the W6 and W8 tholoi. They may have served as ossuaries, mortuary chapels or lowly peak sanctuaries in ritual activities relating to the ancestors lying in the tholoi. Both 4 and 4a are on the narrow tops of prominent hillocks just above the valley floor, and the latter is a very small building. On the other hand traces at E4 might reflect something more spacious, and its position beside a fertile area of sloping land to the north might suggest a farmhouse. As will be elaborated on later, the Minoan ritual sites in any case relate to areas of good land in the same way as a farmstead, so only excavation of 4 can show that it is one or the other. However since it seems plausible that the W8 tombs replaced that at W6, and since 4a is MM and LM i.e. parallel to the main period of W8 and not to that of W6 (EM and early MM), further sherds from E4 might be sufficient to demonstrate this linkage of sites if they proved to be EM. The areas of important land that all these sites 'control' comprise the fertile slopes to north of W6 and W8, and most especially the great area of 'Step' opposite W8 across the river. This siting, more at the edge than amidst the best land, was we suspect a compromise between establishing a visible connection of the tombs of the ancestors and ancestral land, and the desire for a location on a prominent natural feature where the sun's rays early lit up the customary east door of the tholos.

(E5) Agia Kiriake fan site. Also in section of E6 (cf. Figure 4). We have already discussed the obvious interest shown in this small area of irrigable land throughout the occupation of the valley. When the Odigitria Monastery sold off its lands in the centre and south of the Agiofarango, it retained just this patch. A vegetable grower who is the only permanent exploiter of the valley now, besides the monks and the occasional shepherd, conducts the Kiriake water a couple of kms. downstream through pipes to his farmhouse (north-east of W12). The absence of a tholos at this enviable place of natural bounty can be explained in social terms. If we are correct in seeing the Early Minoan period as characterised by the primacy of the community and the extended kin group in the social value system (cf. Branigan 1970b: Chap. 7), then a unique but small piece of highly valuable land is unlikely to have been the property or privileged area of exploitation of any one group or individual, but its fruits were the community's in general, and perhaps the conservation of its fertility was the responsibility of all the heads of families.

(E8) Isolated patch of C quality land, steep access from Kiriake below, difficult access to better land to north (E9). Good access to the grazing land along the tops (cf. E1) and route seems much used by shepherds down to the valley floor and fresh water. This strategic position, and a limited

area of natural hay that will grow here, suggest a fold site for this pottery scatter. In fact there is a modern fold below, by a little hut behind the abandoned Kiriake farmstead. Reuse HR-R and LR.

(E9) A tholos quite clearly associated with terraces and 'walls' of same date, and both relate to an area of 'Step' good land. The extensive acres of 'Step' of the Megali Skoinoi plateau (E14) are easily accessible. E13 is the terrace/wall system.

(E10, 11, 14) The plateau of Megali Skoinoi is rich in remains. 14 refers to the remains of terrace walls and other walls and sherds on the plateau beyond the supposed village E11. E10 refers to two tholoi supposedly within the 'village'. As can be seen from the Soil and Land Potential Maps, this plateau and its extensions north and south comprises the largest zone of continuous high grade land in the valley, and Minoan interest in the area is hardly surprising. The absence of Classical to Roman material here does surprise one, though in fact a number of surface finds gathered here were tentatively suggested as Roman and some are clearly Byzantine to Modern. The whole area is an almost unbroken zone of good land stretching north to the edge of the deserted village of Yialomonochoro, and is one major advantage of that location. There also exist a number of curious small beehive structures associated with walls and terraces on the north-west edge of the main M. Skoinoi ledge, that are of uncertain function (folds?) but appear to be late. Water might be a problem here, the nearest source being by Yial, though it is just possible that the prominent band of exposed schist outcropping immediately behind the tholoi could in the past have been the source of a spring line since dried up, thus necessitating a move of the centre of exploitation for these fields to the northern borders at Yial.

(E12) A clear case for a peak sanctuary on this striking raised knob of white remnant marl. Just as we would relate E4 and 4a to tombs W6 and 8, so here a ritual site is connected to nearby tombs E9 and 10. The parallel of the little Christian chapel on its prominent white marl hillock just to west and above the deserted village of Yial is apposite and will be returned to (but see below on this site).

(E17) A tholos amid good 'Step' land again, and beside a spring source (cf. E16). Reuse Classical and Roman periods and next to recent village of Yial.

(E18) While this site would fit neatly into a pattern detectable elsewhere, of paired burial and ritual units correlated with best arable land, the remains could well be those of a Minoan farmstead, a function the wall and house remains of HR, R and recent times seem to fulfil. A definite link however can be postulated between 17 and 18, on a tomb/sanctuary or tomb/farm model.

(E20) This site is accessible only with difficulty across a deep ravine from the large expanse of 'Step' fields to its north, and is more likely to relate to the considerable areas of grazing that surround it and to the terraced fields that extend down to the river on its west. At present a fine fold exists just above it, and the locality gets plenty of sun in all seasons. It has mainly Roman sherds but some possible Minoan. We would favour a mixed farming and herding site, but we cannot rule out the everpresent interpretation of

'ritual building', and certainly the prehistoric finds are on a prominent white hillock. The caves above, where the fold is, would have served well for flocks, the buildings below for a family. Excavation might solve this.

(E22) This tholos, and the one at W11, are important examples for our contention that these tombs are characteristically associated with discrete plots of good arable land, and represent one of the holdings especially connected to a particular inheritance group. Alexiou (1967) saw it as proof for his theory that the numerous tombs in our valley reflect the use of its beach as a major port for foreign trade. Reasons for rejecting his interpretation are discussed below but we would draw attention to the neat way in which these tombs are identifiable with isolated areas of 'B-C' arable and extensive surrounding 'C' land.

(E24) Yet another discrete zone of 'step' arable sees what is probably a settlement site, later occupied by Roman and recent farmsteads. Three tholoi not far over the ridge to the north east may relate to those who worked this land, or E17 perhaps formed the cemetery of its farmers. A similar gap with a 'missing' tholos exists with another possible pair of farm/peak sanctuary, OW1 and 2. In addition to the good land, the fine spring at Gavaliana is close by to the west. 200 m NNE one MM sherd found at E26.

(E27) These are the three tholoi just mentioned. They sit amongst level and fertile arable just outside of the area surveyed.

(E29) There are three sites that could possibly be ruined tholoi, this, W2 and W9. E29, though there are plenty of large blocks, is the least likely, as it is hidden away beside the river bed and in shadow most of the day. No sherds were with it. Possibly it was never completed and could have been intended as a lime kiln. W9 is also very lowlying and on a gravelly area caused by river meanders, and again is without artefacts or even notable stone lines. W2 though exhibits traces of an arc of stones, and on the assumption that the well-formed terrace here is a normal Second Deposition historic feature, the site in Minoan times could have been high and dry, moderately prominent and well-lit by the desired sunlight throughout the day. No sherds again.

(OW1 and 2) Peak sanctuary and 'farm'. The pattern is repeated: extensive area of good B-C 'step' land sees farm, above it peak sanctuary on prominent white marl hillock. Just as with E24, the same site is favoured by notable Roman and later farmsteads. Both sites also possess similar easy access to higher grazing land and to the valley floor below with its necessary springs. Tholoi are conspicuously lacking up this major branch of the river, and those that might correspond to the settlement at OW2 may lie undiscovered in the scree-like, scrub covered slopes across the stream in the schist, or in unsurveyed ground by the monastery. Alexiou (1967) reports a tholos 'west of the monastery' that could fill the gap.

(OW3) Evidence for Minoan here is dubious and the immediate land of low quality.

(W6) See discussion of E4.

(W7, 8) The former is one MM sherd, and terrace and housewalls probably modern (as are most of the sherds). W8 is two tholoi. See E4 discussion.

(W11) A tholos, and sherds on two little prominent white knolls above and to the east. The tholos sits square in a patch of B-C 'step' arable surrounded by poorer C scattered olive-type land, and with good access to extensive grazing above. A Roman site, probably a farmstead succeeds it almost on the same spot (W12), but the little knolls are only Minoan. Recent small houses and folds are found nearby and at W13 below. The knoll sites could well be ritual sites - ossuaries or peak sanctuaries associated with the tholos, but alternatively remains of Minoan farms is an interpretation that cannot safely be dismissed. If they are ritual possibly they serviced also E22, though two knolls for two tholoi is further than speculation permits.

Discussion

The close correlation of Minoan sites with particular grades of land, and a particular type of soil, has been demonstrated. This will prove equally predictable for all later periods in the valley. In the Physical Geography chapter of the Myrtos excavation volume, M. Wagstaff notes: "The Fournou Korifi settlement, however, occupies a ridge of Pliocene marls. The situation may recur in Crete and has parallels in the Peloponnese and Central Macedonia where similar deposits were extensively settled in prehistoric times" (Wagstaff in Warren 1972:276). Nevros and Zvorykin on light Rendsinas on Marls: "Diese Boden decken grosse Landstriche...die die Fastebene bei Iraklion, Retimon, Kastelli, Kissamos, Hierapetra und Siteia bilden. Die Rendzinen im Gebeit der Fastebene wurden lange vor unserer Zeit zum Entwicklungsgebiet der wirtschaftlichen Tätigkeit des Menschen. Sie wurden früher als alle anderen Bodenarten von ihm genutzt und hier wurden auch bedeutende Städte, wie Knossos und Festos, gegründet" (Nevros and Zvorykin 1939:258).

This relationship can only reasonably be explained in terms of arable farming, and should already cast doubt on interpretations that explain the proliferation of sites in our seemingly desolate valley as due to intensive metalworking or ribbon development along a trade route. Though copper is to be found in very feeble quality and quantity in the Asteroussia range, one cannot conceive of its working supporting more than a few miners' huts at the mine face. The amount of copper in circulation in Crete throughout the Early Bronze Age is correspondingly minute. As for the sea-trade explanation (Alexiou 1967: 482) the bay at the south end of the Agiofarango is dangerously deep and rocky, and any ship forced to put in on this coast would have headed for the bay of Kaloi Limenes along the coast to the east. From here one could imagine people travelling along the central and north-western part of our valley to the Messara, but as Zois has recently pointed out, extensive trade is really a Middle Minoan manifestation,, and tholoi are at their peak in the Early Minoan period (Zois 1972b). In fact a more convenient gateway to the Messara existed in the port at Koumasa, and later Agia Triadha (the latter since landlocked by the historical alluvium), and Kaloi Limenes, which all authorities are agreed is only usable as a seasonal shelter, is never likely to have been an assembly point for the transportation of goods or people in any quantity.

While it would seem probable (see below) that there was a winter visitation of the valley by shepherds from other areas, perhaps without a break

from the Neolithic to the present day, we can also say from our observations on the sites that nearly all the Minoan monuments of our valley, especially the tholoi, are more likely to have been the work of the local and permanent inhabitants of the Agiofarango, whose main living came from cereal crops and olive groves, a few vines and vegetables. This leads on to the question of the population of the valley in past times, and this problem is tackled together with an attempt at a reinterpretation of the Minoan tholos, in an appendix to this chapter (appendix 2: Minoan Tholoi).

In general both Early and Middle Minoan are well represented in the valley, with a possible slight increase in density in the latter period, as Pendlebury registers for Crete as a whole (Pendlebury 1939). We may have several sites with Late Minoan 1 and 3, the poverty of material of the latter period already presaging the probable abandonment of permanent settlement in the area in the Sub-Minoan and Geometric periods. The same picture is given on a broader scale by Pendlebury.

Greco-Roman Period (see Site Map Figure 12. Cultivable land indicated by dashed lines)

Significantly the following locations are reoccupied: E1, E5-7, E8, E17, E19, E20, E24-5; OW2, W12 (by W11). W2A may be near a ruined tholos (W2), E4a should relate to the E4a/W6-8 Minoan complex and local extensive arable.

(E1) Fold cf. Minoan.

(E4a) Likely in situ rather than washed down from hillock top where Minoan was found. Small farm relating to the 'step' fields above, and to north the schist olive land?

(E5-7) Cf. Minoan and comments in Geomorphology section.

(E8) Cf. Minoan.

(E14, 11, 10) Possible material of this date has already been noted above as observed up here and it would be surprising if this good land was not intensively worked.

(E15) A problem site: possible Minoan, Roman and modern sherds scattered amongst each other by the river just below Yial. Similar material can be found up the steep slope immediately behind it to the east, and all this sherd scatter has probably been washed down the slope from a site above, at about the same level as Yial village. The existence of Greco-Roman material at this upper source might go some way to explain the absence of a clear exploitation centre in these periods for the Megali Skoinoi plateau, since both Yial and this site would be well placed beside the Yial spring and at the northern edge of the great plateau area.

(E17-18) Two farms? Cf. Minoan. Highlights the problem of separating off likely peak sanctuaries purely from locational and surface find features.

(E19) What appears to be a small Roman villa, to which possibly belong the remains at E24/5, though they could be a farmstead of earlier or later date. A wall runs across a small gulley here, but the gulley is very fresh and has merely exposed the wall, rather than being the reason for the wall's existence.

(E20) Cf. Minoan.

(E28) Site relating to the same fertile band as E19, 24-5, but closer to the Gavaliana spring farmstead?

(OE1) There may be a slight trend (observable also in the Argolid) to the occupation of land of little arable but extensive olive potential, in the Classical to Roman periods. That is not to say that these areas were not worked before, rather that farms before that time may have had self-sufficiency more in plan, with concentric areas of cereals, olives and grazing land. This site and W2a are amid large areas of low yield unstable schist landscape, nor should the B-C alluvial terraces below them have existed at this time. A specialised production, perhaps by absentee owner and exploiter, is possible.

(OW2) Cf. Minoan. The substantial finished walls here argue for a villa, though whether of this period or Byzantine (both are represented in the surface finds) remains uncertain.

(W1) Gavaliana (deserted village). It is of interest that the Minoan period sites show far more interest in best land than they do in water supplies, and the site of later Gavaliana lacks prehistoric finds. It does not seem likely that in the Greco-Roman period the population of the valley was concentrated into a village such as later Gavaliana or Yial, though there appear to have been a number of ancillary and service buildings associated with the 'temple site' opposite Kiriake (W5). Since the immediate area of the Gavaliana spring is poor land, the site here may have been a little farm with vegetable and fruit gardens on the small patch of irrigable available, or alternatively a spring house or shrine.

(W2a) This seems to be another little villa comparable to E19 and W12, and and possibly OW2. While close to the Gavaliana spring it has only a small area of associated potential high quality cereal land behind and above it, and would be a good candidate for an olive farm. It is interesting to observe that on an identical hillock just to its north a recent farmhouse of somewhat similar dimensions, and we suspect function, was found.

(W5 and W10) The formidable dimensions of stone foundations discovered here, and the notable extent of the complex from W5 along to W10, give this site a unique stature in the valley, the only real comparison being with the Monastery of Odigitria. The parallel is probably more than just scale. We have enough contemporary sites to suppose that the occupiers of W5 were not the sole exploiters of the valley lands, while W5 does not relate to any of the particularly desirable natural resources of the valley, except the Kiriake spring. However we also have levels of this date from Kiriake which should be associated with the actual care and working of the garden land there. The structures at W5 and 10 are much more plausible as public buildings of some sort, and since our valley is only a morning's walk from the centre of the Messara it is hardly likely to be a local authority. For these reasons we suspect very strongly that this is a temple site, and possibly just as with the monastery, the priests owned lands in the valley that were leased out to tributary farmers. David Blackman has found a startling piece of confirmation for this hypothesis in Inscriptiones Creticae,[2] with an inscription from this locality, recording a dedication presumably by 'Krios' to the god Asclepios. The cult of this god seems to have been very important in South Crete, and

there was a shrine at Gortyn and Lasaea, and a major sanctuary at Lebena to which worshippers flocked from all over Crete (Willetts 1962). As Kerenyi points out "in general a spring seems to have been one of the requisites of the temple of Asclepios" (Kerenyi 1960). Actually we might have a similar situation to the recent historical case, with an overall ownership of the valley by a ritual centre (the Monastery, then the suggested 'Asclepium'), associated with dependent farmsteads of tenants of the sacred institution. Both W5 and its extension at 10 have their foundations built firmly on the schist pediment and are partly buried by the alluvial terrace running through them to north and south.

(W9a) This site is rather remote from extensive good land, but has several caves and good access both down to the river and up to the top plateau grazing land to the west. There is a recent threshing floor here, presumably because of the upward winds. A fold seems more probable than a farm.

(W12) Cf. adjacent Minoan W11.

(W13) This site recalls W2a and OE1 in dominating a considerable extent of C land, possessing only a small area of possible high quality cereal land. While this and OE1 could be, as now, fold sites, both modern folds are converted versions of more solid farmhouses and their use as folds may only reflect the general trend in the remoter areas of Greece to totally abandon fields and olive groves. The site may therefore be a little olive farm, possibly exploiting the C land on both sides of the river here, and perhaps this site or W12 was the centre of exploitation for the small arable patch by the Minoan tholos of E22. The absence of any other remains by the shore reinforces our point about the unsuitability of this cove for shipping.

Discussion

We have not attempted to subdivide analysis into Classical, Hellenistic, Early and Late Roman because of the comparative ease in identifying sherds of Samian and the contrasting difficulty of proving the other periods from worn surface sherds. Black Glaze, typical for Classical Greece, varies considerably in local production centres, and except for Attic exports, examples in recent historic levles at Knossos are often dull enough to be confused with Hellenistic derivatives. Early Roman ware is very little known though presumably plentiful in such an early and key province as Crete. Thus the most frequent chronology given for sites of this period, 'Hellenistic-Roman' may conceal considerable differences in actual time, and quite possibly 5th century B.C. material of local manufacture may be included. Certainly the weighting of sites to the detriment of Early Classical and Early Roman seems unlikely in terms of what we know of the prosperity and dense populations of the Aegean states in these times. On the Argolid Survey a similar process seems to account for an apparent 'depopulation' of much of the area in Hellenistic and Early Roman periods. On the Site Map a very similar correlation of sites with B and B-C land, to the Minoan picture, can be seen.

Byzantine to Modern Period (see Site Map, Figure 13. Cultivable land indicated by dashed lines)

The same difficulty in distinguishing between the subdivisions of this long period in surface sherds, forces us to consider sites, again, more as spatial

decisions rather than true expressions of local history. One can still buy 'Byzantine glazed' ware in Greece with that deceptively similar fabric and vulgarity of design, while First Byzantine material is very rare in Crete owing to the truncation of that period by the Saracen raids and final Arab conquest. Hardly any systematic classification is available for pottery in currency in the Aegean under Venetian and Turkish domination.

(E1) Cf. earlier use.

(E2-3) These sites and E23/SC4 appear to be recent industrial areas, judged by the charcoal pit and piles of smashed ferriferous rocks of E2-3 and similar piles and stone enclosures of 23/4. However some of these structures could be simply folds, and the tiniest trace of iron in a rock can give an overall rusty stain to it. There are also traces of a metalled road beside E2-3, a route from Kaloi Limenes still followed by the occasional traveller and the mounted postman, despite the new motor road that exists as far as the W6 tholoi. One would suspect, like other solid and useful rural projects of moderate antiquity in Crete, that this is the work of the Venetians.

(E5, 6-7) Cf. earlier use. The little cave-chapel here by the spring, reminds us of our suspected temple just across the river, perhaps established there for the same reason. Some wall traces and a thick scatter of 'Byzantine' ware just north of the deserted farm-complex of Kiriake were explained to us by locals as the tomb of a wealthy Venetian, but could also perhaps be homes for monks attached to this exoecclesia of the monastery, something we know for the little A. Andoni chapel in the coastal gorge.

(E10, 11, 12, 14) Cf. earlier use and mention of late sherds from here, as also the curious drystone beehive structures and farm (?). This area exploited with ease from Yial.

(E15) Cf. comments under Greco-Roman sherds here.

(E16) The deserted village of Yialomonochoro. This community is inseparable in discussion from W1.

(W1) The deserted village of Gavaliana. Although fifty to seventy years separate the end of community life at these two centres, we have no written or verbal record to tell us of the relationships existing between these close villages. However as archaeologists we have a vital clue in the intermediate site of W3. At first sight this seemed to be the remains of an aqueduct running across the river to Yial and then northwards for an unspecified length. Closer examination reveals that the 'bridge' was in fact a hollow pillar which was the end of the conduit system opposite Yial, where the narrow channel widens into a shallow basin that bears traces of a plastered lining. From here the conduit is carried at right angles to its previous course above the steep slope to the river, and ends by disappearing down a large pillar, which is clearly built into remains of a house at the river's edge. Inside this abandoned house there is a hatch at the base of the pillar. It seemed fairly certain that this was some sort of mill, and subsequently I came upon a description of an identical establishement in A. Trevor-Battye's book, 'Camping in Crete' (1913, cf. his photograph on p. 162): "The stream drives...six mills, placed at intervals up the glen"... "Mill suggests mill-hands, dust and whirring wheels; but the little flour mills of this glen are a very different thing. Built of un-

mortared stone, low and square, with a curious wall raised high in the middle, along the top of which water is led to fall through a chimney on to the horizontal wheel". The head of water is led from the spring source nearby, and in our river area with its dry summer and low winter flow, such a mill is inconceivable without a strong spring source. The water is being brought from upstream, and this does not say much for the people of Yial's faith in their own spring. The only other candidate, and of course directly in line with the remnants of the aqueduct, is the magnificent spring at Gavaliana (W1).

The style of construction of the mill is believed to be Venetian, and the existence of a mill and a constant supply of freshwater right opposite Yial argues strongly for Yial being a village by that time. The plastered basin is most plausibly a place for obtaining drinking water and perhaps for washing. More important, the channelling of what must necessarily have been considerable amounts of water from Gavaliana's spring entails the recognition that the interests of both communities were very close. Though Gavaliana may be later in foundation, we were told that this mill was in operation in living memory. We would suggest, since both villages also share, within easy reach, some of the most fruitful land, that they were hamlets of the same community and quite possibly when Gavaliana was abandoned it was only to swell the houses of their relatives in Yial. This first desertion may have been connected to the protracted last throes of the struggle with the Turks, which saw massive movements of people and village abandonments.

When Yial was forcibly disbanded and its families scattered amongst neighbouring communities in the last war, it was apparently already in an advanced state of decline, and can be seen as in the first major phase of Burgel's two stages of rural depopulation in Crete (Burgel 1965: Chap. 4).

We have already pointed out, how Yial dominates the great plateau of 'step' fertile arable to its south (easily accessible along a well worn track) and it is clear how it controls equally considerable areas of good land to the north. The existence of Gavaliana is best comprehended as on offshoot or partner in this exploitation, though besides this above mentioned land probably worked in common, Yial may have had a particular interest in the downstream part of the valley, Gavaliana in areas upstream of its spring and over to the E27 tomb area - beyond the limits of our survey. That both communities were once tied semi-feudally to the Monastery is highly likely if their Venetian date is correct, since we know that till quite recently it owned all the valley and the total wild country stretching to the coast to south and west, and as noted it still retains possession of the Kiriake patch.

(E17) Sheep-pen incorporates tholos. This may belong to E18.

(E18) Farmhouse, and the two form a common type of mixed farm that may be detectable now or earlier at e.g. E20, OW2, W12. Cf. earlier use.

(E19, 24-5) This area was obviously well tended till recently and several field huts exist in ruined state in this small basin. Cf. earlier use. At 19 there is also a threshing floor, and by 25, a plastered cistern. Since it is likely that these little field-houses are contemporary to nucleated permanent hamlets at Yial and Gavaliana, this should warn us of the difficulty of reconstructing settlement density and patterns of permanent house units simply by

counting discrete structures or sherd scatters. This is a central problem in attempting to determine the relationship between the tholoi and associated buildings, and a possible Minoan nucleated village community at Megali Skoinoi (see Appendix: Tholoi).

(E20) Cf. earlier use.

(E21) There are two folds here in this poor C/D schist country, one reusing an older built house, that in turn relies on a large rock for two of its sides. The earlier hut may also have been merely a fold.

(E22) The little chapel of Agios Andonios and nearby a hut with two walls formed by a great block, the other two drystone. We were told that this chapel was medieval, possibly 11th century, and inside there is an inscription recording its recent reconstruction by people from Pobia across the watershed to the north in the Messara. In Spanakis' 'Kriti' (1965: 77) we learn of the next monastery to the east of Odigitria, Moni Apezanes, that according to tradition, the primary foundation for Apezanes was on the site of Agiofarango, where there is still a church of A. Andoni. This church is of Byzantine date and belongs today to Odigitria, and hence the other names for Apezanes - Agiofarango and A. Andoni. The raids of pirates then became intolerable on the Cretan coasts, and the monks moved to Apezanes further inland. Other traditions suggest an independent origin for Apezanes. The date of these events could be 15th to 16th centuries A.D. Some of the caves in the gorge by the chapel were shown to us as once occupied by monks, while Robert Pashley in his 'Travels in Crete' in the early 19th century met on two occasions itinerant monks raising funds for an impoverished community that may be Apezanes or Andoni proper or both (Pashley 1837).

(E28) Cf. earlier use.

(Moni Odigitria) - for location see period map. Unfortunately time did not permit the examination of the landscape to the Messara (north) side of the monastery, but it is plain from the Land Potential Map that there is a wide expanse of good quality level land up here, some of it irrigated from the apparently abundant well in the monastery itself. The lofty location above its valley is partly symbolic and scenic, partly strategic - as we might infer from the above comments about pirates. On the other hand there is a general trend to locate centres in this massif at or near the watershed e.g. the two Monis Odigitria and Apezanes, the villages of Yial and Gavaliana, Pigaidakia (the regional centre) etc., significantly correlating with the only extensive areas of level and fertile land, and with a day return possible to the larger centres in the Messara. On a coast with no permanent shelter and poor fishing resources, and in hills with what must always have been subsistence agriculture, such locations seem inevitable. Classical remains along the coast to the east, however, belong to the polis of 'Lasaia' which was certainly a port. But it was only one of Gortyn's holds on coastal trade, and as Spratt remarks (1865: Vol. 2: 9) could never have been of any importance. Even when the Messara was divided between rivals Gortyn and Phaistos, the main harbours were respectively Lobena and Matala.

The foundation date of the monastery is uncertain. Byzantine sherds of possibly early types are found in its general area, but the earliest records I have been able to find are the gateway inscription - 1568, and a reference in

Edwardes to Foscarini's monastery income list where in 1557 Odigitria is cited as having an income of £697 (Edwardes 1887: 131).

(OE1) Cf. earlier use.

(OW2) Cf. earlier use. The fold below it is more recent and the sequence intensive to extensive is graphically illustrated in this microcosm of the valley and of rural Greece in general. To the north on the historical terraces possible farmhuts and a mill (?).

(W2a) Cf. earlier use, where the neat parallel with a Roman farm is made.

(W6) To the south of the tholoi a little farm and fold, only the latter still visited.

(W7) Pottery and walls, farm hut or fold ?

(W9a) Cf. earlier use. Threshing floor and folds above.

(W12-13) Several mandra (folds) here, including a very impressive multi-chambered affair. Walls and pots may well signify a farm by 12, less certainly at 13 (cf. earlier comments on these locations).

Discussion

Far too numerous to mention are the folds that blanket our valley. There are e.g. so many caves used throughout the year by goats in the coastal gorge proper, that on the period map we have simply noted E21 'n' for their location. The long-term change to a seasonal and extensive exploitation of the Agiofarango has meant that folds and the slight tending of the ground by shepherds have invaded parts of the valley formerly worked intensively from Yial, Gavaliana, and the Monastery. However over large tracts that we designated as of marginal agricultural value, notably the schist salient that protrudes between the main tributaries at their confluence, and all along the high plateau flanking the valley on either side, such folds are the only relatively modern feature. That they had numerous ancient and prehistoric forerunners is highly likely, but with the possible exceptions of E1 and 20, we lack evidence of them, though the swift erosion of soft limestone caves and the rapid removal of brush and stone folds may account for this.

THE CRISIS OF POPULATION

Rural Greece is in a state of perilous transition; while the small farmer evacuates the country for rapidly expanding towns and cities, his place is taken by the weekend holiday cottage (where it is pretty), the big agricultural operator (where the yields are naturally high and mechanisation very advantageous), and the seasonal shepherd (where it is otherwise i.e. the ruggedly beautiful, stubbornly yielding, mountainous backbone of the land). Guy Burgel has given us an eloquent analysis of the process for the Messara plain and this massif of Asteroussia (1965: Chap. 4).

There was a long depression throughout the centuries of Turkish rule, then a clear rural recovery in the early decades of the new state, an expansion of population and of land intensively exploited. Then followed the beginning of broadened horizons in the villages and little market towns. In Burgel's first, pre-war phase emigration was small-scale and did not greatly affect the integrity and viability of the village; in some ways, such as the return of moneyed villagers from the States and elsewhere, and to a lesser extent in wage packets sent home from abroad, the village received a new impetus.

Burgel writes "Il peut apparaître factice de distinguer émigration de la misère et une émigration par désir d'ascension sociale: toujours l'émigration signifie la certitude que la vie sera plus facile ailleurs. Il reste que sans croire que l'avant-guerre était un âge d'or, l'émigration ne signifait pas que la vie devenait impossible au village mais que les chances étaient plus ouvertes ailleurs. On pourra toujours soutenir, il est vrai, que cette émigration était un trop-plein que a évité la détérioration du niveau de vie rurale, mais son ressort était dans le volonté de gravir quelques échelons sociaux."

"Après la guerre, et surtout dans la dernière décade, les phénomènes changent de nature et d'ampleur. D'abord la mobilité s'accroît ... Les directions changent. Les phénomènes migratoires entre villages perdent de l'importance et l'exode rural vers les centres urbains se précise... L'émigration vers l'étranger a changé d'orientation et de durée."

"Il y a une crise, nous le savons, du commerce et de l'artisanat local; bref, de plus en plus ce sont les conditions économiques locales qui deviennent le moteur du départ. Qu'à cela s'ajoutent, portés par la renommée, la vie plus facile des villes et les salaires mirifiques offerts en Allemagne, et ces conditions d'existence qui incontestablement se restreignent au village deviennent de plus en plus insupportables".

In fact, the earlier period of rural depression, under the Turks, was of a different nature. The insecurity of life on the plains, and the predominance of the great private estates, saw a move amongst the Greek peasants to concentrate in remoter upland villages. When the New Greece restored the fertile plains to cultivation and reclaimed them from swamp and scrub, the farmers returned, and with them, increasingly came all those who had once been proud to scrape a living but now became aware of profit. "L'Astéroussia... Il est assez commun que des familles entières aient quitté ces villages de montagne pour s'installer en bordure de la plaine. Elles ont conservé en montagne des terres a céréales et des oliviers et ont acquis de terres irrigables,

notamment de vignes". Gradually these mountain possessions have fallen into waste, though still some fruit trees and the odd patch of olives are sporadically tended in the Agiofarango by absentee owners. The only reason for working a field now in these areas is the idea of the market, and the only permanent farm, excepting the handful of monks, in the length of the valley is a family growing vegetables between W12 and 9a, pumping irrigation water all the way from Kiriake. "Dans les villages de montagne, le déclin des céréales n'est qu'en partie compensé par la progression d'autres cultures: légumes de plein champ (essentiellement pommes de terre) et cultures fourragères (vesces)" (Burgel 1965:119-21, 115, 83).

GENERAL CONCLUSIONS ON THE LONG-TERM SETTLEMENT OF THE VALLEY

A) The vacillations of occupation may be partly illusory, but definite retractions of settlement appear to be due to a number, rather than one single factor. Apparent abandonments of the valley, in the post-Minoan Dark Ages and the Archaic, the early Byzantine periods (?) may reflect coastal insecurity, and/or a retraction to more fertile districts, while the well-documented Venetian and Turkish periods see a flourishing use of the valley respectively because of political, commercial, ecclesiastical rural development, and subsequent escape into the hills from tyranny, insecurity, economic stagnation of the plains. The present abandonment is the result of over a century's growing disruption of the Greek village, and its social and economic modes of thought, by an intrusive consumer economy and concepts of profit.

B) We have tried to demonstrate the value of micro-scale locational analysis for determining the function and interrelationships of sites, whether excavated or merely known from surface finds. No ancient or modern farm, fold or village is placed randomly in the landscape. The consistent and recurrent preferences exhibited in every period in the valley are to be traced to the determinism of human needs and the determinism of those fortuitous combinations of landscape features that can best satisfy these needs.

C) In Figure 6 three model locations are illustrated that are particularly clear in the farming sites of the valley. The first is a site beside or within good arable, B-C or better. A variant controls a herding corridor to grazing land. Second model is good arable surrounded by poorer land where wide-spaced olives are likely to have been prominent. The third and most viable location combines all these features, and would seem designated to cater for a well-balanced farm, with a small flock of sheep/goat, subsistence cereals and fodder, and olives perhaps just plentiful enough to sell part of the oil for household and farm equipment purchases. It is this last case that is particularly common in the Agiofarango, and is associated with 'villa' type farm establishments in the Classical and Roman period, and possibly also the Medieval period. It is a pattern found common for the same periods in the area of the Argolid Survey and can be found as a model in Roman farming textbooks. K. D. White, in Roman Farming (1970, Chap. 12) summarises the main types of farm estate and management as recommended by the major agronomists. Cato holds that the Oletum should, like all farm enterprises, be self-sufficient and part of a balanced economy where failure of one factor

(and of course the olive is only a significant producer in alternate years), is compensated for by the other exploitations. Thus on a 240 iugera Oletum, 13 are for grain to feed the staff, 15 are for fodder for the work animals; cereals will be grown under all the olives in their unproductive years, and a flock of a hundred sheep graze around and between the olives according to season.

APPENDIX 1

CULTURE, RELIGION AND ECONOMICS

This is a brief discussion of four topics from data gathered in the Agiofarango, that are of especial interest in a wider context.

(1) Transhumance: The catchment area of our valley and the hillland to its west is remarkably large in respect of winter shepherds. This stems from local environmental advantages and not the present near-absence of cultivation in the area. In Figure 7 the source villages are shown, mostly places with a herding bias in poorer upland locations. Regrettably I lack data for transhumant routes in the Knossos-Heraklion area, though it is known that this district participates in movements up into Idha. Particularly interesting is the link to Sfakia. One group from Kroussona comes and occupies houses at Kaloi Limenes, and consists of five interrelated families with about 1,000 sheep and goat: they have a particular right to graze in the Agiofarango. In summer only a small number of animals remain in the valley. At this time, these alien flocks will normally transhume to the Mt. Idha massif, while in the days when Yial and Gavaliana were inhabited the local people took their flocks up to the higher parts of Asteroussia (Mt. Kofinas). The same links are created by winter visitors elsewhere in South Crete, and at Pobia on the south edge of the Messara Burgel records the winter presence of Anogeia shepherds, chiefly five brothers with about 800 caprovines, who live in caves above the village. At Pigaidakia, between Pobia and Agiofarango, he notes shepherds especially Sfakiotes transhuming.

In 1865, Spratt visits Lasaia, just east of Kaloi Limenes, where he notes a patch of terraced ground "that is partially tilled by a Sfakian shepherd, whose mandri or sheepfold is above it" (1865, Vol. 11: 8). Lightly working the poorer land near grazing is quite common even when permanent farmers exist alongside the seasonal visitors. Burgel stresses the long tradition of these practices, and we may suggest their extremely high antiquity.

But the most provocative point of Burgel's comes when he examines the many links of feeling, culture and blood that make his Pobians part of a wider world beyond the village. He concludes "but at the bottom is it not surely the consequence of old economic and human links - transhumance uniting the mountains of Psiloritis, the Messara and the coastal chain of Asteroussia". Archaeologists consume a lot of effort in relating styles of living, as expressed in material culture from different sites, but very little in accounting for the distribution of cultural traits. At least in the Minoan tholoi, and in a preference for certain wares such as local Agios Onoufrios, these same areas were part of a culture area that to some extent stood apart from other areas of Crete in the Early Bronze Age, and we suggest that further research for other archaeological evidence for this Messara culture may prove rewarding.

(2) Deserted Villages: In the traditional Greek village the community has a collective identity which sets it apart from its neighbours. This is expressed and reaffirmed in the community ritual associated with the village patron saint. Once a year, on that saint's day, the village has a sort of 'birthday', with a festival which neighbouring villages attend. Even when the village is abandoned, for a long time any of those who once lived there along with their descendents will return to the site on the village's nameday, with a priest, and celebrate the festival. Thus in September, former inhabitants of Yial reassemble from the villages they dispersed to, and Pashley (1837) writes of a village in central Crete he passes through, where the ruined church is still visited by a priest (and presumably former villagers), on its name-day.

This feeling of a spiritual force around which the thoughts and activities of the villagers are centred, symbolising continuity and the accumulated history of the community, has then a permanent power attached to the scene of past events. In the chequered life of many village and town sites that are excavated, we often come upon curious reoccupation levels, some of which do not seem to be a resettlement, but of a ritual character. A striking example is at the palace of Knossos, where Mervyn Popham, in ' The Last Days of the Palace of Knossos ', concludes: "Much of this pottery was doubtless connected with the Shrine of the Double Axes and its cult, as Evans stated. Indeed it is tempting to believe that most if not all the reoccupation was connected with the shrine. Many of the deposits do not look like occupation pottery....It could well be that the occupiers of the Palace ruins were some priestly body and that the stores of pots were meant primarily for sale to worshippers visiting the shrine" (Popham, 1964: 8-9). We might also cite the famous mound and sacred (?) precinct over the ruins of the House of the Tiles at Lerna (Caskey, 1964: 17).

(3) The Monastery: Odigitria is likely to have controlled all this south-west projection of the Asteroussia in its early modern heyday, as far as a border on the east with the equally extensive lands of Moni Apezanes. To the north we hear of exoecclesia near Pobia belonging to our monastery, suggesting that its territory spread down into the Messara - probably up to the lands of Moni Kalyviani near Phaistos (see Figure 8).

The monastery system, considered purely secularly, is a well-constructed network of economic centres, high up in a carefully organised hierarchy of agricultural exploitation. The parallels to the Bronze Age Palaces in Crete and on the Mainland are remarkable, though it is highly probable that similar environmental and social factors were at work (cf. Ritual Chapter). In Figure 8 the monasteries mentioned in the text are located, together with all the other major monasteries in central Crete, and the Minoan palaces. The notable interest in the Idha and Kophinas upland zones shown by monastic distribution is closely connected to their historical role as large-scale sheep and goat 'ranchers' using these uplands for summer grazing of very sizeable flocks (cf. the same pattern for modern villages in Figure 7). The Knossos Linear B tablets show control over vast flocks as well (cf. the brilliant interpretation by J. Killen in BSA 1964) and almost certainly the major palaces at Knossos and Phaistos were using these zones for seasonal pasturing. The peak sanctuaries on Idha and Kophinas summit can only relate, as with

the present sanctuaries there, to such usage in summer from a wide lowland catchment. However a different and complementary feature of the monastery locations are the extensive lowland arable lands owned by the monasteries in the hills and foothills zone e.g. the territory of Odigitria - which as noted, included the S.W. Asteroussia from the south coast to the Messara Plain, and an important section of the southern Messara around Pobia. Finally there are monasteries such as Kalyviani, almost identical in its territory to ancient Phaistos, and a cluster of wealthy foundations occupying the same central inland zone of Crete, with its fine rendsina soils, as Knossos and Arkhanes.

(4) Peak Sanctuaries: There is evidence that almost all of these begin coincidentally with palace civilisation in Crete (beginning of Middle Minoan), and on the Mainland (Late Helladic 3).[3] They reflect a national cult and are probably to be associated with 'territorial representations' of a ceremonial nature. We might argue, from their Agiofarango distribution, that in an ascending order of integrative ritual, 'extended family' worship at the tholos of the ancestors has been replaced by the hillock shrine for the same group, the village peak sanctuary for the families of a nucleated or dispersed community, and regionally significant peak sanctuaries on the loftiest peaks and beside the palaces. Thus the physical world is related to the religious system, the unified Minoan cultural world and the administrative hierarchy made symbolically manifest, and inseparable, in the Minoan awareness, from these former systems. All the component parts of a world real and conceptual are articulated by the momentum, not least the literal momentum, of ceremonies embracing ever-broadening areas of the landscape, and involving the coming together of worshippers from an ever-widening circle of villages. As Dr. Branigan has pointed out (1974), there is little evidence for use or construction of the tholoi after the MM2 period, although Cretan culture flourished up to the LM1b Thera catastrophe. The peak sanctuaries spread over Crete just before the eclipse of the tholos period, and are well attested into Late Minoan times. It seems very plausible to consider these two networks of fossilised ritual behaviour as serving similar ends, the sanctuaries more 'national' and 'extrovert' social representations in comparison to the close-kin orientated tholos system. If transhumance forms a natural link between the Messara people and the upland pastures of Mt. Kophinas in Asteroussia, there is also the common grazing interest in the Mt. Idha area by villages in the North Messara and the Knossos-Arkhanes plateau land (cf. Figure 7). The major peak shrine at Kophinas would perhaps form a focus for Messara people alone, that on Idha for Messara and central plateau land people. For the Minoans living around and in Arkhanes and Knossos Palaces, the peak shrine at Mt. Iuktas may have formed a distinct ritual focus. The palaces themselves certainly formed important ritual centres for surrounding populations, as J.W. Graham has argued persuasively (1969).

Precisely such a system of religious and cultural integration can be argued for the exactly equivalent 'territorial ceremonies' still retained in attenuated form in rural Greece by the Greek church, and it is no coincidence that the goal of the great Profitis Elias ritual (when all the countryside or a whole island were accustomed to accompany the priest to chapels on prominent local eminences and finally the highest mountain within view) is very often the site of a Bronze Age Peak Sanctuary (see Ritual Chapter).

APPENDIX 2

THE MINOAN THOLOI

In 'The Tombs of the Messara' Dr. Branigan concludes of the tholoi in general, that they are "the tombs of an enlarged family unit such as the clan or genos" and that "the Early Bronze Age village communities were probably about the right size to be comprised of two or three such gene" (Branigan 1970a, 129). Secondly, he notes "the close proximity of the cemeteries to their respective settlements. More than a dozen cemeteries have now been linked with their respective settlements and in every case the tombs have been found within a short distance of the village" (p. 132).

For the first time an intensive suvey of an area of the Messara group of Early Minoan culture has been carried out, and in a place far from being the most prosperous core of that group. The actual number of tholoi surpassed all expectation. Because of this, some unique factor was sought, for example the important trade route. We have shown that the numerous tombs of the Agiofarango are rather a reflection of intensive agricultural activity. From a brief inspection, it now appears very likely that adjacent valleys are equally decorated along their length with tholoi, and a close reading of Xanthoudides reveals a very dense distribution of tholoi within the small areas of the Messara to which his attention was drawn (Xanthoudides, 1924). We are justified in concluding that our valley is in no way exceptional or at least but in the fact that only here has a full search for tholoi been accomplished. It remains to examine the tombs in terms of local economy and society, for it is here that their function in the minds and activities of the Minoans can best be understood.

Dr. Branigan has pointed to two main phases of tholos construction and dates them to the beginning of Early and Middle Minoan respectively. In the valley we have recognised about 4 definite constructions for the first phase, 7 for the second phase - including reuse of 4 tholoi; 2 tombs are undated, and we might include the tholos 'west of the monastery' which could relate to the OW1 and 2 complex; in addition we have 3 tholoi of the second phase just beyond our survey area (E27) which could well relate to people who worked the north-east part of the valley by Gavaliana.

Because we may have a reasonable sample of the original number of tholoi in our area, and working from the assumption (which appears justified on present evidence) that nearly all of the permanent population of the valley were laid to rest in them, and that burials were continuous throughout those periods represented in each tomb, I considered it a worthwhile exercise to estimate the likely population of the area surveyed, in Minoan times.

The calculations involved computing from the Land Potential Map the total area of higher grade acreage, then from accumulated ancient, recent and modern figures suggesting probable figures for crop yields and subsistence requirements per family per year. It had to be assumed that the most plausible

land use pattern was in operation, namely subsistence cereal and surplus olive production. The Carrying Capacity of the area from permanent farming is likely to have been of the order of 17-34 nuclear families, i.e. 70 to 140 people.

The recent and ancient estimates of yields and division of crops are conveniently brought together by Van Effenterre (Et. Crèt. 1963) and Michell (1940), Allbaugh et al. (1953). Most sources, past and present, give values for Mediterranean yields of average 12 bushels per acre for cereals (often higher for barley, lower for wheat), and 150 litres of olive oil per hectare (i.e. 50 trees with cereals below). A suggested annual requirement per individual would be $8\frac{1}{4}$ bushels and 15 litres of oil. A family of 5 adults and 1-2 children (see below) would therefore require over 4 acres of cereal land, and c. $1\frac{1}{2}$ acres of wide-spaced olives. It is a necessary practice to fallow the cereal fields on a 50:50 basis, so a total cereal acreage would then be more than 8 acres. The fallow growth would be used for animal fodder. Olive trees normally produce in quantity only in alternate years, thus favouring a cereal crop beneath a grove every other year. Cretan farmers tend to grow subsistence cereals and an olive surplus for exchange. Thus a hectare of olives is commonly kept, up to half the produce of which is available for the market.

In the S.W. Asteroussia the holding size is large for Crete, and averages c. 30 acres (Burgel 1965). This is a reflection of the less favourable ratio of good soil to poorer land, and correlates with the strong herding interests of the inhabitants of this area (since some of this large acreage must be kept as fodder fields to supplement the extensive stony grazing areas). In addition the olive groves are more likely to be spread loosely over the uneven ground, and the cereal land as we have seen consists of a string of discrete patches. Poorer grazing land accounts for a major part of the 30 acres, and we ignore this sector in the following calculations. From the map compiled by the author of the Potential Land Use for the Agiofarango, all the land in the favourable B and B-C categories has been approximately summed for its total surface area, using a grid of $1\frac{1}{2}$ acre squares. From a final figure of c. 550 acres we must necessarily subtract the land comprised by the recent alluvial terraces, thus leaving a figure of c. 517 acres of land of sufficient quality for sustaining a permanent population in the valley. From this we obtain our maximum estimate of 34 families. However it must be admitted that the quality of the valley soils, especially in the B-C category, is probably below the average for the cereal and oil yields quoted above. Given the characteristic thinness of the soil, the notable summer aridity in our area, and the frequent appearance of years with unfavourable rainfall patterns, we must widen the range of long-term viability in the gorge, and it is possible that a total of say only 17 families would be able to derive a consistent and secure livelihood from the same area.

Population records from the valley begin when already it is probable that local communities were in decline, and it is impossible to discover how permanently resident these people were, or even their exact place of residence.

The National Statistical Office and a Census of Crete in 1889 (Stavraki, 1890) give the following information:

1971: pop. 'Moni Odigitria' : 15
1928: pop. 'Yial' : 20; 'Moni' : 30
1889: pop. 'Yial' : 52; 'Gavaliana' : 18; 'Moni' : 9.

Local informants, including old residents of Yial told us there were still about twenty families belonging to Yial in the valley after World War 1, and before World War 11 there were about 15 families belonging to Yial and 2-3 to Gavaliana.

The general picture gives us at least a lower parameter for population cover in the century or so of gradual decline in the valley, and adds plausibility to our estimates from an independent source.

With 17 to 34 families using on average half a dozen tholoi at any one time, we arrive at a group of 3 to 6 families per tholos, which is admirably suited to Branigan's kin group.

However it is impossible that beside each tholos or little group of tholoi in the valley there existed a village, nor if we consider isolated examples such as E22, E17, W6 (the two behind this seem unfinished, and the W8 pair appear later in date), W11, would we expect a village or even a hamlet per tomb. A factor at first curious is the consistent correlation of tholos and clearly defined zone of good arable land, despite the great discrepancies between the gross size of this patch of land. If for example we take the cases of solitary E22 and W11, the total acreage of associated land is insufficient to maintain the postulated 3 to 6 families using the tomb, while on the other hand the E10 pair of tholoi have the vast area of best quality arable around them.

The answer to both these problems is to be found in rural Greece today. The Greek peasant characteristically has his total holding in a great number of discrete parcels of land, scattered all over the territory of the village or dispersed commune. For a long time this was interpreted by those who ran development programmes (cf. Allbaugh 1953) as a terribly uneconomic practice, stemming purely from a perpetual fragmentation amongst heirs to the land. Now we can see that in many respects parcellation is a sensible and equable adaptation to a tremendously diverse landscape, where a good field borders on bare rock, desirable land exists at discrete blobs amongst the hills, and where the factor of distance reduces in inear progression the value (Land Rent) of a field. The custom therefore arose of giving each farmer a share of the best, level land, of the near and distant land, giving all some harder, unrewarding patches. In short, all the accessible land was used to the full, and as equably as only a closed community can enforce. Fragmentation amongst heirs is followed by consolidation as one brother buys up the others and his co-heirs marry out or seek employment or land outside the commune. Very often, in fact, land is held in common, and the extended family has an interest in keeping the land 'in the family', even if one particular member nominally owns and works the land.

Dr. Branigan has made a good case for an emphasis on community rather than individual expression in the burials of the Early Minoan period, and Prof. Renfrew has pointed out the same in what little we know of the domestic and public architecture (Renfrew, 1972). Therefore, it would seem likely

that land holdings then as now existed in extensive fragmentation, and that the men who tilled the land around E22 and OW2 also had a field strip on the Megali Skoinoi plateau (E11) and a share in the special fruitfulness of the Kiriake irrigated garden (E6-7).

Why do the tholoi mark particular holdings? Most of the probably contemporary collective tombs such as these could reflect subdivisions within the valley community based on kinship, so these parcels are especially to be linked to a kin group down which their exploitation passed. The number of tholoi given the scale of the valley suggests that the 'clan' is too large a unit, though of course several groups of closely blood-linked families could well have made up local clans. The exclusive position of the two Megali Skoinoi tholoi (E10) might further represent the first families to colonise the valley, whose descendents perhaps had some prestige on that account. The spacing of tombs would also have signified symbolically the distance between extended family groups on a kinship map.

The explicit bond I am suggesting between the land, the kin and the dead ancestors, is again a prominent feature of traditional Greek peasant life. Till fairly recently it was a general custom on the Greek islands for the dead to be buried in family groups around a field chapel, amid particular holdings belonging to a narrow kin group (cf. Melos chapter). The timeless stimuli to such activity seems more significant than the question of simple 'continuity', and so I quote from Juliet du Boulay's discussion of the special place of the family holding in the spiritual world of the Greek peasant (1974): "There is a very specific sense in which the past history of the family is linked with the land, for it is from the male side of the family that the bulk of the land is inherited, and the particular aspect of possession which makes land so precious to the Greek villager, over and above that of sheer material wealth, is the implication of that land with his forefathers, with the sweat of his brow, his grandfathers, who toiled in it and made it what he possesses during his lifetime".

The significant frequency of field mausolea for family groups in the Early Bronze Age Aegean is also discussed in the Melos and SW Argolid chapters (q.v.), but while the Messara tholos is practically confined to that Plain and its surrounding hills, there is evidence that throughout Crete at this time rather similar practices were common. Already in Neolithic times burial of the dead was frequently in groups in caves (Branigan 1970b: 112-3), while from EM2 on we find, outside of the tholos zone, over central and eastern Crete, a number of rectangular chambered tombs which could be the equivalent of the tholoi (op.cit., p. 154). These contain very numerous human remains, sometimes apparently of a similar order to the tholoi, e.g. at Arkhanes, where c.200 skulls were counted (see below). Again, some of these chambered tombs have a paved forecourt like a number of the Messara tholoi, which could have been the site of ritual dances (op.cit. p. 177).

Understandably we know little of the rites involved with these two varieties of tombs, but Keith Branigan has plausibly argued that the sepulchres were visited for ceremonies to the memory of the dead ancestors, during which the paved areas around many of the tombs would have been the location of ritual acts - possibly dances - and offerings might have been made on altars or from

tiny cups. In some cases there are annexes to the tholos which were not in use for burial but probably for some sort of ritual. At Apesokari, for example altars were found both outside and inside the mausoleum (see Branigan 1970b: 172ff.; 1970a: 98, 134ff.).

If it is correct that the Early Bronze Age emphasis on local interests, in terms of land and family, reflects some sort of 'stage' in the development of complex societies (as has been suggested in the Social and Political Chapter), then the well-attested parallel emphasis on local holdings, family sepulchres probably associated with discrete areas of arable land, evidence for ritual acts before the tomb, and lack of traces of important domestic architecture, to be found in the Neolithic and Early Bronze Age communities of north-western Europe and their megalithic and earthen burial constructions, is crucially in harmony with this 'stage' concept (cf. Atkinson 1972, Ashbee 1970, Renfrew 1973).

THE DEAD AND THE LIVING

In the islands where burial was dispersed, so often was the farmhouse, but it will be clear now that the location of the tholoi need not mark the settlement of the living, who may have houses beside other plots, or live all together in a nucleated village in some economically strategic position. Indeed, as we saw, it is unlikely that the land with some tombs supported more than one of the families who buried their dead in it. But was the Minoan settlement pattern in the Agiofarango nucleated or dispersed, or intermediate with close hamlets (as Yial and Gavaliana may have been)? We seem to have 'farms' at OW2, E20, E24, while doubt exists about walls at E13 and E5-7 (they could be just terrace walls with field hut sherds) and about the pottery by W8 and W11 tholoi (ancillary tomb houses or peak sanctuaries?). The excavators of the buildings around the two Megali Skoinoi tholoi claimed to have found a village with a 'defensive wall', but we have no further details and the extent of the complex is uncertain (see Branigan 1974; Alexiou 1967). Only the full publication of the site will tell us how many houses were recognised, and to what extent their function and contents were domestic or funerary. A domestic site by the tholos pair of E17-18 is also a good possibility.

It is possible that all these potential domestic sites were occupied in both Early and Middle Minoan, and a few (Megali Skoinoi, Kiriake) into Late Minoan. The lack of any clear locational differences between these periods is less surprising when we consider the remarkable coincidence of historic sites on the same preferred positions.

Since the evidence outside of Skoinoi is appropriate for little more than half a dozen family sites, the bulk of the population is to be expected living in a concentrated community at that site. If this is correct we must revise the opinion cited earlier, that the tombs generally adjoin domestic sites, even at the lowest level of the single farmstead. The pattern proposed from the Agiofarango is one of ancestral tombs scattered over the total fields of the community, to a lesser extent single farms dispersed amongst the fields: but the majority of the local population in a nucleated settlement central to the most productive and extensive arable land.[4]

EXTERNAL PARALLELS

If we reconsider the evidence for tholoi and settlements elsewhere in the Messara culture area a reasonable case can be made for a similar pattern. First the tholoi of Xanthoudides (1924):

Koumasa - 3 tombs EM to MM, with a 'settlement' MM to LM 100m away; nearby peak sanctuary.

A. Eirene - half an hour distant from Koumasa (NE), EM on, isolated tomb-pair

Porti - EM tomb, 'settlement' (?) 100m or so distant? 'Above' an 'acropolis wall' seems to be the settlement evidence. Site only 4km NW from Koumasa and probably much closer to Eirene.

Christos - tholos, ? to MM1, above the site is a rocky hill with Minoan 'settlement'. Possibly another tholos 'nearby'. Site an hour SW of Koumasa.

Salame and Koutsomera - Salame: tholos EM1-2, 10m away an MM and LM 'settlement'. 100m to the north the Koutsokera tholos also EM1-2. Site within an hour from Koumasa.

Drakonies - two tholoi MM and LM, 3km east of Koumasa.

Kalathiani - tholos EM2-3, 'settlement' of MM1-2 'to the north'.

Platanos - three tholoi.

The most significant thing is the fact that from a central point at Koumasa, within a radius of 4-5km, (an hour's walk), we find the tholoi and 'settlements' of A. Eirene, Drakones, Salame, Koutsokera, Porti, Christos, and of course the finds at Koumasa itself (Xanthoudides 1924: 132). In terms of nucleated village communities, the existence of one such per tomb or tomb group is almost as improbable as in the Agiofarango, and even for those tholoi where a settlement is claimed we may be dealing with one or two farmhouses, or even with ancillary ritual buildings. Dr. Branigan discusses other associations of tholoi and domestic sites (1907a: 132).

Trypiti - from Alexiou we learn (1967: 484) that there is a tomb - EM1-?, and above this location, to the north-west, a settlement on a rocky height, also of EM, and MM, while to west of these there is another tomb.

Komo - tholos about 10m north of houses of EM-MM date.

Viannos - beside the EM3 - MM1 tholos was an MM1 house.

The curious lack, or apparent lack of contemporaneity, in most of these cases, between domestic and funerary remains, may point to a later custom of more dispersed settlement at a time when the tholoi were abandoned or new ones built elsewhere in the village territory, though of course both in the Agiofarango and throughout the Messara many tholoi continue in use till Late Minoan times. The absence of nearby house traces in the early period of many tombs, (which may cover hundreds if not a thousand years), may be further support for our suggestions.

HOW MANY BODIES?

Finally another independent way to confirm our estimates for the social group using each tholos, is to calculate the order of magnitude of human remains that would accumulate over a given number of centuries from 3 to 6 families, and compare this to the rough figures given by excavators for tholoi whose use is known, from enclosed pottery, to within a century or two.

Again we have necessarily made certain assumptions about generation length and death-rates, relying on ancient and modern estimates. It is generally agreed (Xanthoudides 1924, Branigan 1970a) that the Messara tholoi were used for the burial of the whole community of a given area. Certainly both sexes are well represented, and precious articles deposited with the dead are rare and hardly ever suggestive of 'royal' status. This writer has in fact assumed that all family members were buried in their kin tholos, including the sub-adult mortalities. It is unfortunate that we lack any evidence for mortality patterns in these tholoi. In Charles' summary of burial finds throughout Crete (1965), we find that, rather naturally only well-preserved mature and robust specimens are worth examination by the physical anthropologists past and present, therefore sub-adults get little mention. A cave at H. Nikolaos in Eastern Crete, provided Late Neolithic burials, and we are told that along with a number of adults a 6 year-old infant was found (BSA 1902-3: 344ff.). Another cave cemetery was examined in the Zakro gorge, with MM burials, and a child was identified with 3 adults (BSA 1900-1: 150-5). From Alexiou's Lebena tholos excavations we hear of only two good specimens later aged at 30 and 45, and from the Viannos tholos, east of the Messara, a few of the better specimens gave ages from 20-25 upwards (Charles 1965: 45, 208ff.). This writer has already allowed for distortion of the burial counts in the tholoi (see below) by contrasting the poor preservation of the infant bones with the tendency to exaggerate minimum number of dead from a mass of disarticulated skeletons. If the infants had been buried elsewhere, we need not adjust any further than if they were very poorly observed amongst the tholos boneheaps.

The best source for population statistics is J.C. Russell's monumental work on 'Ancient and Medieval Population' (1958). He concludes that the European peasant family in the medieval age, on gross average, consisted of 7 members. Of five children, one was likely to die in the first year of life, a second before the age of 20, while only 2 of the remainder were likely to produce a further generation. Obviously in times of economic growth or collapse, these figures were slightly different. The evidence for these generalisations tems from historical records and cemetery analysis. Authorities such as Wrigley (1967), Cox (1970), and Schott (in Acsadi 1970) seem agreed on these figures, though analyses simply on cemetery excavations by Gejvall (in Acsadi 1970), and Acsadi and Nemeskevi (1970), suggest that at times 60% of the dead may have been immature specimens.

Taking the more general figure, we might expect that the Cretan family contributed 5 'bodies' to a communal tomb in every generation (normally accepted to be every 25 years). These five were made up of two generations, the three surviving children of a former generation and two immature deaths from their summed offspring (for convenience one can take two productive

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The best source for population statistics is J.C. Russell's monumental work on 'Ancient and Medieval Population' (1958). He concludes that the European peasant family in the medieval age, on gross average, consisted of 7 members. Of five children, one was likely to die in the first year of life, a second before the age of 20, while only 2 of the remainder were likely to produce a further generation. Obviously in times of economic growth or collapse, these figures were slightly different. The evidence for these generalisations tems from historical records and cemetery analysis. Authorities such as Wrigley (1967), Cox (1970), and Schott (in Acsadi 1970) seem agreed on these figures, though analyses simply on cemetery excavations by Gejvall (in Acsadi 1970), and Acsadi and Nemeskevi (1970), suggest that at times 60% of the dead may have been immature specimens.

Taking the more general figure, we might expect that the Cretan family contributed 5 'bodies' to a communal tomb in every generation (normally accepted to be every 25 years). These five were made up of two generations, the three surviving children of a former generation and two immature deaths from their summed offspring (for convenience one can take two productive

siblings as 'producing' two immature dead children, even though they married into other families). Therefore 1/5 or 2/5 of the bodies could be sub-adult and hence less easily recognisable or preserved in a tomb context. However to offset this factor, we must also allow for a frequently observed tendency amongst excavators to overestimate the number of individuals, either animal or human, from bone agglomerations, and this is even clearer when a bone specialist provides us with an estimate of minimum number of diagnostic bones.

In any century, then, we might expect to find the interment of 20 bodies per family. Some check on the following comparison of recorded estimates from excavation of bodies against the time factor is available in our independent estimates of the carrying capacity of the valley and the number of tholoi that were apparently in use simultaneously. On present evidence, in the Early Minoan period, 4-6 tholoi may have been in use in the valley, with a possible additional tholos near the monastery perhaps to be linked to some occupation at the OW2 settlement site. In the Middle Minoan period 7-9 tholoi may have been used, and we should remember the three tholoi just north-east of the survey area, with associated MM and LM finds, and the 'Minoan' tholos just near the monastery. One could argue that we have evidence here for increased population - and indeed such a process is certainly to be expected with the beginning of the great palace systems in the latter period. This would clearly complicate our burial averages, which deal essentially with a more static population.

I have necessarily compromised, and taken an average of 6 tholoi for the calculation of the size of social unit utilising both tombs and valley resources.

Let us now examine recorded estimates of tholoi population:

KOUMASA B & MARATHOKEFALON 2	-	Many hundreds	(Xanthoudides)
PORTI	-	At least many hundreds	(Xanthoudides)
AGIA TRIADA	-	c. 250	(Halbherr)
LEBENA 1	-	c. 600	(Alexiou)
KAMILARI 1	-	c. 4-500	(Branigan)
MYRSINI	-	c. 100	(Branigan)
VOROU A	-	c. 100	(Branigan)

From the pottery these tholoi could have been used for: 900 years; 900; 1400 (probably discontinuous though); 700; 5-800 (almost certainly discontinuous); 400; 400.

On a basis of 20 per family per century, the above figures might represent the dead of repectively: 3-4 families?; 3-4 families?; 1 family; 4 families; 4-6 families; 1 family?; 1 family?. The Triada tholos should probably have its working life in centuries shortened, thus raising the number of families using it, but in contrast the Kamilari 1 tomb would be more likely 6 than 4 families for the same reason.

In general I consider that the order of magnitude of these tomb figures, given the range of error in estimates, both mine and the excavators (and none

of the latter actually count the number of diagnostic bones), compares favourably with those predicted from the Carrying Capacity of an intensively cultivated Agiofarango valley.

APPENDIX 3

DEFORESTATION IN CRETE - MALLIA AND 'LA COUVERTURE VEGETALE'

(Ét. Crèt., Vol. 13, 1963:31-2, Pareyn, Van Effenterre et al.)

"Il est d'usage d'imaginer la Crète ancienne couverte de forêts. Sur le Séléna lui-meme, écrivait P. Demargne après Evans ou Pendlebury, 'il faut sans doute replanter en imagination les forêts de pins et de cyprès qu'ont dévastées les uns après les autres les occupants de l'île'. Nos recherches nous obligent à nuancer ces affirmations. D'abord, la formation même des sols exclut que la ceinture montagneuse de Mallia ait jamais présenté aux yeux des Minoens l'allure alpestre qu'on imagine. Le faciès et le pendage des calcaires jurassiques ou triassiques du rebord septentrional du Lasithi (Séléna et sommets voisins) ne permettent pas de couverture vegetale. C'était une montagne aride hier, comme elle l'est encore aujourd'hui. En revanche, les forêts du flanc du Nord du Séléna n'ont pas à être imaginées, elles existent encore bel et bien, tout en n'étant pas visibles de la plaine. En effet, le dôme anticlinal qui constitue les contreforts du Séléna a été modelé par l'érosion en plans étagés favorables à la formation de cuvettes perchées ... Y'eut-il jamais lá de pins et des cyprès que les Minoens auraient utilisés pour les navires et leurs charpentes? C'est possible, bien que le climat du second millenaire avant notre ère, tres voisin en Crète du climat actuel, ne semble guère favorable à ce genre de forêt en altitude. Mais il y avait sans doute des forêts de chênes verts comme il en subsiste encore aujourd'hui de magnifiques vestiges ... à l'altitude moyenne de 800 metres, dans des dépressions karstiques... Nous y avons vu les bucherons de Tsermiadho, comme ceux du haut Mirabello, y pratiquer des coupes régulières dont le produit est transporté à dos d'âne par les chemins de la montagne. La structure anticlinale explique que cette forêt soit invisible de Mallia, d'où l'on a bien l'impression...comme l'écrivait P. Demargne, les feux des bergers, le soir, y brûlent les derniers buissons...

Ces buissons sont en réalité le pauvre végétation méditerranéenne normale sur les dévers des plissements calcaires: épineux qui s'accrochent au rocher, myrtes et thyms, maigres pâtures qui n'attirent guère les chèvres sur les pentes dépourvues du tout point d'eau. Il faut descendre à moins de 250 m d'altitude pour trouver, à hauteur des grands éboulis plus ou moins retaillés par les plages successives, les premiers oliviers puis les caroubiers. Rien ne peut faire penser que le paysage minoen ait été sur ces versants très différent de ce qu'il est aujourd'hui."

NOTES

1. Mr. Doe is also incorrect in supposing that the lower alluvium is from the main river, the upper deposited by 'downslope processes' i.e. from behind, on the grounds that schist fragments are plentiful in the lower, rare in the upper alluvium, and 'on the slope behind the terrace schist does not outcrop'. In fact small pieces of schist are abundant throughout the section, and stem from a striking schist outcrop at the head of the fan and extending up the torrents behind the fan. This outcrop is of course the reason for the emergence of two abundant springs at this point.

2. Guarducci: Ins. Cret. Vol. 1, 15, no. 3, Fragmenta 1917, H. Kiriakes inter Hodigitria et rudera Lasaeae.

3. While of a very large number of peak sanctuaries, only Petsofa and Fournou Korifi may begin earlier than MM1 (EM3 possibly), the interesting new evidence from the Agiofarango for two such sites with some Early Minoan sherds alongside Middle and Late Minoan material has suggested to Keith Branigan (1974) that the sacred tradition may have its origins in a more localised ritual of the Early Minoans in this part of Crete.

There is clearly a major problem here, for two of the new peak sanctuaries (E12 and E18, with a further example possible - W11b), have pottery finds as far back as EM1. Dr. Branigan points out that the distinctive 'temenos' walls around the first two cited sites may in fact be MM constructions, but that ritual should now be seen to date back far earlier. While we may in fact be discovering the localised origins of the sanctuaries which are later to spread throughout Crete, an alternative explanation may be offered.

By far the best examples of non-utilitarian Minoan locations in the valley are the eruptive block of site E4a (a few square metres on the summit of a bare and steep rock), the small hillocks of W11B in the south of the gorge, and the hillock of OW1. E4A seems to be purely MM in use; OW1 is 'Minoan' and seems to be associated with settlement remains at OW2 of MM and just possibly also EM date; W11B seems to include two features - pottery scatters perhaps belonging to a peak sanctuary and a rectilinear ossuary (?), both overlooking a tholos W11A - of 'Minoan' date. While the first two (E4A and OW1) would be satisfactorily assignable to MM, in the finds from W11B we may be mixing material from an EM ossuary complex with that from an MM peak sanctuary. E4A was originally interpreted as an 'ossuary'.

Although Dr. Branigan has claimed the possible peak sites of E12 and E18 as the best examples of the type in the Agiofarango, these locations are especially open to alternative uses. E12 is closely adjacent to the remains of the hamlet/village of Megali Skoinoi (E10, 11, 14), and if we are right in demanding that the community here would have settled on the poorer areas of land beside the best land (see above) this hillock might have been used for a domestic house or two in the Early Minoan period. Certainly the temenos

walls argue ritual significance, in comparison to sanctuaries elsewhere in Crete, but the later arrival of the peak sanctuary religion may have displaced earlier less sacred structures. This argument is even more plausible with the hillock of E18, where as Dr. Branigan himself noted (1974), the site surface is quite extensive, and bears traces of recent farm and stock enclosure walls. An earlier analysis catalogued the site as a domestic site and peak sanctuary. Here again a later ritual use could be suggested to account for the juxtaposition of material found. However, the case remains open, and even if some Agiofarango shrines begin in EM, it is clear that the flourishing of peak sanctuaries is undoubtedly MM and LM (see Ritual Chapter).

Why have we not encountered similar situations before, with so many known examples of peak sanctuaries over Crete? Nearly all cited examples seem so far to have been on important summits in upland zones, or in other situations where settlement remains and field burial sites are not to be expected from previous eras. The more lowly and localised variety, as suggested for our valley, may perhaps be very little known, or confused with adjacent secular finds.

4. Dr. Branigan (unpublished paper 1974) has pointed out that a dense village on the Skoinoi plateau would be built over the very soil that accounts for its prosperity. This would be true if we imagine both the likely upper limit of population in the valley - 34 families - mainly living up here, and a village built right across the centre of this plateau. In fact the tholos pair and immediately associated house-walls (?) are sited on an unproductive rocky zone apart from the fertile soils of this area. Further house remains nearby at E14 on poorer ground are known, and at E9/13. It is possible that a good number of families might have had houses up here on similar areas of unproductive soil, without affecting the working of the good soil, though place for around 28 or so houses could be rather difficult to find. However the Yialomonochoro village does exactly this, cramping together a large village into a small shelf just below the fertile plateau. Admittedly we have a maximum of only about 50 people for this village in the late 19th century A.D. We could perhaps enlarge the number of family farmsteads along the valley, and assume that a number remain to be found, in order to make up the balance of family establishments.

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AGIOFARANGO : maps 1 - 3

Figure 1:

Geology of the Agiofarango, spatial sequence (After D. Holmes).

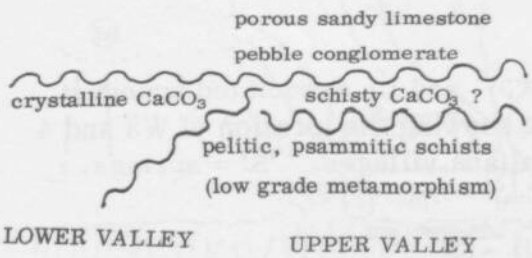
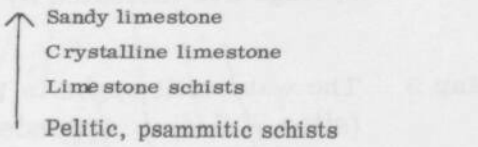


Figure 2: Geology of the Agiofarango, temporal sequence (After D. Holmes)



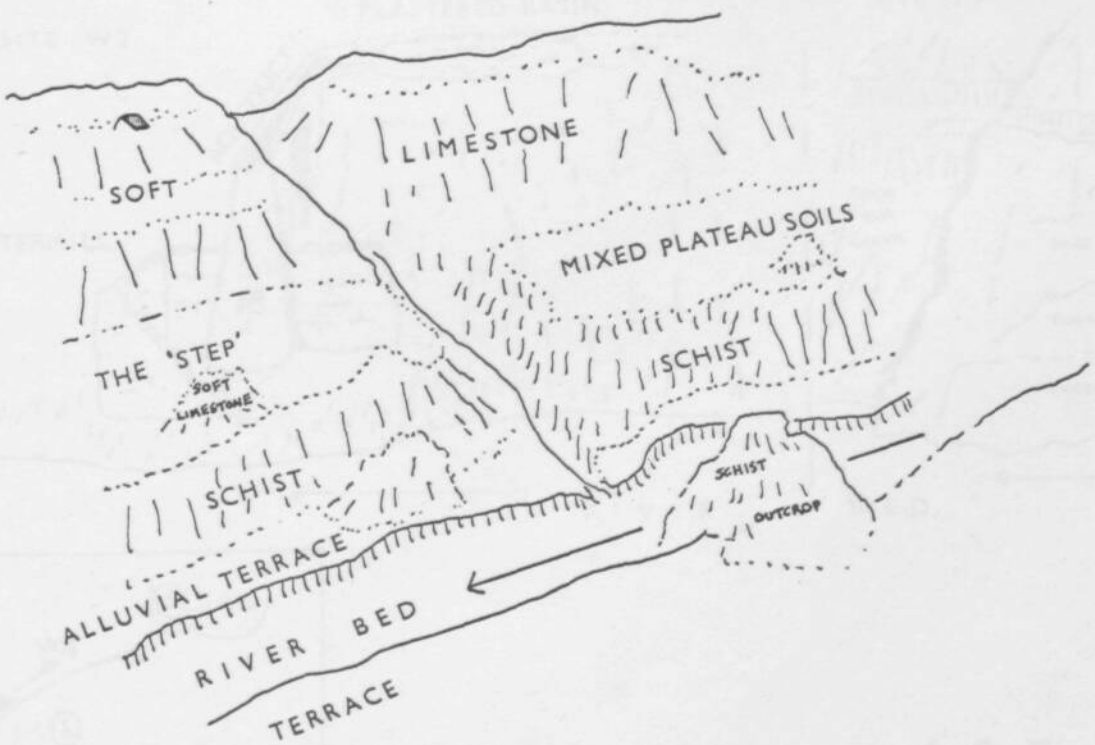
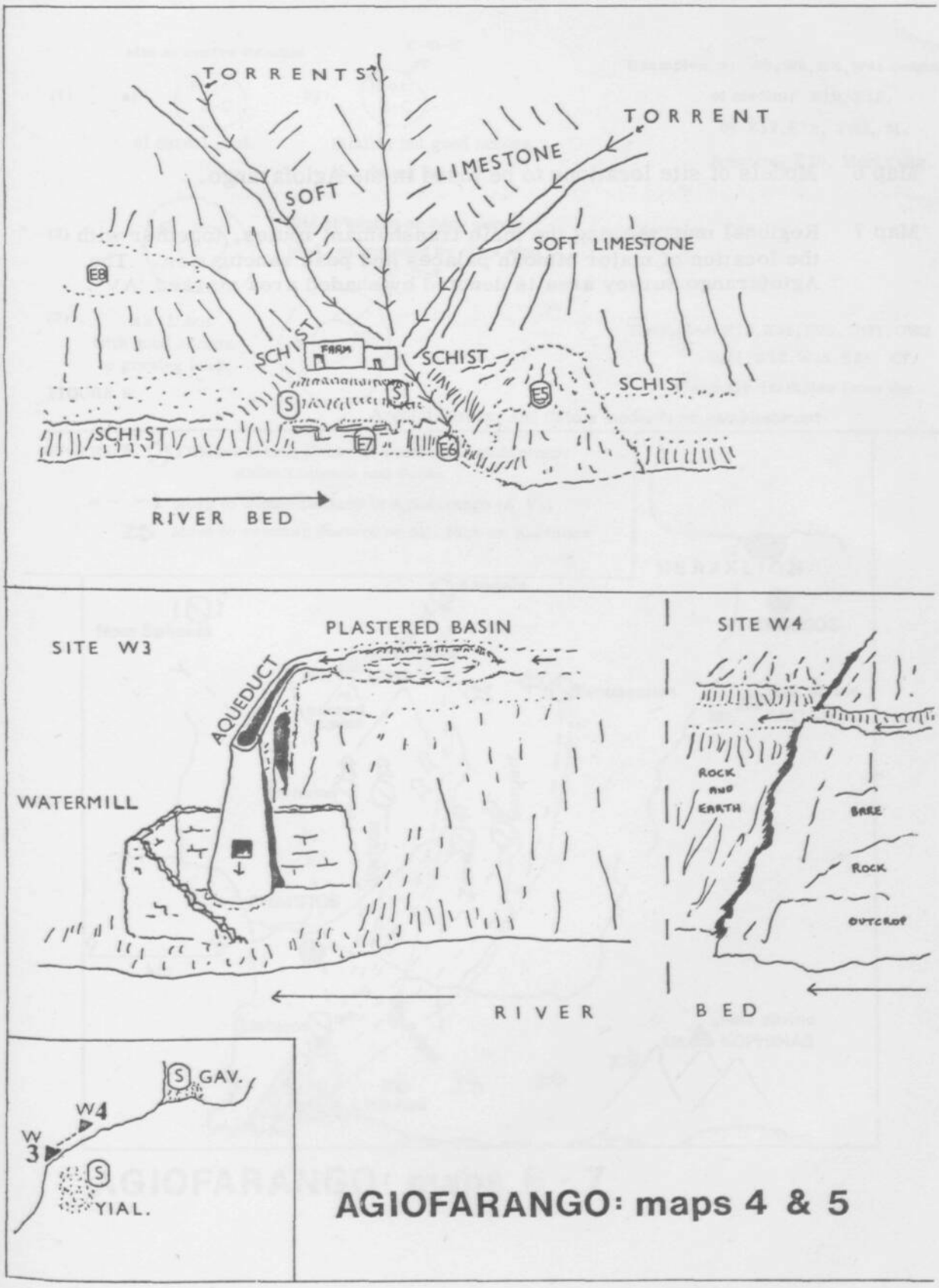


Figure 3: Schematic cross-section of the Agiofarango valley

Map 4 General Sketch of Agia Kiriake locality, to illustrate the position of the alluvial fan over the E7 site, with associated drainage lines. Springs are indicated by 'S'.

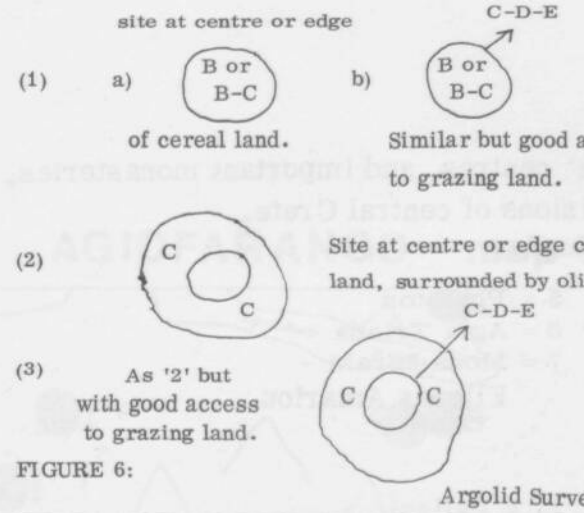
Map 5 The watermill opposite Yial (site W3), and its associated aqueduct (sites W 3-4). Appended is a map showing the location of W3 and 4 in relationship to the Yial and Gavaliana villages. 'S' = springs.



AGIOFARANGO: maps 4 & 5

Map 6 Models of site locations to be found in the Agiofarango.

Map 7 Regional map showing the main transhumant routes, together with the location of major Minoan palaces and peak sanctuaries. The Agiofarango Survey area is denoted by shaded area marked 'AV'.



Examples: a) W6, W8, W4, W4a (edge) of circle); E19, E13.
b) E17, E18, Yial, M. Schoinoi, E20, Moni Odig.

Example: E22

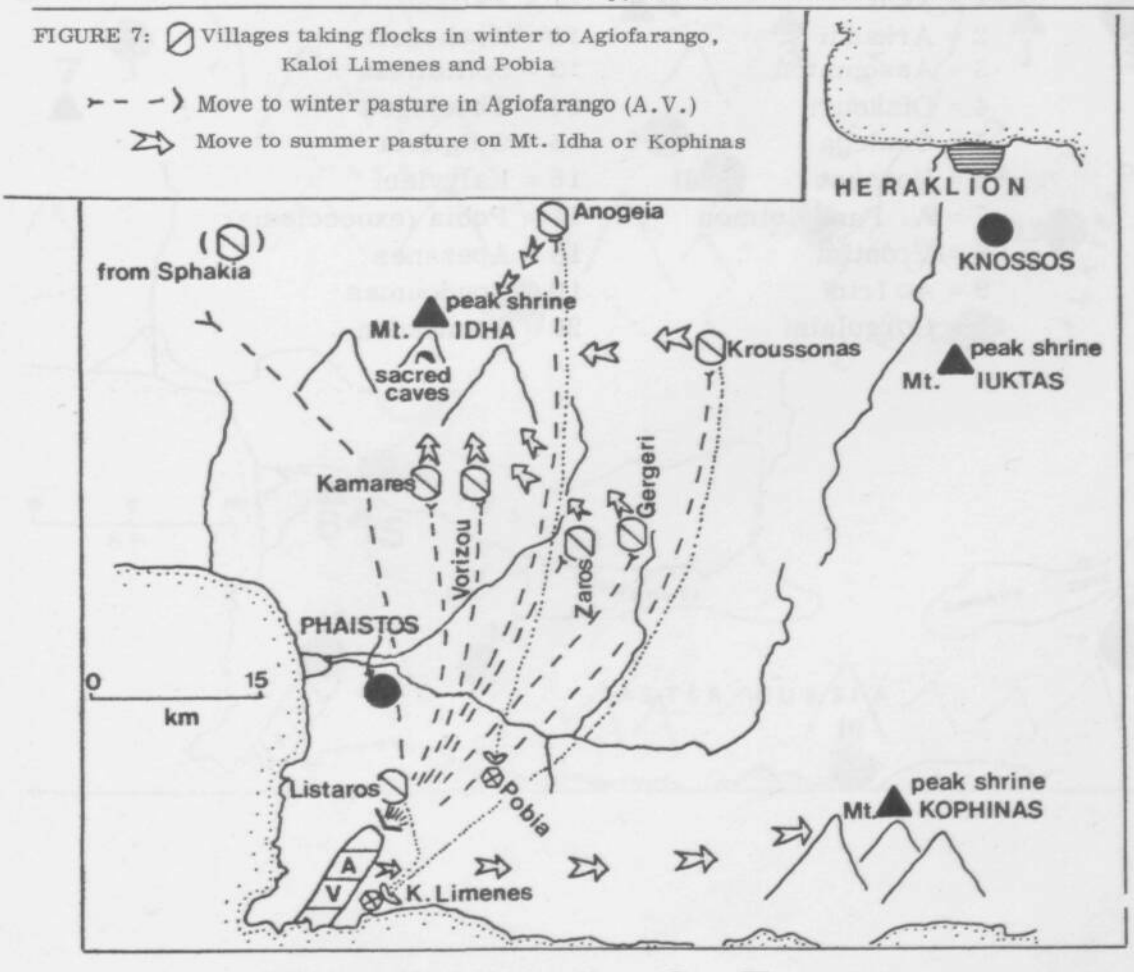
Examples: E19, E24, E25, OW1, OW2 W11, W12, W2a, E28; Cf. alsomany examples from the Argolid Survey, and Cato's model farm establishment

FIGURE 6:

FIGURE 7: Villages taking flocks in winter to Agiofarango, Kaloi Limenes and Pobia

Move to winter pasture in Agiofarango (A.V.)

Move to summer pasture on Mt. Idha or Kophinas



AGIOFARANGO: maps 6 - 7

Map 8 The location of major 'Minoan' centres, and important monasteries, within the chief landscape divisions of central Crete.

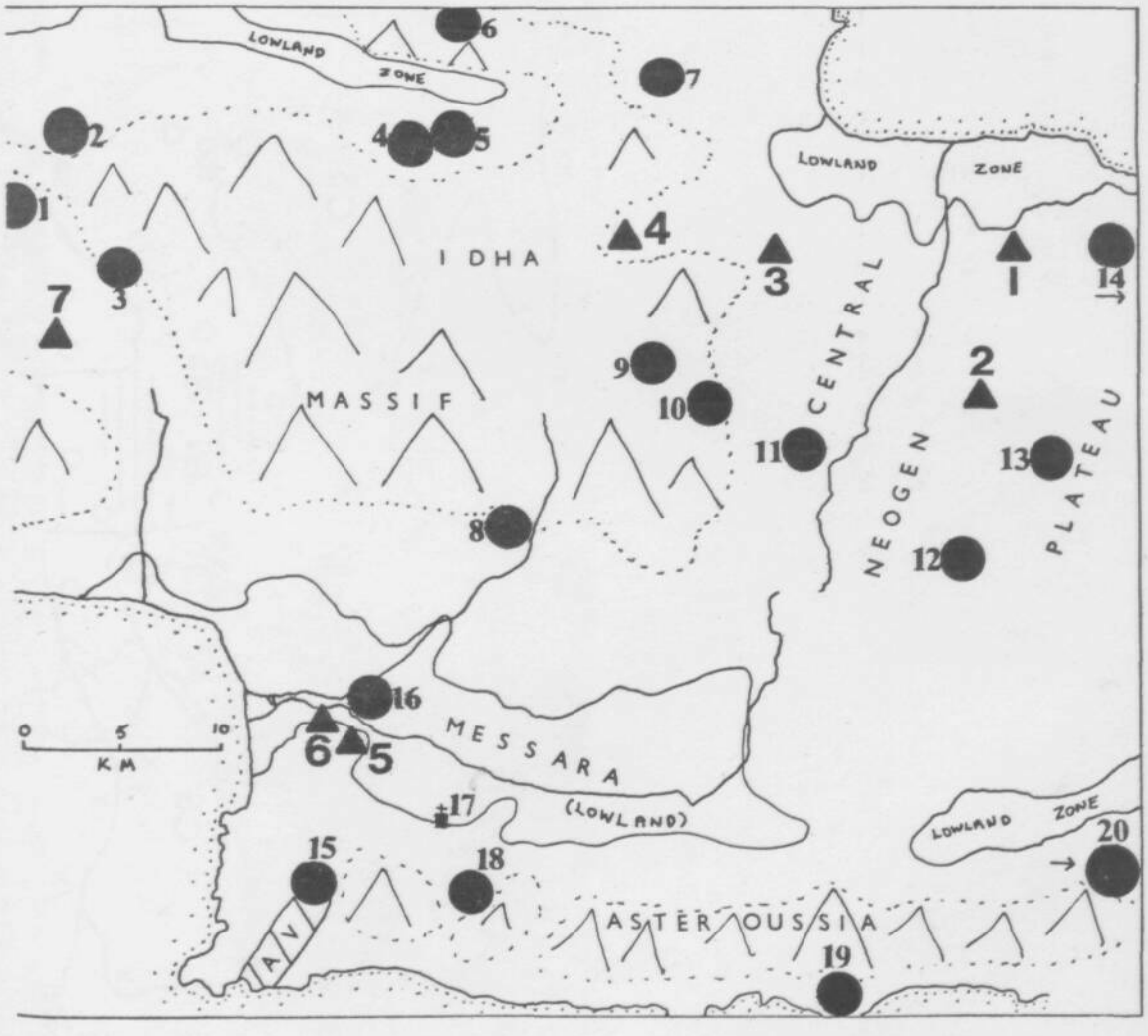
Key: MINOAN CENTRES (triangles)

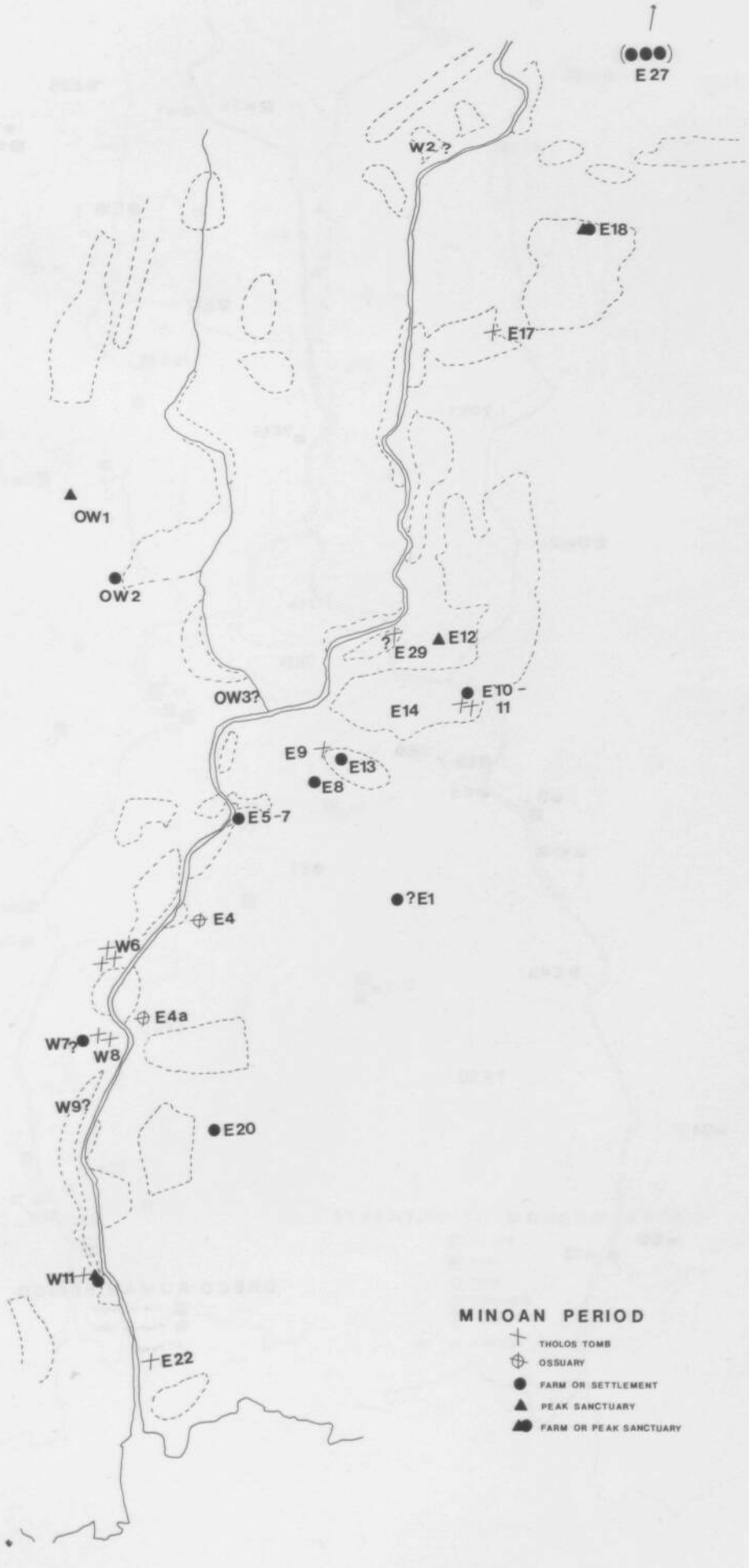
1 = Knossos
2 = Arkhanes
3 = Tylissos
4 = Sklavokambos
5 = Phaistos
6 = Agia Triada
7 = Monasteraki - Ellenes Amariou

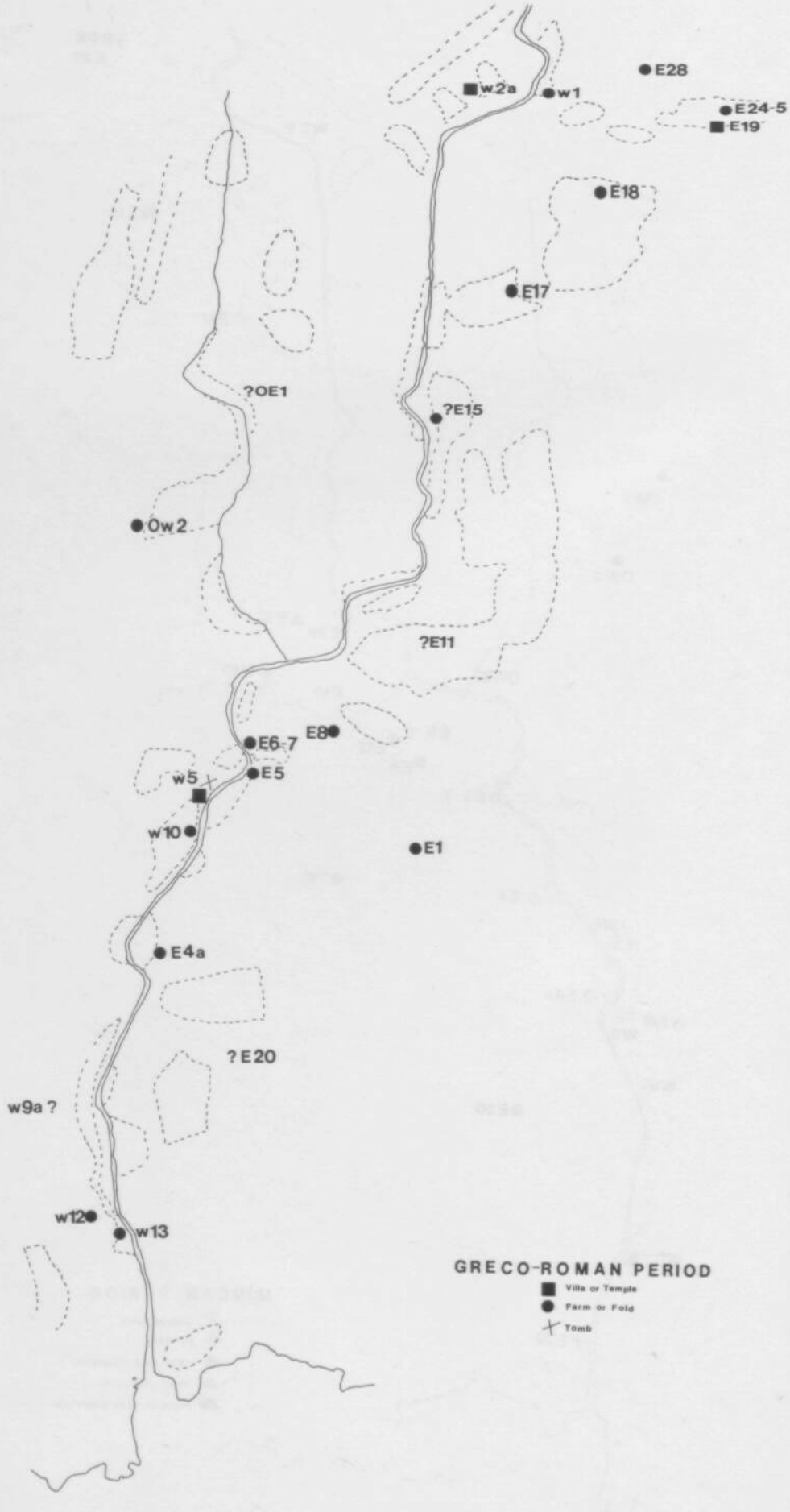
MONASTERIES

1 = Veni
2 = Arkadhi
3 = Assomaton
4 = Diskouri
5 = Chalepa
6 = Vosakou
7 = A. Pandeleimon
8 = Vrontisi
9 = A. Irini
10 = Gorgolaini
11 = Pallani
12 = Apanosofi
13 = Spiliotissa
14 = Theologos
15 = Odigitria
16 = Kalyviani
17 = Pobia (exoecclesia)
18 = Apezanes
19 = Coudoumas
20 = Foundadon

AGIOFARANGO: map 8




E 27
W2 ?
E18
E17
OW1
OW2
E 29
E12
OW3?
E14
E10 -
11
E9
E13
E8
E5-7
?E1
E4
W6
E4a
W7?
W8
W9?
E20
W11
E22
MINOAN PERIOD
THOLOS TOMB
OSSUARY
FARM OR SETTLEMENT
PEAK SANCTUARY
FARM OR PEAK SANCTUARY


E28
w2a
w1
E24-5
E19
E18
E17
?OE1
?E15
Ow2
?E11
E8
E6-7
E5
w5
w10
E1
E4a
?E20
w9a ?
w12
w13
GRECO-ROMAN PERIOD
Villa or Temple
Farm or Fold
Tomb


w 2a
gav.
e 24-5
e19
e18
w3-4
m.o.
vial.
oe1
? e15
ow2
e11
e5
e1
w6
w7
e2-3
Ue20
w9a
Ue21
w13
N
BYZANTINE TO MODERN PERIOD
VILLAGE
FARM
FOLD
MONASTERY
CHAPEL
AQUEDUCT

APPENDIX A:

STATISTICAL INFORMATION AND DISCUSSION: TERRITORIES AND HIERARCHIES IN THE SETTLEMENTS OF THE LATE BRONZE AGE

TABLE 1:

Site by site breakdown of soil correlations, by region. In each instance, with the exception of the Agiofarango region, the nature of the soils associated with each site is indicated in three categories. These three priorities represent soils available at increasing distances from each site (1 to 3). In the final column we append comments which bear on significant aspects of site location, and hence may be of value in accounting for divergences from expected soil/settlement correlations. (Mykonos is not included).

ARGOS REGION

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
TIRYNS	Older Fill/Coast	Same	Same + Deltaic Fill	Harbour; lighter Older Fill
VOURKATELI	Limestone/Older Fill/ Flysch	Same	Limestone/Older Fill	Small site
MIDEA	Limestone	Limestone	Flysch/Older Fill	Acropolis, defensive site; lower town better soiled (Dendra)
DENDRA	Neogen	Neogen/Older Fill	Same	
HERAION	Neogen/Conglomerate	Same	Neogen/Conglomerate/ Older Fill/Limestone	Defensive site
VERSEKA	Neogen/Conglomerate	Same	Same	
PRIPHTIANI	Neogen/Older Fill	Same	Same	
FYCHTIA	Neogen	Neogen/Conglomerate Older Fill	Same	
GUARDHOUSE (FYCHTIA)	Neogen	Neogen/Older Fill	Same	
AGIOS GEORGIOS	Neogen/Conglomerate/ Flysch	Same	Same	Defensive site
MYCENAE	Limestone/Conglomerate	Neogen/Conglomerate/ Limestone	Same	Defensive site
KALKANI	Neogen/Conglomerate	Same	Same + Older Fill/ Limestone	
ELIAS (MYCENAE)	Older Fill/Limestone	Same	Same	Plateau tombs and peak above; latter defensive potential
BOLIARI	Neogen/Conglomerate	Same	Same + Older Fill	
BERBATI	Limestone/Neogen	Same	Same + Older Fill/ Flysch	Defensive site

Site	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
PROFITIS ELIAS	Limestone	Limestone	Limestone/Flysch/ Older Fill	Defensive potential; ritual site?
ACRONAUPLIA	Limestone	Limestone/sea	Same + Flysch/Older Fill	Defensive; harbours; main settlement better soiled? (Pronaia)
PRONAIA	Flysch/Limestone	Same	Same + Older Fill	
ARIA	Flysch/Limestone/ Older Fill	Same	Same	
LEUKAKIA	Flysch/Older Fill	Same	Same	
ASINE	Limestone/sea/Older Fill/Flysch	Same	Same	Defence; harbours
SKALA	Neogen/Conglomerate/ Older Fill	Same	Same	Defensive potential
FARM (SKALA)	Older Fill	Same + Neogen/Conglomerate	Same	
SCHOINOCHORI	Neogen/Conglomerate	Same	Same + Older Fill	Defensive site
ARGOS	Flysch/Older Fill	Same	Same	Defensive site
MAKROVOUNI	Flysch/Older Fill	Same	Same + Limestone	Defensive potential
KEPHALARI CAVE	Limestone/Flysch/ Older Fill	Same	Limestone/Older Fill	Herding and ritual aspects; good spring
KEPHALARI-MAGOULA	Older Fill/Deltaic Fill/ sea	Same	Same	Lighter Older Fill; harbour potential; perennial river
ELLINIKA	Flysch/Limestone	Limestone/Older Fill	Same	Small site; defensive site
SKAPHIDAKI	Older Fill	Same	Same + Limestone	Small site
LERNA	Older Fill/sea	Same + Limestone	Same	Harbour site; good springs
KIVERI TOMBS	Neogen	Neogen/Older Fill	Same + sea	
KIVERI VILLAGE	Neogen/Conglomerate/ Limestone/sea	Same	Same	Harbour site

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
DALAMANARA/ GEORGIOS	Older Fill/sea/Deltaic Fill	Same	Same	Lighter Older Fill; harbour potential
KOURTAKI	Older Fill	Same	Same	Ritual site
NEA KIOS	Deltaic Fill/sea	Same	Same	Harbour site
KATSINGRI	Limestone/Older Fill/ Flysch	Older Fill/Flysch	Same	Fortification
4 MID-PLAIN SITES	Older Fill	Same	Same	Possibly ritual (On texts and finds); lighter Older Fill
METOCHI	Neogen	Neogen/Older Fill	Same	Ritual site
MALANDRENI	Neogen/Conglomerate	Same	Same	
SITES BELOW ASPIS	Flysch/Older Fill	Same + Older Fill	Same	Ritual ?
S. W. ARGOLID				
B2	Neogen	Same	Same	Defensive potential
B3	Neogen	Same	Same	Defensive
B4	Neogen/sea	Same + Conglomerate	Same	Harbour site
B5	Neogen/Serpentine	Same	Older Fill	
B7	Neogen/Conglomerate	Same	Neogen/Older Fill/ Serpentine	Defensive potential
B8	Neogen	Neogen/Older Fill	Same + Limestone	
B9	Neogen	Neogen/Older Fill	Same + Limestone	
B10	Limestone	Neogen/Older Fill/ Limestone	Same	Defensive; easy access to fields; fold/settlement?
B14	Neogen/Serpentine	Same	Neogen	
B16	Limestone	Neogen/Limestone	Same	Fold/settlement with easy access to fields

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
B17	Neogen	Same	Neogen/Limestone	
B20	Neogen	Same	Same	
B21	Limestone	Same	Same	Peak sanctuary
B23	Limestone	Neogen/Limestone	Same	Fold/settlement with easy access to fields
B24	Limestone	Neogen/Limestone	Same	As B23
B25	Neogen	Same	Neogen/Limestone	
B26	Limestone	Neogen/Limestone	Same	As B23
B28	Neogen	Same	Same	Defensive
B29	Neogen	Same	Same	Defensive
B30	Neogen	Same	Same	
B31	Neogen	Neogen/Older Fill	Same + Limestone	
B32	Limestone	Neogen/Limestone	Same	As B23
B33-4	Older Fill	Older Fill/Limestone	Same	Scrappy, small site
B36	Neogen	Older Fill/Neogen	Same + Limestone	
B37	Neogen/Serpentine	Sea/Older Fill/Neogen	Same	
B38	Neogen/Serpentine	Same	Same + Older Fill	Defensive
B39	Neogen/Serpentine	Same	Same + Older Fill	Defensive
B40	Neogen/Serpentine	Same	Older Fill	
C1	Neogen/Conglomerate	Same + sea	Same	Harbour
C2	Conglomerate/sea	Same	Same + Neogen	Fishing reef
C3	Neogen	Neogen/Conglomerate	Same + sea	Harbour near
C6	Conglomerate/sea	Same	Same	Fishing reef
C7	Conglomerate/sea	Same	Same	Fishing reef
C8	Neogen	Same	Same + Conglomerate	
C10	Neogen	Neogen	Same + Older Fill/sea	Harbour
C11	Neogen/sea	Same + Older Fill	Same	Harbour
C12	Neogen	Same	Same + Older Fill	Near harbour

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
C13	Limestone	Limestone/Older Fill/ sea	Same	Great cave by harbour
C14	Neogen	Same	Neogen/Older Fill/sea	Near harbour
C15	Neogen	Neogen/Conglomerate	Same	
C16	Neogen	Same	Same	
C17	Limestone/Older Fill/ sea	Same	Same	Harbour
C18	Limestone/Older Fill/ sea	Same	Same	Harbour
C20	Neogen/Serpentine	Neogen	Same	
C21	Neogen/Serpentine	Neogen	Same	
C22	Neogen/Conglomerate/ sea	Same	Same	Harbour
C24	Neogen	Same	Same	
C25	Neogen	Same	Same	
C26	Neogen/Conglomerate	Same	Same	
D3	Limestone	Limestone/Older Fill	Same	Great cave
D4	Older Fill	Older Fill/Limestone	Same	Small, scrappy site
E11	Limestone	Limestone/Older Fill/ Serpentine	Limestone/Older Fill/ Neogen	Small site, access to good soils
E12	Limestone	Limestone/Older Fill/ Serpentine	Limestone/Older Fill/ Neogen	As E11
F1	Serpentine	Serpentine/Older Fill	Same + Limestone	
F2	Serpentine/Neogen	Same	Same + Older Fill	
F3	Older Fill/sea/Limestone	Same	Same	Harbour
F4	Limestone/ sea	Same	Same	Harbour
F5	Serpentine/Limestone	Same + Older Fill	Same	Defensive
F21	Serpentine	Same	Same + Older Fill	

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
F27	Serpentine	Same	Serpentine/Older Fill	
F29	Serpentine	Same	Serpentine/Older Fill	
F6 etc. sites	Serpentine	Same	Serpentine/Older Fill	
F7	Older Fill/sea	Same + Limestone	Same	Harbour; scrappy, doubtful site
F8	Limestone/sea	Same	Same	Harbour and fishing reefs
F9	Limestone/Serpentine	Same + Older Fill	Limestone/Older Fill	
F14	Limestone/Older Fill	Same	Same + Serpentine	Scrappy, dubious site
F16	Serpentine/Limestone	Same + Older Fill	Same	
F18	Serpentine	Serpentine/Older Fill/ Limestone	Same	
F19	Serpentine	Serpentine/Older Fill/ Limestone	Same	
F20	Limestone	Limestone/Flysch/ Serpentine	Same	
F22	Older Fill/Limestone	Same + Serpentine/ Neogen	Same	Scrappy, dubious site
F23	Serpentine	Limestone/Older Fill/ Serpentine	Same	
F24	Serpentine	Same + Limestone/ Neogen	Same	
F25	Serpentine/Neogen	Same	Same + Older Fill	
F26	Limestone	Limestone/Older Fill	Same + Serpentine	Scrappy, dubious site
F31	Neogen/Serpentine	Same + Older Fill	Same	
F34	Neogen/Serpentine	Same	Same	

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
SPARTA REGION				
MENELAION	Neogen/Conglomerate	Same	Same	Defensive
AFISSOU	Neogen	Same	Neogen/Conglomerate	
SPARTA ACROPOLIS	Neogen/Conglomerate	Same	Same	Defensive
SPARTA TOWN	Neogen	Same	Neogen/Conglomerate	
KOUPHOVOUNO	Neogen	Neogen/Older Fill	Same	
AMYCLAI	Neogen/Conglomerate	Neogen	Neogen/Older Fill	Defensive
VAPHIO	Neogen	Same	Neogen/Older Fill	Defensive
ELEUSINION	Older Fill	Older Fill/Limestone	Same	Ritual site
MELATHRIA	Limestone/Neogen	Neogen	Same	
AGIOS VASSILIOS	Neogen	Same	Neogen/Older Fill	Defensive
ANTHOCHORIO	Neogen	Neogen/Older Fill	Same + Schist	
ORTHIA	Neogen	Same	Same	
MAGOULA	Neogen	Neogen/Older Fill	Same	
ALESIAI	Neogen	Same	Neogen/Older Fill	
3 MID-PLAIN SITES	Neogen	Same	Neogen/Older Fill	
4 PIEDMONT SITES	Older Fill	Older Fill/Limestone	Same	Shrines?
SKOURA	Neogen	Same	Same	
HELOS REGION				
AGIOS STRATEGOS	Neogen/sea	Same	Same	Harbour
ASTERI	Neogen/sea/Deltaic	Same	Same	
DHRAGATSOULA	Fill			
ASTERI	Neogen/sea/Deltaic	Same	Same	Defensive
KARAOUSI	Fill			

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
'HELOS'	Neogen	Same	Neogen/sea/Deltaic Fill	
PLATEAU SITE	Neogen	Same	Same	
VLACHIOTI SE	Neogen/Limestone	Neogen	Neogen/Conglomerate/ Older Fill	
VLACHIOTI	Neogen	Same	Neogen/Older Fill	
KOKKINADHA	Neogen/Conglomerate	Same + Older Fill	Same	Defensive
TSASI	Neogen/Conglomerate	Same	Same + Older Fill	
ROMAIKA	Neogen/Conglomerate	Same + Limestone/ Older Fill	Same	Defensive
AGIOS NIKOLAOS	Neogen	Same	Same + Limestone/ Deltaic Fill	
AGIOS IOANNES	Neogen/Limestone	Same	Same + Deltaic Fill	
XERONISI	Neogen	Same	Same + Limestone/ Deltaic Fill	
LEKAS PANAYIOTIS	Neogen	Same	Same + Limestone/ Older Fill	Defensive
LEKAS SW	Neogen	Same	Same + Limestone/ Older Fill	
LEKAS SOUTH	Neogen	Neogen/sea	Same	Harbour
AGIOS STEPHANOS	Schist/Limestone/sea	Same	Same	Harbour; defence
LAGIO	Schist	Same	Same	Defence
TRINISIA	Conglomerate/sea	Same	Same	Harbour
GYTHEION	Neogen/Conglomerate/ sea	Same	Same	Harbour
CRANAE	Limestone/sea	Same + Neogen/Conglomerate	Same	Harbour

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
MESSENIA REGION				
PHERAI/ KALAMATA	Neogen/Older Fill/sea	Same	Same	Harbour
AKOVITIKA	Older Fill/sea	Same + Neogen	Same	Harbour
PYLOS (ENGLIANOS)	Neogen	Same	Same + Older Fill	Defensive
MALTHI	Limestone	Limestone/Older Fill	Same + Flysch	Defensive but lower town by fields?
MALTHI - Lower Town?	Flysch	Flysch + Older Fill	Same + Limestone	
NICHORIA	Neogen	Same	Neogen/Older Fill/ harbour	Defensive; near harbour
MELOS				
PHYLAKOPI	Tuff rock/sea	Same + Limey stable	Same	Harbour; easy access to good soils
AGRILIA	Andesite-Dacite	Tuff rock/sea/Limey stable tuff soils	Sea/Stable tuff soils/ Andesite-Dacite rock	Defensive; access to harbour, good soils
ASPROCHORIO	Stable tuff soils	Same + Unstable tuff soil	Same + Andesite-Dacite rock	Near harbour
PELOS	Stable tuff soils	Same + unstable tuff soils	Same	
AYIASMATA	Stable/Unstable tuff soils	Same	Same	
UPPER KOMIA	Stable tuff soils	Same	Same	
LANGADHA	Stable tuff soils	Same + unstable tuff soils	Same	
AGIOS PANDELEIMON	Stable tuff soils	Same + unstable tuff soils	Same	

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
SPATHI (3 sites)	Stable/unstable tuff soils/sea	Same	Same	Harbour
ALIKI/STAVROS	Rhyolite/sea	Same	Same + Deltaic Fill	Harbour?
ANCIENT MELOS	Andesite-Dacite soil and rock	Same	Same + Tuff soil/rock	
TRAMYTHIA	Andesite-Dacite soil and rock	Same	Same + Tuff soil/rock	
ARETI	Andesite-Dacite soil and rock	Same	Same + Tuff soil/rock	
PHIROPOTAMOS	Stable tuff soil/tuff rock/ Rhyolite	Same + Andesite-Dacite soil/sea	Same	
SPYRIDON	Tuff rock	Same + Tuff stable soils	Same	Ritual site?; access to good soils
ANGATHIA	Andesite-Dacite and Tuff soils/rock	Same	Same	
KALOGRIES	Andesite-Dacite soils/ rock	Same	Andesite-Dacite rock	
SAMARI	Tuff rock/Andesite-Dacite rock/sea	Same	Same	Harbour
KORPHOS	Stable tuff soils/tuff rock	Same	Same	
TRIA PIGADIA	Unstable tuff soils/sea	Same	Same	Harbour
AGIOFARANGO				
E18	Neogen and Schist soils			
E17	Neogen and Schist soils			
E12	Neogen and Schist soil/ conglomerate			

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
E29	Neogen and Schist soils			Uncertain site
E10/11	Neogen and Schist soils			Defensive potential
E13	Neogen and Schist soils			
E9	Neogen and Schist soils			
E8	Neogen soils			
OW1	Neogen soils			
OW2	Neogen and Schist soils/ Neogen rock			
OW3	Schist soil/Neogen rock			Uncertain site
E5-7 (Agia Kiriake)	Schist rock/Neogen soil/ Deltaic alluvium			
E1	Neogen soil/Conglomerate			Scrappy, dubious site
E4	Neogen and Schist soil/ Schist rock			
W6	Neogen and Schist soils			
E4 A	Neogen and Schist soil/ Schist rock			
W7-8	Neogen and Schist soil/ Schist rock			
W9	Neogen and Schist soil/ Conglomerate			
E20	Neogen and Schist soil/ Neogen rock			
W11	Neogen and Schist soil/ Neogen rock/Schist rock			
E22	Schist soil/Schist rock/ Limestone			

Sites	Soil Priority 1	Soil Priority 2	Soil Priority 3	Comments
W2 A	Schist Soil/Schist rock/ Neogen soil			
E28	Schist/Limestone/Neogen soils			
E24-5/19	Schist rock/Schist/Limestone/Neogen soils			
OE1	Schist rock/Neogen and Schist soil			Uncertain site
W5	Neogen and Schist soil/ Neogen rock			
W10	Neogen and Schist soil/ Schist soil			
W9 A	Neogen rock/soil			
W13	Neogen and Schist soil/ Neogen rock/Schist rock			
OTHER REGIONS				
PELLA	Neogen/sea	Same + Deltaic alluvium	Same	
NEA NIKOMEDEIA 1	Lacustrine Marls	Same	Same	Cf. Neogen
NEA NIKOMEDEIA 2	Lacustrine Marls	Same	Same	Cf. Neogen
LEFKANDI (EVVOIA)	Neogen/sea	Same + Older Fill	Same + Deltaic Alluvium	

TABLE 2

PART A: Intersite spacing in the Argolid Survey, Units represent 1/5th of a kilometre

NEOLITHIC:

1)	3	3½	8
2)	3	4	7
3)	3½	4	7
4)	2½	5	5
5)	2½	5	6
6)	5	6	10
7)	3	12½	15½
8)	3	11½	13½
9)	4	8	12
10)	4	8	12
11)	8	8	16
12)	7	9	12
13)	9	11	20½
14)	7	11	13½

EARLY HELLADIC:

1)	4	14	14
2)	4	10	10
3)	3½	4	5
4)	3	3½	5
5)	3	3½	3½
6)	3	3	3½
7)	3	3½	3½
8)	3	3	3
9)	3	3	3
10)	3	3	4½
11)	3½	5	5
12)	3½	4½	6½
13)	3½	4½	6½
14)	4	5	8½
15)	4	5	6
16)	5	8½	11
17)	9	10	12
18)	3½	8	9
19)	3½	5	6
20)	4	6½	8
21)	4	4	5
22)	3½	4	5½
23)	4	5	6
24)	3	3½	4
25)	3	6	7
26)	3½	4	5
27)	4	8	8½
28)	6	8	8
29)	4	6	7½

MIDDLE HELLADIC:

1)	3½	5	8½
2)	3½	3½	5
3)	3½	5	6½
4)	5	3½	8½
5)	12	14½	19
6)	7½	9	12½
7)	9	10½	12½
8)	10½	15	18½
9)	7½	8½	15
10)	8½	9	21

LATE HELLADIC:

1)	4	4½	5
2)	4	4	6
3)	3½	4	4
4)	3½	4	4½
5)	2½	3½	4½
6)	2½	4	5½
7)	4	4½	6
8)	4	7	13
9)	3	4	14
10)	3	7	12
11)	4	8½	13
12)	4	5	10
13)	5	5	9
14)	5	6	10
15)	3	6	8
16)	3	8½	12½
17)	8½	10½	10½
18)	7½	7½	8½
19)	3	6	6½
20)	3	4	6½
21)	4	4	6
22)	4	4½	6
23)	4½	7½	10

PART B: Sites within a certain radius of each other. Only relative proportions are real. Wherever necessary the original total number of sites has been multiplied up to a common figure of around 28 to facilitate inter-period comparison.

FIRST NEIGHBOURS:

	In 0-1 km	1-2 km	2-3 km	> 3 km
N/	20	8		
MH/	12	12	6	
EH/	27	2		
LH/	26 1/4	2½		

SECOND NEIGHBOURS:

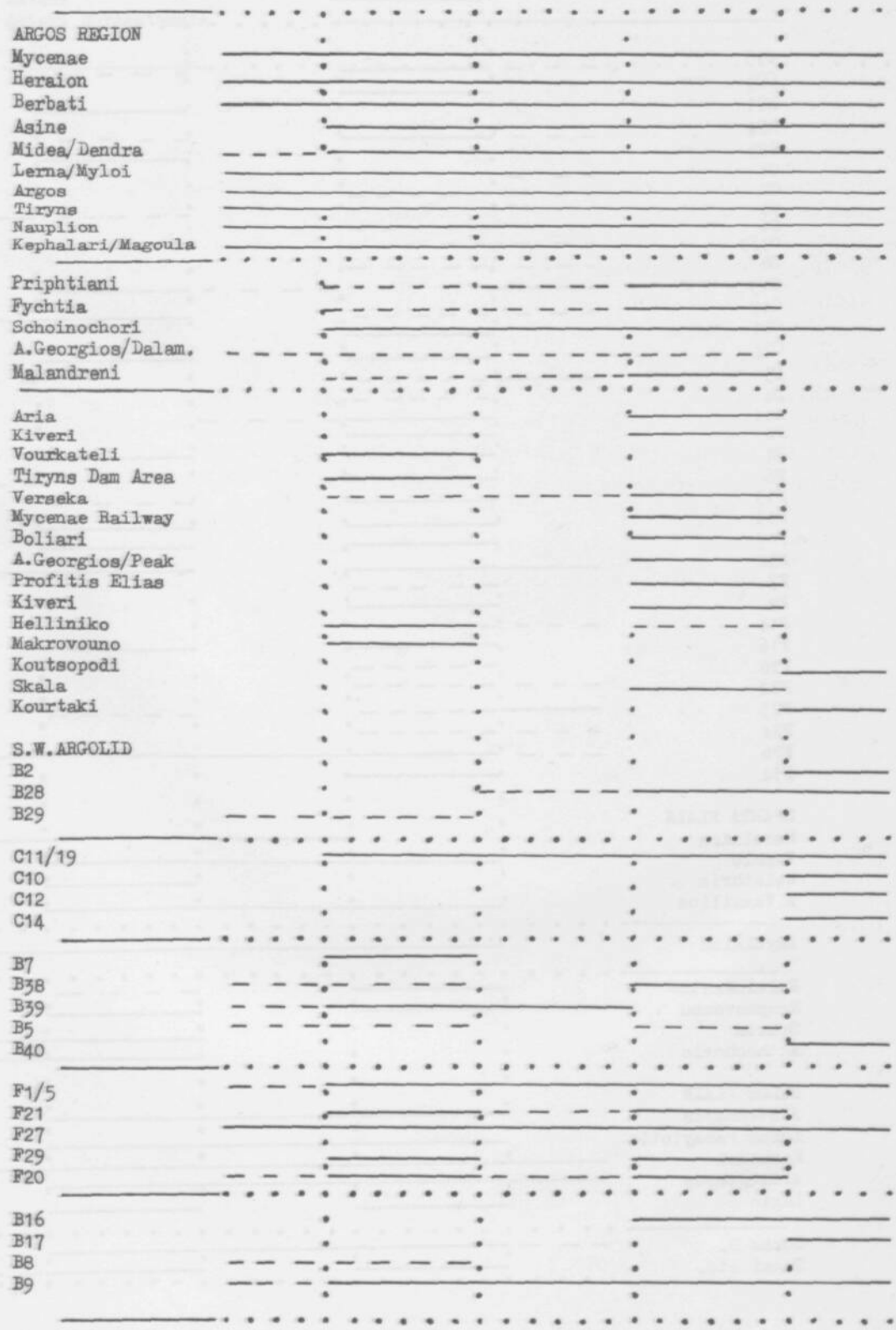
	In 0-1 km	1-2 km	2-3 km	> 3 km
N/	10	10	8	
MH/	12	9	9	
EH/	19	9	1	
LH/	15	11 1/4	1 1/4	

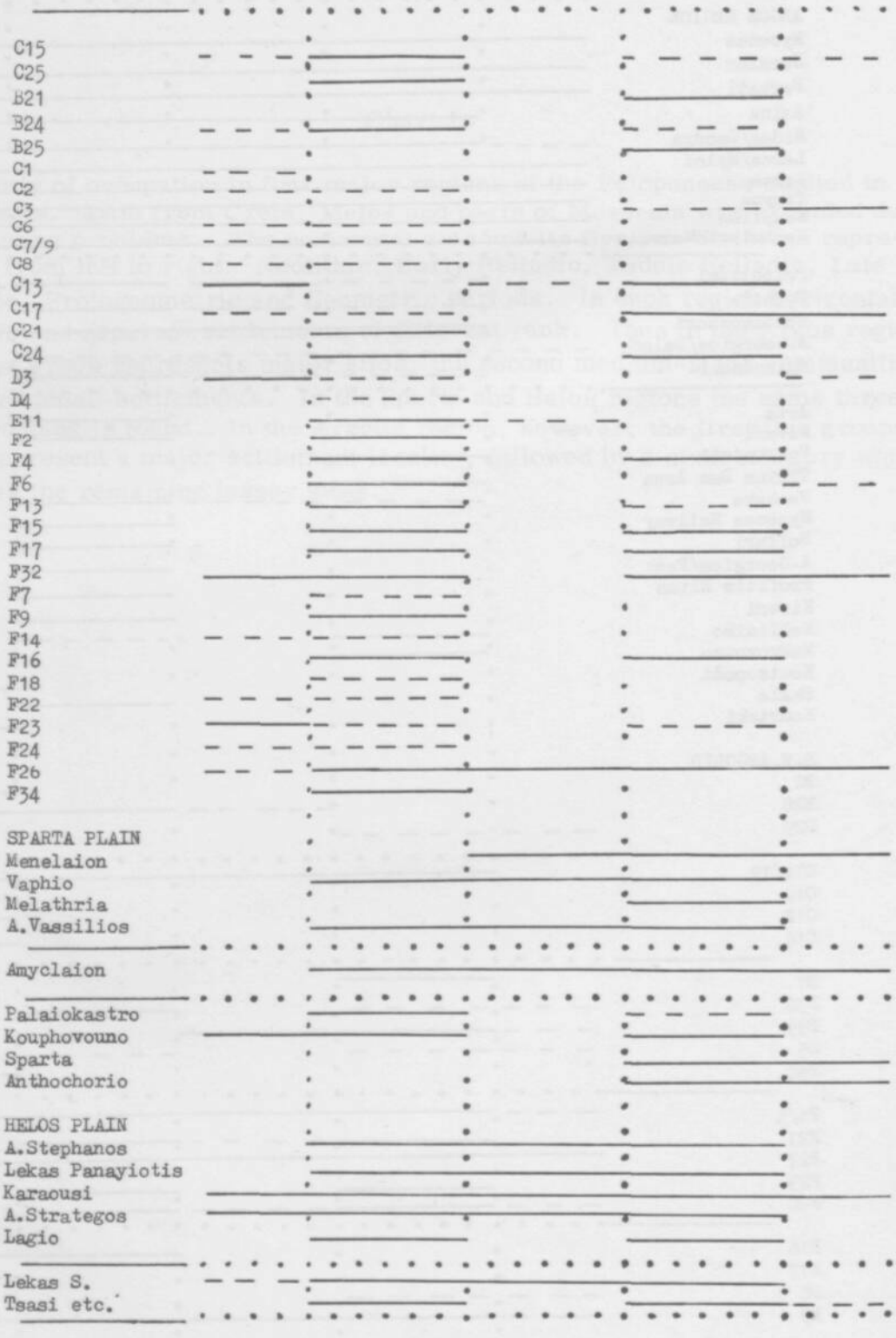
THIRD NEIGHBOURS:

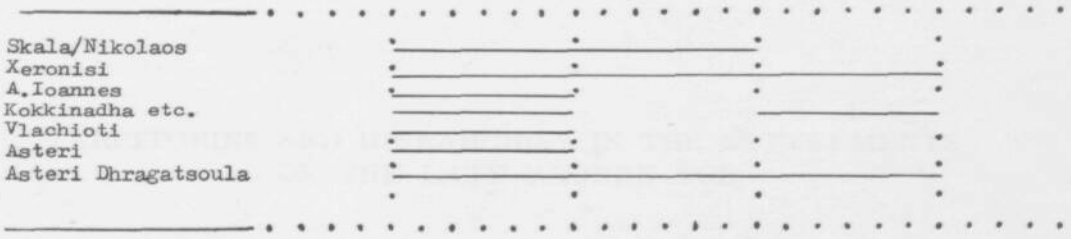
	In 0-1 km	1-2 km	2-3 km	> 3km
N/	4	8	8	8
MH/	3	9	9	9
EH/	12	14	2	
LH/	5	16 1/4	7½	

Chart 1

Continuity of occupation in four major regions of the Peloponnese studied in this thesis. Data from Crete, Melos and parts of Messenia was excluded due to sampling problems. The horizontal axis and its five sub-divisions represents, from left to right: Neolithic, Early Helladic, Middle Helladic, Late Helladic, Protogeometric and Geometric periods. In each region horizontal subdivisions separate settlements of different rank. Thus in the Argos region, the first group represents major sites, the second medium-sized communities, the third small settlements. In the Sparta and Helos regions the same threefold grouping is found. In the Argolid region, however, the first five groups each represent a major settlement locality, followed by a sixth category which includes the remaining lesser sites.


ARGOS REGION
Mycenae
Heraion
Berbati
Asine
Midea/Dendra
Lerna/Myloi
Argos
Tiryns
Nauplion
Kephalari/Magoula
Priphtiani
Fychtia
Schoinochori
A.Georgios/Dalam.
Malandreni
Aria
Kiveri
Vourkateli
Tiryns Dam Area
Verseka
Mycenae Railway
Boliari
A.Georgios/Peak
Profitis Elias
Kiveri
Helliniko
Makrovouno
Koutsopodi
Skala
Kourtaki
S.W.ARGOLID
B2
B28
B29
C11/19
C10
C12
C14
B7
B38
B39
B5
B40
F1/5
F21
F27
F29
F20
B16
B17
B8
B9


C15
C25
B21
B24
B25
C1
C2
C3
C6
C7/9
C8
C13
C17
C21
C24
D3
D4
E11
F2
F4
F6
F13
F15
F17
F32
F7
F9
F14
F16
F18
F22
F23
F24
F26
F34
SPARTA PLAIN
Menelaion
Vaphio
Melathria
A.Vassilios
Amyclaion
Palaiokastro
Kouphovouno
Sparta
Anthochorio
HELOS PLAIN
A.Stephanos
Lekas Panayiotis
Karaousi
A.Strategos
Lagio
Lekas S.
Tsasi etc.


Skala/Nikolaos
Xeronisi
A.Ioannes
Kokkinadha etc.
Vlachioti
Asteri
Asteri Dhragatsoula

TERRITORIES AND HIERARCHIES IN THE SETTLEMENTS OF THE LATE BRONZE AGE

In the regional study chapters, and in the Sociopolitical Chapter, we have attempted a preliminary identification of regularities in the spacing of major and minor Mycenaean communities. We found that intervals between adjacent medium to large settlements averaged one to one-and-a-half hours on foot (about 5 to 8 km on the map), giving an hypothetical radius to respective community territories of half to three-quarters of an hour, well under the one hour radius territory put forward as a possible maximum by some authorities in geography and archaeology (see Economics of Settlement Chapter). Where we felt reasonably confident on a sample of sites and their relative status, we drew up territorial boundaries for Mycenaean centres, within which and on the perimeter of which satellite communities were located (see Ch. 1, Map 6; Ch. 2, Map 7; Ch. 3, Map 4; Ch. 5, Map 7). It is the purpose of this section of Appendix A to provide quantitative data on such hierarchical spacing, to investigate in more detail the correctness of our earlier territorial reconstructions, and to attempt to account for the significance of variability in territorial dimensions.

In prehistoric periods other than the Mycenaean, with the exception of the long period covered by the tholoi of Southern Crete (see Agiofarango Chapter), I do not feel confident that the sample size and the control over site chronology is sufficient to allow of such detailed analysis of inter-site spacing. However, I have made numerous suggestions in the regional chapters and the Sociopolitical Chapter regarding possible spatial patterns in these other periods, though such comments are qualitative and fragmentary as befits the nature of the available data. It might be argued that some of this data, and all of the Mycenaean settlement evidence presented in this thesis, could be analysed with the aid of statistical techniques as used in Locational Geography. I consider that these methods are not suitable for settlement data derived from Greek prehistory, at least in our present state of knowledge, owing to the unacceptable number of basic assumptions that must be made in order to obtain significant results with such methods on that material - so many that the final analysis would merely provide a numerical gloss over qualitative and a priori statements. The author would also add that his lack of training in statistical techniques would in any case hinder any sophisticated applications which might be most appropriate to the data.

It is therefore my intention to investigate settlement spacing only in that prehistoric period, the Mycenaean when survey data and control over chronology reach acceptable degrees of definition in our study areas. Our investigation will recognise the constant necessity to introduce assumptions and qualitative approximations by employing a stage by stage discursive

method of analysis rather than a series of mathematical calculations which cannot satisfactorily reflect the real-world complexity of our settlement data. The kind of 'unmathematical' factors which we must insert into the analysis to approximate reality would seem to be such as follows: to produce a regional picture one must place all known sites into categories of importance, although in most cases such a categorisation is necessarily based on personal opinions of poorly sampled and unquantified data; distances between sites of equal status may fluctuate according to whether each site is in the centre or near the periphery of its personal territory - evaluating such frequent distortions involves many assumptions on economic patterns and equilibrium tendencies.

In Table 3 we present measurements both in map distance and approximate walking-times, of intervals between important Mycenaean sites in various study areas (overleaf), Recurrent intersite measurements of the same order that can be observed on this table, led me to my partial reconstructions of territorial boundaries in the regional study chapters. However it may also be seen from this table that many adjacent important sites vary considerably from such regularities. We shall now attempt to account for regularities and deviances, in a detailed examination of the significance of spatial variation in the Argos Plain.[1]

In Chapter 2, Map 7, I produced a first attempt at a settlement hierarchy for the Argos Plain in Mycenaean times. I confined my reconstructions to the regular grouping in the NE Plain, and with some reservations to sites in the SW Plain that also exhibited similar spacing. Links elsewhere in the region, particularly across the plain proper, seemed to fall outside of these regularities. Further, it was curious that the same order of intersite distance could be found between sites of apparently contrasted status.

In Maps 1A, B and C of this appendix, I have taken this analysis a stage further by attempting a total territorial reconstruction of the region in Mycenaean times. These different versions of the same map offer varying statuses for sites of unclear importance, and I have also experimented with different methods for delimiting territorial boundaries.

Thus in Map 1A, we have treated Nauplion as an internal subsidiary of Tiryns (cell 10, respectively triangles in lower and middle cell). However although lacking, in finds hitherto, a princely tholos or palace complex, and being ecologically complementary to Tiryns, yet Nauplion with its very large chamber tomb cemetery could well have been a separate centre with its own territory. The uncertainty over the exact distance to Tiryns, since we have postulated that a silted inlet of unclear dimensions intervenes between the two sites, further confuses the issue. In 1B and 1C we have given both sites their own territory. The method we have employed in constructing territories is to build up Thiessen Polygons (Cf. Haggett, 1965, p. 247). These polygons are made by joining up all the lines that can be drawn exactly midway between adjacent sites, assuming that each site has an equal share to land dividing it and its neighbours from each other. As I will explain below, in 1B and 1C I have modified this procedure somewhat, in 1A it is used in its original form.

TABLE 3*

Table of intersite distances for the mature Mycenaean period

Sites Concerned	Map Distance	Distance on Foot	Status of Sites
ARGOS REGION			
Mycenae to Heraion	5 km	1 hr	Major to major
Mycenae to Berbati	5 km	1 hr	Major to major
Mycenae to Malandreni	c. 10 km	2½-3 hrs?	Major to medium?
Mycenae to Argos	) 10 km	) 2 hrs?	Major to major
Heraion to Dendra/Midea	5-7 km	1-1.3 hrs	Major to major
Mycenae to Dendra/Midea	10-12 km	2-2.3 hrs	Major to major
Heraion to Berbati	6 km	) 1 hr	Major to major
Heraion to Argos	(7 km	) 1.3 hrs	Major to major
Dendra/Midea to Argos	9-10 km	1½-(2 hrs	Major to major
Dendra/Midea to Tiryns	6-7 km	1-1.3 hrs	Major to major
Dendra/Midea to Kasarma	10-12½ km	2½-3 hrs	Major to major/ medium?
Tiryns to Argos	8 km	1½ hrs?	Major to major
Tiryns to Asine	10 km	(2 hrs?	Major to major
Tiryns to Kasarma	13 km	3 hrs?	Major to major/ medium?
Asine to Kasarma	10 km	2½ hrs?	Major to major/ medium?
Asine to Kandia	8 km	) 1½ hrs?	Major to medium
Kandia to Kasarma	12½ km	2½ hrs?	Medium to major/ medium?
Argos to Magoula K	5-6 km	1 hr?	Major to medium
Argos to Schoinochori	(10 km	c. 2 hrs?	Major to medium
Schoinochori to Malandreni	(5 km	) 1½ hrs?	Medium to medium?
Magoula K to Kiveri	) 7½ km	(1½ hrs	Medium to medium
Tiryns to Nauplion	4 km?	½-3/4 hr?	Major to major/ medium?
Asine to Nauplion	7½ km	c. 1½ hrs	Major to major/ medium?
Nauplion to P. Elias	7 km	1½ hrs?	Major/medium to medium/minor?
Dendra/Midea to P. Elias	(7 km	) 1.3 hrs?	Major to medium/ minor?
Tiryns to P. Elias	) 5 km	) 1 hr	Major to medium/ minor?
Asine to P. Elias	7½ km	2 hrs?	Major to medium/ minor
Kasarma to P. Elias	c. 5 km	) 1 hr?	Major/medium to medium/minor?

* (= less than;) = more than.

Mycenae to Fychtia	) 2 km	½ hr	Major to minor
Mycenae to Boliari	) 2 km	½ hr	Major to minor
Mycenae to Priphtiani	2½ km	½ hr	Major to medium/ minor?
Heraion to Priphtiani	3 km	) ½ hr	Major to medium/ minor?
Heraion to Verseka	1 1/4 km	1/4 hr	Major to minor
Tiryns to Georgios/Dalamanara	2½ km	(½ hr	Major to minor
Tiryns to Aria	) 4 km	) ½ hr	Major to minor
Schoinochori to Skala	2 km	½ hr	Medium to minor
Malandreni to Skala	4 km	c. 1 hr	Medium to minor?
Magoula to Hellenika	c. 3 km	3/4 hr	Medium to minor
Magoula to Lerna	c. 5 km	) 3/4 hr	Medium to medium/ minor?
Kiveri to Kiveri Tombs	(1 km	(1/4 hr	Medium to minor
Kiveri to Lerna	(3 km	½ hr	Medium to medium/ minor?

SPARTA REGION

Menelaion to Vaphio	c. 5 km	1 hr	Major to major
Vaphio to A. Vassilios	) 4 km	1 hr	Major to major
Vaphio to Melathria	(4 km	1 hr	Major to medium?
A. Vassilios to Melathria	5 km	) 1 hr?	Major to medium?
Menelaion to Amyclai	3 km	½ hr	Major to medium
Vaphio to Amyclai	2 km	½ hr	Major to medium
Menelaion to Sparta	(3 km	c. ½ hr	Major to minor
Menelaion to Kouphovouno	(3 km	c. ½ hr	Major to minor
A. Vassilios to Anthochorio	3½ km	3/4 hr	Major to minor/ medium?

HELOS REGION

Lekas P. to A. Stephanos	) 2 km	½ hr	Medium to major/ medium?
A. Strategos to Asteri K.	) 2 km	½ hr	Major/medium to major/medium?
Lekas P. to Tsasi District	c. 7 km	1½ hrs?	Medium to medium?
Asteri K. to Tsasi District	) 5 km	) 1 hr	Major/medium to medium?
Tsasi District to Skala District	3-5 km	½-1 hr	Medium to minor?
Lekas P. to Skala District	1½-3 km	1/4-3/4 hr	Medium to minor

For Soulima (Messenia) and Argolid Mycenaean spacings cf. those chapters and Map 7 (Messenia Chapter), Map 6 (Argolid Chapter).

Another site that is of disputed status is that of Profitis Elias (on the borders of cells 6, 10 and 11 in Map 1A). In our discussion of this site in the Argos Chapter we found the archaeological evidence to be quite insufficient to support claims that this was a settlement of some importance, rather we suggested that it was a peak sanctuary. Its location on the borders of several territories in Map 1A would be ideal for a communal shrine, being the sort of pattern very common in ancient and modern rural Greece. However, the soils near the site are reasonably fertile and extensive, and some distance away from adjacent centres. I was led to suggest that an important settlement may well be found in this district, perhaps to the north of Elias, where it would be the regular one hour distance from adjacent centres characteristic for the better-known sites in the region. In Map 1C, I have therefore hypothesized the existence of an independent centre of exploitation in the Elias area (18).

With cell 6 we find a problem of some significance to our methodology. We have argued that the acropolis site was accompanied by a lower-lying domestic settlement (respectively the triangle and circle), although some distance separates them. Should we take the acropolis or lower town as our base for the Thiessen polygon? The crucial factor that is raised by this example is the function of intersite intervals. Is a regularity in the distance separating two adjacent centres a reflection of communication between them, or rather a result of each centre possessing approximately equal areas of land with a similar territorial radius?

It is our conclusion that regularities observed in this region and others shortly to be discussed, in intersite distances, are due primarily to the latter factor, i.e. common land requirements. Thus we have in Maps 1B and C taken the agricultural exploitation centre of cell 6, the lower town, as the natural centre of the cell.

In Map 1A we observe another problem in defining territorial boundaries - our lack of recorded sites in the mountain and higher hilland beyond the plain and low hilland zone. Working from the distribution of arable land in these districts, and the correlated pattern of traditional villages here, we have, in Maps 1B and C, positioned several hypothetical Mycenaean sites, producing new cells - 14, 15, 16, and 17. The resultant boundaries to polygons of known sites are very satisfactory in terms of ecological zones, shape and dimensions of territories, and it is highly likely that these hinterland districts were too remote to have been exploited from our known sites. Thus we now find cells 8 and 9 commanding natural coastal basins fringed by sea and mountainous watersheds, and these cells are larger than elsewhere because of the scantiness of best soils in them. With the new sites for cells 15 and 16, we again find that they provide natural basin and watershed boundaries for cells with known sites - 5, 6, and 11. The latter cells also now possess centres optimally placed in respect of cell shape, measurements and contents. Cell 6 centre is close to its best soils, furthest from its poorest soils (Cf. Argos Chapter for details on which this summary is based); cell 5 centre is similarly placed. Cell 11 centre dominates a long E-W valley with a core of good but not very fertile soils; the territory now suggested is admirable in size and shape and in the internal placing of the centre itself.

Our reasons for tracing intersite regularities to land requirements will now be justified:

1) Distances of about one hour between sites are frequent but can be found not only between major centres such as Mycenae(1), Heraion(4) and Dendra(6), but also between much lesser sites such as Magoula(8), Kiveri(9), and their major and minor neighbours.

2) Examining Table 3 and the postulated shapes of territories of Maps 1A to C, variation in the intersite distances within a general average of three-quarters to one-and-a-half hours seems accountable to the shape of territory, and that in turn seems due to the quality of soils available around each site. The frequent figure of one hour or about 5 km between sites is found over areas of good to excellent soil, suggesting that it is indication of the quantity of such required by each site. Longer distances are associated with poorer soils. For the former compare intervals 1-4, 1-5, 4-6, for the latter see intervals 1-7, 4-7, 2-3, 7-10, and those from sites 13 and 11 to neighbours.

3) Where intersite intervals conform to the average, the status of the sites involved is a function of the quantity of good and best soils found within their lands. Thus although the interval between Magoula and Argos(7), and between Magoula and Kiveri, is similar to that between Mycenae and Heraion, there is a great difference in the soil qualities and in the relative extent of rocky, poor and good soils in the intervening landscapes of these two groups. Thus Mycenae and Heraion are far more important sites than Magoula and Kiveri, while Argos with high status must compensate for its poor land resources to its south by an above-average territory radius to west, north and east.

One final additional factor must be introduced into our analysis to complete our approximations to reality. If an important site is located in a district with one particular major resource pre-eminent above other resources, this may well distort the placing of the centre in its cell. Thus the Neogen and Flysch preferences which we have detected in almost all of the Argos Plain prehistoric sites, and a preference for coastal locations, often cause a centre to be positioned by the sea or amid a narrow band of excellent soils. From this location good soils may be found to extend only in certain directions, and if the centre is to include in its territory about as much cultivable land as other centres with arable land in all directions, then its territory must be asymmetric around the centre. So e.g., if a site requires enough land as would be covered by a circle of radius x, then ideally for best access the centre of exploitation would lie in the centre of that circle; if a desire to be beside the coast or excellent soils placed a settlement at the side rather than in the middle of the main areas of mixed quality arable land in a particular district, then that settlement may well be found to lie on the perimeter or notably off-centre to the same circle of radius x. We must therefore allow for such a necessary compensation by adjusting the territorial boundaries of sites where such asymmetry seems highly probable.

The site of Asine (cell 12) will serve as a good example. It is over the average intersite distance from its neighbours in cells 10/19, 11, 18 and 13. This could be explained with sites in cells 13, 11 because they need larger lands with their poor soils, but with cells 10/19 and 18 this factor cannot be claimed. However if we assume that the desire of Asine to be by the coast and a good extent of flysch soils outweighed the advantages of being truly central to its overall farming lands, then the extra distance to neighbours inland could be due to a compensation for a lack of arable land in the 180° to the south of the centre.

Let us establish a 'norm' based upon our recurrent intersite distance of about 5 km. We have noted that this value seems to apply to areas of landscape characterised by extensive good land, so that we may suspect that a radius of $2\frac{1}{2}$ km is a significant figure for calculating the desired area of good land required by each centre.

If asymmetrical locations for centres are nearer the perimeters than the centres of our hypothetical territory of a circle of $2\frac{1}{2}$ km radius, then we should move the defining lines of polygons to give cells with asymmetrical centres enough arable land. For a coastal site then, the necessary arable land would run for about 5 km inland before one reached land belonging to the nearest inland centre. In Map 1A our polygons are constructed at all midway points, but in Maps 1B and C we have placed the boundary of an asymmetrical centre and a broadly symmetric centre at a point 2/3 of the way towards the symmetric centre, corresponding to a diameter followed by a radius of two contingent circles.

The test of our tentative conclusions may be judged by the closeness of fit obtained by our methods to the realities of settlement spacing and estimated archaeological importance of each cell. If we were to assume that the polygonal territories in Maps 1A to C approximated in a general way to the lands formerly exploited from each identified centre of settlement in Mycenaean times, then a calculation of the carrying capacity of each cell might provide for the first time estimates of Mycenaean population densities. Moreover, if our methodology has been sufficiently adapted to reality, we might expect that the relative carrying capacities of each cell would relate in a consistent fashion to what is known or may be inferred of the relative importance of individual cell centres. An independent check on our formulae for estimating carrying capacity is provided by a comparison with the population of each cell in the 1928 census of the Argos region.

Figures for the relationship of population to land area in Greece, and in particular in a typical plain and hilland landscape such as the Argos Plain, can be obtained from the study of Burgel (1965) for the similar Messara Plain in Crete, and from the study of De Vooys and Piket (1958) of the village economy of modern Dendra/Manessi villages in the Argos Plain itself. The overall average landholding size in Greece is 3.6 hectares. However much of this is composed of small intensively cultivated irrigated cash-crop holdings, whereas we would argue that in ancient and prehistoric times the average holding was a larger affair with extensive crops such as cereals and olives predominating (see discussions of soils and crops in the regional study chapters, and in chapters on Soils and Economics). Confirmation on

a detailed level can be found from the dry-farmed village territories of the Messara Plain, and Manessi/Dendra in the Argos Plain. In the Messara, only one or two village territories on recent alluvium have landholdings less than 4 hectares in size, whilst the average for the numerous communes on older drier soils is 5.5 hectares. In the latter cereals and olives are the main crops, with herding as a fairly important adjunct to the economy and providing exploitation of the bordering uplands. In the Argos Plain a very similar economy characterises the communes on the plain rim, and hence in our view would have been typical for earlier settlements in the same location. Average holding size in the Dendra/Manessi commune is 5 hectares.

However, the present strains of crops and advances in agricultural science, taken with the far wider marketing facilities available to the modern peasant farmer, may be assumed to have raised crop yields and the intensity of production in the rich agricultural areas such as these great plains. Deep-well irrigation customarily provides even the mainly dry-farmed older soil areas with patches of garden culture, thus lessening holding size. For these reasons we have raised the suspected average holding for ancient and prehistoric times, in a landscape and with an economy such as the Argos and Messara Plains, from 5-5.5 hectares to 7 hectares.

Examination of village occupational statistics in the Messara Plain suggests that each holding relates to 5 - 6 inhabitants in the village. That is not to say that the holding actually supports that number of people, for although a holding generally provides the main resource for a family of 4 or 5, a small proportion of villagers live either whole or part-time by crafts, commerce and servicing. It seems likely that this breakdown is fairly characteristic for traditional Greek villages, and we cannot detect any significant distortion due to purely modern social and economic conditions.

It is obvious that a village's landholdings are almost all concentrated in its most extensive areas of arable land; grazing is usually carried on in communal upland zones of low arable potential within the village territory. If we take our hypothetical Mycenaean cells in the Argos Plain (Maps 1A to C) it will be observed that most consist of varied topography and soil conditions, but in almost all cases the arable land exists in a continuous zone of the cell. Let us take our $2\frac{1}{2}$ km radius circle as our 'norm' for comparing arable areas within each cell. We should recall that we have suggested tentatively that this area of cultivable land may be chiefly responsible for observed regularities in intersite spacing of around 5 km. In Map 2A we have located within each cell (using Map 1C as perhaps our best approximation to reality for an underlay), a circle of $2\frac{1}{2}$ km radius, placing it in each case over the main zone of arable land possessed by that cell. Immediately we may note that the circle offers a remarkable fit to the area of arable land found in many cells (Cf. cells 1, 2, 3, 4, 5, 6, 8, 10, 11, 12, and 18), with arable land consistently covering areas of three-quarters to one-and-a-quarter times the area of a circle of radius $2\frac{1}{2}$ km. It may further be seen, comparing this with Table 3, that intersite regularities of around 5 km are correlated with radii of these circles where the main arable land of one cell immediately adjoins that of a neighbouring cell (Cf. these

relationships for the interaction of cells 1 and 4; 4 and 5 and 6; 6 and 10; 2 and 3; 7 and 8; 8 and 9; 10 and 18; 12 and 19 and 10 and 18; note that in some of these cases we have allowed for asymmetry, e.g. with cells 8, 9, 10, 12, 19, 1, 2 and 3, though usually asymmetric centres still manage to lie at the broad equivalent of a radius from adjacent centres).

If a circle of $2\frac{1}{2}$ km radius represents an average area of arable land in many cells, what order of carrying capacity would this provide for? The surface area of a circle of $2\frac{1}{2}$ km radius is about 20 sq.km., which equals 2000 hectares. Working from an average holding of 7 hectares and each holding correlating with 5 people, we result with a figure of 1500 people. In the following table we have estimated the approximate carrying capacities of each cell using this method on Map 2A, and set alongside these projections the actual figures for each cell in the 1928 census where available (taken from Lehmann, 1937). In several cases we have indicated that the 1928 figures reflect a higher population than our projections for carrying capacity, as a result of purely modern conditions (post-Classical landscape changes, new crops and technology, etc.). However in all these cases our calculations suggest that at least as many people in these particular cells were still being supported by local resources that were available in prehistoric times, as in our estimates of pre-modern carrying capacities.

TABLE 4

(N.B. The theoretical projections have been weighted according to the quality of the arable land within a given surface area.)

Hypothetical Carrying-Capacity	1928 Census Figures (asterisks mark modern distortions)
CELL 1: 2250	1299
CELL 2: 1125	1207
CELL 3: 1125	812
CELL 4: 1875	1288
CELL 5: 1875	901
CELL 6: 1875	3215*
CELL 7: 3000	11 - 12,000*
CELL 8: 1125	938
CELL 9: 750	767
CELL 10: 1875	More than 1875*
CELL 11: 1125	---
CELL 12: 1825	2514*
CELL 13: 375 or less	---
CELL 14: 375 or less	---
CELL 15: 375 or less	1354*
CELL 16: 1125	---
CELL 17: 375 or less	---
CELL 18: 750	838
CELL 19: 1125	Around 8000*

We might first remark that there is a reasonably good fit between our independent estimates of carrying capacity and actual figures, with several cells where modern factors provide no serious distortions, e.g. cells 2, 8, 9 and 18. In other cases of undistorted conditions we find the 1928 figures running at half to two-thirds of the suggested population capacity, with cells 1, 3, 4, 5. I suspect that underexploitation and temporary depression may be responsible for the deficit here.

An aspect of great interest is a comparison we may now undertake between carrying capacities and the inferrable archaeological importance of each cell. Summarising our detailed discussion of each site in the Argos Chapter, we might grade the important Mycenaean sites that command each cell, on archaeological grounds, in the following descending series of statuses: 1; 10; 4, 5, 6, 7, 12; 11; 8; 2, 3, 9, 18; 13. From our carrying capacities we derive the following order: 7; 1; 4, 5, 6, 10, 12; 2, 3, 8, 11, 16, 19; 9, 18; 13, 14, 15, 17. There is an undeniable high level of agreement between these orderings that justifies us in concluding that the relative status of Mycenaean centres in the Argos Plain is primarily due to local differences in arable fertility within the region. Can we account for the minor discrepancies between the two lists?

The prime importance of Argos(7) in farming potential is a natural result of its locational advantages, as may be seen from our maps. Being also central to the region as a whole, it is no surprise that Argos was the regional capital in ancient and medieval times, as it remains to this day. As we have seen (Cf. Argos Chapter) Argos is believed to have been one of the most important, if not the foremost site in the region during Middle Bronze Age times, but was under an eclipse during mature Late Bronze Age times, perhaps due to repression by enemies. Mycenae's(1) pre-eminence in the Late Bronze Age we have also ascribed to its function as regional capital for both Argos and Corinth regions, a role it was better suited for geographically than Argos. Tiryns(10) is archaeologically more important than its land resources would suppose, and this must almost certainly relate to its role as the chief marine site for the region. In 1928 Argos was the largest settlement in the Argos Plain, followed by Nauplion; the higher than expected archaeological status for Tiryns and Nauplion(19) seems accountable to their importance as regional centres for fishing and trade, and probably also as war harbours. Nauplion assumed most of the functions of prehistoric Tiryns and Nauplion after the abandonment and silting up of Tiryns.

We might make a further observation from this analysis, that one method of inferring status for Mycenaean centre is largely in agreement with the relative fertility of that centre's resources in land, and its importance as a marine base i.e. cemetery statistics. In the regional study chapters we have suggested that the presence of a tholos tomb is generally confined to the larger and more important Mycenaean centres; at these and centres of medium size numerous chamber tombs are found; at remaining smaller centres, a few chamber tombs may be found. Archaeological sampling naturally distorts the observable regularities in this pattern, particularly where but one tholos or a handful of chamber tombs are expected to be present. Thus in our two series of statuses for Argos Plain centres, carrying capacity and settlement status, it is satisfactory to find tholoi

with the most important and fertile cells such as 1, 4, 5, 6, and 10. Of the same settlement and soil status, cells 7 and 12 will almost certainly yield tholoi as their cemeteries are more completely investigated. In the next category down, cell 11 has a tholos and settlement of uncertain importance. On fertility we suggest it is on the border of larger and smaller centres, and centres with about the same resources hitherto lack tholoi.

How does this detailed analysis of the Argos Plain further our understanding of other regions of Mycenaean settlement? Let us turn first to the Sparta Plain. In Map 2B I have drawn $2\frac{1}{2}$ km radius circles over the arable land of the Mycenaean centres of this region. In the Sparta Chapter we observed a regularity of one hour spacing between these centres. It can now be seen that all but the Menelaion sit approximately central to their major areas of arable land; the latter is on the periphery of its $2\frac{1}{2}$ km circle, but as with parallel cases in the Argos Plain, its location is still approximately two radii from the adjacent Vaphio centre. Hence the overall regularity. As for the quality of the land within our $2\frac{1}{2}$ km circles, those belonging to the Menelaion, Vaphio and Agios Vassilios are filled by very high quality soils, and we might suggest a carrying capacity for the mature Mycenaean period of the full 1500 inhabitants. Melathria includes in its circle much poorer soil and rock, and our estimate of potential population would suggest around 750 people - this accords well with its apparently lower status from the scanty archaeological material. The populations of the remaining three centres would place them on a par with centres such as Heraion, Berbati, Midea/Dendra in the Argos Plain, though slightly less populous at least in theory. The archaeological evidence for the Menelaion and Vaphio suggests that these sites were at least as important as those cited from the Argos region, with extensive settlements at both and a rich tholos at the latter. The Menelaion would indeed seem to have been the regional capital, and hence we may assume that its population was enlarged by administrative officials and other people with positions in the regional rather than the purely local sector. On the other hand, we might also ascribe its great size and suggested importance to its control over the fertile salient of the Sparta Plain that runs to the north-west of its own immediate lands (see discussion in Sparta Chapter). We lack a prehistoric centre to exploit this area, and although there is enough good land here for a small centre, there is insufficient for a community as large as our Menelaion/Vaphio/Vassilios class. Possibly a small centre here was subordinate to the Menelaion, providing that community with overall lands capable of supporting around 2250 inhabitants; the Menelaion would then be exactly parallel to Mycenae in the Argos Plain in the potential of its resource base.

In the Helos Chapter I attempted to derive a series of equally-spaced Mycenaean centres from rather fragmentary data. I argued that the regional centre, 'Helos', lay by Strategos and Asteri Karaousi, on the preeminence of fertile soils in this district, the discovery of a tholos tomb and ancient references. On the opposite side of the Plain the sites of Stephanos and Lekas Panayiotis seemed to be of importance in Mycenaean times, though their proximity was such that possibly they were occupied by the same community for different functions and perhaps at different seasons. In our reconstruction of the prehistoric Helos landscape we found that the Strategos/Asteri centre commanded very fertile lands to north, north-east and north-

west, sea on the remaining sides; the Stephanos/Lekas centre(s) possessed a much smaller but very fertile district of fine soils lying between them. To the east of Lekas we suggested only limited areas of cultivable land associated with several small prehistoric sites as characteristic for the pre-Classical period, precluding the existence of large settlements until one reaches the north-east Plain, where a side-plain and fertile hilland may once have supported an important prehistoric community. In this latter area, near the Tsasi village, there are numerous indications of dense Mycenaean settlement, and on local resources and the distance to the next known centre at Asteri we have argued that there may exist a large Mycenaean site here. In Map 2C we have placed $2\frac{1}{2}$ km circles over the main arable areas of each postulated centre in the Helos region. The Asteri/Strategos area contains almost enough fine soil to fill the circle, giving a population capacity of around 13-1500 people. Possessing the only tholos so far recognised in the region, and indications that it was formerly the regional centre, this community seems satisfactorily of high status primarily because of its pre-eminent arable resources. It almost certainly had a harbour on both east and west, which added greatly to its locational advantages, but the important site of Stephanos on the other side of the plain proper quite probably possessed a much more sheltered port. We suspect that it was the much smaller area of good arable land available to Stephanos, even if we assume that Lekas and Stephanos were one community with shared lands, that tipped the balance in favour of Strategos/Asteri as the regional centre in Mycenaean times. The combined lands of Stephanos/Lekas provide only sufficient good arable resources to support around 500 people, one-third of the Asteri/Strategos potential.

Our hypothetical centre in the Tsasi side-plain would have commanded more extensive fields than Stephanos/Lekas, but of poorer quality; we estimate that a population of 1000 people might have been locally supported. Such a calculation would point to a prehistoric site of some magnitude awaiting discovery in this district. Outside of the plain proper, we have two more possible Mycenaean centres to examine, one in the remote Lagio valley and another to correspond to modern and ancient Gytheion. If we are correct in postulating prehistoric centres in and near these locations, our estimates of local soil resources would suggest a carrying capacity of around 150 for Lagio, perhaps as much as 1500 for Gytheion.

If we compare archaeology and resources in the Helos region, we find the same satisfactory fit as in the Argos and Sparta regions. Comparing Helos with those regions we see that only Asteri/Strategos and Gytheion would seem to be in the same class as the big centres of Argos and Sparta, and are best paralleled by the status category that includes sites such as Midea, Berbati and Vaphio. If anything, these Helos sites are somewhat less fertile in territory than those parallels, though over the 'tholos' threshhold, and this helps to account for the presence only at Strategos of a tholos tomb (prehistoric Gytheion is yet to be explored in any detail), and the provincial and smallscale character of the overall Mycenaean settlement in this region.

Let us now turn to the Soulima Valley in Messenia. In our brief discussion of this area (see Messenia Chapter) we pointed to apparently regular spacings of major Mycenaean sites in the neighbourhood of the Malthi settlement. Characteristic intersite intervals of around 5 km were observed. In Map 2D we have once more located circles of $2\frac{1}{2}$ km radius over the arable land in each 'cell'. In general the arable land in this region is represented by valley bottom and lower hilland, with the higher hilland being fairly infertile. It is instantly clear that Malthi itself has the most extensive area of arable land; adjacent centres to north and north-west have nearly as much cultivable land, but the remaining cells in the region have generally far less than Malthi. Considering the quality of the Soulima Valley soils, we would estimate that the Malthi cell might have supported 1125 people, the cells to north and northwest around 1000 each, and the remaining cells one-third to two-thirds of this total. Malthi, the only one of the centres for which we have detailed information, does indeed compare in its settlement evidence with small centres with a similar territorial carrying capacity in the Argos Plain such as Melissi/Schoinochori, Magoula and Kasarma, which are around the threshold of tholos status. But in the Soulima region it is clear that tholoi can be associated with much smaller centres, perhaps representing a mere 750 people per cell (Cf. the cells in the centre and northwest corner of the area in Map 2D). This observation is well in line with archaeological knowledge, for it has long been recognised that the Mycenaean tholos tomb is far more commonplace in Messenia than in the rest of southern Greece. In the UMME survey of prehistoric Messenia, about 30 tholoi groups and isolated tholoi are recorded (McDonald and Rapp, 1972, p. 142), far denser than in the Argos, Corinth and Sparta provinces of the Peloponnese. We might finally draw attention to the underlying factor of resources as sufficient explanation for variations in intersite distances on Map 2D. Where the cell centre is approximately at midpoint to its $2\frac{1}{2}$ km circle, intersite intervals are closest to the sum of two radii. Where the interval is shorter we find that settlement centres are not centrally located to their chief resources (Cf. the interrelations of the cells in the northwest, northeast and centre of the region). The centre to the southwest of Malthi would at first sight seem to be on the edge of its arable land and yet at the customary distance from its neighbours. However the location that would be truly most accessible to its cultivable resources of lower hilland, a position about 2 km to the northeast of the actual settlement centre, would also remain approximately 5 km from adjacent centres. The preference for an edge rather than central position within this cell clearly reflects a desire to be equally accessible to upland and lowland zones, either for defence or more likely pastoral purposes.

The last region we shall analyse is that of the S.W. Argolid (Cf. that chapter). This area is without doubt the poorest in extensive fertile soils of all those so far examined. In Map 2E we have located $2\frac{1}{2}$ km circles over the chief arable lands of suggested Mycenaean centres. Only the Tell and Ermione Tell sites would seem to have commanded sufficient arable land to fill the circles, and the quality of enclosed soils leads to an estimate of around 1000 people for each of these cells. This is below the 'tholos threshold' as found in regions other than Messenia, and we know of none in

this region so far, though admittedly it is only now being carefully explored. The Didima and Fournoi cells on arable resources seem capable of supporting no more than 750 people. Once more this analysis is in full agreement with the archaeological evidence for the region, both suggesting a provincial and smallscale character for Mycenaean settlement. Arable resources point to the Tell site as regionally pre-eminent; this is important confirmation of other evidence that suggests that in that locality we should expect to find the regional capital for the Mycenaean period 'Mases'. It is of particular interest that in comparative terms the Tell cell, despite its local importance, falls into an intermediate status between more fertile cells in the Argos region such as Kasarma, Melissi, Malandreni, and less fertile cells such as Kiveri and Elias.

A study of presentday populations in the Sparta, Helos, Soulima and S.W. Argolid regions finds a good correlation with our estimates of district carrying capacities, as in the Argos region, and details may be obtained from the present writer but are not provided in this thesis.

In summary we have demonstrated that the status of any particular Mycenaean centre is primarily a function of the arable and marine resources to be found within its individual cell. The status of a whole region is in turn primarily a function of the overall arable and marine resources of its combined cells. Such factors appear to be far more determining than any influences stemming from unique 'historical processes' confined to certain Mycenaean communities and particular regions of settlement.

NOTE

1. In our discussions of each region in this Appendix, we have not repeated details of local soil differences, nor are such shown on the Map Figures of this Appendix. Our estimates for carrying capacity in any single district are based not only on the available surface area within each hypothetical 'cell', which can generally be calculated from the Appendix Maps, but also on the area of arable land this zone contains and localised variations of soil types. Details of these latter are to be found in the site-by-site discussions of the regional chapters of this thesis.

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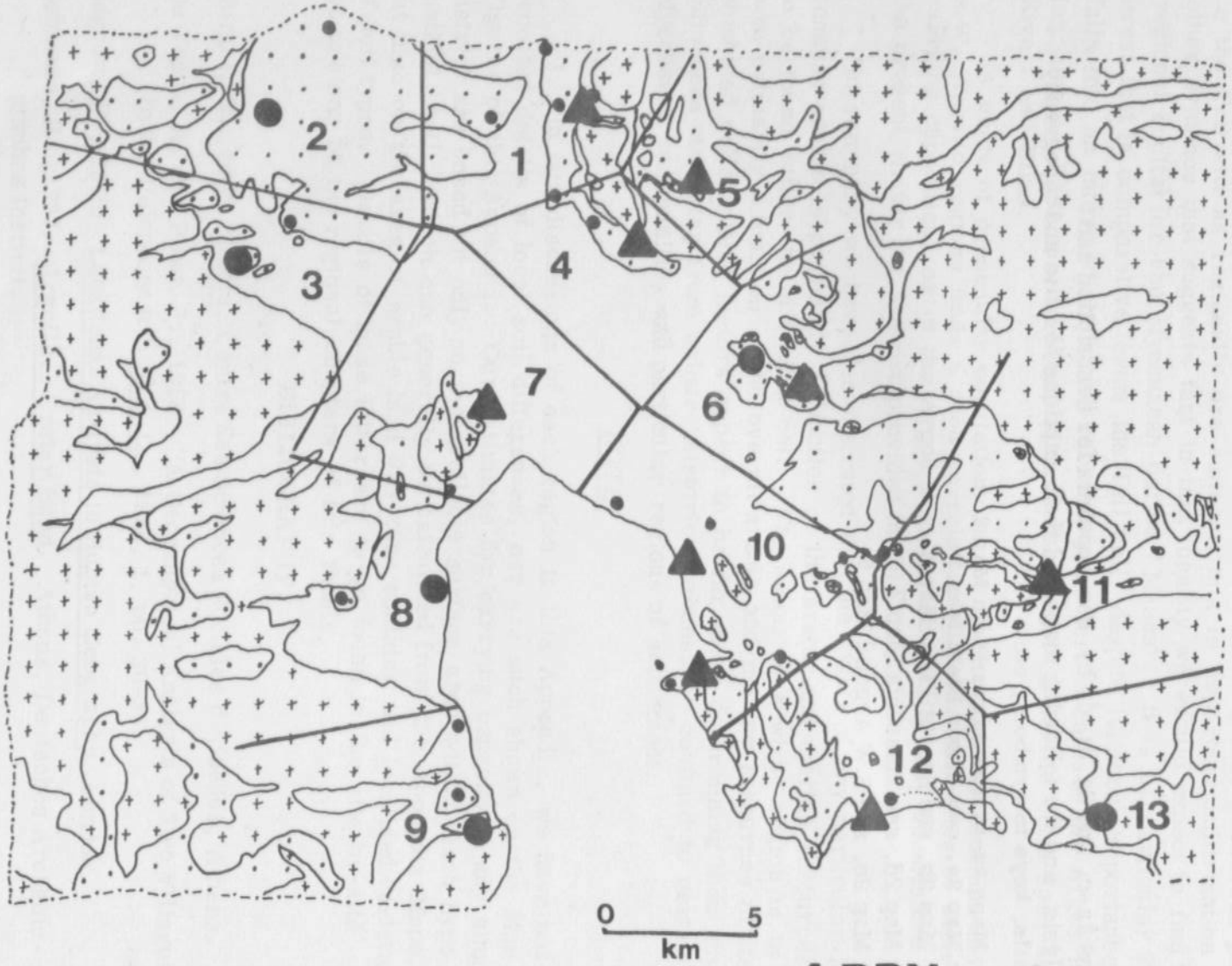
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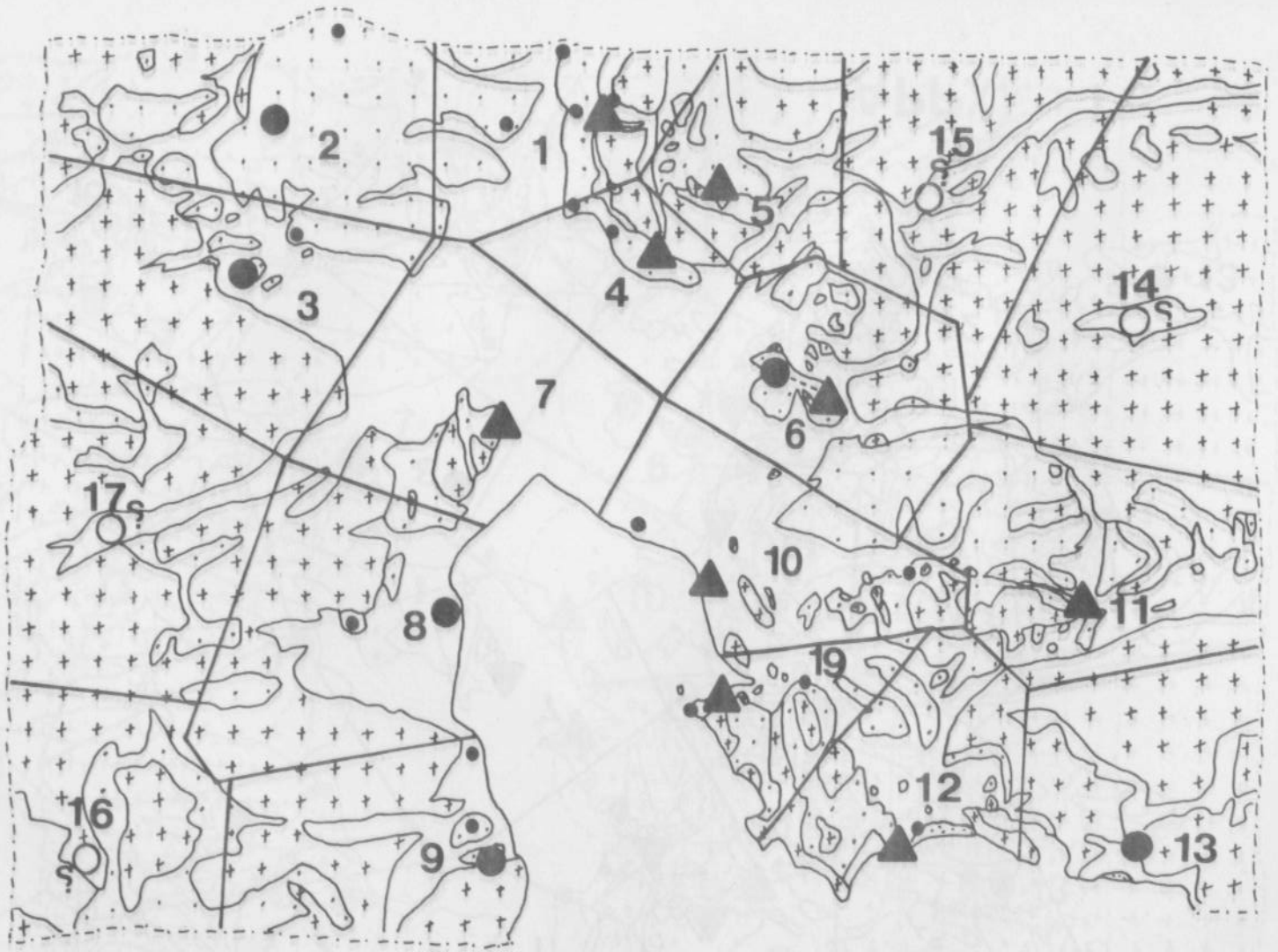
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Maps 1a-c, and 2a, b, d, e: see Appendix for description and analysis, and the following maps and their captions for site and topography details, keys to symbols, etc.:

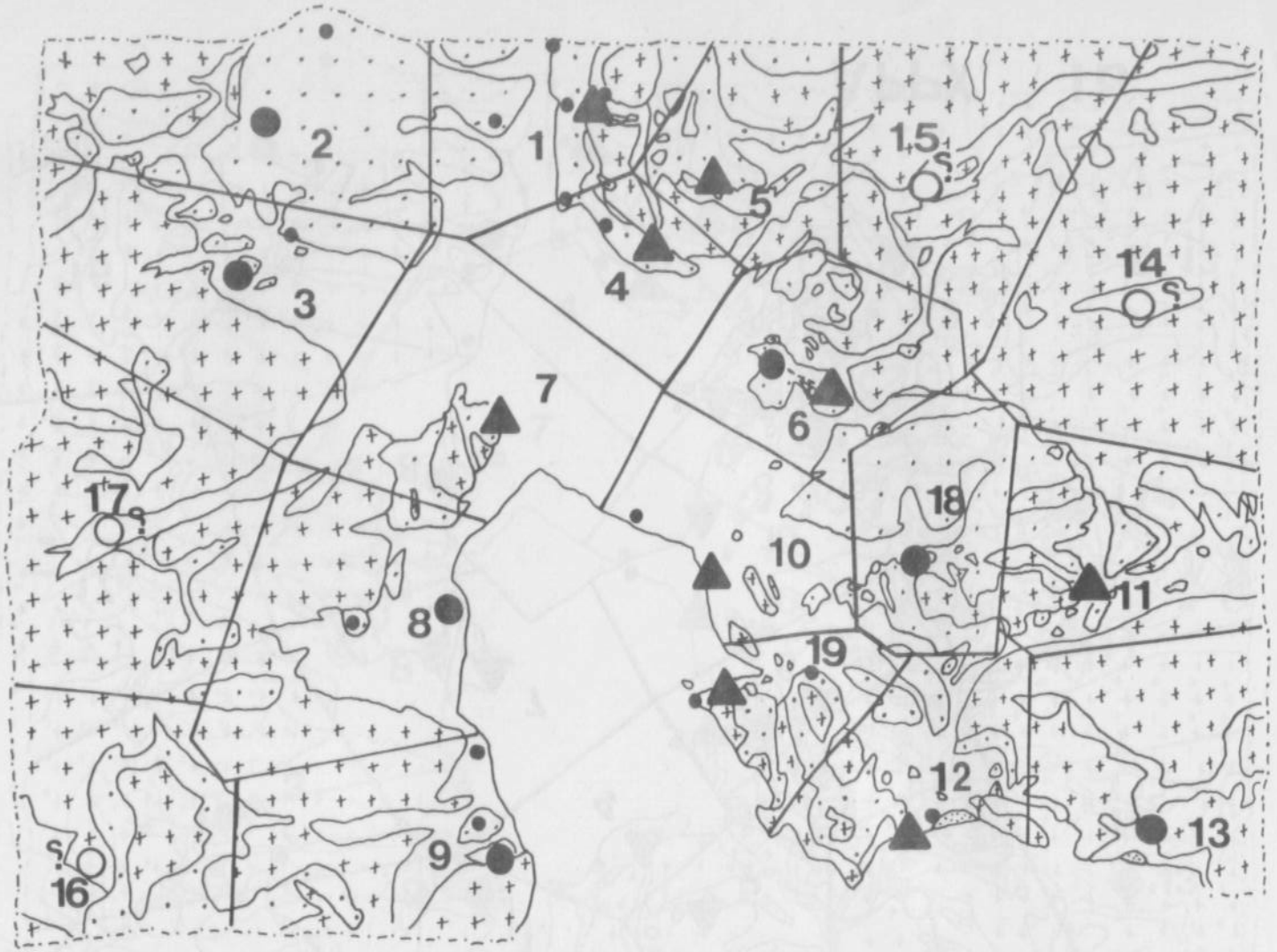
For Maps 1a-c, see Argos Plain Map 2
For Map 2a, see Argos Plain Map 2
For Map 2b, see Sparta Plain Map 5
For Map 2d, see Messenia Map 7
For Map 2e, see S W Argolid Map 6



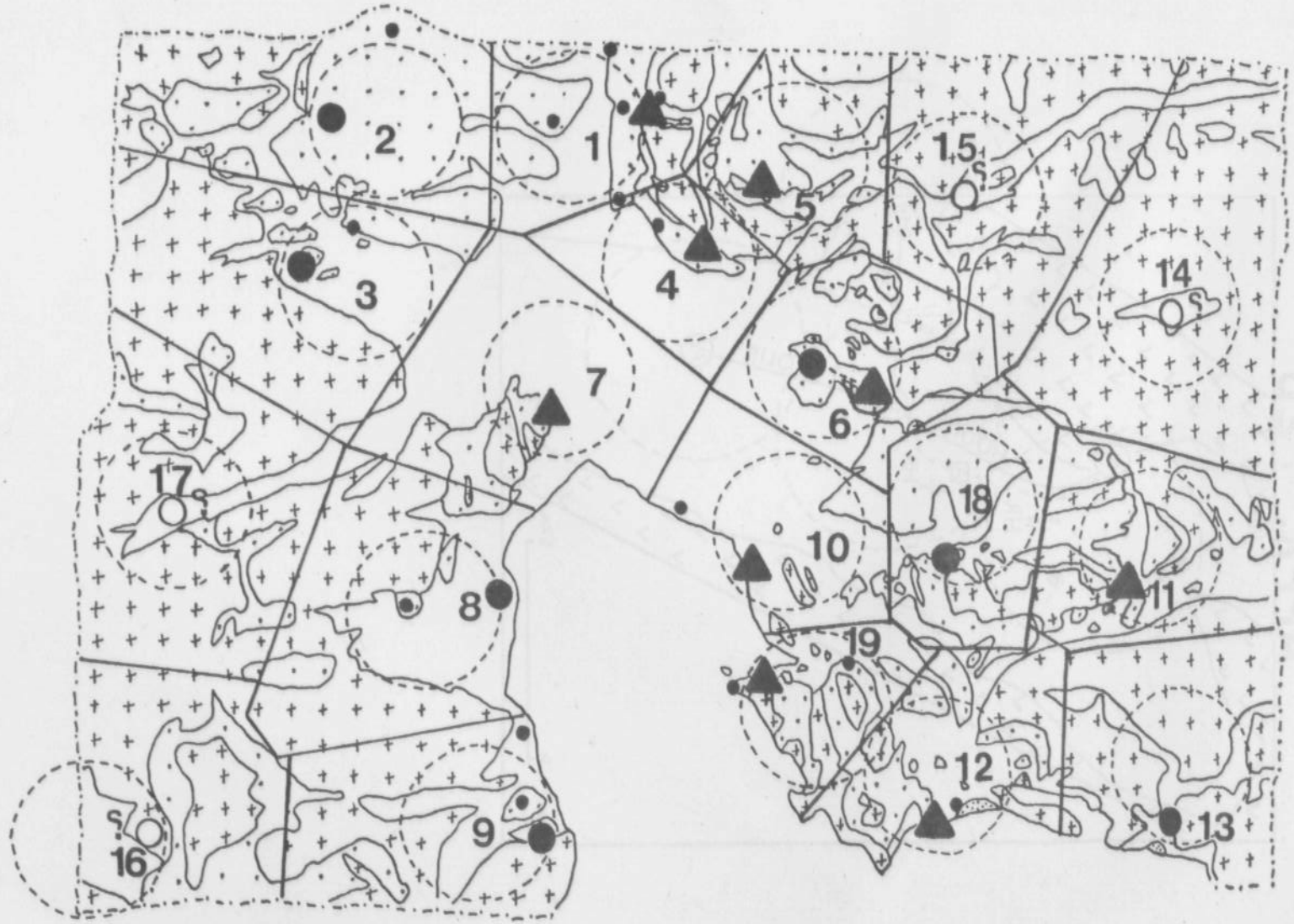
APPX. : Ia



APPX. : Ib

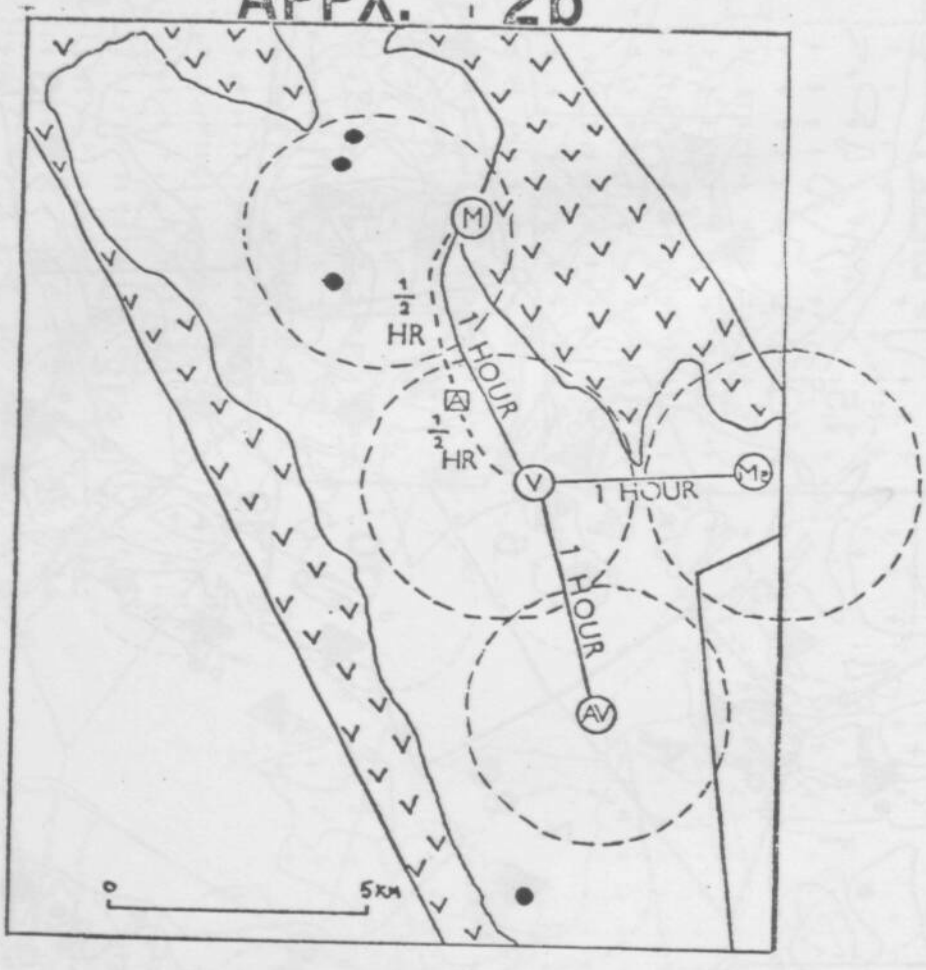


APPX. : I c

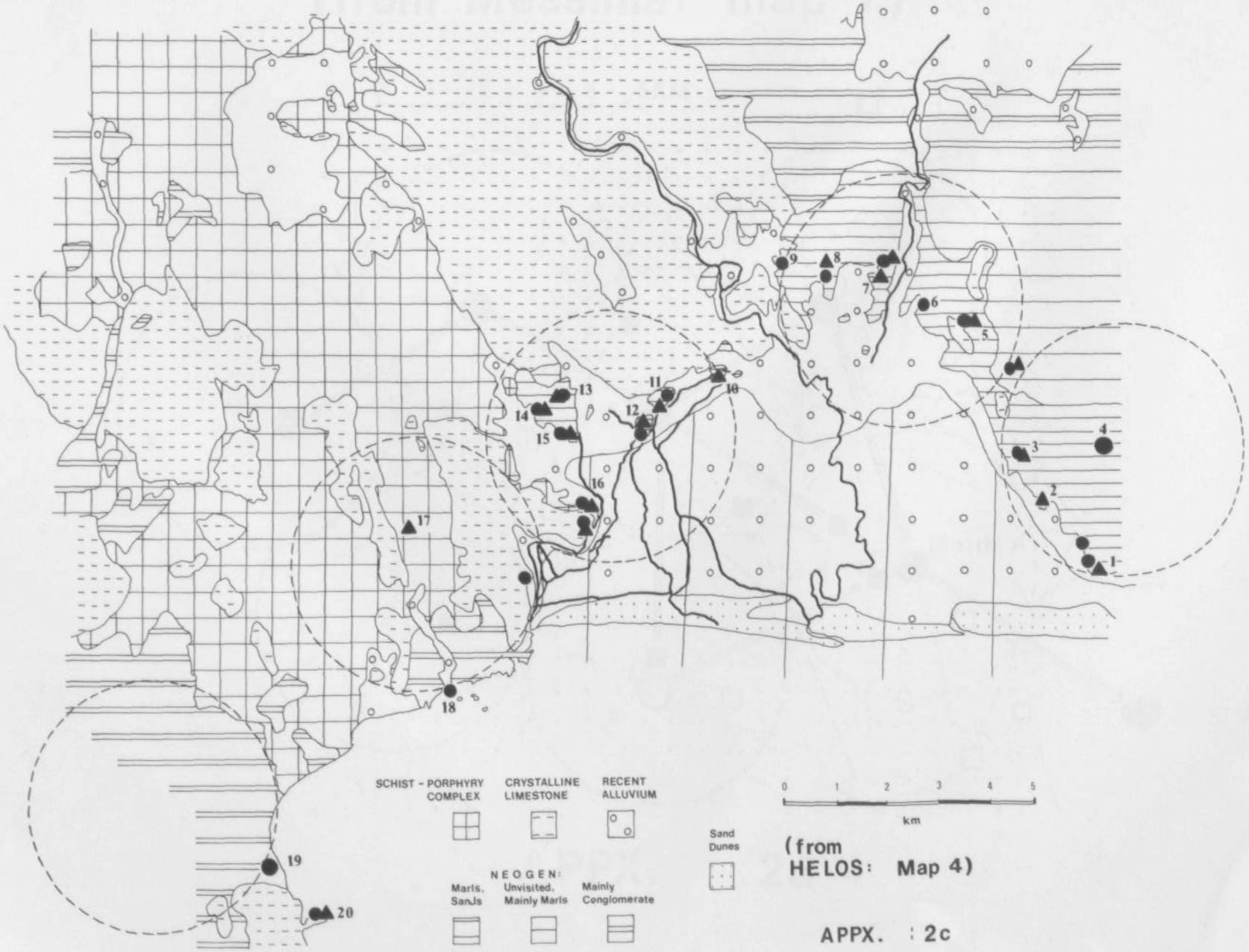


APPX.: 2 A

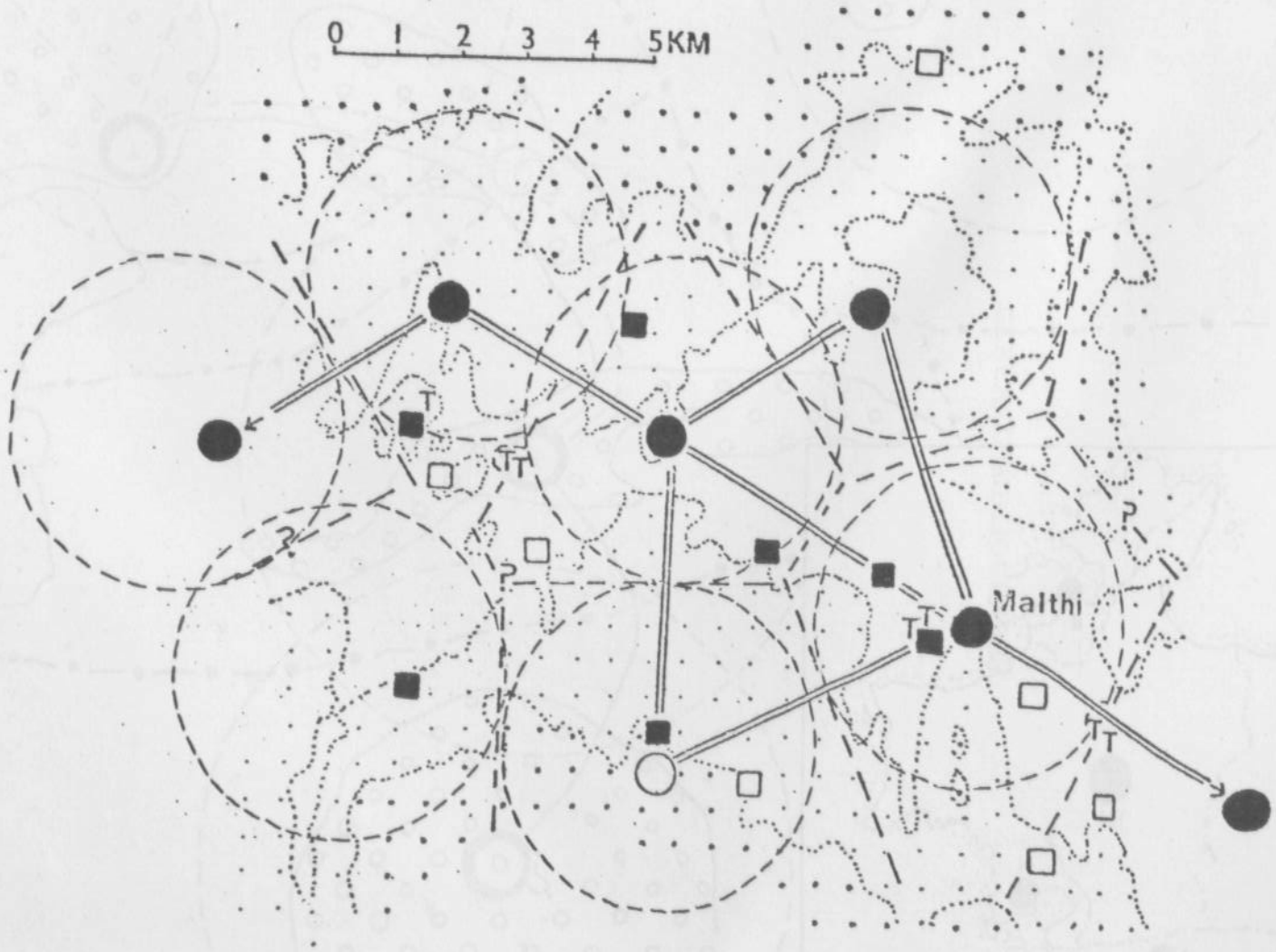
APPX. : 2b



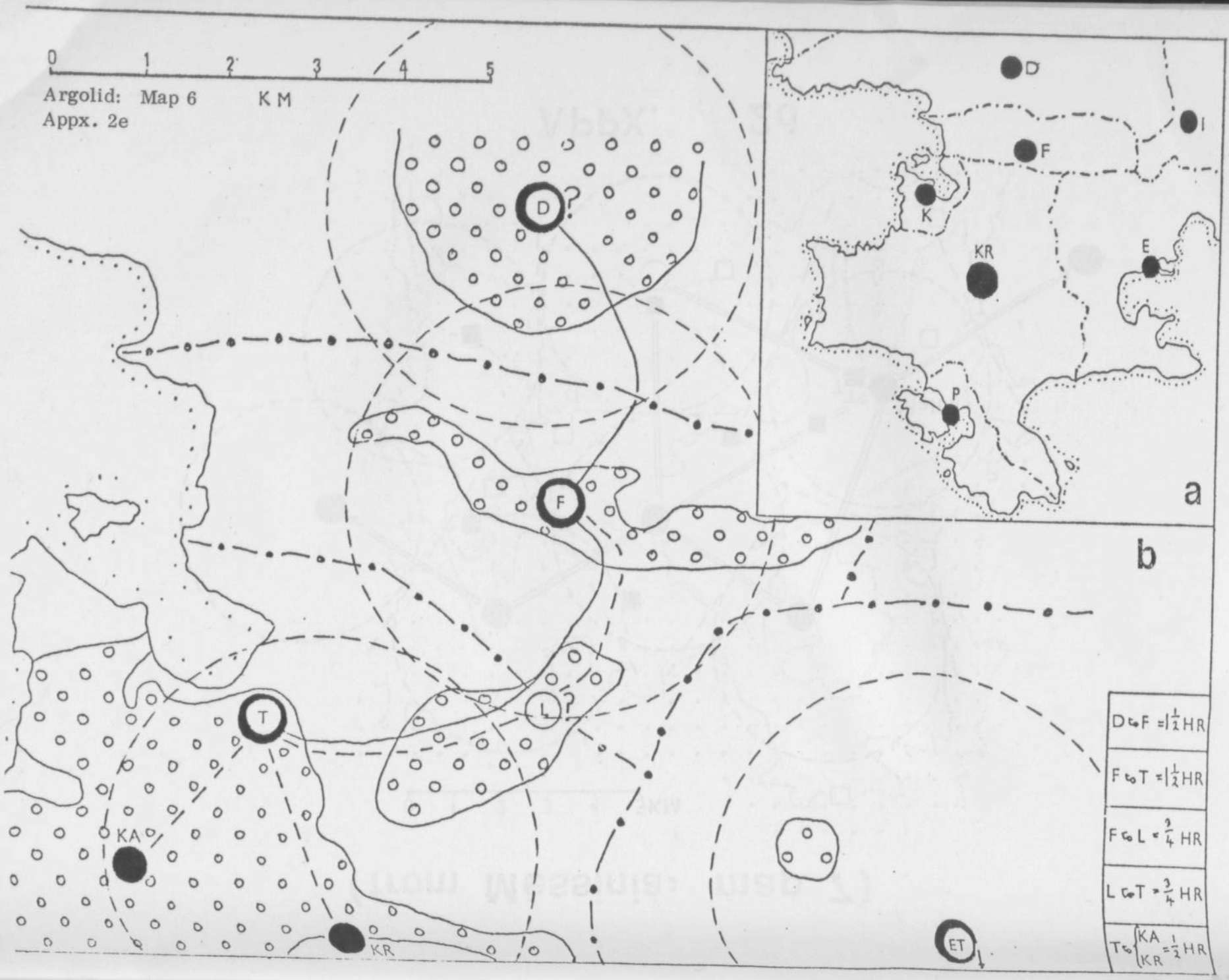
Map 2c: see Appendix for description and analysis, and Helos Map 4 and its caption for key to sites and symbols. The area shaded is approximately that part of the modern Helos Plain considered to have been covered by the sea in the late prehistoric period (cf. Helos Map 6).


SCHIST - PORPHYRY COMPLEX
CRYSTALLINE LIMESTONE
RECENT ALLUVIUM
Sand Dunes
NEOGEN:
Marls, Sands
Unvisited, Mainly Marls
Mainly Conglomerate
0 1 2 3 4 5
km
(from HELOS: Map 4)
APPX. : 2c

(from Messinia: map 7)



APPX. 2d


0 1 2 3 4 5
KM
Argolid: Map 6
Appx. 2e
D?
F
T
L?
KA
KR
ET
D
I
F
K
KR
E
P
a
b
D to F = 1½ HR
F to T = 1½ HR
F to L = ¾ HR
L to T = ¾ HR
T to KA = ½ HR
T to KR = ½ HR

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