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Territorial Behaviour and the Natural History of the Greek Polis

Aus diesen Erwägungen...ergibt sich für unsere Thema-Stellung schon ein wesentlicher Hinweis: wir werden vom geographischen und historischen Standpunkt aus immer, auch bei der griechischen Polis, scheiden müssen zwischen dem geographischen Stadtbegriff, für den wir im alten Orient keine Belege finden, und dem historischen Begriff des Kleinstaates, der primär auf einen Punkt als Siedlung und dessen naturräumliche Umgebung beschränkt ist. (KIRSTEN 1956, p.36).

An Introduction to some Relevant Theory

In 1970, VITA-FINZI and HIGGS introduced the archaeological world to the technique they called 'Site Catchment Analysis' (VITA-FINZI and HIGGS 1970). They suggested that human societies in the pre-Industrial past were closely tied to variations in the resource potential of the landscape, so that the location and size of ancient settlements closely mirrored the local ecology. Research into animal behaviour since the 1920's had shown that most species of animal exhibit 'territorial behaviour' (Figure 1: territories of song-sparrows), where individuals or mating pairs claim patches of land as a personal resource zone, mark or patrol its boundaries and may sometimes fight to defend it. VITA-FINZI and HIGGS hypothesized that ancient communities likewise behaved territorially, by choosing settlement locations which controlled discrete blocks of landscape containing adequate resources to make the new settlement viable (Figure 2). And just as animal territories are defined by the mobility and food needs of a particular species, allowing animal ethologists to give average territory sizes, so study of human territories suggested that recurring limits could be found for the exploitation territories of ancient settlements.

In the case of hunter-gatherer sites discovered by archaeologists it was suggested that territories could commonly be delimited by a circle of radius 10 kms around the camp, and the same was po-

stulated for settlements of an essentially pastoral economy. But for settlements located by historians or archaeologists which relied primarily on agriculture, a smaller territorial radius was proposed, of a 5 km circle. These approximate boundaries were seen as likely maxima, beyond which the time taken to travel seriously hindered efficient exploitation of resources. The term 'catchment analysis' reflected the concept of foodstuffs being channeled into the carefully-sited settlement, in the same way as a stream draws in water from its basin. 'Ecological archaeologists' working in the field now had a technique for investigating the relationship between the inhabitants of an ancient settlement and its surrounding landscape, offering the possibility of insights into past economic practices, population dynamics, and soil and crop preferences.

Quite soon practitioners of Catchment- or Site Territory-Analysis made an obvious modification from using map distance to using walking time, for estimating probable catchment boundaries. Two additional clarifications to the theory of site catchments should be mentioned. Firstly it can commonly be the case that a small settlement will obtain all its necessary subsistence from a much reduced radius, so that the distance constraints of 1 or 2 hours' walking time do not come into operation. The packing of clusters of such small settlements can therefore proceed across a landscape at much closer intervals, with an effective territorial radius no longer predictable from catchment maxima. A complementary technique borrowed from Geography which is very helpful here is that of THIESSEN Polygon analysis: constructing theoretical boundaries at midpoints between each neighbouring settlement of comparable status offers a reasonable possibility of detecting the variable size of catchments that would result from varying resource needs and variations in the fertility of land. Once a theoretical site territory has been delimited through THIESSEN Polygons, it is possible to study the resources contained within it at increasing distance from the settlement using Catchment Analysis. In the next example (Figure 3) from an illuminating comparative study of changing land use patterns in Southern England from later prehistoric to Medieval times (ELLISON and HARRISS 1972), early medieval village territories are shown to form narrow parallel

rectangles running across a range of land types to make a very balanced economy. This study found that farming settlements from Neolithic to Anglo-Saxon times required less land than the catchment maximum of around 5 kms, and could generally be studied with a territory confined to a 2 km radius circle. Interestingly, earlier work on English medieval villages had also found them to lie spaced at approximately 4–5 km intervals across the landscape. It is significant to note that when a site territory is much smaller than the 1 or 2 hour maximum radius, the settlement itself need not be exactly central to its territory, but can be placed asymmetrically, perhaps to take advantage of a defensive situation, water resources, a communication route, or some local patterning in varying resources. THIESSEN Polygon analysis will generally reveal such asymmetries.

A second clarification to Site Catchment theory occurs in a useful discussion of the technique as applied to early farming villages in Mesoamerica. FLANNERY (1976) points out that his early villages are indeed regularly spaced as if to create modular site territories of 2.5 km radius (Figure 4), but the land required when these settlements were first founded was only a fraction of the potential available. Only when the sites had grown over time would the territories apparently delimited by intersite spacing have been fully in use. It looked as if site location might involve 'forward planning' anticipating the need for a larger territory with population growth. At the same time some kind of growth limit to settlements seems to be implied by FLANNERY's and ELLISON and HARRISS's studies, pointing to a tendency for human settlements to keep within certain size limits. Until settlement growth causes obvious stress on the time–distance constraints of the 1 to 2 hour radius, it is not clear what other factors could inhibit settlement and territory size in this way, but empirical research regularly finds agricultural settlement networks with approximately half-hour, or two to two-and-a-half kilometre, radius territories.

It is clear that even the smallest site, for example a Classical Greek or Roman farmstead, is amenable to catchment analysis. So also are much larger sites, but here we need to produce a more elaborate theory. Let me illustrate the approach from an Early Iron

Age settlement system in Southern England (Figure 5)(cf. BINTLIFF 1984, CUNLIFFE 1983). The landscape is dominated by hillforts (the examples shown are Danebury and Woolbury), but although the hillfort occupants will certainly have farmed the land immediately around, most of the land associated with an individual hillfort was farmed from rural farmsteads in its wider hinterland. The hillfort has therefore two territories or catchments: its own inner farming catchment, directly exploited by hillfort occupants, and a much wider catchment involving rural peasants coming in to the hillfort as a 'central place' providing refuge in war, market facilities, legal and socio-political facilities. So there is a smaller catchment orientated outwards, and a larger one orientated inwards. The dependent rural farmsteads will each of course have their own mini-catchment, suggested here by THIESSEN boundaries.

The behavioural factors that affect the larger, central place, territory are clearly rather different from those already discussed for simple farming catchments. Comparative study by historical geographers and archaeologists shows that for relatively smallscale central place networks, for example medieval market towns, there is often an upper limit to the 'service catchment'. Rural farming populations prefer to be able to visit, and do business in, a central place without an overnight stay, thus creating a catchment threshold of 2-3 hours' walking distance, or 10-15 kms radius out from the centre. On the other hand, provided that the furthest dependent farms or villages remain within these servicing limits, the central place itself can be asymmetrically located within its wider territory, for the range of reasons I have given earlier.

In this British example, the spacing of contemporary hillforts appears irregular, if we try to fit an identical or modular servicing territory to them all, concentric to the hillfort (Figure 6). But if we first delimit their wider territories through THIESSEN Polygons (Figure 7) then fit an identical module within each, allowing centres to be asymmetric, we find a much better fit; most hillforts tend to dominate an area of similar size and probably comparable units of rural population.

Professor COLIN RENFREW of Cambridge University has made two important contributions to our understanding of central place systems in prehistory and the ancient world. The first he calls (RENFREW 1975) the Early State Module (Figure 8). He draws attention to the fact that many early civilisations or foci of high culture develop from an amalgamation of smaller territories, which might be chiefdoms or independent towns. An example he gives is the emergence of Etruscan civilisation (Figure 9) from 12 autonomous city states by the 6th century BC. Initially he suggested that the size of the modules in such fused mosaics was often around 1500 sq kms, but as he accumulated more and more examples he came to a second discovery: that one can frequently observe exactly the same pattern and process at a whole series of different spatial scales. Indeed in the development of the most complex civilisations it appears likely that the initial stage came with a merger of a network of village territories (perhaps around an urban or ceremonial centre), followed by a stage when that multi-village unit merged with similar village clusters to form a higher polity (perhaps centred on a royal palace or major town), and sometimes these kingdoms or small states were later merged with others into even larger imperial systems. At each stage the model looks very similar (Figure 10): enhanced interaction between the identical parts of the system leads to their peaceful or forceful amalgamation into a higher political unit. This process RENFREW dubbed Peer Polity Interaction (RENFREW and CHERRY 1986).

The Mycenaean Background

I want to use these theoretical approaches to investigate the development of settlements and boundaries in early historic Greece, especially in Boeotia and Attica, and it is helpful to start with the Late Bronze Age or Mycenaean situation in South-Central Greece, in order to see clearly what the succeeding Dark Age settlement patterns have developed out of (Figure 11).

This illustration shows my own analysis (BINTLIFF 1977b) of the settlement hierarchy of the Argos Plain in late Mycenaean times.

We see here probably only a major part rather than the whole of the kingdom or state of Mycenae (Site No.1 at the top of the picture), yet it can still be seen that the state has probably arisen through the amalgamation of a whole mosaic of competing Mycenaean centres, some with their own fortifications, palaces and rich tombs (sites shown as triangles). Within the putative territorial cells of these statelets, in turn, archaeology has occasionally revealed a yet lower level of settlements (sites shown as small circles), satellite farms and hamlets focussed on the central place of each cell. The pattern of major centres shown here, together with minor centres and the larger satellite hamlets (shown as large circles), is comparable to the traditional village network in this region.

In another Mycenaean kingdom, that of Pylos (Figure 12), careful study of the Linear B texts has shown that the state was probably administered as two provinces and some 17 sub-provinces, and it may well be that we see preserved here the mosaic of originally autonomous chiefdoms/principedoms out of which the Pylos state emerged (cf. BINTLIFF 1977a).

At a yet higher level, both COLIN RENFREW and I (RENFREW 1975, BINTLIFF 1977a), have used the blocs of Mycenaean kingdoms as another illustration of an Early State Module mosaic of separate polities (Figure 13) that may or may not have eventually been fused into a Mycenaean imperial state focussed on Mycenae, but in any case was certainly the basis for Mycenaean civilisation.

Settlement Evolution in the Dark Ages: The case of Boeotia

In many respects the Dark Ages or Early Iron Age in Greece, the period after the collapse of Mycenaean palace civilisation, seem to show such a catastrophic decline that one might think all kinds of settlement patterns feasible. The Greek landscape, especially in Protogeometric to Middle Geometric times, appears so depopulated and empty of human traces, that one could imagine it as a *tabula rasa* on which something totally unconnected with the past would arise to form the beginnings of the historic settlement pattern.

In particular, with low populations it might seem natural, in an almost empty landscape, for Dark Age communities to be small, and scattered in an almost random fashion over the countryside. Some of these sites might disappear by historic times, others continue to grow and eventually become important towns or *poleis*. Furthermore, with abundant resources and merely a shortage of manpower to make full use of them, with long-distance trade reduced to a minimum, and the disappearance of kings, bureaucrats and taxes, one would expect Dark Age society to return to a state of social equality, with political authority being reduced to the joint decisions of adult males in autonomous hamlets or farm clusters.

In almost all respects, these reasonable expectations, some of which were cogently explored in my colleague ANTHONY SNODGRASS's book *Archaic Greece* (1980), now have to be revised and overturned, not least as a result of fieldwork Professor SNODGRASS himself has carried out with my collaboration in Boeotia in recent years, but also and equally fittingly as a result of insights provided in the PhD dissertations of two of his students, ROBIN OSBORNE and IAN MORRIS (cf. OSBORNE 1985a, MORRIS 1987).

Since 1979 Professor SNODGRASS and I have been carrying out total intensive field survey in South-West Boeotia (the Cambridge/Bradford/Durham Boeotia Project), discovering and mapping in the over 40 sq kms hitherto fieldwalked, over 200 archaeological sites, only a handful of which were previously recorded (Figure 14)(cf. BINTLIFF and SNODGRASS 1985, 1988b). One of the many surprises this database has given us is the nature of Dark Age settlement: occupation from Protogeometric to Late Geometric times is clearly attested at only three points of the landscape. One is within a site later to develop into the large village or small town (*komopolis*) of Askra (Figure 15). The second consists of a cluster of hamlets or cemeteries across the site later to develop into the major city of Thespiae (Figure 16). The third consists of settlement on the acropolis of the hill later to become the minor city of Haliartos (Figure 17), together with 2 or 3 very small rural sites in its immediate vicinity.

These are all prime locations, well apart from each other, and with access to extensive arable land and water supplies. Indeed Haliartos had been a Mycenaean settlement, and continuity of occupation is quite probable. In any case, the subsequent development of these few refuge settlements, into flourishing towns, which will dominate the entire zone we have surveyed as its 'central places', seems to follow naturally from their nodal positioning even at this remote era.

We cannot follow Dark Age settlements to quite this level of local detail in the rest of Boeotia, but it must be significant that a distribution map of all known sites of the Geometric period (Figure 18) shows occupation almost without exception confined to settlements which will later become cities (underlined) or major villages (other named sites) in the early historic (Archaic–Classical) period. Moreover it is immediately apparent that the almost regular spacing at large intervals of these nodal communities, seen earlier for our survey district with Askra, Haliartos and Thespieae, can be generalised for much of Boeotia.

But already by the 8th century BC or Late Geometric times, these settlements have become differentiated into larger and smaller communities, and by implication into more or less powerful political and military units in an increasingly competitive landscape. Thus as we saw, the small hamlet at Askra is contrasted to what looks like a cluster of hamlets at Thespieae, and to the large nucleated settlement on the acropolis at Haliartos (already with a few satellite farms in its immediate territory or *chora*). These differences are however dwarfed by the contrast between all these sites and Dark Age Thebes, a settlement which like Haliartos had probably continued in use from Mycenaean times. Even in Protogeometric times the evidence from the upper town (Cadmeia) at Thebes (Figure 19) seems to show a large site with several hamlet foci (marked by separate burial areas), whilst by Late Geometric times the scatter of hamlets has spread out into the lower town to suggest a very extensive, if multifocal, community far more populous than the other nodal settlements we have considered so far.

It is very unlikely that we have evidence yet for all the original Geometric settlements in Boeotia, and there are some obvious locations (eg that of the later city of Thisbe), where we can expect to find continuity of occupation from Mycenaean times. Nonetheless the overall picture is strikingly consistent with a landscape where nearly all the main natural districts of agricultural fertility have at least one initial Dark Age settlement, even if the scale of land use must have been slight compared to the potential area available for cultivation. So, just as FLANNERY suggested for his Mesoamerican villages, Dark Age settlements were so placed to allow for long-term growth in population and an increasing requirement for fresh land within catchment access.

We simply do not know enough about these focal settlements across the Dark Age Boeotian landscape to discuss all their individual population sizes and layouts, but circumstantial evidence and more reliable data for individual sites, (eg the surface archaeology at Thespieae, or Hesiod's clear statement that his home was the village of Askra), point to interpreting them as hamlets, villages, and in the exceptional case of Thebes (and probably its rival Orchomenos) small towns. In other words we would suggest that population was nucleated into recognisable settlement foci.

During the Archaic centuries internal colonisation of the Boeotian landscape took place from these Dark Age settlements, infilling with daughter settlements all the potential catchment niches for mixed farming villages. The next illustration (Figure 20)(villages of Classical Boeotia with 2.5 km radius territories), builds on our incomplete archaeological evidence for this process whereby the entire cultivable landscape came to be divided into mixed farming territories of comparable size, each exploited by a village (circle) or *polis* (triangle) settlement. It shows the known or probable location of all *poleis* and villages mentioned by the ancient sources, together with other archaeological sites of village status. I have also indicated with a question mark hypothetical catchments where there are obvious gaps for village territories but so far lacking corresponding archaeological sites, niches currently exploited by modern villages, with the

suggestion that in time we might well find further ancient settlements controlling these putative catchments.

The territory size I have employed is a circle of two and half kilometre radius, or approximately half an hour's walking time, and you will notice that the nucleated settlements are often asymmetric to their supposed territories; this is the result of a prior use of THIESSEN Polygon analysis to define the likely boundaries between catchments.

It is not too early to return at this point to the magisterial work of ERNST KIRSTEN, *Die Griechische Polis* (1956). What we have seen so far in Boeotia, and been led to infer, echo very closely KIRSTEN's penetrating insights into the origins and development of the Classical Greek city landscape.

In our opening quotation to this paper, we cited KIRSTEN's challenge, to integrate the historical and contextual, with the ahistorical and geographical in the study of ancient Greek settlements. KIRSTEN used as an example for the historical component the survival of Mycenaean settlements through the Dark Ages, with an elite somehow staying in control, or being replaced by the chieftains of immigrant tribes like the Dorians. For the ahistorical and geographical he made a powerful case, built on a *tour de force* survey of Greek settlement dynamics around the Mediterranean, for viewing the Greek *polis* as a political metamorphosis of an otherwise natural settlement form, the Mediterranean village. Traditional Mediterranean villages and Greek cities alike were typically (but not exclusively) small in scale (cf. the 'Normalpolis' of RUSCHENBUSCH, 1985), essentially concerned with agriculture and herding, and developed wherever certain geographical conditions were to be found (Figure 21), namely discrete districts of alluvial or similar soil, good springs, and preferably access to the sea. In this illustration the alluvial settlement chambers of the North-East Peloponnese are each associated with an ancient *polis*. KIRSTEN went so far as to predict that for every traditional Greek village one could look for a Classical *polis* predecessor, and vice versa.

His resolution of the history/geography paradox was characteristically dogmatic: Mycenaean settlements had arisen from the same natural fit to discrete blocs of fertile land cut off from each other by infertile land or other natural barriers, hence (Figure 22) the striking similarity of maps showing the spread of Mycenaean settlements in Greece and the distribution of the Classical *polis*.

One further point can be recalled from that remarkable 1956 monograph: KIRSTEN suggested that as the discrete *Siedlungskammern* varied in relative size and fertility, so one might find that *poleis* arising within them likewise became major or minor in size and influence.

From the wealth of insights made possible by this remarkable synthesis, let me focus on a number of important questions for which we have clearer empirical data than in 1956. Firstly, as we saw in our analysis of the Mycenaean settlements in the Plain of Argos, the natural 'village territory' character of settlements of that period is undeniable. On the other hand, there are two important qualifications I would make to KIRSTEN's model. Logically it is implausible that the Greek landscape 'naturally' divides itself into an endless series of settlement chambers just of the right proportions, as if fixed for all time. Those of us who study settlement locations in the Greek landscape can point to too many exceptions to that principle, where for example a long band of fertile land offers scope for a series of settlements yet no natural barriers to fix their exact location, or in contrast, where a heavily dissected landscape requires a settlement to exploit a series of 'chambers'. What traditional Greek villages and Greek *poleis* have more fundamentally in common is an a priori preference for a certain size range of nucleated population; from this basis both societies require a certain size of territory. The locational trick which village founders were clearly masters of, was so to place the settlement that it dominated one or more concentrated zones of fertile land, so that the mosaic of *polis* territories now appears to us as entirely 'natural'. We have to take account of the fact that we deliberately select maps at a scale to show clusters of *polis* or village settlements and the blocs of land that supported each one

(Figure 23). Were we to take much more detailed or much less detailed maps we would find rather different patterns of cultivable and non-cultivable zones, which would be more relevant for a study of farm or hamlet territories, and federal or imperial state territories, respectively.

I think KIRSTEN was moving towards recognising this deeper pattern when he discussed *polis* networks where one city grew to dominate its neighbours, for example Thebes in central Boeotia, or Athens within Attica. The unusual ease of communication or lack of natural barriers seemed to him to be significant in the creation of state federations and synoecised states. But how, then, if we recall his natural settlement chamber model, had a series of original village/*polis* territories developed here in the first place? He likewise seems to be arguing awkwardly when confronted by rows of *poleis* exploiting an undifferentiated alluvial plain (as for example with the cities around Lake Copais or the Theban Plain), where he has recourse to suggesting that the *poleis* originated in natural *Siedlungskammern* within the hilly fringes to these plains. If the alluvial plains were the essence of a *polis* territory, the choice of peripheral locations seems unnatural, as if the settlers sought *Siedlungskammern* as ends in themselves.

Greek settlements ancient and modern, we now know, dominate many different kinds of fertile land. KIRSTEN was the first to admit, in his 1956 synthesis, that he was relying on very inadequate soil maps and far too little empirical research on land use. What he therefore underestimated was the wide range of fertile soils that sustained ancient *poleis* alongside or instead of alluvial plains and basins. Indeed some of these alluvial sediments may have been more difficult to cultivate successfully or with a full range of crops than soils given little value by KIRSTEN, such as the Neogen soft limestones which are very extensive in the middle-altitude topography of southern Greece (cf. BINTLIFF 1977b). It is factors such as this that explain why ancient settlements are often located in hilland zones adjacent to alluvial plains rather than within the plains themselves.

To summarize our interpretation so far, we would suggest that Dark Age to Archaic Boeotia witnessed a gradual recovery of population after the collapse of the Mycenaean civilisation. Starting with a small number of nucleated settlements, some of them Bronze Age survivors, many new foundations, so located to control plentiful territory for future expansion, the five centuries from Protogeometric to late Archaic gave scope for the process of landscape infilling, as the modular early village territories, like biological cells, reproduced themselves (through daughter settlements) across the empty landscape zones. By the climax of population growth, in the Classical 5th–4th centuries BC, we should envisage a dominant tendency for the entire cultivable land of Boeotia to be divided into modular territories of some two and a half kilometres' radius, each exploited by a *polis* or village. Even from the beginning of this developmental cycle, however, certain village locations by virtue of factors such as unusually rich resources of arable land or grazing, abundant water resources for garden culture, and/or centrality to clusters of villages, grow larger than the norm, thus anticipating their future status as major cities. In this context, KIRSTEN's instinctive reaction to emphasize the fundamental importance of agriculture to *polis* differentiation, and the slighter role of trade and industry, is fully borne out by recent contributions to the 'ancient economy debate' (cf. GARNSEY, HOPKINS and WHITTAKER 1983).

Another aspect of KIRSTEN's *polis* development model which has become central to much recent research, is the nature of Dark Age social systems. Despite the reasonable expectation that society ought to have regressed into primitive equality, in the absence of most of the factors generally believed contributory to social stratification, research published since ANTHONY SNODGRASS's inaugural lecture at Cambridge (SNODGRASS 1977), and his subsequent Archaic Greece (1980), indicates a persistent and well-developed hierarchy of power and status even within the typically small Dark Age communities.

The settlement at Lefkandi on Evvoia for example, despite showing on cemetery evidence a characteristically small nucleated community during the early Dark Ages, nevertheless produced an archaeological

wonder with its remarkable 10th century status burials incorporated into a 'hero temple' (or perhaps 'hero's house', cf. WHITLEY 1991). Similar evidence of high status burial associated with a founder's shrine comes rather later from the earliest deposits at nearby Eretria (cf. SNODGRASS 1987). Most striking of all is the argument presented convincingly by IAN MORRIS in his recent book (1987), that throughout the Protogeometric and Early to Middle Geometric periods in Attica, formal burial was usually restricted to the higher status members in each community, with the lower status population essentially leaving little archaeological trace in excavated cemeteries of the Dark Ages. JAMES WHITLEY (1991) likewise argues for a 'big man' society as a fundamental feature of the Greek Dark Ages, identifying their residences in a number of recently published C12th–10th 'mansions' at Lefkandi, Nichoria, Kavousi and other sites of Southern Greece and the Islands.

Several further lines of evidence are supportive of this view, that social ranking survived from Mycenaean times into the well-recorded class societies of the Archaic period. Firstly, from the earliest social documents such as Hesiod's *Works and Days*, it is clear that by Late Geometric times Greek society was dominated by a class of aristocrats, the 'basileis'. Significantly, this word had stood for a minor official in the Mycenaean state administration, and it does not seem fanciful to support the oft-repeated theory that whereas the upper levels of political power disappeared after Submycenaean times, with the final collapse of the state apparatus, the role of such minor potentates remained viable within the scattered refuge communities such as we have been studying in Boeotia. On the basis of the archaeological evidence, I would favour the related view that the legendary kings, whose vaguely-recorded exploits were located during the Dark Ages by Classical Greek writers, are generally to be placed in final Mycenaean and Submycenaean times, but not later (if they really existed, and were not confused memories of Mycenaean times, to cite the case of Theseus and the Union of Attica). In support of this interpretation, the older work of JACOBY can be linked to more recent research by DREWS (DREWS 1983; cf. also for Boeotian kingship BUCK 1979).

Despite this satisfactory congruence between our current archaeological knowledge of the Dark Ages, and the fragmentary historic evidence, I think there still remains a major difficulty in comprehending the origins and maintenance of power structures through these centuries. KIRSTEN's continuity of chieftain power, whether from indigenous Mycenaean or incoming tribal social structure, seems to me inadequate to account for the persistence of relations of dominance and subordination throughout the key four centuries from Protogeometric to Late Geometric times.

In what remained a landscape full of unexploited land, it could not have been the case that Dark Age elites kept commoners under their sway by restricting peasant landholding through their own great estates. Nor would it have been difficult for commoner families, dissatisfied with the actions of local basileis, to leave their settlement and found an independent new hamlet in the vacant niches well away from their oppressors.

A pathway to a solution seems to me to be linked to the clear preference for nucleated settlement. People chose to live in communities, in order to gain certain advantages which would outweigh the disadvantages of not living directly on their farmholdings. In any case, with generally small communities the distance to one's fields would still have been short for all farmers. Two factors of attraction to nucleation spring immediately to mind. The first is security: with the disappearance of any authority beyond the village, life in an isolated farm could be dangerous, both from human attack and wild animals. Secondly, there is a negative side to the seemingly happy situation where a family can cultivate as much land as it desires; if the adult male in a peasant family falls ill, or even dies, the family can starve. Life in a multi-family community offered a straightforward solution to these concerns. A group of adult males would deter banditry, whilst relations of kinship and clientship within a close community would provide labour and substitute parentage for peasant families weakened by illness or death. Under such circumstances families would become dependent on community life, and as the cumulative evidence of Mediterranean village sociology has shown us, a

frequent alternative to the support of close kin for the less successful peasant families, was support of more successful families, whether related or not: the familiar patron–client relationship.

Returning briefly to the issue of continuity or discontinuity of Dark Age social structures with those of final Mycenaean times, it seems to me unlikely that Mycenaean basileis were able to hang on to power and wealth by virtue of inherited status, and it is more plausible that the role of basileus was assumed by any leading family whose economic production outstripped their neighbours, generation after generation. One hint that this may be correct lies in the observation that many aristocratic families in early historic times had recourse to fabrication to generate sufficient ancestors for tracing a genealogy back to Mycenaean times, and as ANTHONY SNODGRASS has argued persuasively, the popularity of hero shrines at Mycenaean tombs in Late Geometric times may well demonstrate attempts by wealthy landowners to claim spurious ancestry to dynasties remote in time to them (SNODGRASS 1977,1980). What can be said about the likely mechanisms for economic differentiation in the Dark Age? PAUL HALSTEAD (1992) has drawn attention to the way in which traditional Mediterranean farming societies convert surplus crop production into capital investment in animal stock. Employing our earlier model of a long period of Dark Age development focussed on the nucleated rural settlement, where low populations ensured that only a minor part of the potential village territory was being farmed, we see that the opportunities for this kind of wealth accumulation were rather ideal, with abundant grazing land available and a practical limitation on the acquisition of large herds to the wealthiest farming families. The concomitant prediction would be that big–man or basileus status might be expected to highlight extravagant feasting with meat and a status symbolism emphasizing large flocks or pairs of oxen. It is therefore significant that current discussions of Dark Age society as it is disentangled from Homer and other literary and archaeological sources, focus on elite banqueting (the ‘symposium’) and stock–keeping (MURRAY 1990, HODKINSON 1990).

Another alternative for social interaction during the Dark Age, till recently envisaged, was the support of a broader kinship system within a tribal or sub-tribal form of social organisation. However the telling critique of ROUSSEL (1976) has all but demolished the evidence for a pre-polis tribal organisation. The effective social structure that emerges from the earliest historic records is one of smallscale familial units, between which differences of status identify big-man families or aristocratic family lineages; elite class formation proceeds through opportunistic intermarriage and inheritance control within the wealthier sector of society (MORRIS, 1990). It is not difficult to imagine a situation where some big-man families succeeded in perpetuating their leading status in a community for a number of generations, thereby establishing a lineage accustomed to wealth and influence. As is well-known, a viable and healthy gene-pool requires an intermarrying population of several hundred people, so that our model of typically small-sized Dark Age settlements, together with the conscious desire for high-status families to marry only within their own class, would have the effect of broadening elite networks to include clusters of neighbouring villages.

It is from this hypothetical basis that I consider it feasible to venture an interpretation of the origins of what is now seen as a 'pseudo-tribal' form of political organisation, found already in earliest Archaic times in Attica and other Greek city-states: 'brotherhoods' or *phratre*. Recent study of the Athenian example, demonstrably in existence by the mid-7th century BC (HEDRICK, 1991) shows *phratre* to be both urban and rural, based like the later *deme* (parish constituency) organisation on specific districts in the landscape, yet incomparably less numerous than the 139 Kleisthenic *demes* of the late 6th century. MURRAY (1990) suggests they were initially aristocratic warrior factions led by dominant families (*gennetai*), excluding the lower class; as a result, however, of the far-reaching reforms of Kleisthenes in Athens (and paralleled in the other Greek cities with similar early historic institutions), these local cooperative groups were redefined and reordered to act as an administrative unit for the organisation of the total citizen population. HEDRICK (1991) also argues that *phratre* represent a major form of regional institu-

tion used by the earliest Athenian state before the politicisation of the *deme*. More generally we might suggest that *phratre* may have acted as nuclei of multi-hamlet and multi-village socio-political networks of power, relevant to the progressive simplification of the Dark Age village-hamlet maps of Southern Greece into hierarchical clusters of dominant and subordinate settlements that will emerge as the hamlet-village-*polis* maps of Archaic times. The much smaller number of *phratre* districts in Attica compared to Kleisthenic *deme* numbers, yet including several in the city of Athens, would also harmonize with both the rapid multiplication of settlements in the Attic countryside across the Archaic centuries and the abnormally large size of a multi-village settlement in Dark Age Athens. Such an analysis is reinforced by JAMES WHITLEY's reconsideration of 'Homeric society' (1991): he believes that the dominant element is a portrayal of late Dark Age social life, with an emphasis on only two levels of social cooperation, the family of close kin, and beyond that the *phylon* and *phretre* as non-kin-based and potentially unstable groupings of local population.

Despite the apparent congruence of opinion amongst these recent commentators on Dark Age society and its organisation, one highly significant aspect of Morris's detailed study of Dark Age burial traditions in Attica (MORRIS 1987) opens up a fundamental question which neither he nor the other authors just reviewed have shown any awareness of (BINTLIFF, 1992) – namely the relationship of the two broad Dark Age social classes of elite (buried formally) and non-elite (burial archaeologically unobservable), to the dominant social divisions to be found in most Greek *poleis* of Archaic-Classical times of wealthy (*hippeis-hoplite*) and poor (*peltast-thetes*) citizens. Morris characterizes his Attic elite as some 25–50% of the total population in the Dark Age, whilst most scholars would probably consider the later wealthy-poor division as numerically comparable. Thus Hesiod, who is usually argued to be a 'yeoman farmer' and therefore would in later times be a typical representative of the hoplite class, should belong with his aristocratic superiors, the local 'basileis', in the elite class of Dark Age times. If the rise of the city-state or *polis* represents a new form of power-sharing between a traditional aristocracy

and a burgeoning yeoman (*hoplite*) class, then we must rethink this transition, not as the enfranchisement of the wealthier part of a totally unprivileged lower class, but a significant extension of privilege to the socially-inferior sector of the Dark Age elite class.

This allows us to make much more sense of an otherwise curious phenomenon in the Attic burial tradition. MORRIS argues that the creation of the Athenian *polis* is associated with a change in burial rules, so that during the C8th BC the lower classes are at last allowed formal burial as a symbol of their promotion to full citizenship. However in the C7th the elite-only burial tradition returns, only to be relaxed once more from the C6th onwards. For MORRIS this has to mean the temporary collapse of the *polis*-citizen experiment at Athens and an abrupt return to Dark Age society. But we can now suggest that the opening and closing of burial privilege concerns the status of the lowest, sub-hoplite class of citizen, a class that in most constitutions outside of C5th Athens had little or no power anyway. There is indeed no evidence for the dissolution of the Athenian *polis* in the C7th, and the burial changes would seem to reflect changing attitudes of the upper half of society, the genuine power-sharers, towards the lower class of poor farmers and artisans whose actual enfranchisement was only to occur in piecemeal fashion, through various reforms of the late Archaic period and over the course of the C5th, beginning with the Solonic and Kleisthenic programmes.

By the end of Geometric times we begin to have clear evidence of attempts by the larger settlements of Boeotia to achieve political and military dominance over their smaller neighbours, and each other. Indeed much of the internal history of Boeotia from final Geometric to late Hellenistic times is taken up with inter-city rivalry and conflict (Figures 24-27). From a large number of autonomous settlements in the Dark Ages, peaceful and forced incorporation into larger political units led to a maximum of 14 to 15 city states in the Classical period, of which many were actually satellites of the few largest *poleis* in Boeotia. RENFREW's concepts of Peer Polity Interaction and the Early State Module seem both very appropriate to this progressive simplification of political units in Boeotia, for the

process of unification seems to develop along ever-increasing spatial scales as we follow events from final Geometric times to the 4th century. An initial stage sees the larger settlements extending their dominance over smaller neighbours, at first villages that never reach *polis* status (as with the military takeover of the 'komopolis' or village-town of Askra by the *polis* Thespieae, or the rivalry for dominance of the Tetrakomia villages in Eastern Boeotia between the *poleis* of Tanagra and Thebes). Then major *poleis* attempt to gain power over smaller *poleis* in their vicinity, and in the process 'spheres of influence' are created around the major *poleis*. In this way the two largest cities of Boeotia, Orchomenos and Thebes, came into conflict at Onchestos (c.700 BC?), a critical geographical location forming a natural divide between their spheres of influence in West and East Boeotia respectively. Orchomenos seems to have lost this war, and despite the setbacks which befell Thebes as a result of assisting the invading Persians in 480 BC, it is Thebes alone who subsequently pursued the ambition of converting the 14-15 unit Early State Modules of the Boeotian ethnos into one great territorial state, an aim that she almost brought to fruition during the first half of the 4th century.

Political and military history can show us how successfully Thebes managed to dominate the Boeotian Confederacy, weakening and even eliminating the other cities of the Confederacy one by one. In my contribution to the last Stuttgart Conference (BINTLIFF 1991) I was able to show that a different sort of evidence underlines even more clearly how far Thebes as a city had outgrown all other 'central places' in Boeotia: the evidence of city size (Figure 28). The progressive outward movement of cemetery location shown here (cf. SYMEONOGLOU 1985) from Protogeometric to Classical times, mirrors the expansion of this precociously large community. By the 4th century climax of Theban power, the walls of Greater Thebes (Figure 29) enclose some 350 hectares, and even if we make allowance for ancient comments that the city had more gardenland than any other city, it is still a *megapolis* far outranking the other cities of the Boeotian Confederacy. A graph as shown here for the size of a region's cities, would be described by an urban geographer as in-

dicating a 'primate city' network, where in the process of regional economic development a single town acts as an accentuated focus for the growth of the region as a whole.

Our journey through Boeotian settlement history does not end here, however, for we have yet to introduce a most dramatic modification to the settlement mosaic, which occurred in the 6th–4th centuries BC. Up until the final century of the Archaic period, with very few known exceptions, it seems that Boeotian settlement consisted of nucleated communities farming small territories of comparable, modular size. But then from the 6th century onwards our archaeological survey has demonstrated (Figure 30) a veritable explosion of small rural sites throughout the countryside or *chora* of each *polis* and satellite village (the relevant nucleated centres of Haliartos, Thespieae and Askra are shown as black rectangles, black circles indicate small rural sites of farm and farm cluster type). Although some of these small sites, as ROBIN OSBORNE has argued from historic sources (OSBORNE 1985b, 1987), may have been uninhabited stores for farm equipment or animal sheds, there are good reasons for believing that most were permanently occupied as dispersed farmsteads and hamlets by citizen families and their slaves (BINTLIFF 1991, and in press). Yet at the very same time, our city surveys have shown (Figure 31) as here at Thespieae, the greatest extent of city area in occupation. All this is in harmony with our ancient sources, which indicate maximum population densities during the Classical period in Boeotia.

If the modular *polis* units of the Boeotian Early State Modules can now be subdivided into innumerable rustic farm territories, it is tempting to map their putative catchments (Figure 32), and some years ago I did succumb to that temptation, exploring the THIESSEN Polygon territories for each cluster of known Classical farms in one part of our survey region. Fitting an appropriate farmholding module within each THIESSEN cell, such as a 5.4 hectare landholding suggested by some as an average hoplite plot (Figure 33) at first looked promising, but there are very good reasons why I soon came to see

this particular exercise as unlikely to yield accurate and meaningful results (cf. BINTLIFF 1988).

Firstly, field survey archaeologists discover very quickly that soil conditions vary dramatically from year to year, covering and uncovering surface sites at a bewildering rate: moral – you will always find only a fraction of the original number of small sites. Secondly, as the large holes in the rural site map should be warning us, almost all the city-dwellers will also have farmland in the countryside which they are cultivating at a distance, without the benefit of fieldhouses, – and they should make up the majority of farmers (BINTLIFF in press). Thirdly, if, as has been argued from ancient sources, the ancient Greeks like their modern village counterparts practised partible inheritance (OSBORNE 1987), then in only a few generations a family landholding would probably consist of multiple plots in several different places within the *polis* territory. Presumably the erection of a field hut or a permanent residence in the country should indicate to us where a particular family had its largest, or most intensively cultivated plot, or perhaps where a family had managed, as happens today, to amalgamate several plots into a contiguous bloc.

But what could have been the reasons behind this dramatic transformation of settlement patterns in the countryside, especially when dispersed rural settlement of farmhouse and small hamlet character has been highly unusual throughout the long history of settlement in Mainland Greece?

I think there are two very important factors behind this development. The first is the Classical population boom in Boeotia, seen in every category of archaeological and historical evidence we possess. If we are correct in suggesting that by late Archaic times all the cultivable land in Boeotia had been carved out into modular village or *polis* territories, then the only way to support a further massive increase in population is to intensify the exploitation of these existing territories. Residence on the land, and even constructing field huts for temporary use, are reasonably to be interpreted as evidence for a more intense concern with higher economic productivity. Further-

more, as the nucleated settlements had grown, exploitation of their territory would have expanded outwards to their remoter districts, creating for many a wasteful return-journey-time to shorten effective labour on the estate during a working day. Residence in a remote district, or preferably (in a multi-plot estate) on a landholding somewhere between the city and one's remoter fields, now becomes far more attractive. In addition, alongside the rapidly growing market for food surpluses in the burgeoning Boeotian *poleis* we could now turn our eyes speculatively to that phenomenal megalopolis at Thebes, asking ourselves from how wide a zone of Boeotia it was now provisioning itself. Calculations I carried out some years ago (cf. BINTLIFF and SNODGRASS 1985, BINTLIFF 1991), based on the 4th century BC Boeotian army contingents, suggested that contemporary population density was pushing the natural resources of Boeotia into a dangerous level of maximal exploitation, and I still would maintain that the incontestable collapse of Boeotian population, economy and social stability which archaeology and history show had occurred by the 2nd century BC, was the inevitable result of the collapse of soil fertility.

The second, and potentially equally significant factor which may have given rise to the rural farmstead phenomenon is the changing nature of citizenship in late Archaic Boeotia. Although we lack precise historical information, specialists in early Boeotian history (cf. BUCK 1979, 1985) have suggested that the late Archaic period witnessed a general shift of effective power away from an aristocratic oligarchy to a limited or 'moderate' democracy, or from a narrow group of families in each *polis*, and towards the middle class of yeoman farmers, in other words what is described elsewhere in Greece as the 'hoplite reform'. Just as the Boeotian armies were now transformed into hoplite phalanxes, so the status of the hoplite in political life rose sharply. From a situation in earlier centuries, where, as we have argued earlier, one's role in the community and call upon community support depended on residence in the nucleated settlement and continuous maintenance of a social network within it, we may now consider that the hoplite class was free to take up rural residence, secure in its full rights of participation in and support from

the new larger community – the *polis*/state. Indeed the passport to full citizen status was now no longer actual residence in the settlement, but maintenance of the appropriate landholding. The freedom to live ‘on the land’ may therefore have been won for the *polis* middle classes by the *polis* reform, and the peculiarity of this form of settlement in the Mainland landscape accounted for by the exceptional relationship between *polis* citizenship and ownership of agricultural land.

In the light of our critique of MORRIS’ burial model above, our views on the nature of a ‘hoplite reform’ require clarification. If the hoplite class counted as ‘elite’ throughout the Dark Ages, yet inferior to ‘basileus’ aristocratic lineages, the thesis that their accession to full citizenship rights in the Greek *polis* is the defining feature of *polis* creation has to take account of their apparent privileges in earlier centuries and provide cogent reasons for the concession to power-sharing by the basileus class.

The critical factor to my mind is the archaeologically well-attested population explosion of Late Geometric and Archaic times throughout Southern Greece. This presented aristocracies with the need to accommodate the aspirations of a middle class of yeoman farmers far too numerous to control through the methods of small-community patron-client politics. That populous class and its wealth grew rapidly at the same time as industry and trade revived to a remarkable extent, permitting the purchase and easy access of that sector to heavy armour and weaponry; thus was created a heavily-armed and highly-populous faction, irresistably dominant over both aristocratic and lower classes alike. It is therefore possible to agree with some scholars that there is no clearcut case for a complete and dramatic shift from a warfare of aristocratic single combat to one of citizen hoplite formations, coinciding with Archaic *polis* formation. Rather we would hypothesize a no less critical transformation from warfare between small armies of aristocratic and hoplite forces in loose formations and individual skirmishes (basileis and client retinue?), to one between large armies typified by massed citizen hoplite forma-

tions, the aristocratic citizen cavalry being peripheral to the main issue of combat.

The Development of Settlement in Dark Age to Classical Attica

My analysis of parallel developments in Attica will base itself on the interpretation of the late 6th century Kleisthenic *deme* system (Figure 34, from TRAILL 1975) as essentially a translation into a political system, of a pre-existing settlement pattern of rural villages and urban suburbs. This viewpoint has been proposed by many scholars, most recently in English in OSBORNE's (1985a) *Demos* and WHITEHEAD's (1986) *The Demes of Attica*.

For the historical geographer, acceptance of this model gives us a remarkably privileged opportunity to study a late Archaic settlement pattern. And in many significant ways, one is directly reminded of the contemporary pattern of settlement in Boeotia. The parallels continue when we look into the archaeological and semi-legendary evidence for the development of preceding settlements during the Dark Ages (Figure 35). This illustration (based on the data in MORRIS, 1987) shows the gradual rise in number and increase in distribution of archaeological sites in Attica between Protogeometric and Late Geometric times. Each site is identified by the earliest period when occupation is attested. From the first stage we can see evidence, as in Boeotia, for a small number of widely-spread nodal settlements. Out of these refuge sites the Attic countryside is gradually colonised by the infilling of daughter settlements, until we reach the end of the 6th century when we can utilize the Kleisthenic settlement map as marking the probable achievement of a complete coverage of all the cultivable land in Attica by modular village territories (Figure 34). ROBIN OSBORNE's recent view (1991), that the absence of C6th BC ceramic finds in an archaeological survey of the Atene *deme* in southern Attica puts into question whether the 139 *demes* were really in existence in Kleisthenes' time, asks too much of the 'coarse-meshed sieve' of field survey chronology. Recognisably 'Archaic' as opposed to 'Archaic to Classical' surface finds are likely to be extremely rare, a problem compounded by the extreme ero-

sion of the landsurface in this particular region since Classical times (BRÜCKNER 1990).

Already by Late Geometric times something like a quarter of Classical *demes* show archaeological evidence of occupation, the rest being colonised during the massive population growth of later Archaic times (particularly the 6th century). Just as in Boeotia, commentators have noted that there has developed by late Archaic times a clear differentiation in the size and importance of individual settlements. A high proportion of the earliest Dark Age sites will develop by Archaic times into district central places in the Attic countryside, to judge by the bouletic quotas, communities OSBORNE has likened to market towns in medieval Europe. They are often predictably located in the most fertile areas of Attica, such as the upper and lower plains of Athens, and the plains of Eleusis and Marathon.

It is difficult to disentangle from the Classical tales of the Union or Synoecism of Attica which elements actually record Dark Age events, as it is recognised that in Classical times these legends were conflated with the cycle of Theseus myths, which in turn may preserve a garbled account of an earlier Bronze Age Union of Attica. But it is possible to see hints in these stories of formerly independent centres in various parts of Attica, which came to be peaceably or forcibly incorporated into the Athenian state sometime between Geometric and later Archaic times. Centres named in the legends as in competition with Athens include those settlements that were settled early in the Dark Age and which later on appear as major rural sites in the *deme* system.

I think it very likely that had Athens failed, like contemporary Orchomenus and Thebes in Boeotia, to achieve its Attic Union by Archaic times, then Attica, almost exactly the same size as Boeotia, would probably have developed into an *ethnos* with perhaps a dozen or so competing city states of similar scale to the 14–15 Boeotian Confederate *poleis*. The Union of Attica, as once again ERNST KIRSTEN noted with insight in 1956, is a different process to normal *polis* formation, seen as essentially a politicisation of the village.

Athens became a precocious *Megalopolis*, a fusion of Early State Modules (the numerous potential village-poleis territories), and in so doing enters a very different kind of settlement system, more closely comparable, as KIRSTEN pointed out, to the city/country system of advanced medieval states in Western Europe.

Before we turn to the nature of Athenian urban development, I should like to say something about the interpretation of the deme-village network in rural Attica (Figure 36). This illustration investigates the spatial patterning of the located demes in Attica, using THIESSEN Polygons to suggest likely deme boundaries and a circle of two and a half kilometre radius as a potential village catchment. Some words of caution are required before we seek to interpret the resultant pattern. Firstly, the base map derived from TRAILL (1975) omits some 24 demes, whose locations are unknown, out of a likely total of 139. Although it is likely that many of these should be sought in the apparently empty areas of Northern Attica, it must be assumed that some lie undetected amidst the mapped demes, and that therefore my territorial network cannot be very accurate. Secondly, I have deliberately omitted constructing polygon cells for many of the demes of the Asty or Urban region of Attica (those surrounding the city of Athens itself), focussing merely on the two much larger, rural regions of the Coast and Inland divisions in the Kleisthenic tripartite constitutional scheme; the reasons for this will soon become apparent.

Despite the incompleteness of the deme map in the Attic countryside, I consider it reasonable to conclude from this analysis that the rural deme-village network arose through the Dark Ages and Archaic centuries as a modular village territory, of some two and a half kilometre radius, which duplicated itself across the countryside to saturation point by early Classical times. The parallels to the Boeotian situation will be clear.

From a close analysis of the Dark Age and Archaic archaeological database for Attica, as we have seen, IAN MORRIS (1987) has advanced the argument for a persistent class structure from Protogeometric

to Classical times. Here, as in Boeotia, we can consider the social and economic interactions within and between the close communities of the nodal villages of the Dark Age, the proto-*demes*, as responsible for the origins and maintenance of basileus power structures, with these privileged families and an associated yeoman farming class in every village reserving for themselves the right of formal burial, and the most powerful clans being represented by groups of rich burials in the larger villages and the city of Athens itself.

Now let us turn to the city of Athens, and firstly to a paradox I came upon when writing my paper for the last Stuttgart conference (Figure 37; cf. BINTLIFF 1991). In the Classical period the two largest towns in Boeotia and Attica, Thebes and Athens, were described by contemporaries as comparable in size. Yet the walls of Greater Thebes enclose some 350 hectares, those of 5th century Athens some 211 hectares. Although as mentioned earlier, Thebes may have been unusual in the percentage of garden land within its walls, the contrast is too great to be accounted for by this single factor, and we can assume that Athens likewise had plentiful garden space.

The solution could be very straightforward (Figure 38). Whereas the distribution of *demes* in the rural 2 divisions of Attica (shaded) seems to follow our predictable geographic model of modular village territories, the picture in the City or 'Metropolitan' Region of the *Asty* is very different. The *deme* centres are tightly packed in and around the Plain of Athens, especially in a cluster running east and west out from the city walls.

Some provisional calculations I have made from the surface area of Attica bring this out quantitatively: if we divide the surface area of the rural divisions of Coast and Inland by the likely number of their *demes*, they would each control on average a territory of 2.53 kms radius (remarkably close to our geographical model village territory). In the Metropolitan 'Asty' division around Athens (which includes the *demes* within the city walls), however, the average *deme* territory will only have a radius of 1.72 kilometres.

Many scholars of the Attic *demes* have used the varying number of councillors representing each *deme*, the bouleutic quotas, as direct indicators for the population of individual *demes*. We do know however that this approach becomes less and less accurate the further we are in time from the original Kleisthenic reform, as citizens continued to be registered by their ancestral *deme* even if their family had moved residence elsewhere, such as into the city of Athens. And we also know that through marriage and the land market *deme* residents frequently owned land in other, even remote *demes*.

Nonetheless I will follow the majority of commentators who suggest that the Kleisthenic system was essentially designed to work on the assumption that most people affiliating themselves to a *deme* were actually resident there, in other words that the primary building block of Athenian democracy, the *deme*, was a real not a fictitious village community. Recent studies indeed reiterate the view that *demes* remained the physical residence of a large proportion of *deme* members throughout Classical times, with the further support of one isolated but unambiguous reference of the C4th (cf. HEDRICK, 1991). In which case, with due reservation, we will treat the bouleutic quotas as giving at least an idea of the relative proportions of population in different parts of Attica, especially in final Archaic and early Classical times. A rapid calculation shows that some 26% of the citizen population around 500 BC were living in something like 15% of the surface area of Attica. Examination of the archaeological map for the development of Attic settlement suggests that this dense clustering of population in and around Athens is a persistent feature from Dark Age times.

Just as we saw with Thebes, the evolution of the city of Athens (Figure 39) seems to begin with an abnormally large refuge community from Mycenaean times, made up of a wide scatter of hamlets dispersed over the later area of the walled city. It is from these discrete hamlets that the urban *demes* may have developed, even if by Hellenistic times it was impossible for a visitor to tell when he crossed from one urban *deme* to another in what by then had become a totally built-up urban complex. Just as at Thebes, the logarithmic

growth in the population of Athens can be followed by the progressively centrifugal location of the town's cemeteries (Figure 40, from MORRIS 1987), until they cluster almost exclusively outside the 5th century city walls. The importance of a relatively large Dark Age community in a landscape of low population and otherwise small to very small settlements cannot, I think be exaggerated, and in the case of Athens would have been a potent factor in its sphere of influence since the Sub- Mycenaean period. It is therefore not so surprising that Athens was an Aegean cultural leader at several points of the Dark Age, especially for Proto-Geometric and Middle Geometric styles (OSBORNE, 1989). WHITLEY (1991), whilst noting the special status of a category of large and long-lived Dark Age sites such as Athens, Argos and Knossos (to which we would add Thebes), is led to overlook the political and economic significance these settlements must have exerted through his overemphasis on a remote anthropological analogue for Dark Age political systems, the Kachin of Burma.

But of equal importance to the late Archaic and Classical character of the city of Athens is a closer consideration of the significance of the remarkable cluster of Kleisthenic *demes* in the Asty or Metropolitan region of Attica, outside the city proper, and especially the group immediately outside the walls. It could well be argued that these point to a Greater Athens beyond the walls, never enclosed as was the case at Thebes by a sheltering fortification. Hence we should consider the comparison of Classical Athens and Thebes as one between this Greater Athens and walled Greater Thebes. Both are clearly Megalopoleis in KIRSTEN's terms, primate centres for whole regions and hence grown totally out of scale with the other towns in their regions.

The full implications of primate centre growth cannot be pursued here, yet we are obviously being drawn into consideration of a higher level of Peer Polity Interaction over Greece, in which the modular blocs are large regions like Boeotia, Attica, in competition with imperial blocks like that of Sparta. The successful fusion of these much higher-level Early State Modules of Greek *megalopolis* states was at

various times within the grasp of Athens, Sparta and Thebes, but in the end was achieved by a much larger, external state, a polity with perhaps far greater resources of manpower, the kingdom of Macedon.

The apparent unnatural concentration of Attic citizen population into the City region, both in and around the city proper, arguably raises considerable problems of food production. Provisional calculations suggest that the early 5th century BC *deme* populations of the rural two divisions of Attica could easily have derived their subsistence needs from local land, whereas the City region population had already outstripped local production by Kleisthenic times. The obvious solution is to accept that a major part of the essential food supplies for the City region came from surplus food production in the Coast and Inland *demes*. Some of this we know of historically, where individuals in Athens possessed farms in these rural *demes*. Yet distance constraints should have made it very difficult for residents of the City region to have carried out intensive cultivation to the required level with their own hands, and only a minority of wealthy citizens could have afforded to leave farm cultivation to a bailiff and been essentially absentee landowners. A partial solution, on analogy with rural suburbs in city regions elsewhere in time and space, would be that City region farmers carried out intensive market gardening in their more confined *deme* territories, to feed the urban population; limits on irrigation will have acted however as a severe constraint on productivity. (One is incidentally reminded that the suburbs of lower Thebes are notable for their water supplies and garden culture in several historic periods). We should therefore on balance conclude that there must have been a very active market in the City region for rural food surpluses from the rural two divisions of Attica, and this will help account for sporadic references that even Boeotian farmers were supplying the Athens market.

MARKLE (1990) in a recent study of rural participation in urban civic duties at Athens, has also drawn attention to the large clustering of 'city *demes*' in a radius up to 8 kms out from the city walls, emphasizing one aspect of their potential activity: that of easily-accessible participation in the supplementary income-support scheme available

for poorer sectors of the Athenian citizenry through pay for assembly and jury service. The very high proportion of landowners in the citizen body of Classical Athens and the apparent rarity of large landholdings both support the conclusion that there must have been a very numerous class of smallholders. Many of the latter may have owned plots too small for long-term subsistence viability, but who found adequate income supplement through dependence on these opportunities made possible by state revenues. On the other hand, the unusual density of rural *demes* around the city in the Kleisthenic distribution clearly predates state pay for civic participation, and should reflect the attraction of the urban market for goods and services. Nonetheless as the city reached its 5th century peak the spiralling demand for foodstuffs and other products, together with the considerable state revenues that underpinned jury and assembly service, would have preferentially favoured the survival and probable growth of the tightly-packed rural *demes* of the Asty region, thus furthering their role as 'garden suburbs'.

In his recent book on food crises in the ancient Mediterranean world, PETER GARNSEY (1988) has included a major case-study of Classical Athens and the measures it took to ensure adequate food supplies. He rightly upgrades the potential food production of Attica, and from careful scrutiny of the historical evidence for food imports he comes to controversial conclusions: that Attica was largely self-sufficient in basic foodstuffs at early 5th century BC population levels, but required supplementary food imports by the Peloponnesian War as a result of a vastly increased population.

Once again a valuable parallel to the Boeotia sequence can be made, where we saw the evidence for major population increase in final Archaic and Classical times, following the establishment of the overall village network. Our comparison reaches even further, for we can now suggest, chiefly as a result of the exciting discoveries of HANS LOHMANN and his colleagues in southern Attica (Figure 41) (LOHMANN 1985) and his revaluation of the western borderlands (1989), that just as in Boeotia, the Classical period witnesses in Attica a transformation of the rural landscape, with the establishment of a

carpet of dispersed farmsteads and farm clusters, across and even beyond the territories of the traditional village settlements. Here again, I would suggest that the provisioning of the swollen populations of the Asty region and city proper is a major factor in the interpretation of this evidence for a more intensive cultivation of rural Attica, and equally important, the effects of the hoplite and Kleisthenic reforms, which made full citizen rights and status independent of actual residence and shifted the emphasis towards economic productivity. Dr. LOHMANN's recent suggestion, that the 4th century was a particularly important period in the Attic countryside for rural farm occupation, might also indicate the particular need for Attica to become more self-reliant with the waning of Empire (LOHMANN 1989, based on archaeological survey; cf. HODKINSON 1990 for support from historic sources).

Attica may be almost as large as Boeotia, but its natural fertility is more limited, for pedological, geological and climatic reasons. The extraordinary levels of land use and regional population in Classical Boeotia and Attica could not have been sustained without deterioration of crop yields and soil conditions. We would infer from indirect evidence that agricultural collapse had occurred in Boeotia by the 2nd century BC; in the more fragile soils of Attica it is possible that the land was already exhausted by the end of the 4th century BC.

There are three reasons to support the latter hypothesis. Firstly, and most directly, detailed geomorphological studies in the Thorikos district by ROLAND PAEPE and colleagues (1980)(Figure 42) have identified a major episode of soil erosion at the boundary of Classical and Hellenistic times. It is surely significant that the same horizon has been recorded in recent palaeolandscape studies in the Argolid (POPE and VAN ANDEL 1984) and on Evvoia (RUST 1978). The effects of this episode are considered to have been critical to soil fertility by JERRY VAN ANDEL (VAN ANDEL et al.1986). Secondly, Dr. LOHMANN reports that the dispersed farm landscape in Southern Attica is abandoned after the 4th century BC, and indeed is never brought back into the same degree of intensive cultivation by subsequent farming populations, allowing the Classical terrace

walls, soil retention dams in the streams, and associated farm layouts to survive together in marginal land until the recent spread of holiday homes has threatened to destroy this unique historic landscape. Geomorphological investigations by BRÜCKNER (1990) have revealed a phase of such severe erosion during or subsequent to this late Classical farm horizon that the district has never recovered its fertility. Finally, GARNSEY's (1988) analysis of the Athenian food supply reveals a curious fact without offering an adequate explanation. Whereas Attic population appears to have declined by the end of the 4th century to levels close to early Classical population, and ought therefore to have been supportable by Attica's own food production, during this period on the contrary the evidence for food imports and shortages is greater than ever before.

Wider Comparisons: Aetolia and Etruria

At the conclusion of our analysis of Boeotian and Attic settlement and territorial development in early historic times, we can only reaffirm ERNST KIRSTEN's (1956) thesis that the Greek Polis is in essence the *Stadtdorf*, and its territory or Chora a *Dorfmark*. Higher level central places which through the processes of Peer Polity Interaction come to dominate groups of *poleis* or proto-*poleis* deserve a different classification for which KIRSTEN offered *Megalopolis* or *Großstadt* and for analogy the medieval City and its region.

Let us return to KIRSTEN's mapping of the distribution of urban life in Classical Greece (Figure 43). KIRSTEN made many fruitful observations about this map, not least in trying to explain why city life, and earlier, Mycenaean civilisation, made little progress in Central and Northern Greece. Let us take one example treated by KIRSTEN. If the Greek *polis* was essentially a politicisation of a natural unit of settlement, a village within its discrete catchment, then surely the peoples of the peripheral regions of the Greek world, such as the Aetolians, whom we know from Classical sources to have lived in dispersed villages, ought to have developed cities as early as anywhere else in Mainland Greece? In fact the Aetolians developed large central places of an urban character only later, in the late Hellenistic

heyday of the Aetolian Confederacy, and even then these centres do not appear to have been major population centres like Athens or Thebes, although their role was certainly closer to these primate regional centres than to the enhanced village model we would use for the typical small *polis*.

KIRSTEN's answer was simple and geographical: he suggested that only in the zones of true city life were to be found that combination of soil types and climate fundamental to the rise of the Polis. Where these conditions were lacking, the villages remained as villages or *ko-mai* and those central places as existed above the village had limited roles as military refuge and assembly points, or tribal sanctuaries.

Although I think there are difficulties with accepting this model as an absolute law, it is rather striking that the admirable research carried out by the Dutch Aetolia Project (cf. BOMMELJÉ et al. 1987, DOORN 1985) (Figure 44) is very much in agreement with KIRSTEN's geographical insights, for example in the area shown here, where the rugged hinterland of the East Aetolians is characterised by hamlets in the Classical era and the rich Mediterranean coastland by the *poleis* of the Locrians. Zoning by the most appropriate land use regimes (Figure 45) highlights the distinctively advantaged economic conditions of the coastal zone.

In contrast to what we might term the more natural path to true urban life of the *polis* heartlands, the Aetolia Project has given us a highly stimulating model (Figure 46) for comprehending the later development of central places such as Kallipolis as pseudo-urban regional foci for the Aetolian hinterland. As these provincial centres, in their scale of influence, have more in common with regional centres (*Megalopoleis*) like Athens and Thebes in the *polis* heartlands, I consider that the novel approaches and conclusions being offered by the Aetolia team may offer a fruitful way forward for those of us trying to understand the processes of Peer Polity Interaction that led to *polis* amalgamation under *Megalopoleis* in the city-state zones proper of Greece. It is more than appropriate, that these new methods, such as (Figure 47) calculation of ease of human interaction

within a landscape, are borrowed from modern geographical theory, a collaboration I am sure that would have delighted ERNST KIRSTEN.

Current research in a more distant, and non-Greek civilisation, that of the Etruscans, also deserves to be mentioned, for the striking resemblances to Greek settlement evolution which seem to be emerging over an almost identical time period (cf. POTTER 1979; SPIVEY and STODDART. 1990; G.BARKER, pers.comm.). During the early 1st Millennium BC the Early Iron Age population of Etruria (Figure 48) appears to be focussed into a series of major and minor nucleated settlements. As early as the 9th century the largest communities include those destined to develop into the 12 cities of the Etruscan Confederacy, and archaeological survey has shown (Figure 49) these sites to be surprisingly large, and on the evidence of multiple cemeteries and discontinuous settlement traces, potentially multi-focal as in Dark Age Athens. The example shown here is the site of Veii, with the location of Villanovan settlement traces and the later historic city wall.

In contrast to the suggested situation in Attica and Boeotia, there is evidence of a limited number of small rural settlements of Late Bronze Age and Early Iron Age date in the territory of these nucleated major and minor centres. There is nonetheless a dramatic rise in the number of rural farmsteads when we enter the 6th–5th century florescence of Etruscan city-state civilisation (Figure 50). Etruscologists such as CRISTOFANI (1979) have suggested a social change in Etruscan society at this time parallel to the Greek hoplite reform, and it is tempting to see the spread of rural farms as indicative of the rise in status of the farming middle classes as in Mainland Greece.

The Territorial Analysis of Ancient Greek Settlements: an Alternative Way to Test whether 'the Answer Lies in the Soil'

On the Boeotia Project we have been experimenting with unusually detailed examination of the landscape around ancient farms and cities, in order to develop yet more new approaches to understanding ancient Greek settlement dynamics (Figure 51) (cf. BINTLIFF and SNODGRASS 1985, 1988a; BINTLIFF, DAVIES et al., 1990).

If one counts and maps all the surface pottery fragments across an ancient landscape, not only can you identify gross concentrations of roof-tile and domestic potsherds as the visible remnants of ancient farms, villages and cities, (which are shown in black in this sector of Boeotia), but it soon becomes clear that these ancient settlements created around them zones of intense rubbish disposal, which we call site haloes. With distance these haloes merge into an almost endless surface pattern of ancient pottery at lower densities. We have interpreted these 'offsite' pottery distributions as the direct result of agricultural manuring activity carried out from each settlement, large or small. What we are seeing therefore in a map of this kind, are the fossilised patterns of ancient intensive agriculture preserved around the farmers' residences. Although it is likely that only certain kinds of field were manured in this way, wherever this system of fertilisation was generally in use we possess an independent trace of actual zones of intensive exploitation around ancient settlements. It is important to note that we have not found this degree of manuring in all areas of our survey, and significantly those zones low in offsite ceramics are also low in rural sites.

The particular sector of our survey area illustrated here is very close to the city of Thespieae, just off to the right of the picture. As well as showing manuring zones for even small farm sites with as little occupation life as two centuries, as in the top right hand corner of the figure, the map also allows us to observe a broad band of elevated offsite pottery values running from west to east along the lower half of the area. This band corresponds to a flat plain extending up to the walls of ancient Thespieae, and the overall enhancement here must be a result of intensive manuring carried out by the city-dwellers of Thespieae itself, fertilising the most accessible area of flat land to their urban homes; in effect we are picking up the intensive exploitation zone of the city itself.

I want you to carry in mind this west-east zone running towards the walls of Thespieae, as I illustrate (Figure 52) the results of a transect of soil samples taken at 200m intervals along this same west-east axis and over a distance of 4 kilometres. My colleague Professor

BRIAN DAVIES of the Environmental Sciences Department at Bradford University has analysed these soil samples for particular trace metals which are considered today to mark soil pollution by human, animal and industrial waste products. Here we show only the Lead values, but there does seem to be a marked overall trend towards rising values as we get closer to the city walls. There seems little doubt that the enhanced surface pottery values, inorganic residues of manuring, are directly mirrored by soil chemistry indicating organic waste products from intensive rubbish disposal. We are therefore picking up, using soil chemistry, as we approach the city, zones of increasingly intensive land use by urban dwellers.

Because offsite surface pottery can generally be dated, we are able to compare and contrast the intensity of manuring and its distributional changes, period by period across an ancient landscape. In this sector near Thespieae, most of the manuring ceramics are Classical Greek and Late Roman, a result which matches closely the two most frequently represented periods in rural sites and city occupation for this area. In effect, we may have discovered a novel approach to the territory of ancient Greek cities through combining soil geochemistry with surface archaeological survey, which offers an independent approach to estimating human impact in the 'chora' or agricultural hinterland for individual eras of the past.

Bibliography

- J.L. BINTLIFF, 1977a (Ed.) *Mycenaean Geography*. The British Association for Mycenaean Studies, Cambridge.
- J.L. BINTLIFF, 1977b *Natural Environment and Human Settlement in Prehistoric Southern Greece*. British Archaeological Reports, Int.Ser. Oxford.
- J.L. BINTLIFF, 1984 "Iron Age social evolution", pp.157-225 in J.L. BINTLIFF (Ed.) *European Social Evolution: Archaeological Perspectives*. Bradford University Press.
- J.L. BINTLIFF, 1988 "Site patterning: Separating environmental, cultural and preservation factors", pp.129-144 in J.L. BINTLIFF

- et al. (Eds.) *Conceptual Issues in Environmental Archaeology*. Edinburgh University Press.
- J.L. BINTLIFF, 1991 "Die Polis-Landschaften Griechenlands: Probleme und Aussichten der Bevölkerungsgeschichte", pp.149-202 in E.OLSHAUSEN and H.SONNABEND (Eds.) *Raum und Bevölkerung in der antiken Stadtkultur*. Stuttgarter Kolloquium zur Historischen Geographie des Altertums 3. Rudolf Habelt, Bonn.
- J.L. BINTLIFF, 1992 Review of Ian Morris, *Burial and Ancient Society* in *Journal of Mediterranean Studies* Vol.2, 1992, pp.286-289.
- J.L. BINTLIFF, in press "Further considerations on the population of ancient Boeotia", in J.L.BINTLIFF, H.HURT and J.PINSENT (Eds.) *Peoples of Central Greece. Recent Developments in the History and Archaeology of Boeotia*. Liverpool Classical Press, Liverpool.
- J.L. BINTLIFF, B. DAVIES et al., 1990 "Trace metal accumulations in soils on and around ancient settlements in Greece", pp.159-172 in S.BOTTEMA, G.ENTJES-NIEBORG and W.VAN ZEIST (Eds.) *Man's Role in the Shaping of the Eastern Mediterranean Landscape*. A.A.Balkema, Rotterdam.
- J.L. BINTLIFF and A.M. SNODGRASS, 1985 "The Boeotia Survey, a preliminary report: The first four years", *Journal of Field Archaeology* Vol.12, pp.123-161.
- J.L. BINTLIFF and A.M. SNODGRASS, 1988a "Off-site pottery distributions: A regional and interregional perspective", *Current Anthropology* Vol.29, pp.506-513.
- J.L. BINTLIFF and A.M. SNODGRASS, 1988b "Mediterranean survey and the city", *Antiquity* Vol.62, pp.57-71.
- S. BOMMELJÉ et al., 1987 *Aetolia and the Aetolians*. Parnassus Press, Utrecht.
- H. BRÜCKNER, 1990 "Changes in the Mediterranean ecosystem during antiquity. A geomorphological approach as seen in two examples", pp.127-137 in S.BOTTEMA, G.ENTJES-NIEBORG and

- W.VAN ZEIST (Eds.) *Man's Role in the Shaping of the Eastern Mediterranean Landscape*. A.A.Balkema, Rotterdam.
- R.J. BUCK, 1979 *A History of Boeotia*. University of Alberta Press.
- R.J. BUCK, 1985 "Boeotian oligarchies and Greek oligarchic theory", pp.25-31 in J.M.FOSSEY and H.GIROUX (Eds.) *Proceedings of the 3rd International Conference on Boiotian Antiquities*. J.C.Gieben, Amsterdam.
- M.CRISTOFANI, 1979 *The Etruscans*. Galahad Press, New York.
- B.CUNLIFFE, 1983 *Danebury: Anatomy of an Iron Age Hillfort*. Batsford, London.
- P.K. DOORN, 1985 "Geographical analysis of early modern data in ancient historical research: the example of the Strouza Region Project in Central Greece", *Trans.Inst.Br.Geogr.N.S.* Vol.10, pp.275-291.
- R. DREWS, 1983 *Basileus. The Evidence for Kingship in Geometric Greece*. Yale University Press, New Haven.
- A. ELLISON and D. HARRISS, 1972 "Settlement and land use in the prehistory and early history of southern England: a study based on locational models", pp.911-962 in D.L.CLARKE (Ed.) *Models in Archaeology*. Methuen, London.
- K.V. FLANNERY, 1976 (Ed.) *The Early Mesoamerican Village*. Academic Press. New York.
- P. GARNSEY, 1988 *Famine and Food Supply in the Graeco-Roman World*. Cambridge University Press.
- P. GARNSEY, K. HOPKINS and C.R. WHITTAKER 1983 (Eds.) *Trade in the Ancient Economy*. Chatto and Windus, London.
- P. HALSTEAD, 1992 "Intensive/extensive land use and land tenure". Unpublished paper given to the Laurence Seminar Settlement and Rural Economy in Classical and Later Greece. Cambridge University 22-25 May, 1992.
- C.W. HEDRICK JR., 1991 "Phratry shrines of Attica and Athens", *Hesperia* Vol.60, pp.241-268.

- S. HODKINSON, 1990 "Politics as a determinant of pastoralism: the case of Southern Greece, ca.800– 300 BC", *Rivista di Studi Liguri* Vol.56, pp.139–163.
- E. KIRSTEN, 1956 *Die Griechische Polis als historisch–geographisches Problem des Mittelmeerraumes. Colloquium Geographicum 5.* Bonn.
- H. LOHMANN, 1985 "Landleben im klassischen Attika", *Jahrbuch Ruhr–Universität Bochum*, pp.71–96.
- H. LOHMANN, 1989 "Der Kastro von H.Georgios ('Erenea')", pp.34–66 in *Attische Festungen. Marburger Winckelmann–Programm 1988.* Philipps– Universität Marburg.
- M.M. MARKLE, 1990 "Participation of farmers in Athenian juries and assemblies", *Ancient Society* Vol.21, pp.149–165.
- I.M. MORRIS, 1987 *Burial and Ancient Society: The Rise of the Greek City–State.* Cambridge University Press.
- I.M. MORRIS, 1990 "The Gortyn Code and Greek kinship", *Greek, Roman and Byzantine Studies* Vol.31, pp.233–254.
- O. MURRAY, 1990 "Cities of reason", pp.1–25 in O.MURRAY and S.PRICE (Eds.) *The Greek City from Homer to Alexander.* Oxford University Press.
- R. OSBORNE, 1985a *Demos: The Discovery of Classical Attika.* Cambridge University Press.
- R. OSBORNE, 1985b "Buildings and residence on the land in Classical and Hellenistic Greece", *Annual of the British School at Athens* Vol.80, pp.119–128.
- R. OSBORNE, 1987 *Classical Landscape with Figures.* George Philip, London.
- R. OSBORNE, 1989 "A crisis in archaeological history? The seventh century B.C. in Attica", *Annual of the British School at Athens* Vol.84, pp.297–322.
- R. OSBORNE, 1991 "The potential mobility of human populations", *Oxford Journal of Archaeology* Vol.10, pp.231–252.

- R. PAEPE, M.E. HATZIOTIS and J. THOREZ 1980 Geomorphological Evolution in the Eastern Mediterranean Belt and Mesopotamian Plain. Report for the International Geological Correlation Programme Project 146: River Flood and Lake Level Changes.
- K.O. POPE and T.H. VAN ANDEL 1984 "Late Quaternary alluviation and soil formation in the Southern Argolid: Its history, causes, and archaeological implications", *Journal of Archaeological Science* Vol.11, pp.281-306.
- T.W. POTTER, 1979 *The Changing Landscape of South Etruria*. Paul Elek, London.
- C. RENFREW, 1975 "Trade as action at a distance: Questions of integration and communication", pp.3- 59 in J.A. SABLOFF and C.C.LAMBERG-KARLOVSKY (Eds.) *Ancient Civilisation and Trade*. University of New Mexico Press,Albuquerque.
- C. RENFREW and J.F. CHERRY, 1986 (Eds.) *Peer Polity Interaction and Socio-Political Change*. Cambridge University Press.
- D. ROUSSEL, 1976 *Tribu et Cité*. *Annales Littéraires de l'Université de Besançon*, 193. Paris.
- E. RUSCHENBUSCH, 1985 "Die Zahl der griechischen Staaten und Arealgrösse und Bürgerzahl der 'Normalpolis'", *Zeitschrift für Papyrologie und Epigraphik* Vol.59, pp.253-263.
- U. RUST, 1978 "Die Reaktion der fluvialen Morphodynamik auf anthropogene Entwaldung östlich von Chalkis", *Zeitschrift für Geomorphologie N.F. Suppl.*Bd.30, pp.183-203.
- A.M. SNODGRASS, 1977 *Archaeology and the Rise of the Greek State*. Inaugural lecture. Cambridge University Press.
- A.M. SNODGRASS, 1980 *Archaic Greece: The Age of Experiment*. Dent, London.
- A.M. SNODGRASS, 1987 *An Archaeology of Greece*. University of California Press.
- N. SPIVEY and S.STODDART, 1990 *Etruscan Italy*. Batsford, London.

- S. SYMEONOGLOU, 1985 *The Topography of Thebes from the Bronze Age to Modern Times*. Princeton University Press.
- J.S. TRAILL, 1975 *The Political Organisation of Attica*. *Hesperia*, Supplement 14, Princeton.
- T.H. VAN ANDEL, C.N. RUNNELS and K.O. POPE, 1986 "5000 years of land use and abuse in the Southern Argolid, Greece", *Hesperia* Vol.55, pp.103-128.
- C. VITA-FINZI and E.S. HIGGS, 1970 "Prehistoric economy in the Mt.Carmel area of Palestine: site catchment analysis", *Proceedings of the Prehistoric Society* Vol.36, pp.1-37.
- D. WHITEHEAD, 1986 *The Demes of Attica 508/7-ca.250 B.C.: A Political and Social Study*. Princeton University Press.
- J. WHITLEY, 1991 "Social diversity in Dark Age Greece", *Annual of the British School at Athens* Vol.86, pp.341-365.

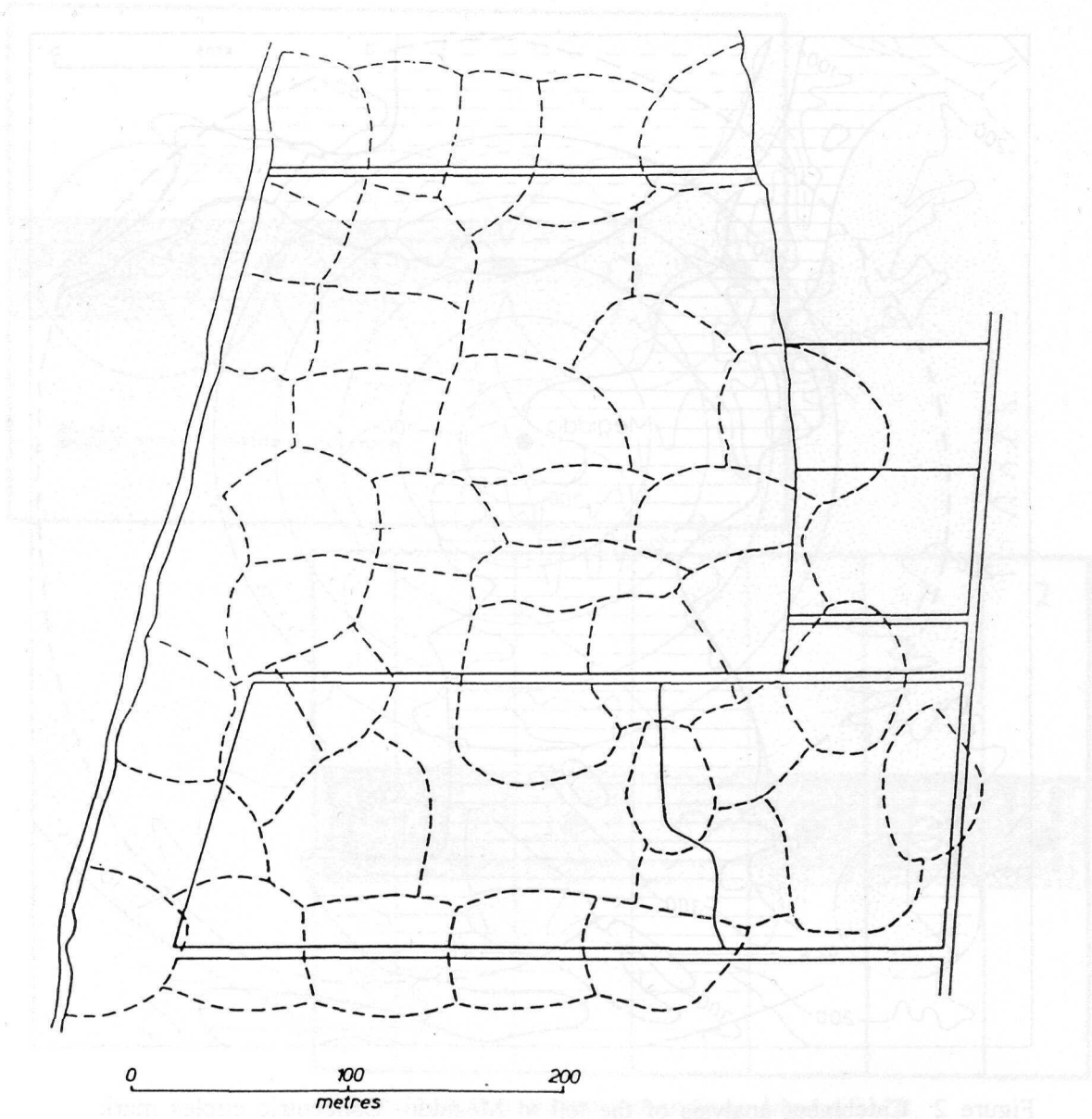


Figure 1 Territories of song-sparrows within suburban gardens.

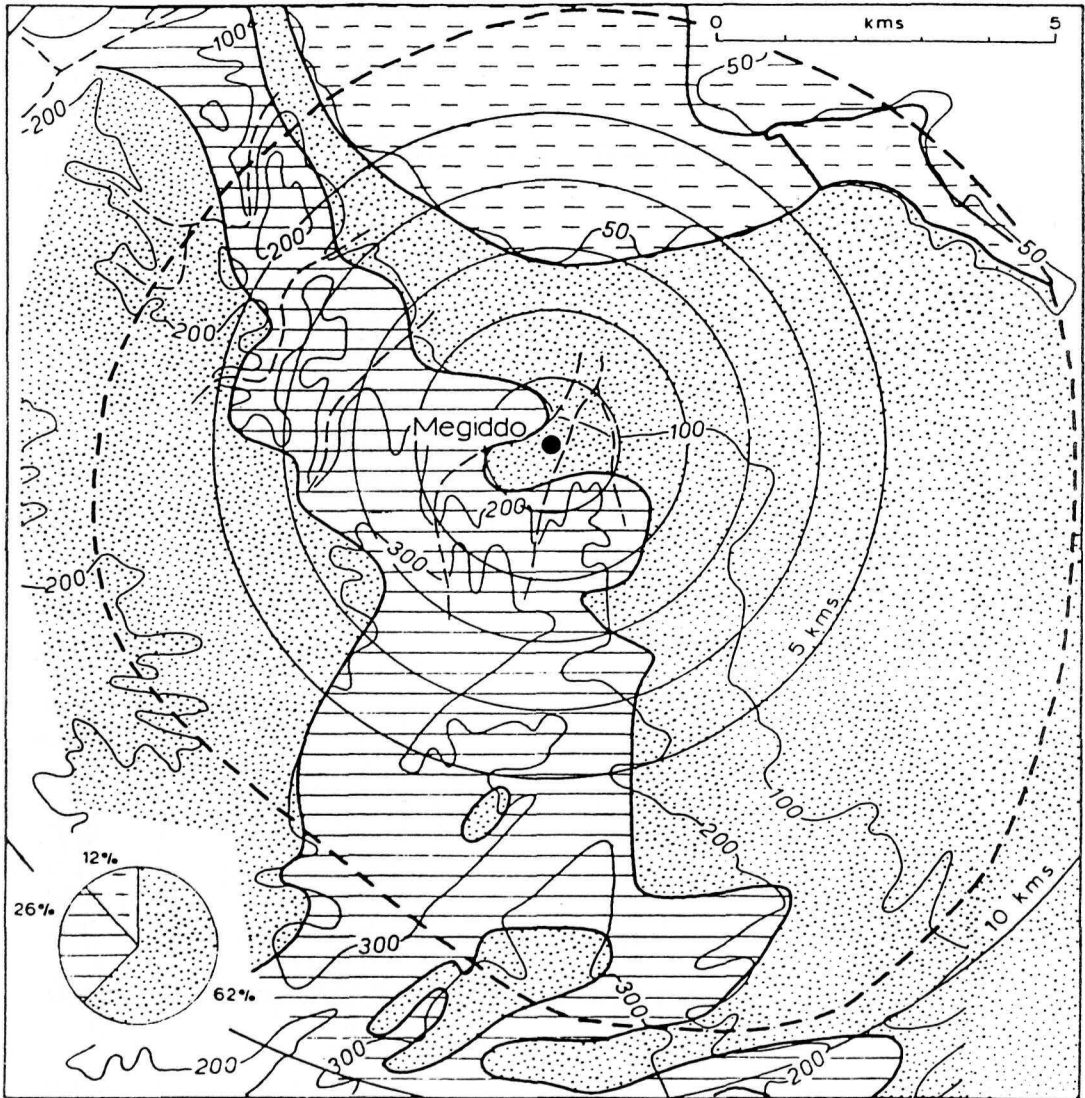
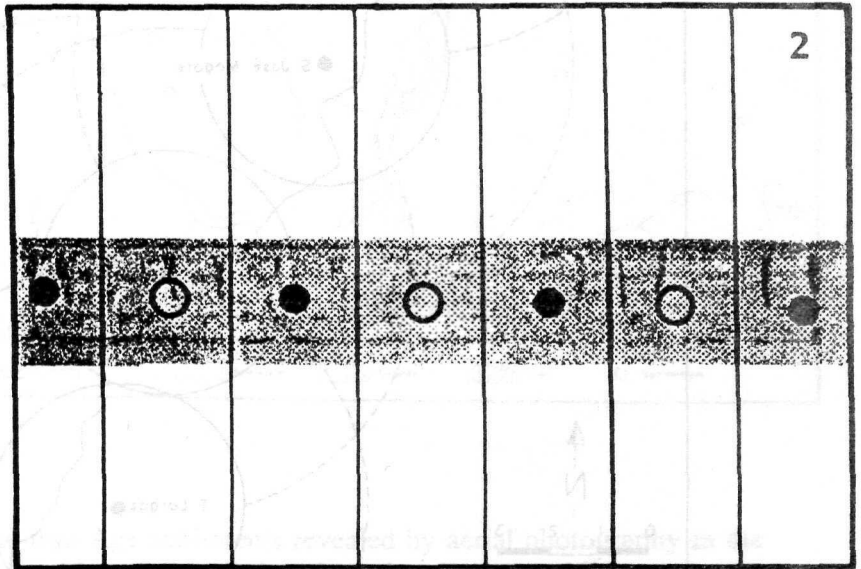
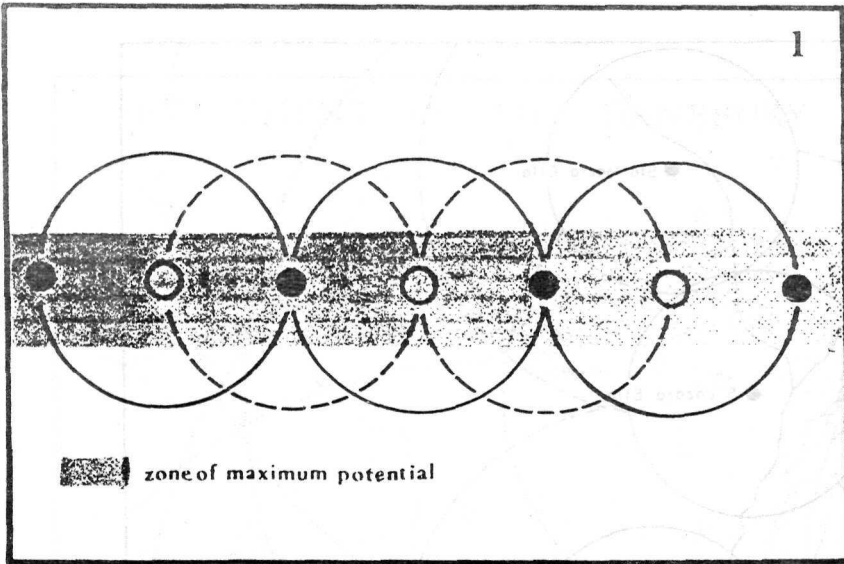


Figure 2 Catchment analysis of the tell at Megiddo. Concentric circles mark distances from the tell, the dashed line a two-hour walking radius. Land use in the pie-chart shows a dominance of arable land, with lesser areas of grazing and even less seasonal marsh.



Models of settlement expansion: Model IIIB.

Figure 3 Modification of overlapping ideal catchment circles using Thiessen Polygon analysis to reveal narrow strip territories.

Figure 4 Early formative villages along the Aravao River in the northern Valley of Oaxaca. Catchment circles with radii of 1.5 kilometers are shown (dashed line) and 2.5 kilometers (solid line). The shaded area indicates the zone of maximum potential.

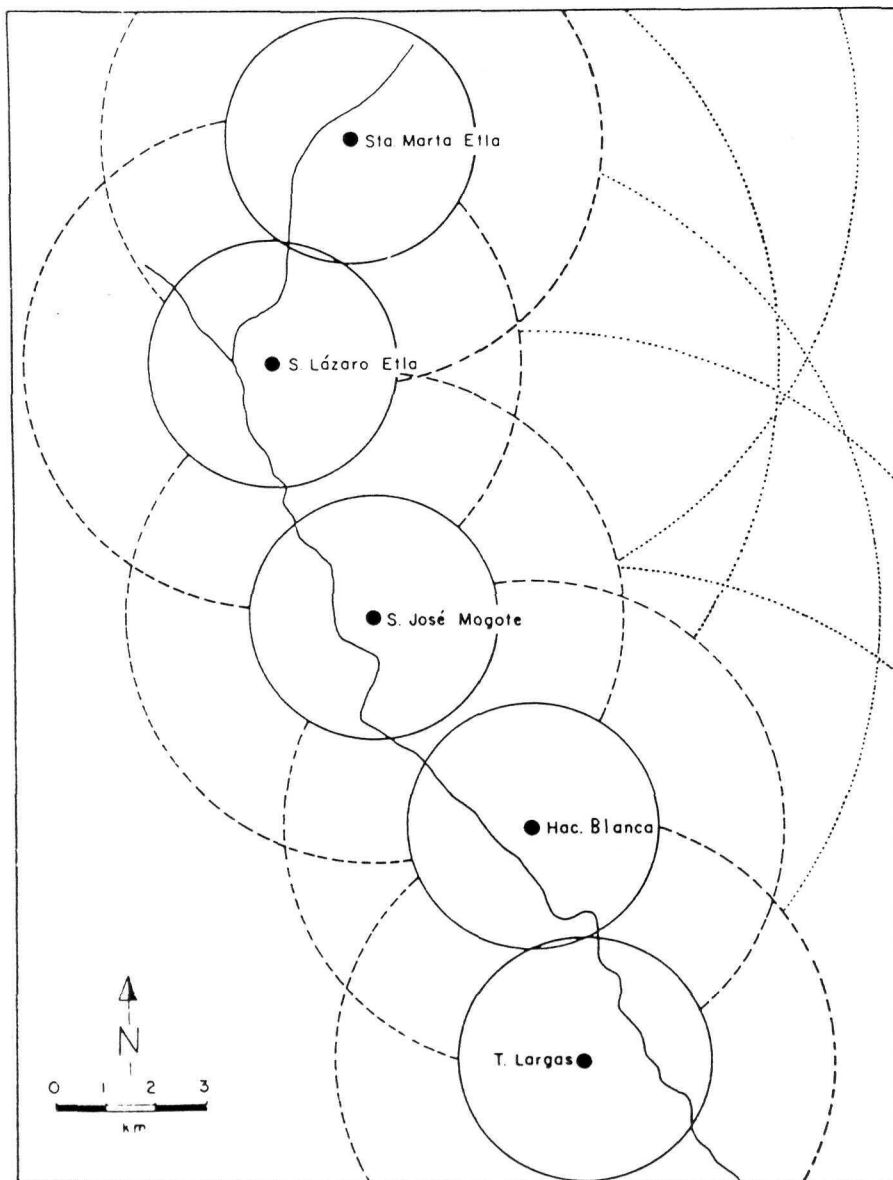


Figure 4 Early Formative villages along the Atoyac River in the northeastern Valley of Oaxaca. Catchment circles with radii of 2.5 km (solid line —), 5.0 km (dashed line ---) and 7.5 km (dotted line ...) are indicated.

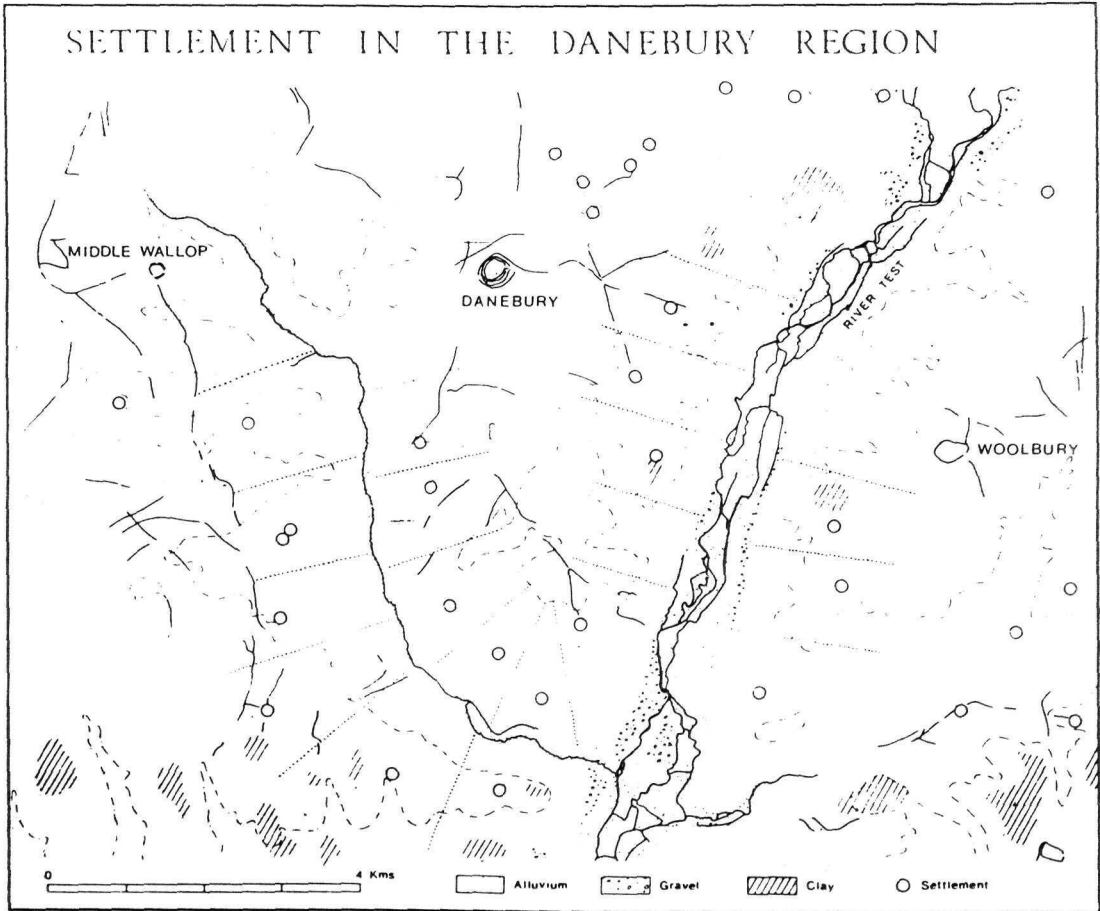


Figure 5 Plan of the Iron Age settlements revealed by aerial photography in the area south of Danebury. Note the regularity of spacing. The dotted lines represent theoretical boundaries between different farms.

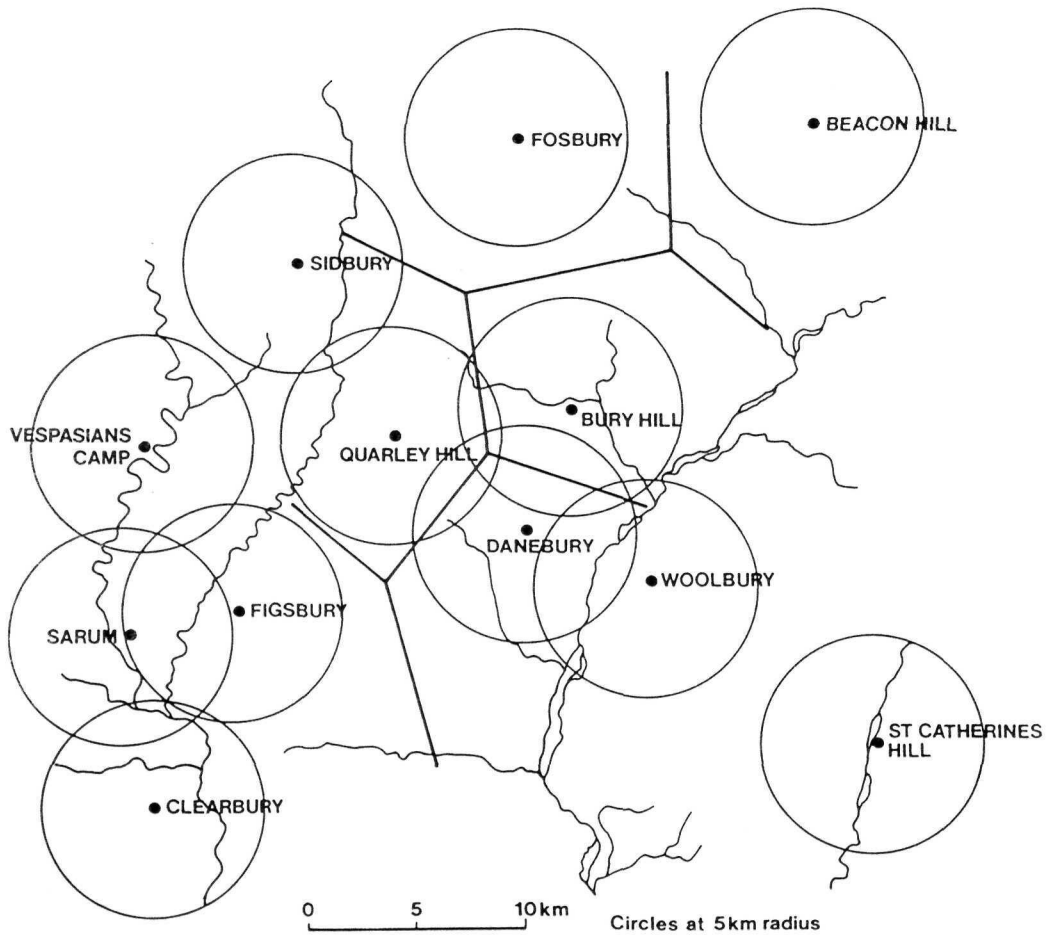


Figure 6

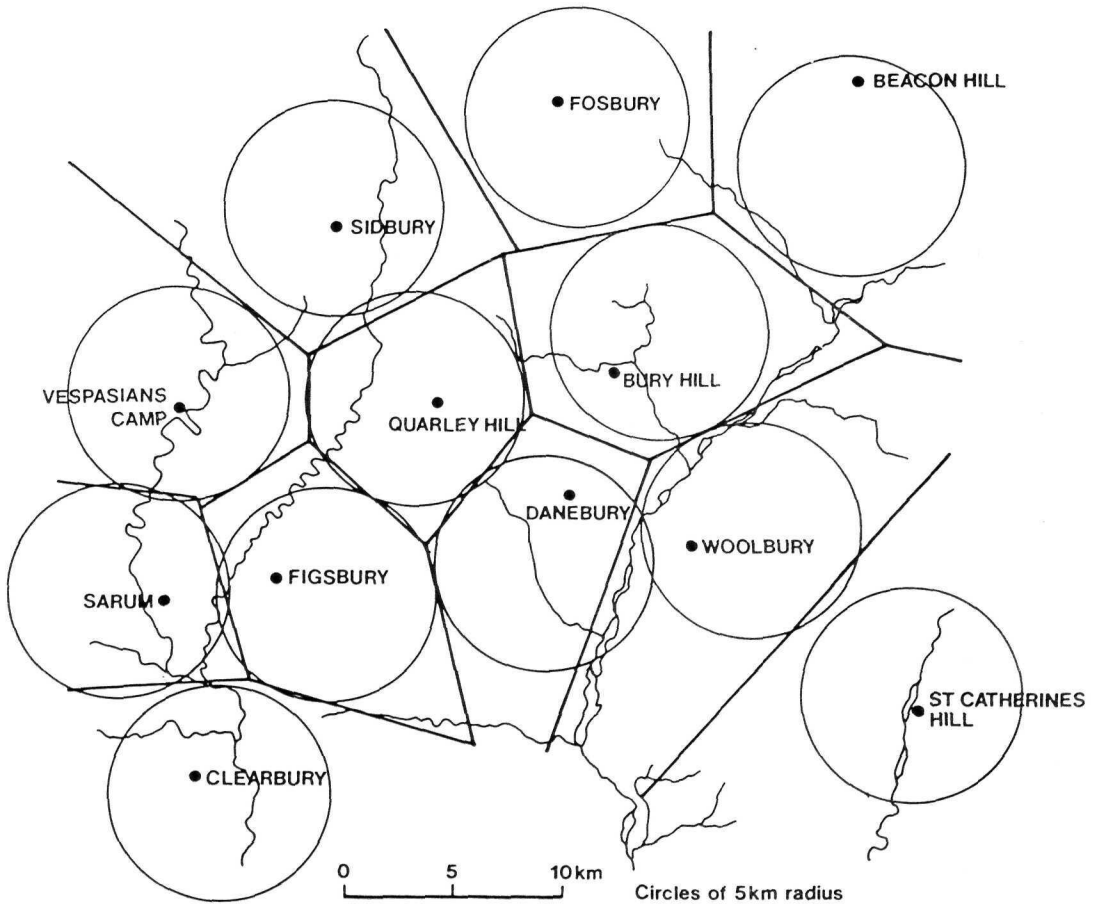


Figure 7

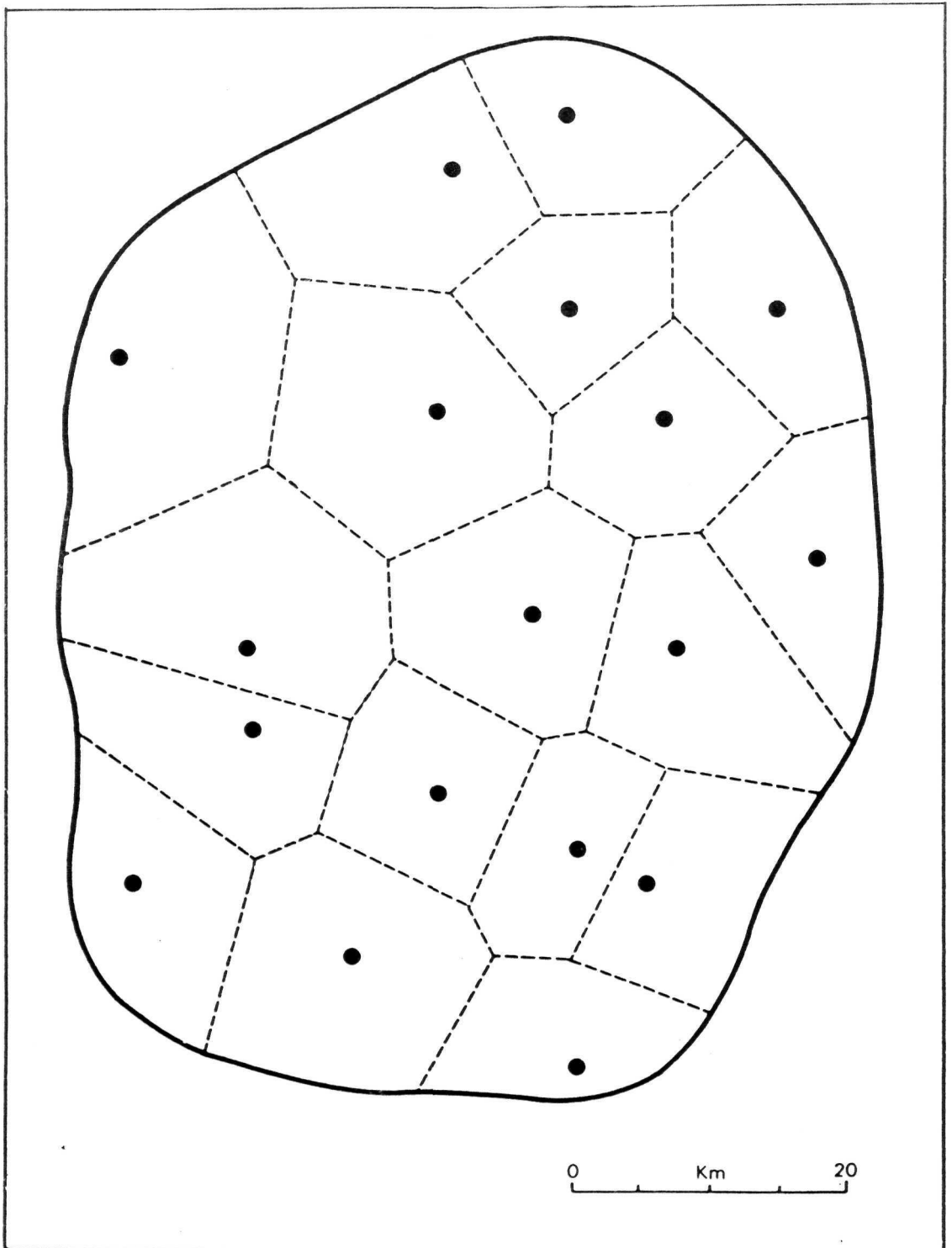


Figure 8 The early state module: idealised territorial structure of early civilisations showing the territories and centres of the ESMS within the civilisation (i.e. the area of cultural homogeneity).

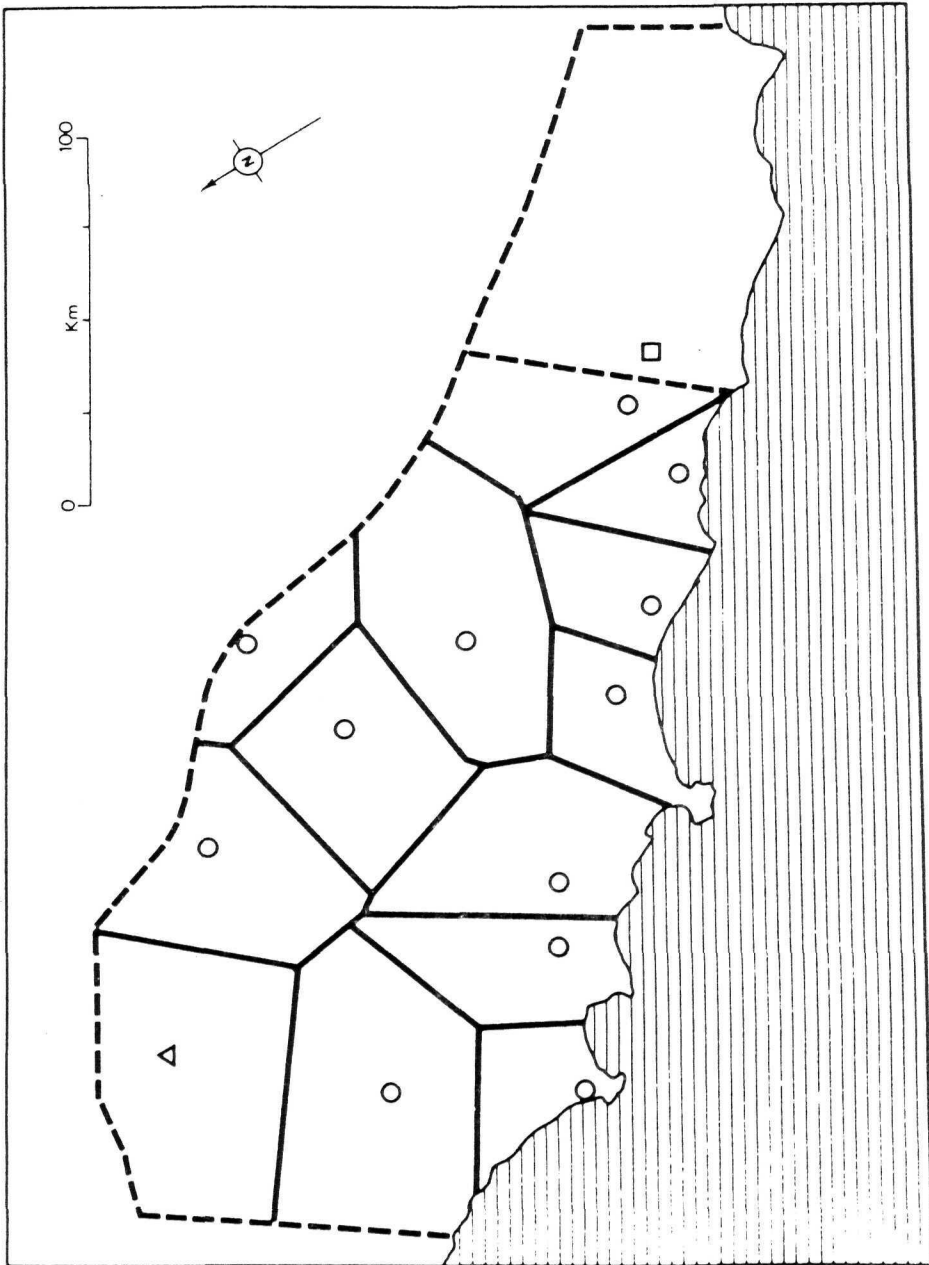


Figure 9 The early state module in Etruria: the twelve cities of ancient Etruria (circles) with hypothetical territorial boundaries. Rome is indicated by a square and Fiesole by a triangle. The Etruscan cities competed and were not united under a single rule till Roman times.

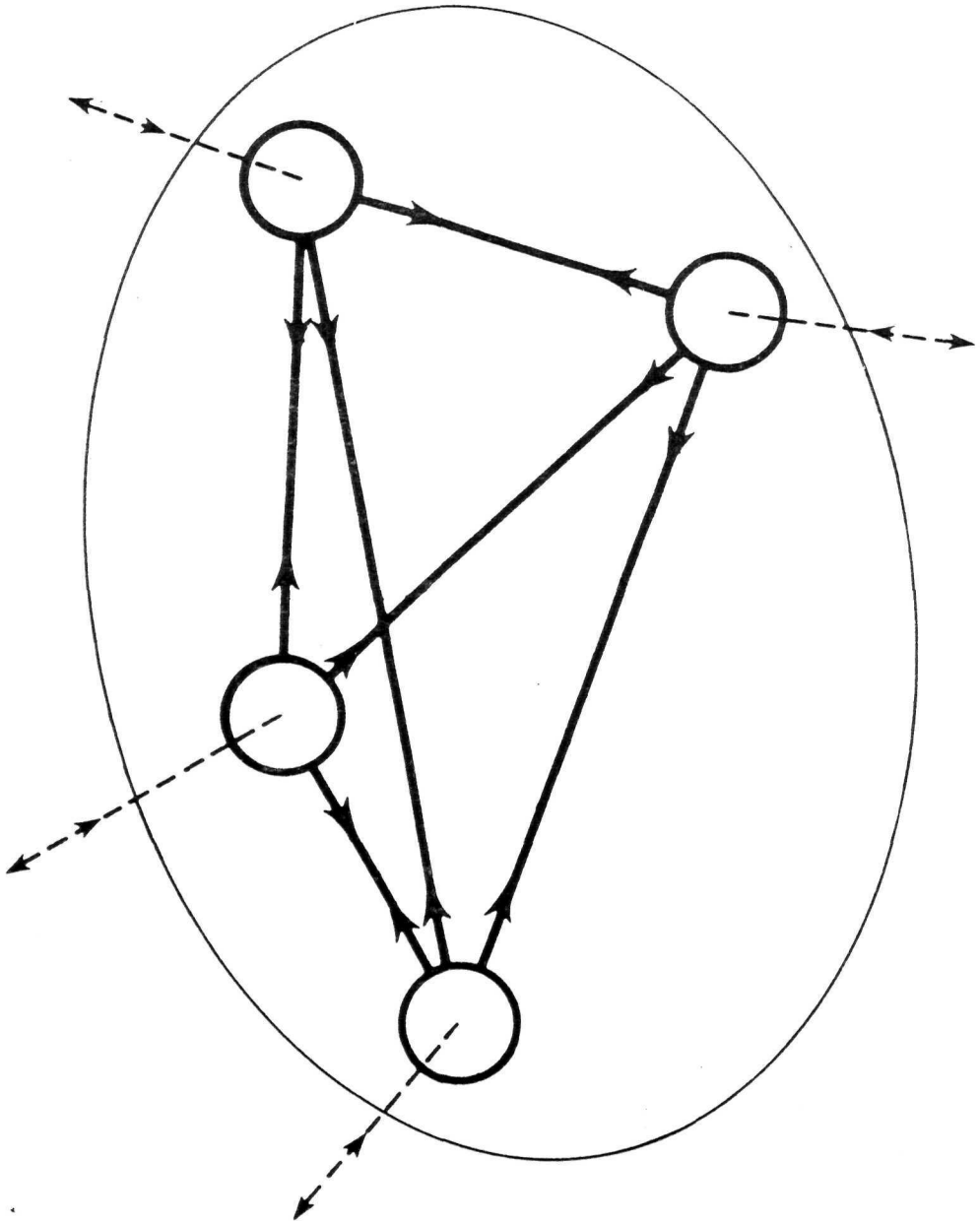


Figure 10 Peer polity inter action. Strong interactions between the autonomous socio-political units within the region are of greater significance than external links with other areas.

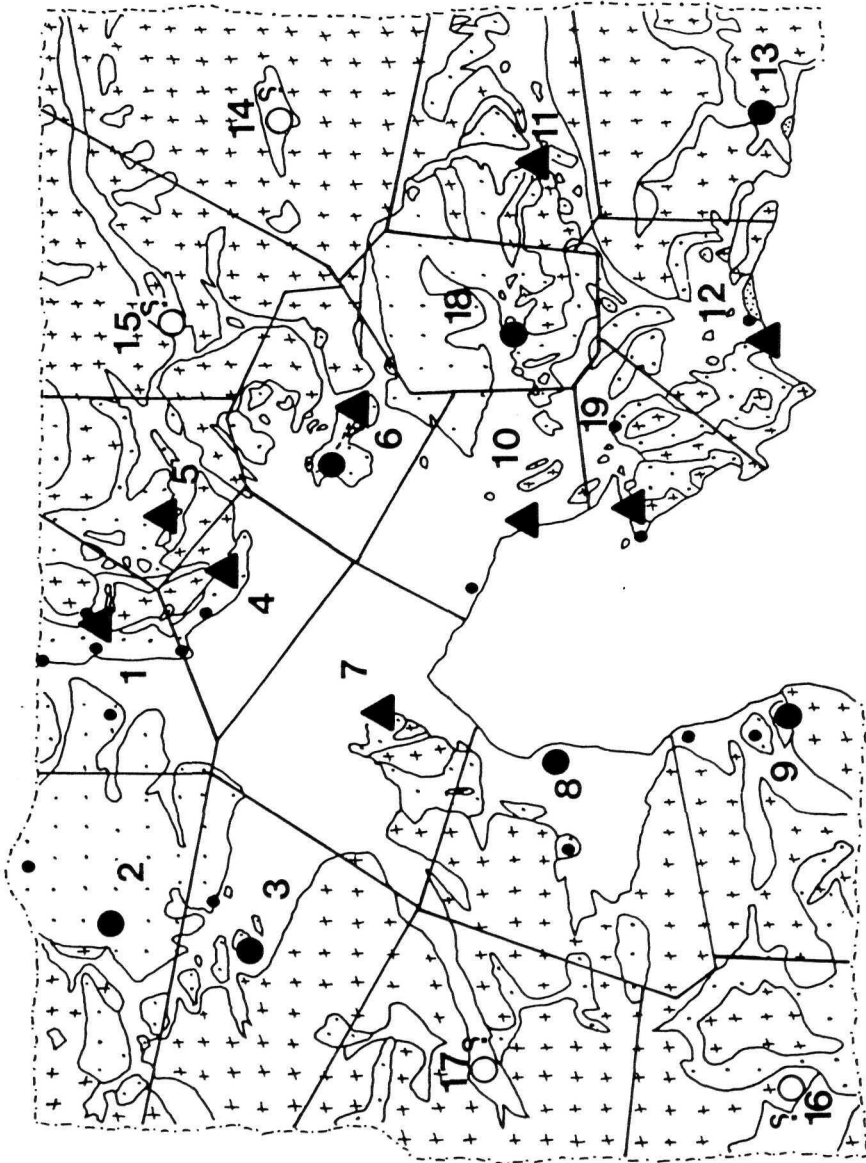


Figure 11

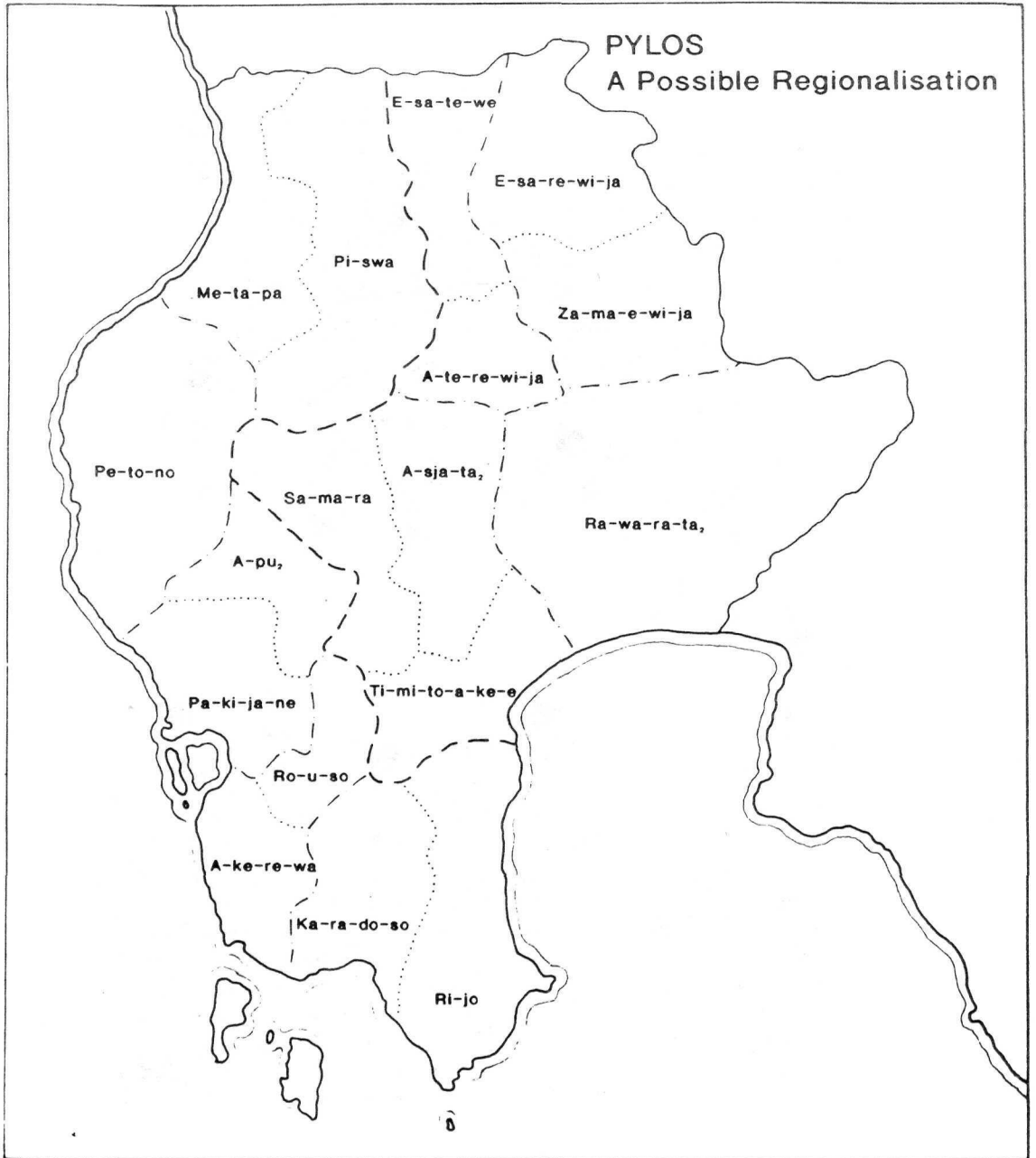


Figure 12

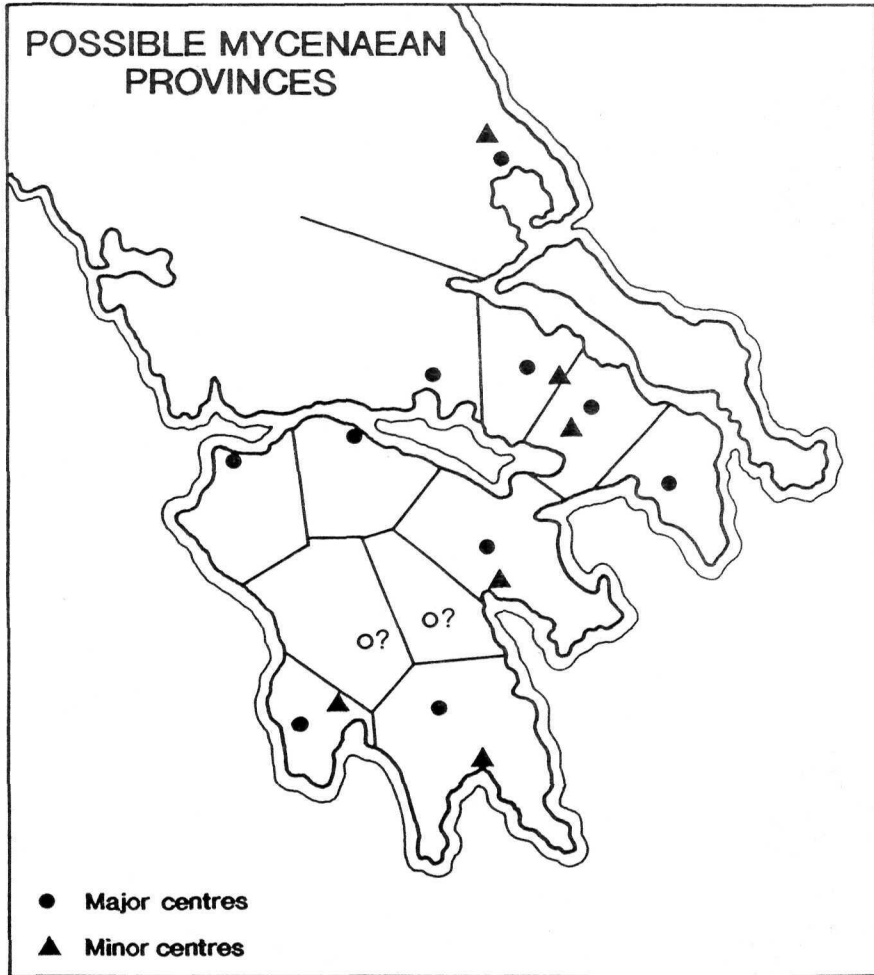


Figure 13 Thiessen polygon analysis of Mycenaean administrative centres in Mainland Greece (from Bintliff 1977a).



Figure 14

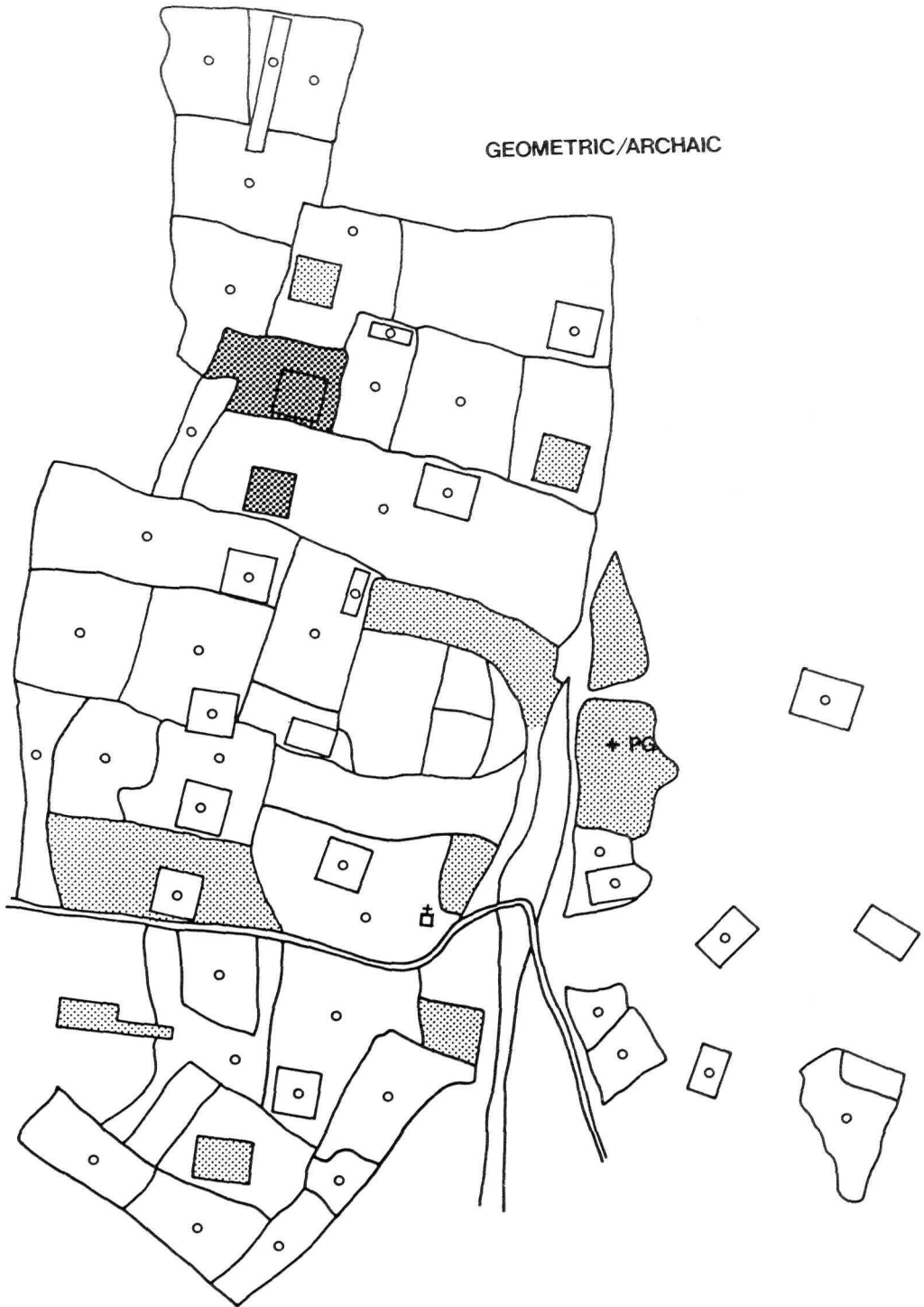


Figure 15 Distribution of surface ceramics of Geometric and Archaic date across the ancient village of Askra.

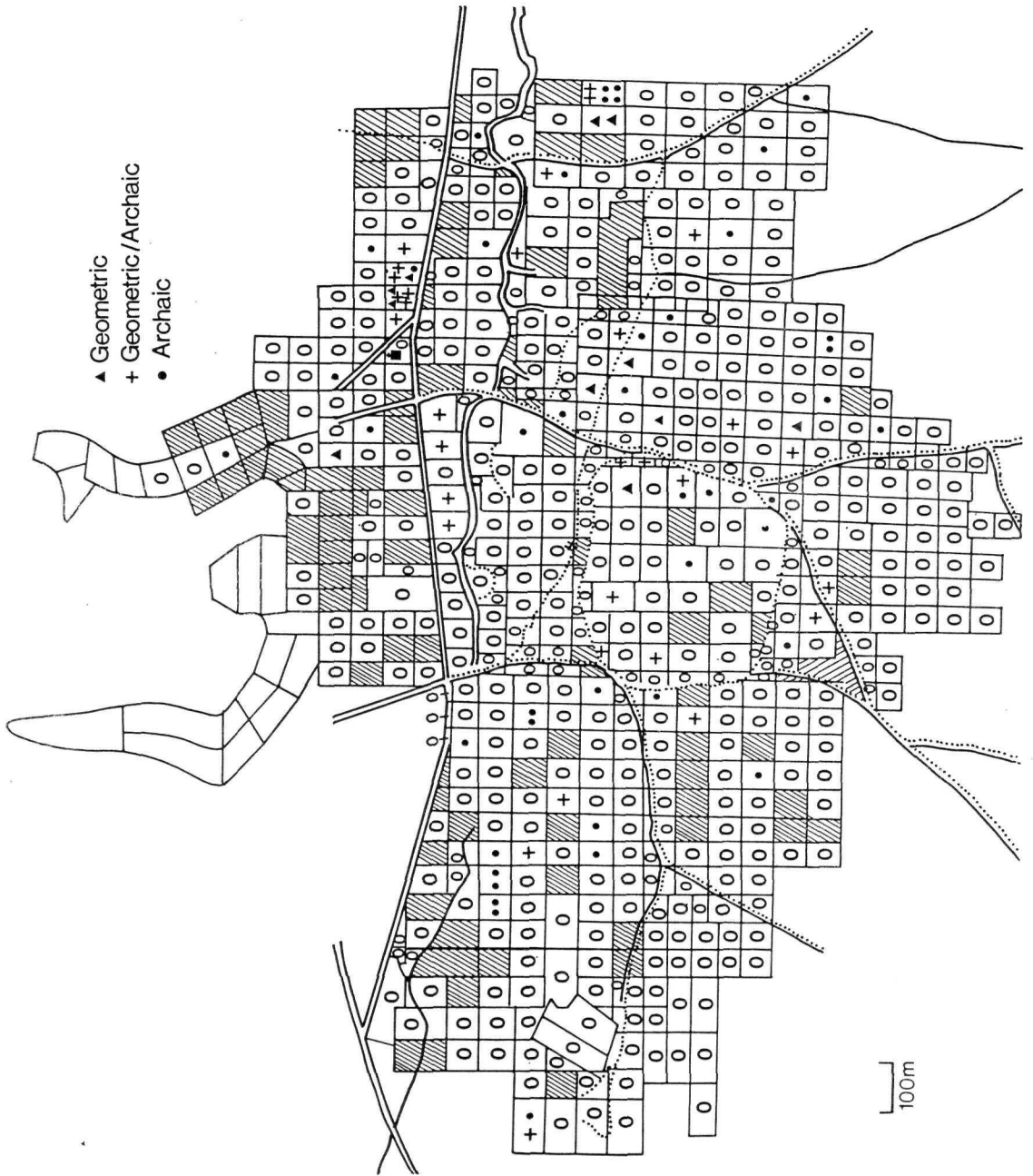


Figure 16 Distribution of Geometric to Archaic surface ceramics across the ancient city of Thespieae.

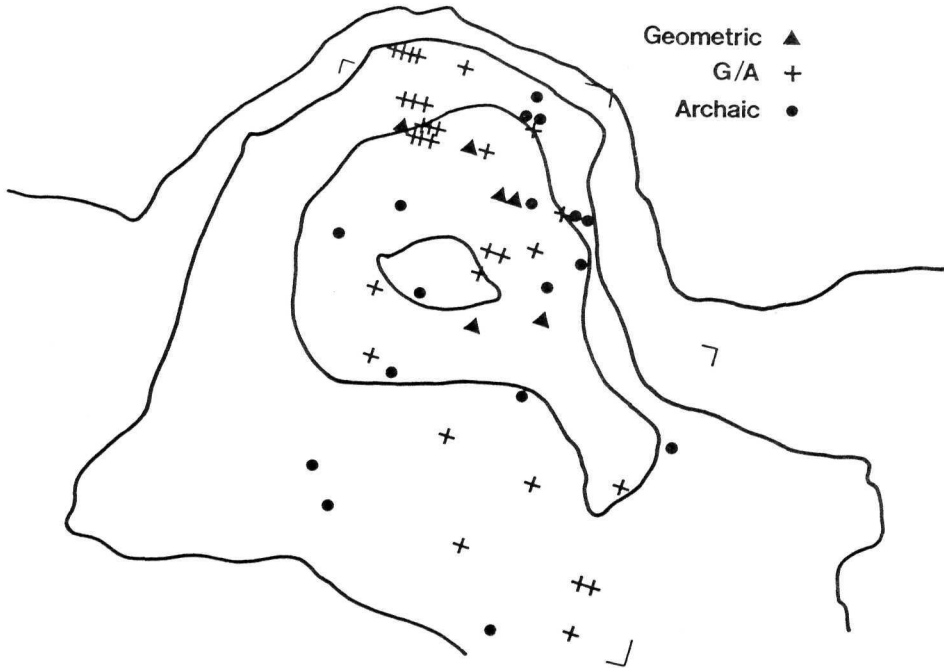


Figure 17 Distribution of surface ceramics of Geometric to Archaic date across the ancient city of Haliartos.

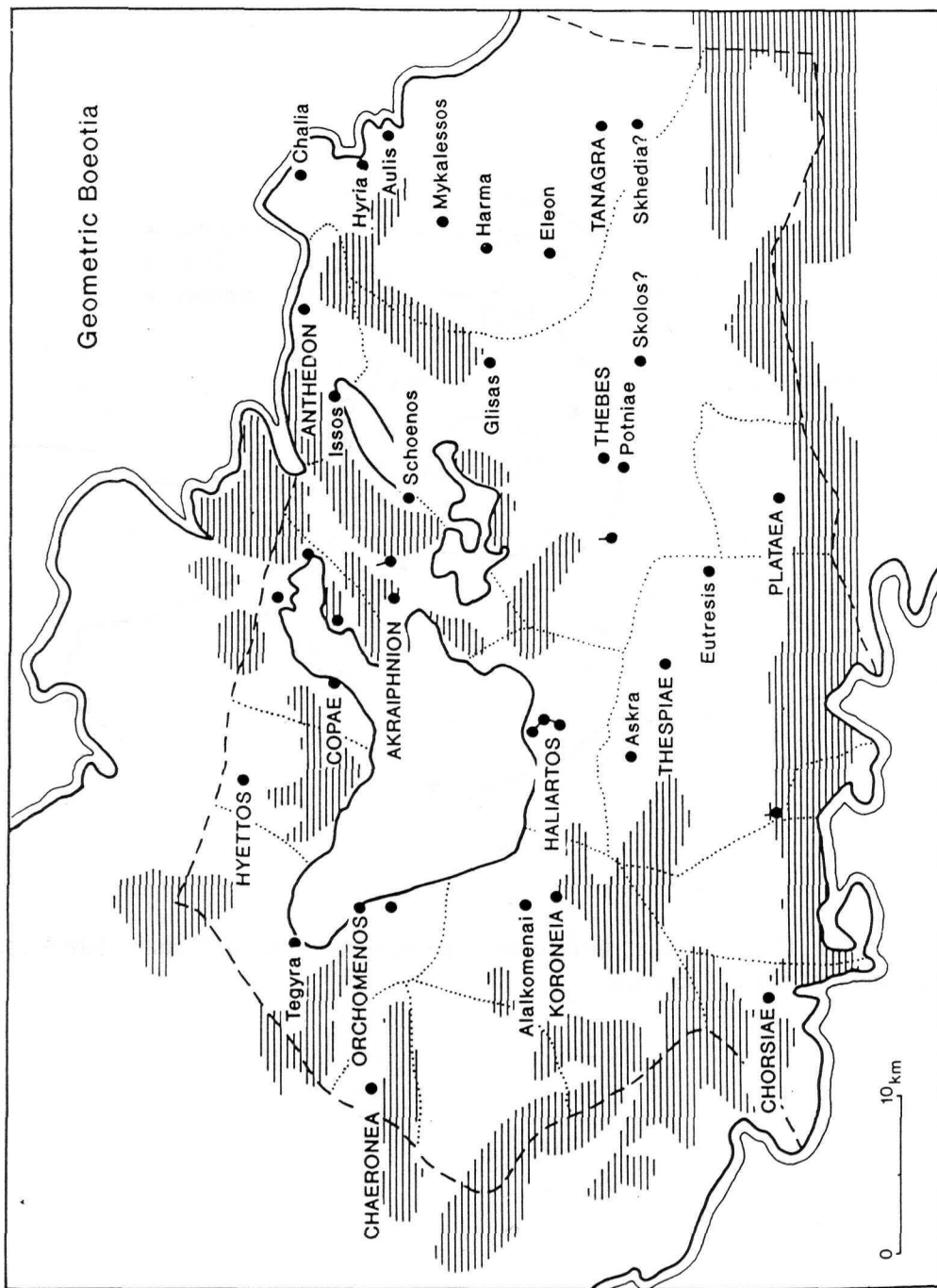


Figure 18 Geometric sites in Boeotia. Circles mark settlement or cemetery evidence, circles with a projecting arm sanctuary sites.

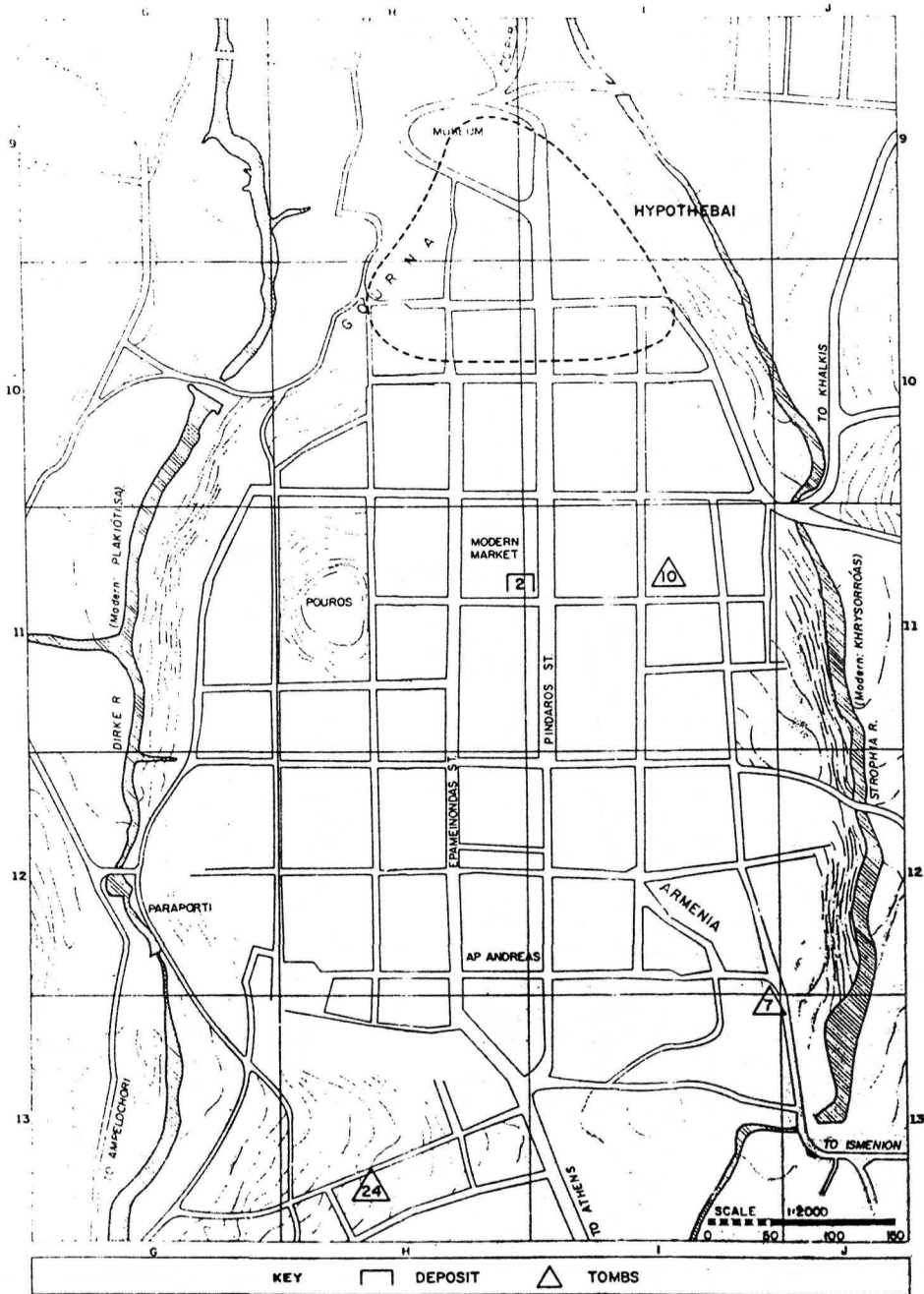


Figure 19a Thebes in the Protogeometric period, ca. 1050-900 B.C. (from Symeonglou 1985).

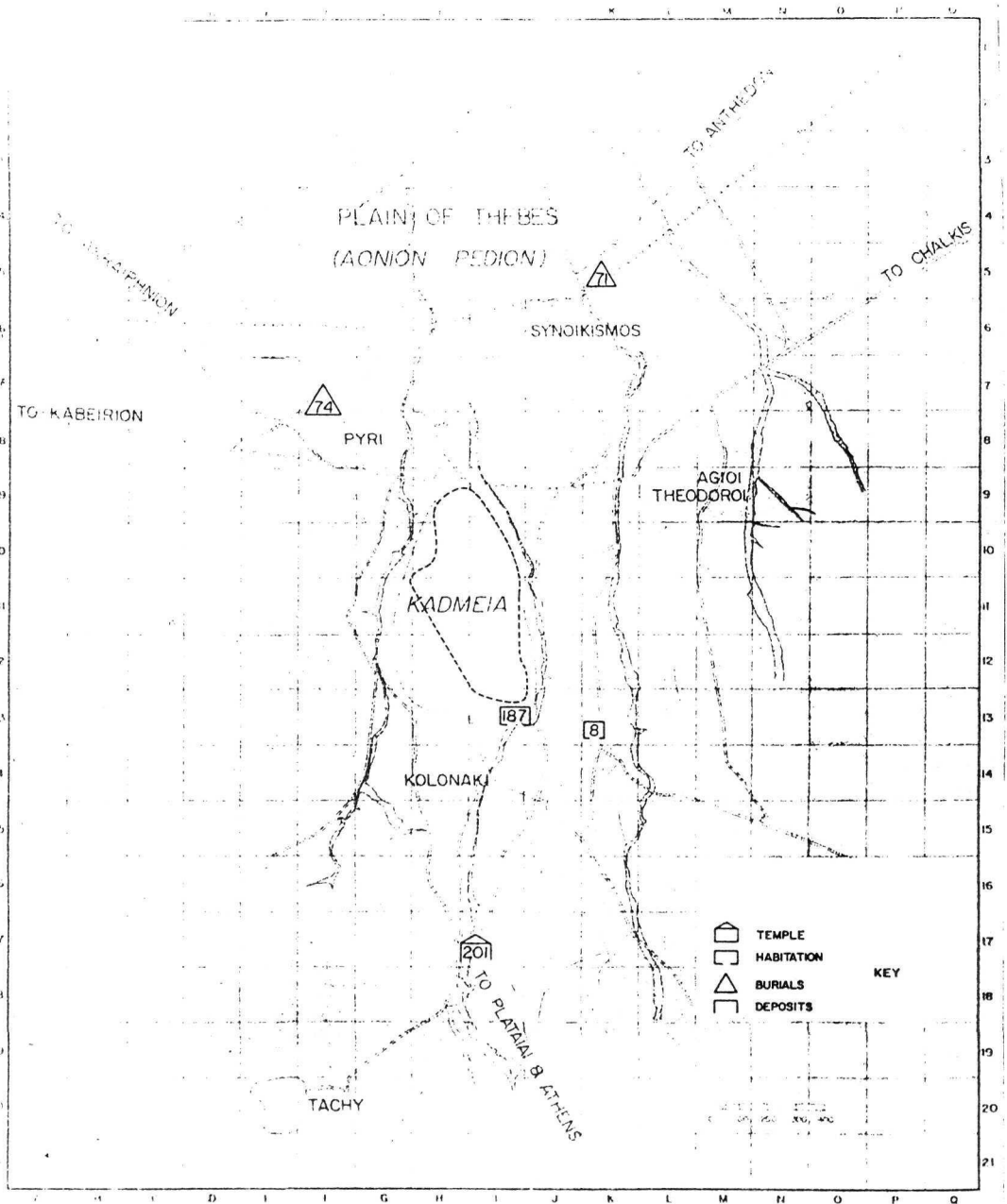


Figure 19b Thebes in the Geometric and Orientalizing periods, ca. 900-600 B.C. (from Symeonglou 1985).

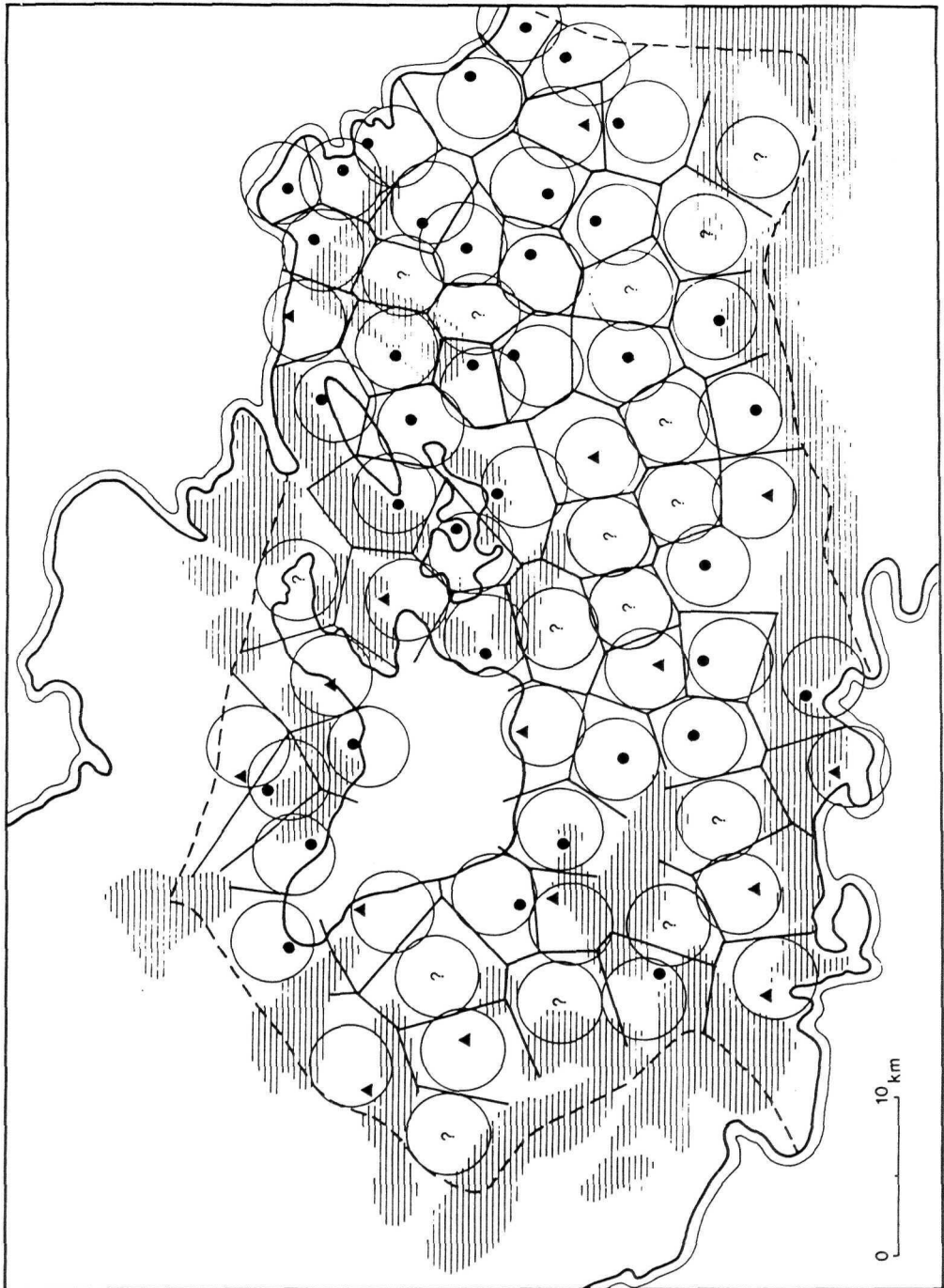


Figure 20

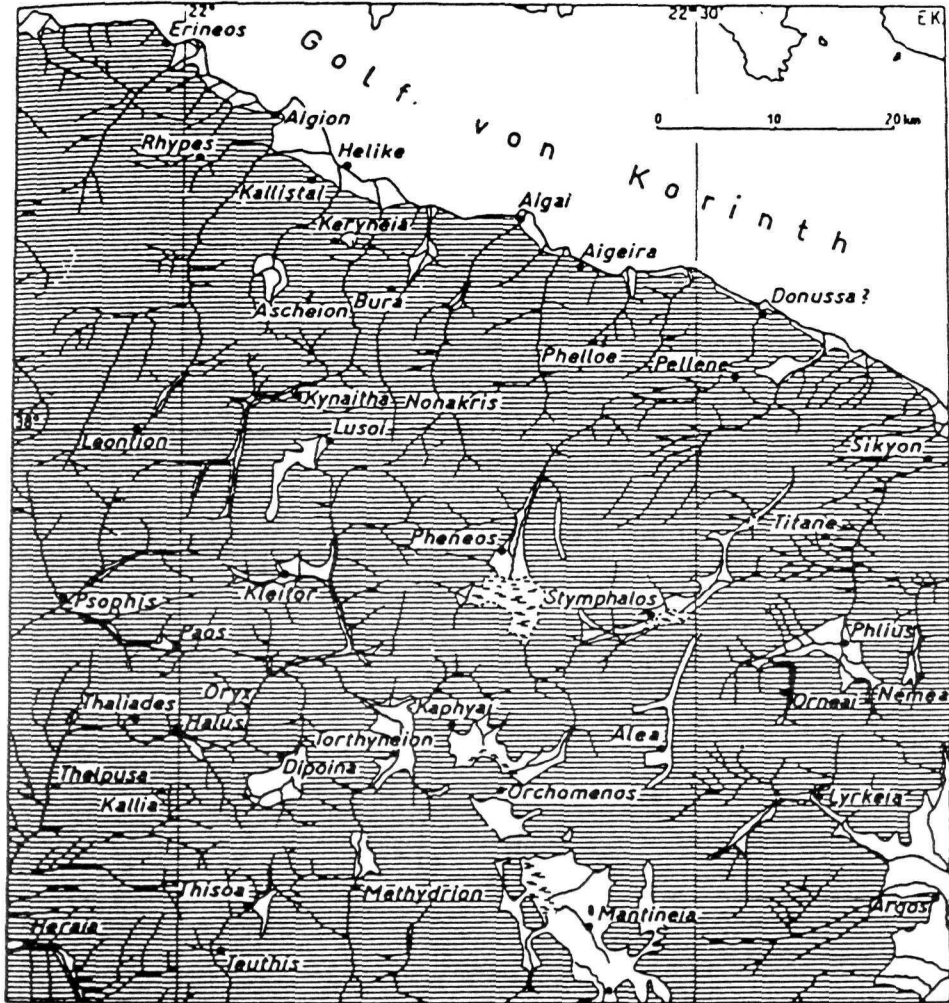
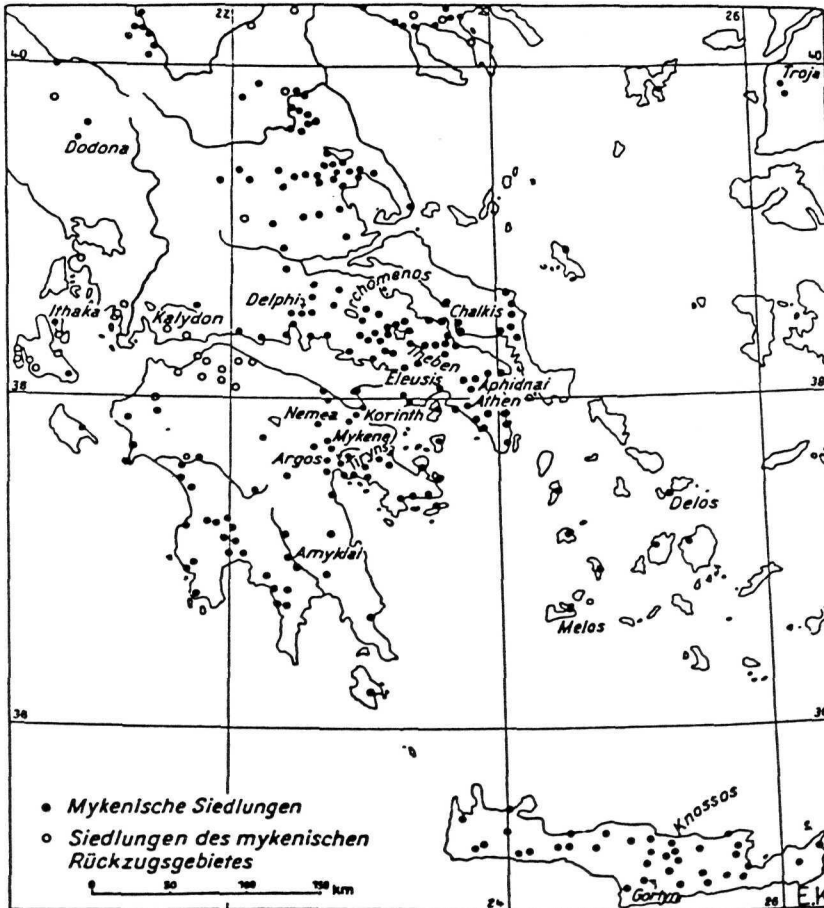


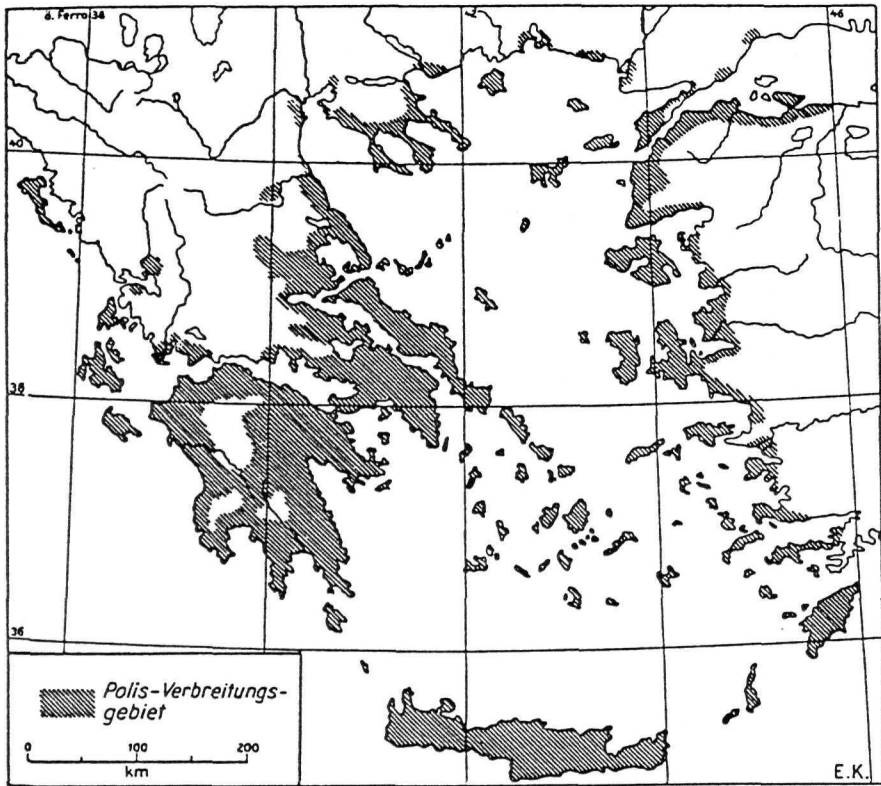
Figure 21 Siedlungen und Alluvial-Kerngebiete der Poleis der Nordost-Peloponnes (Ansätze n. E. Kirsten).

Figure 22a-b Comparison of the Mycenaean settlement region with that of the Classical polis (from Kirsten 1956).



Die Verbreitung von Siedlungsfunden der mykenischen Zeit (1700-1100 v. Chr.) in Griechenland (Entwurf E. Kirsten).

Figure 22a



Die Verbreitung der Polis im Ägäis-Raum um 400 v. Chr. (Entwurf E. Kirsten).

Figure 22b

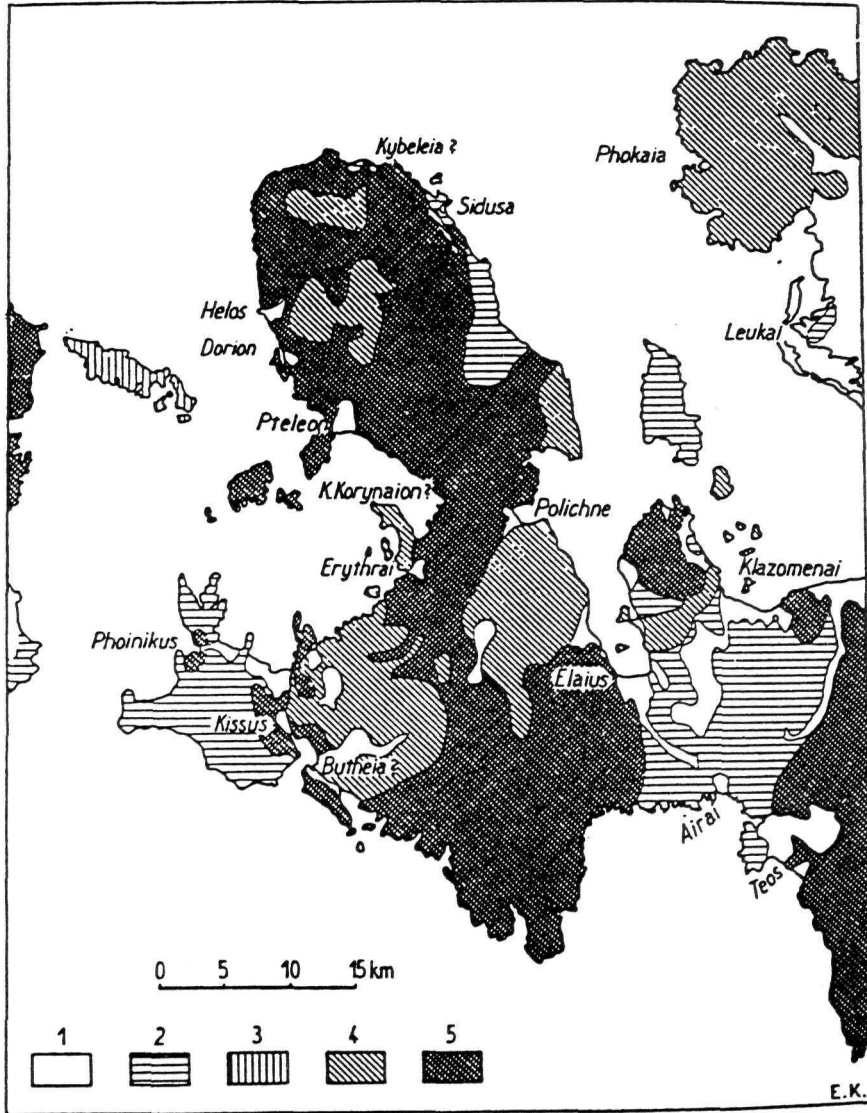


Figure 23 Classical poleis and geological zones in part of the west coast of Turkey (from Kirsten 1956).

Figures 24-27 Intercity rivalry and conflict from the 8th-4th centuries B.C. in Boeotia. Major cities shown as squares, minor cities and villages as circles.

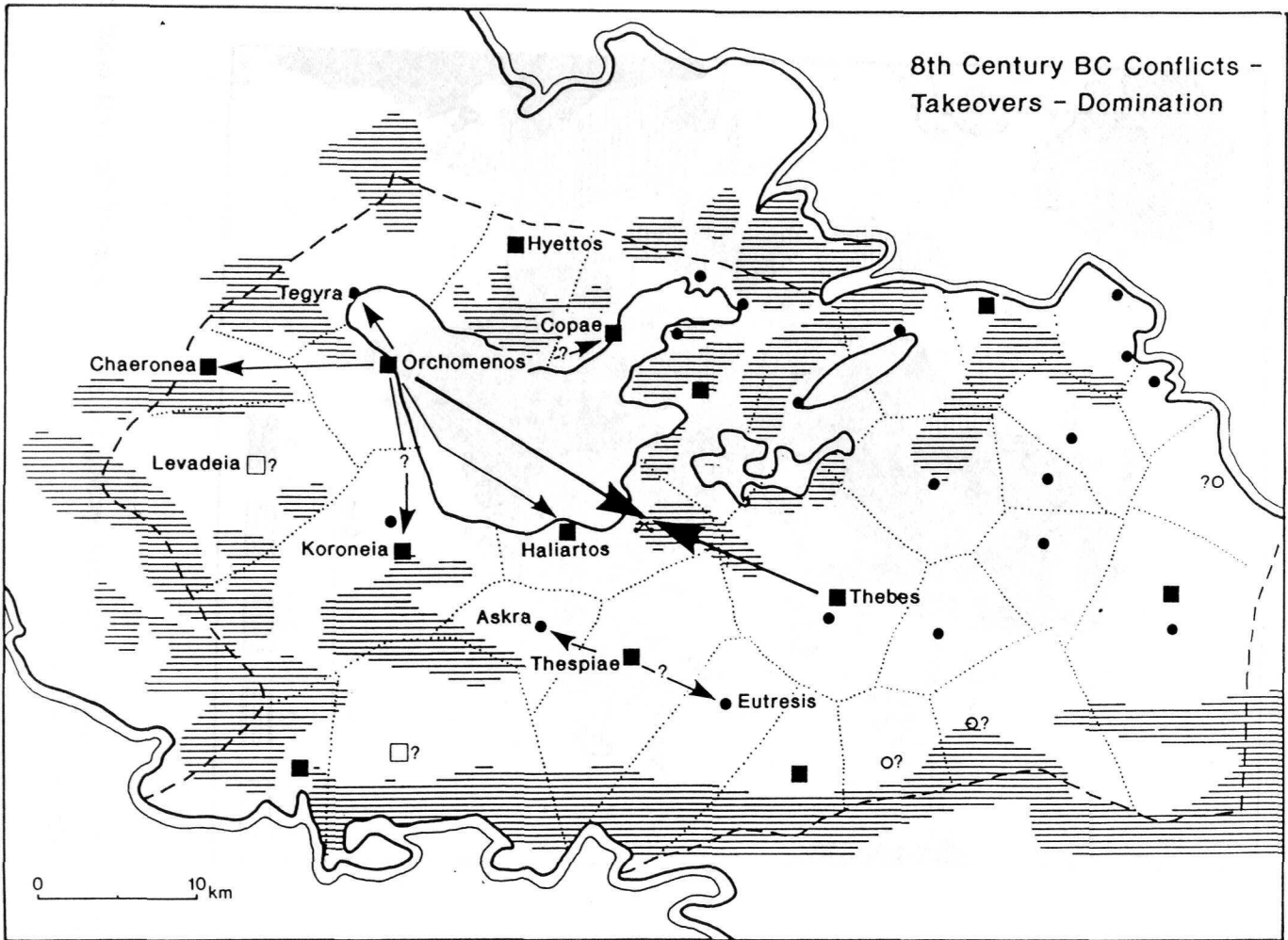
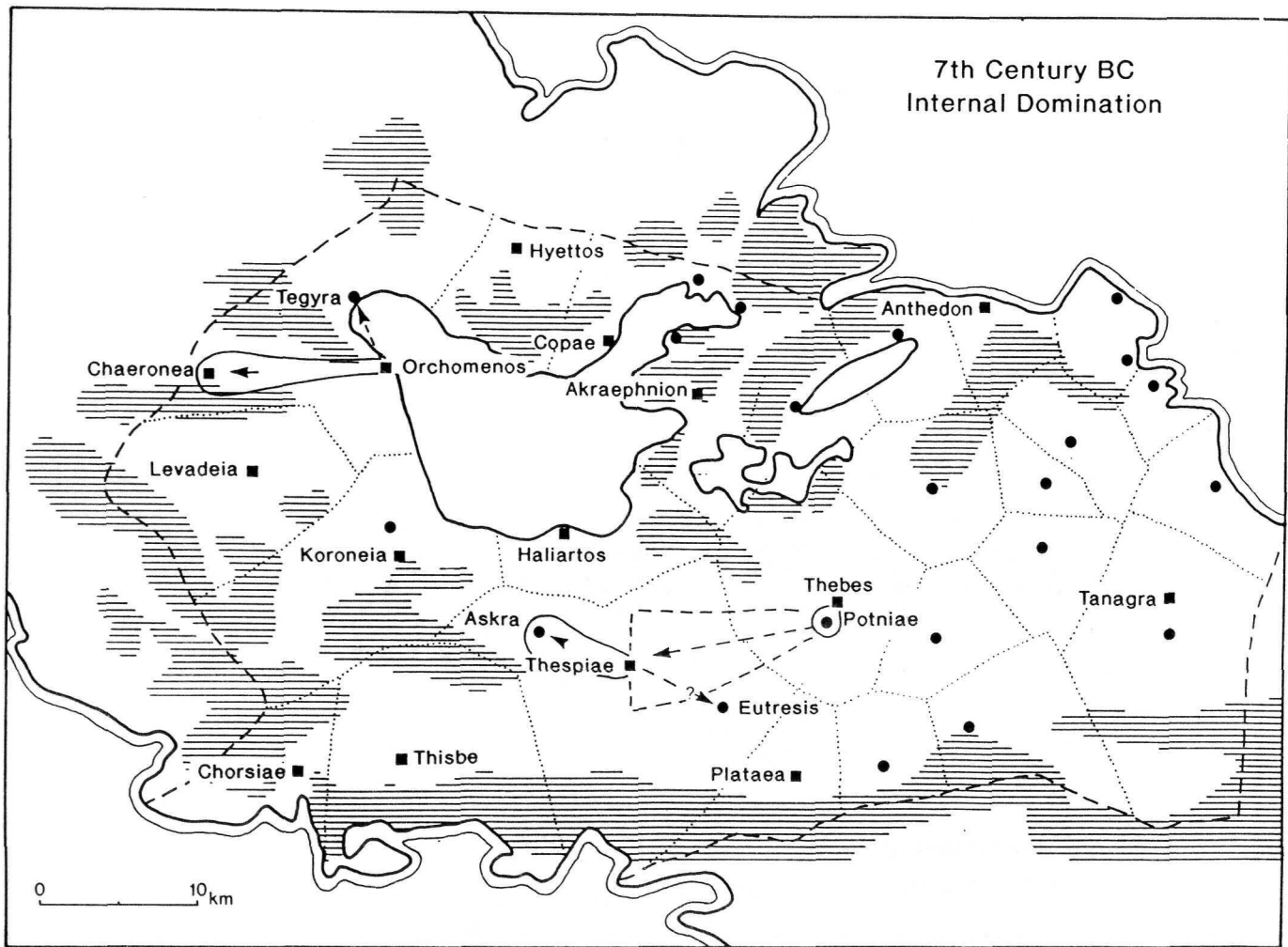


Figure 25



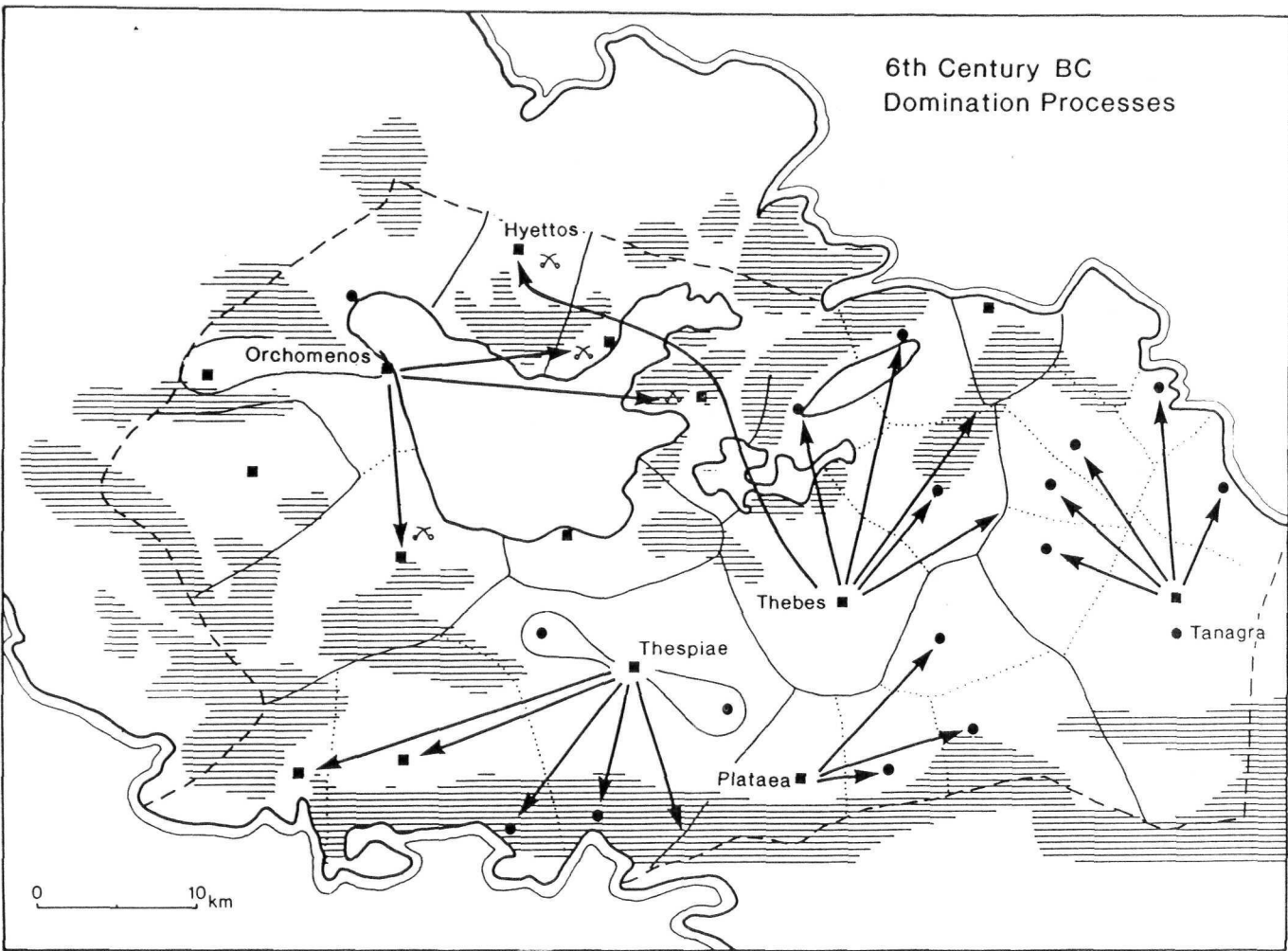


Figure 26

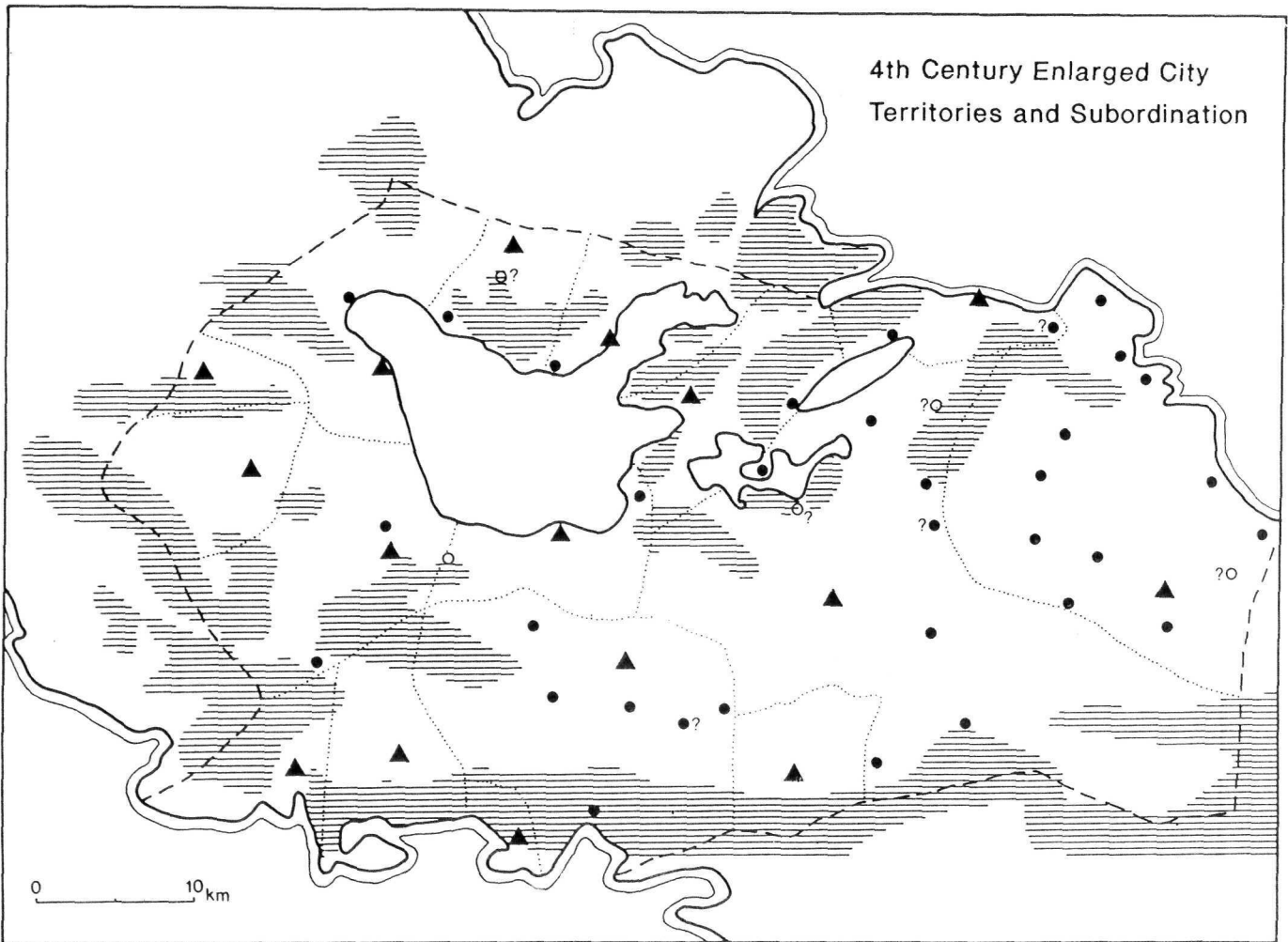


Figure 27

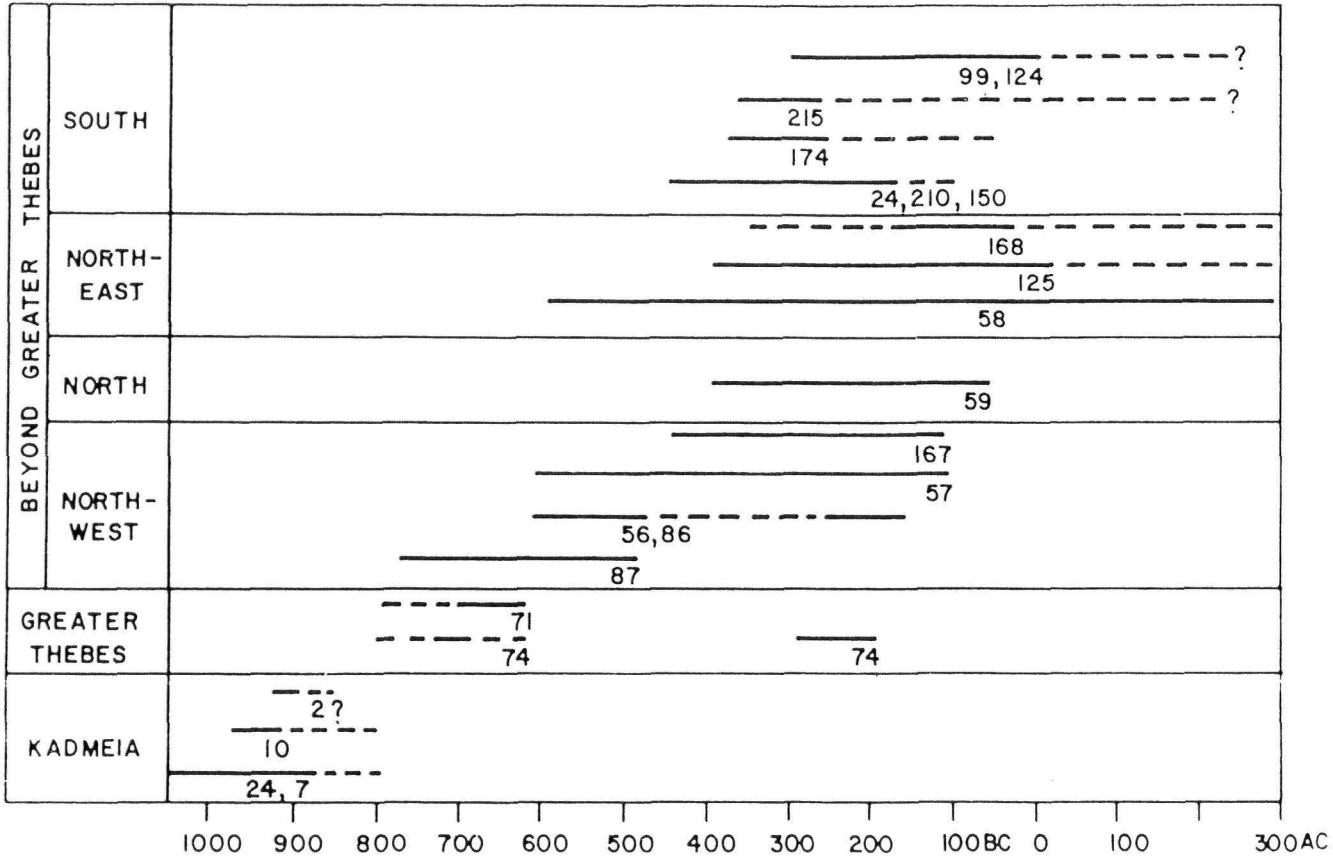


Figure 28 The duration of the cemeteries of Thebes, arranged by location and period.

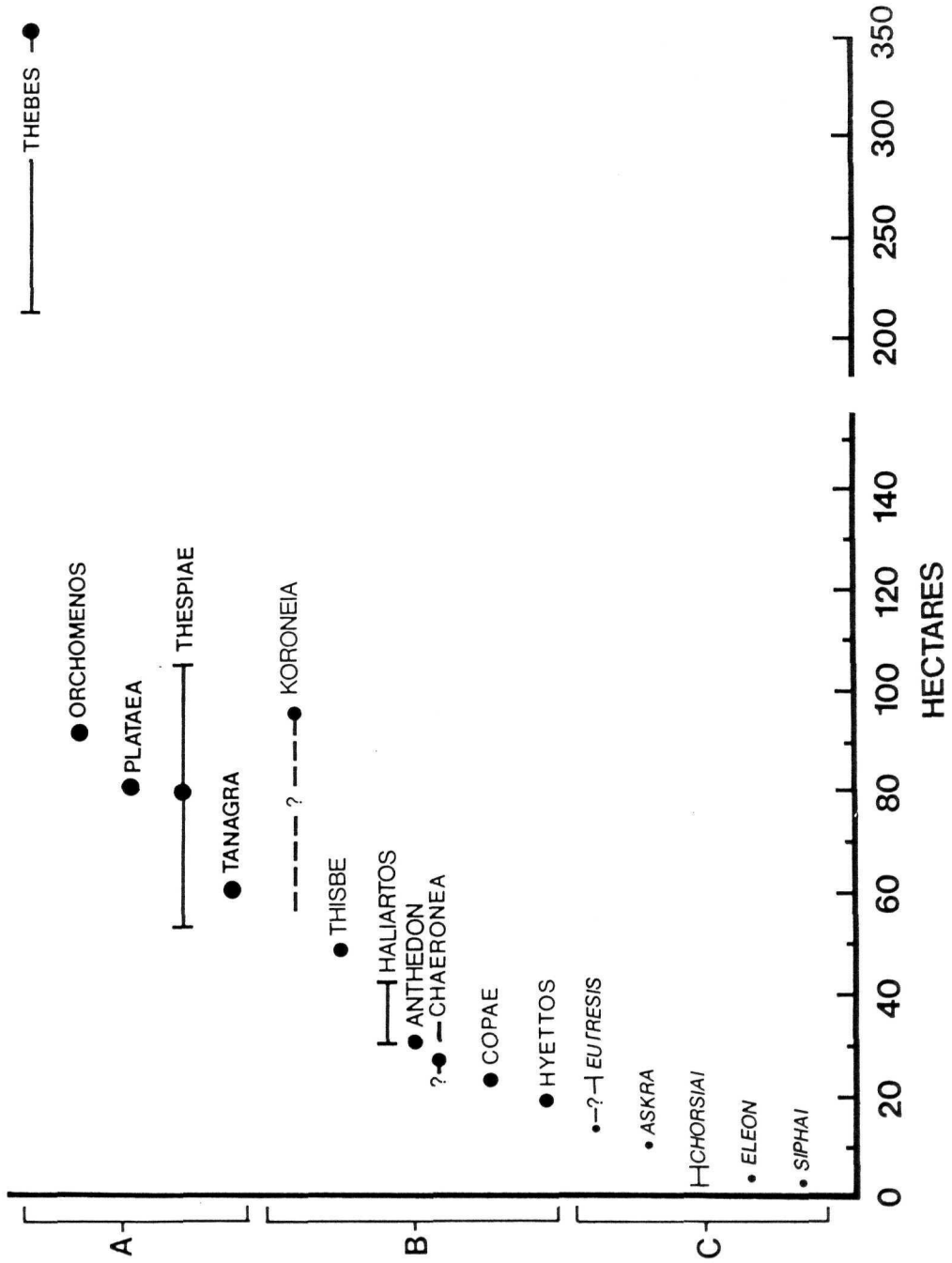


Figure 29

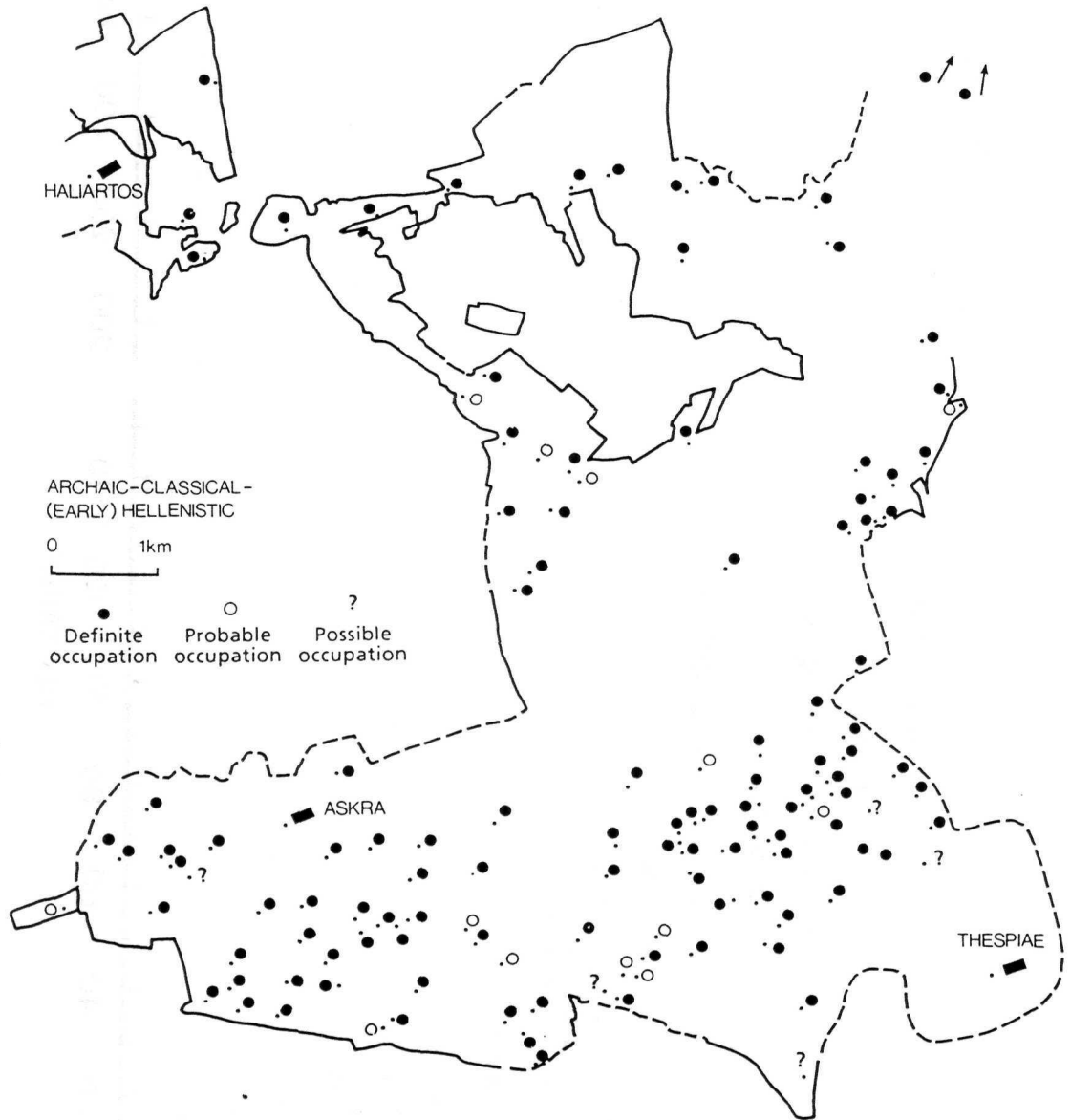


Figure 30 Settlements of the Archaic-Classical-Early Hellenistic date in South-West Boeotia.

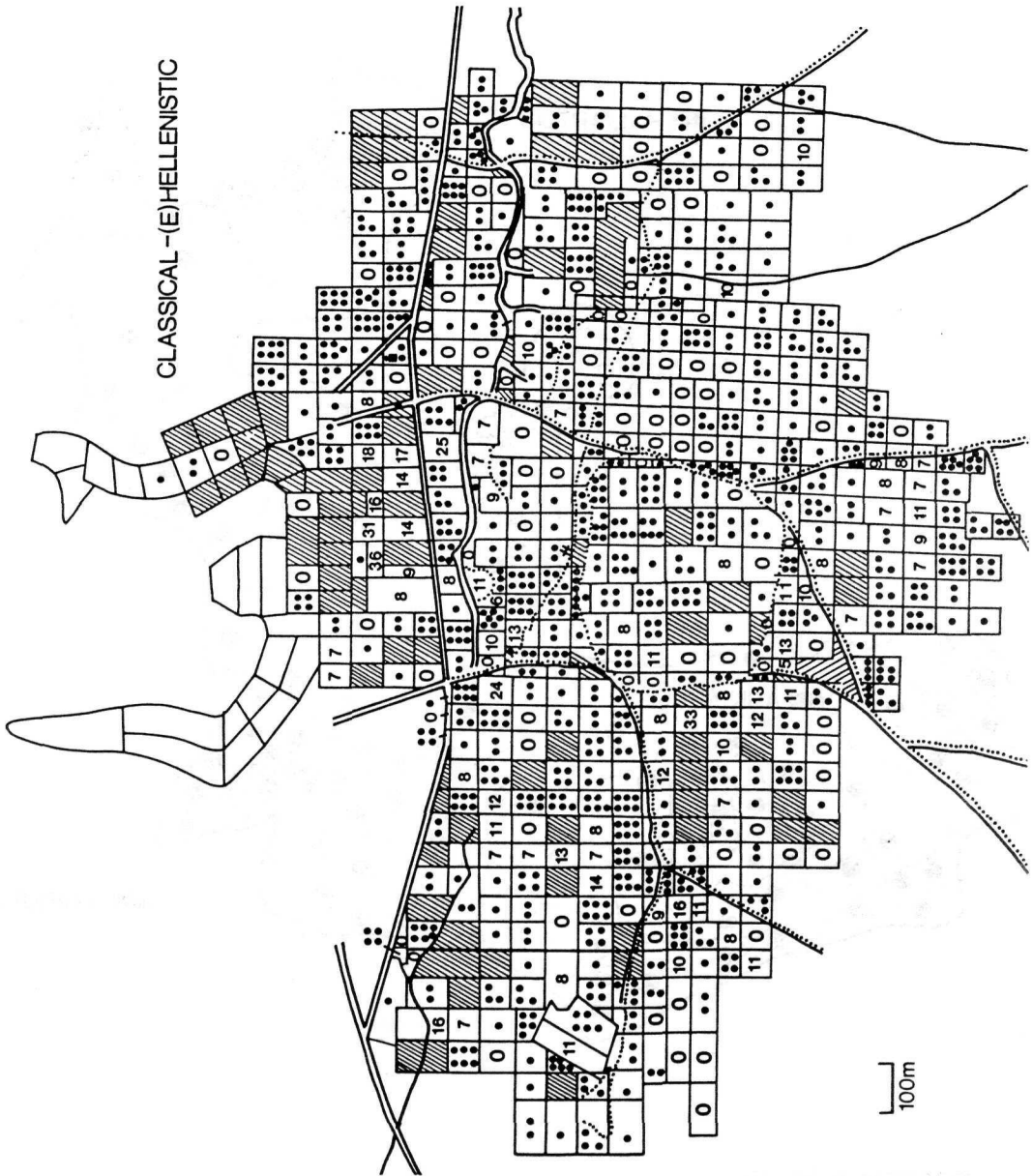
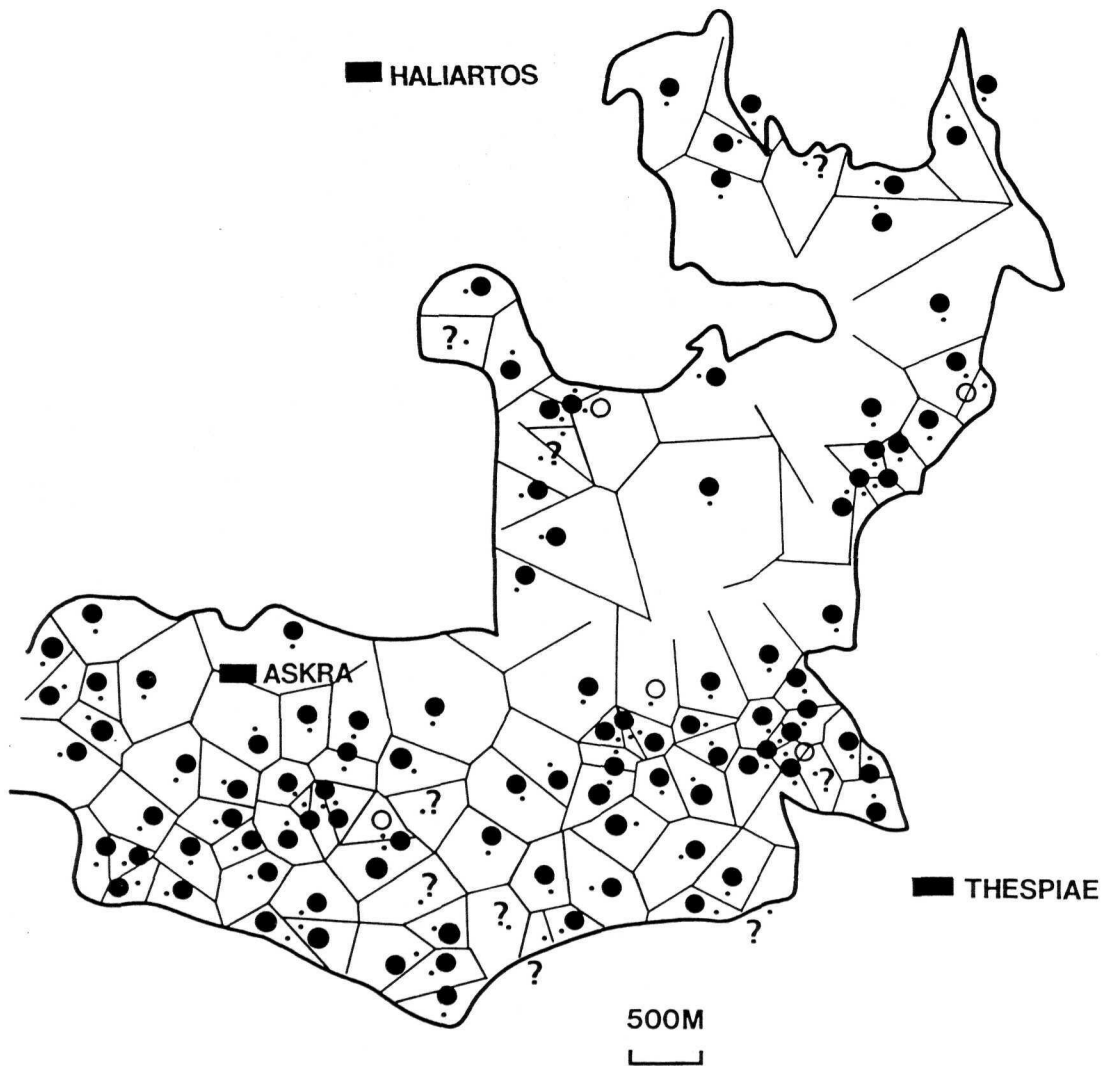
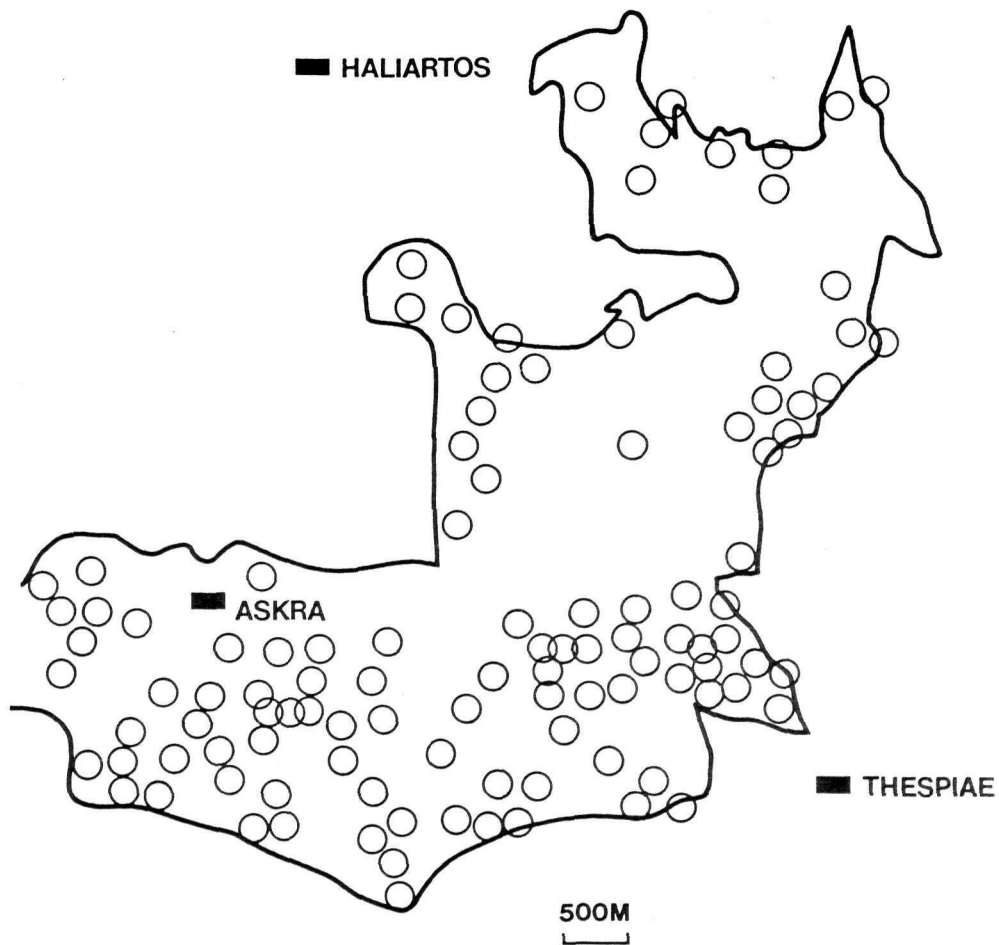


Figure 31 Distribution of surface ceramics of Classical-Early Hellenistic date across the city of Thespieae.



BÓEOTIA SURVEY
ARCHAIC/CLASSICAL

Figure 32



BOEOTIA SURVEY
ARCHAIC/CLASSICAL

Figure 33

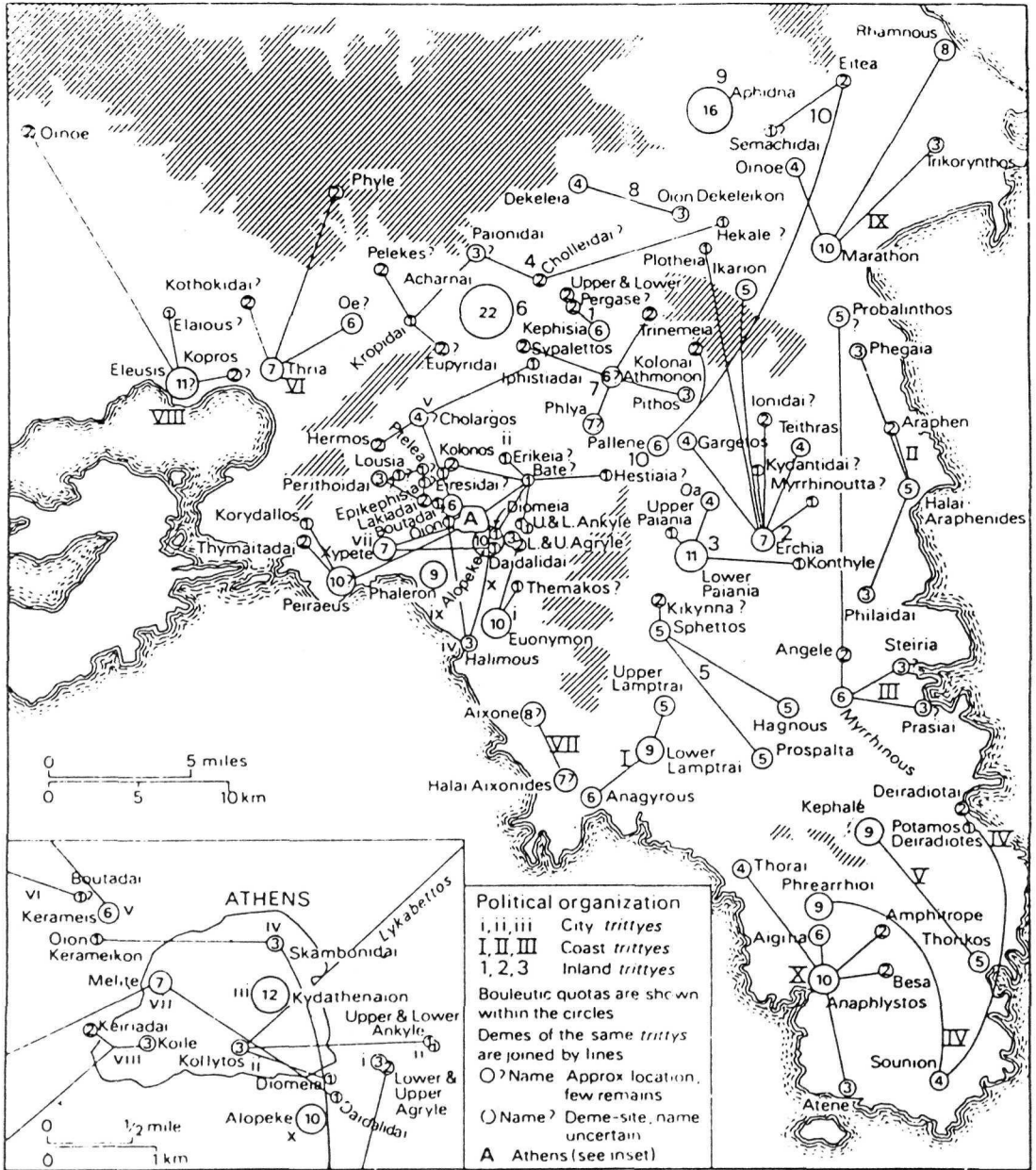


Figure 34 The political organisation of Attika. From Traill (1975) map 2 (adapted).

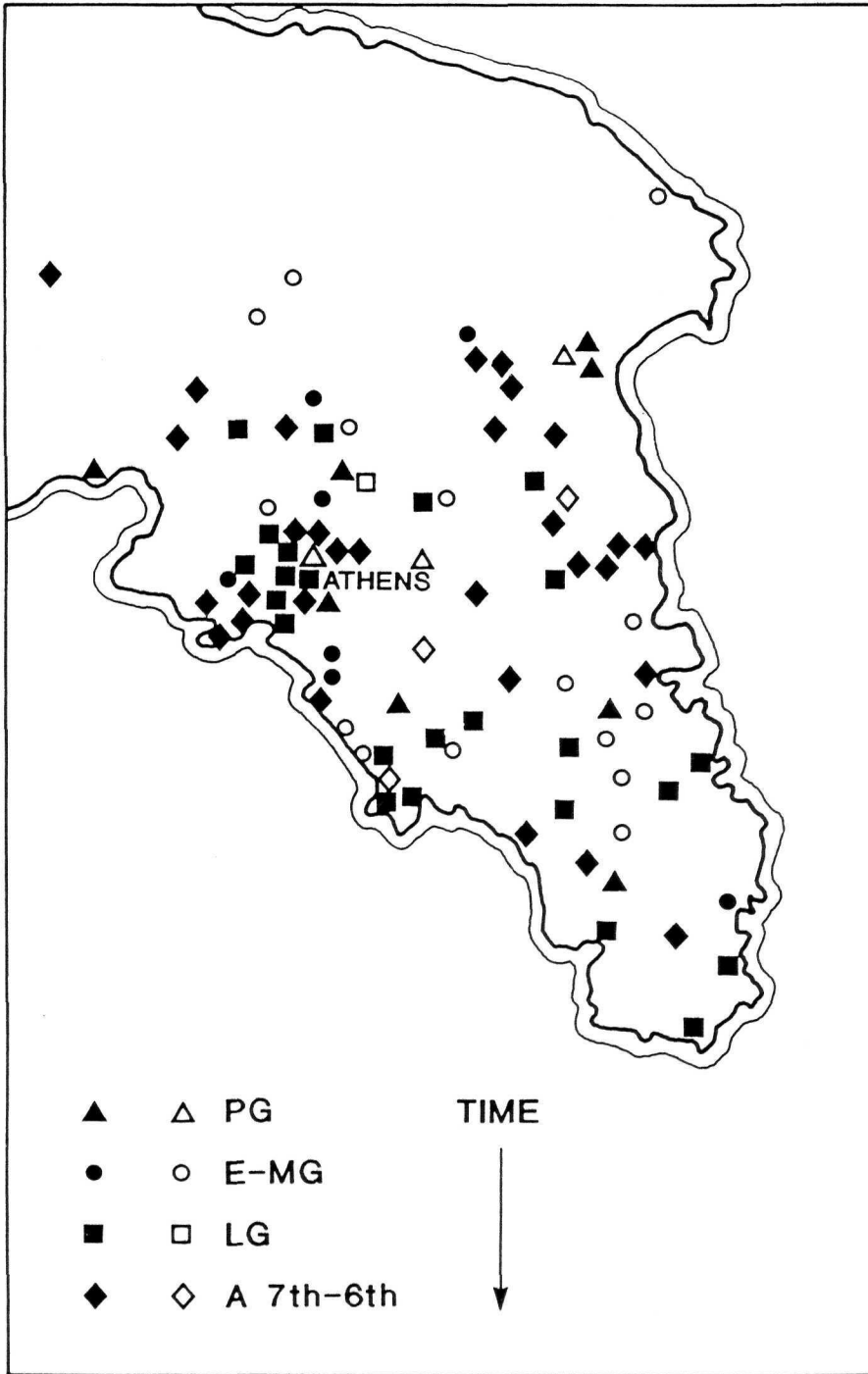


Figure 35

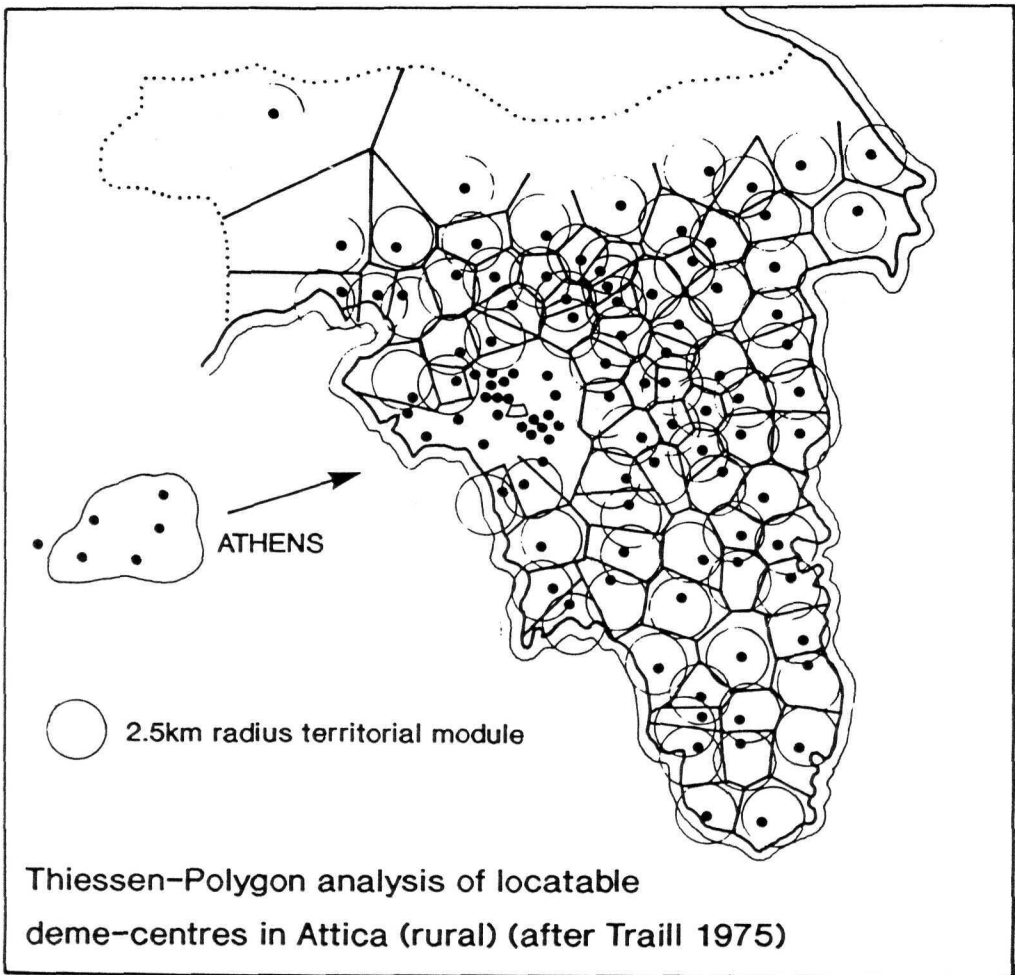
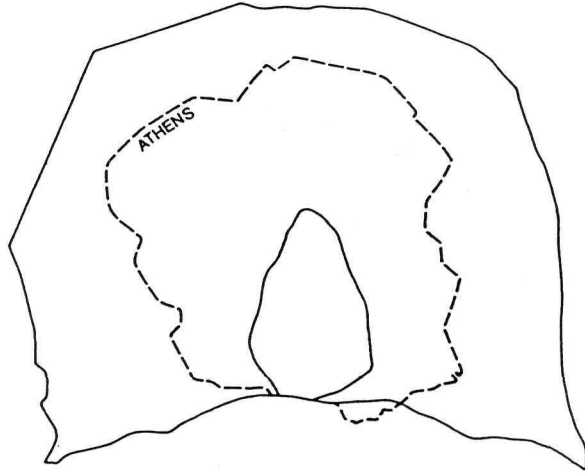
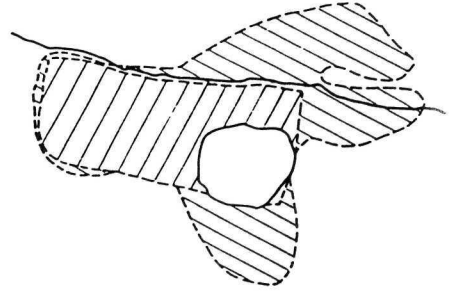


Figure 36

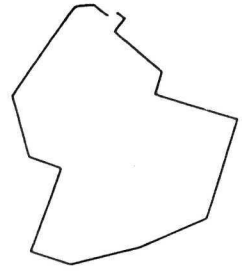
THEBES
350 (→ 211?)Ha



THESPIAE
78.5? (53-104)Ha

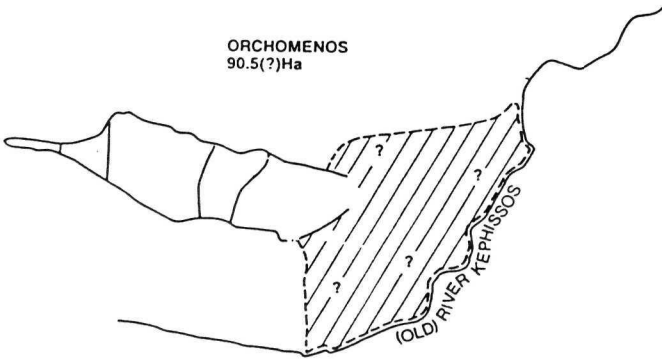


TANAGRA
60.5Ha



500m

ORCHOMENOS
90.5(?)Ha



PLATAEA
80.5Ha

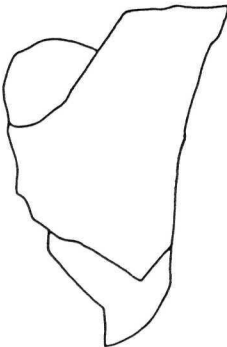


Figure 37 The largest cities in Classical Boeotia, based on walled areas. For comparison the walled area of contemporary Athens is shown as a dashed line within the plan of Thebes.

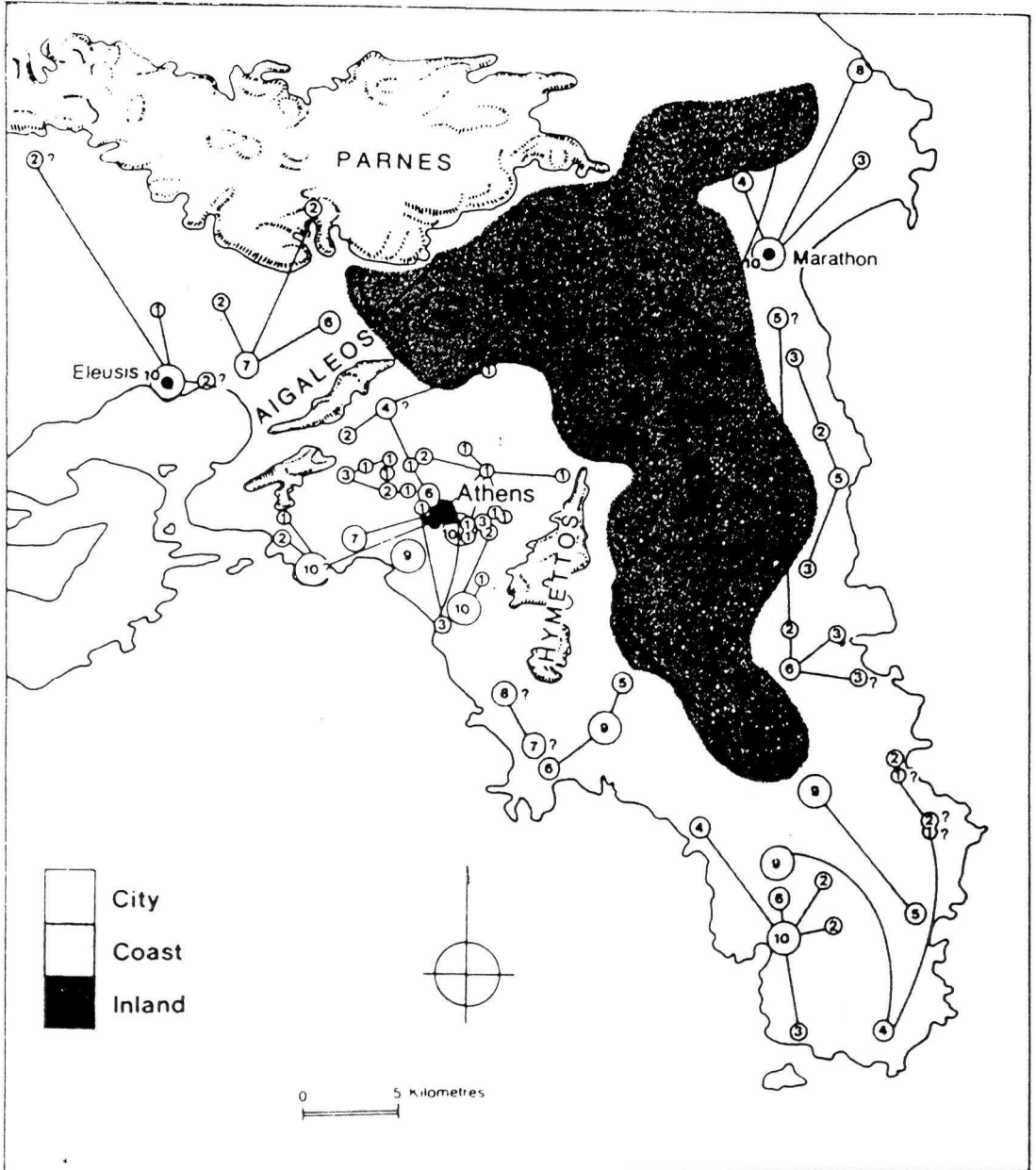


Figure 38 The geographical effect of Kleisthenes' reforms (after J:S: Traill, *The political organization of Attica* (*Hesperia*, supplement 14, 1975)). The circles are the *demes*, the networks are the *trittyes*, the numerals shown the number of councillors elected.

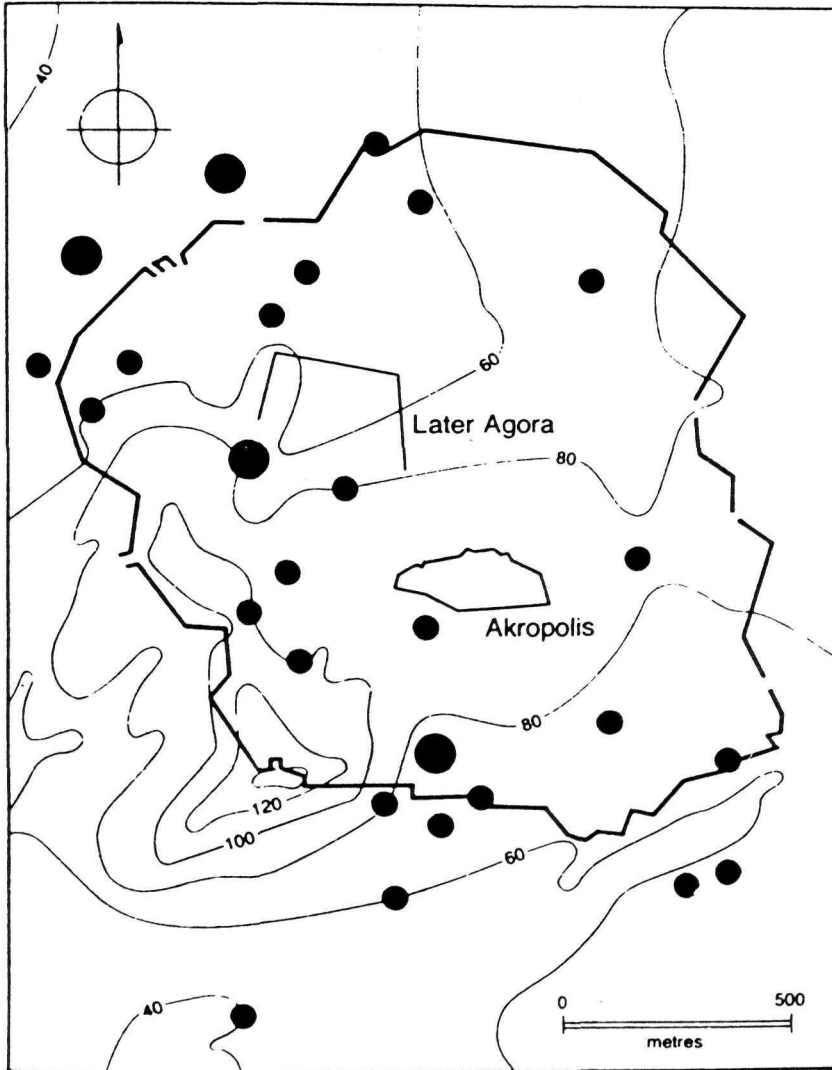


Figure 39 Distribution of early burials (ninth and eighth centuries B.C.) in Athens.

Figure 40a-b Progressive displacement of cemeteries outwards as Athens grows from Dark Ages onto early historic times (from Morris 1987).



Figure 40a Placing the dead: cemeteries are marked by solid circles, and traces of settlement are marked by 'S'. The walls around the city are fifth-century BC, and are shown for topographical reference only.

(a) Submycenaean; (b) Protogeometric; (c) Early and Middle Geometric; (d) Late Geometric I.

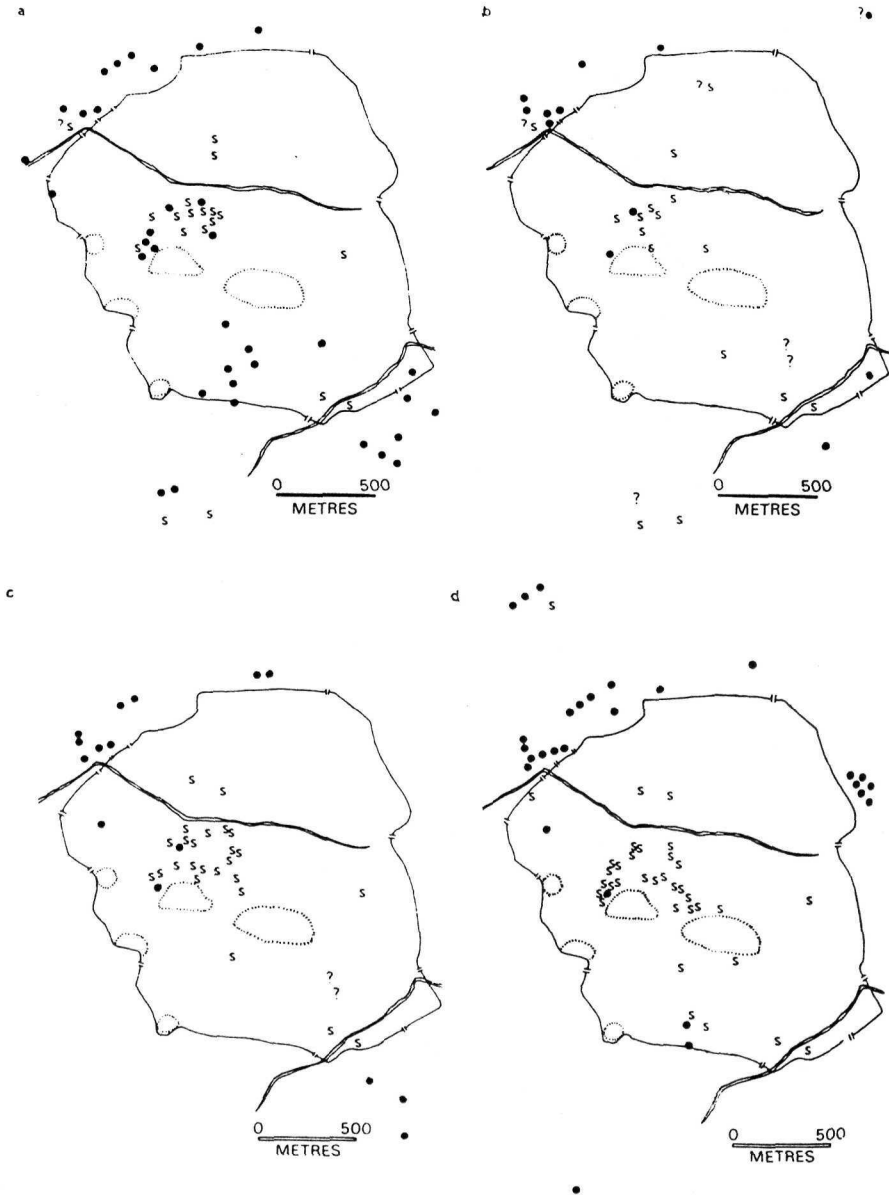
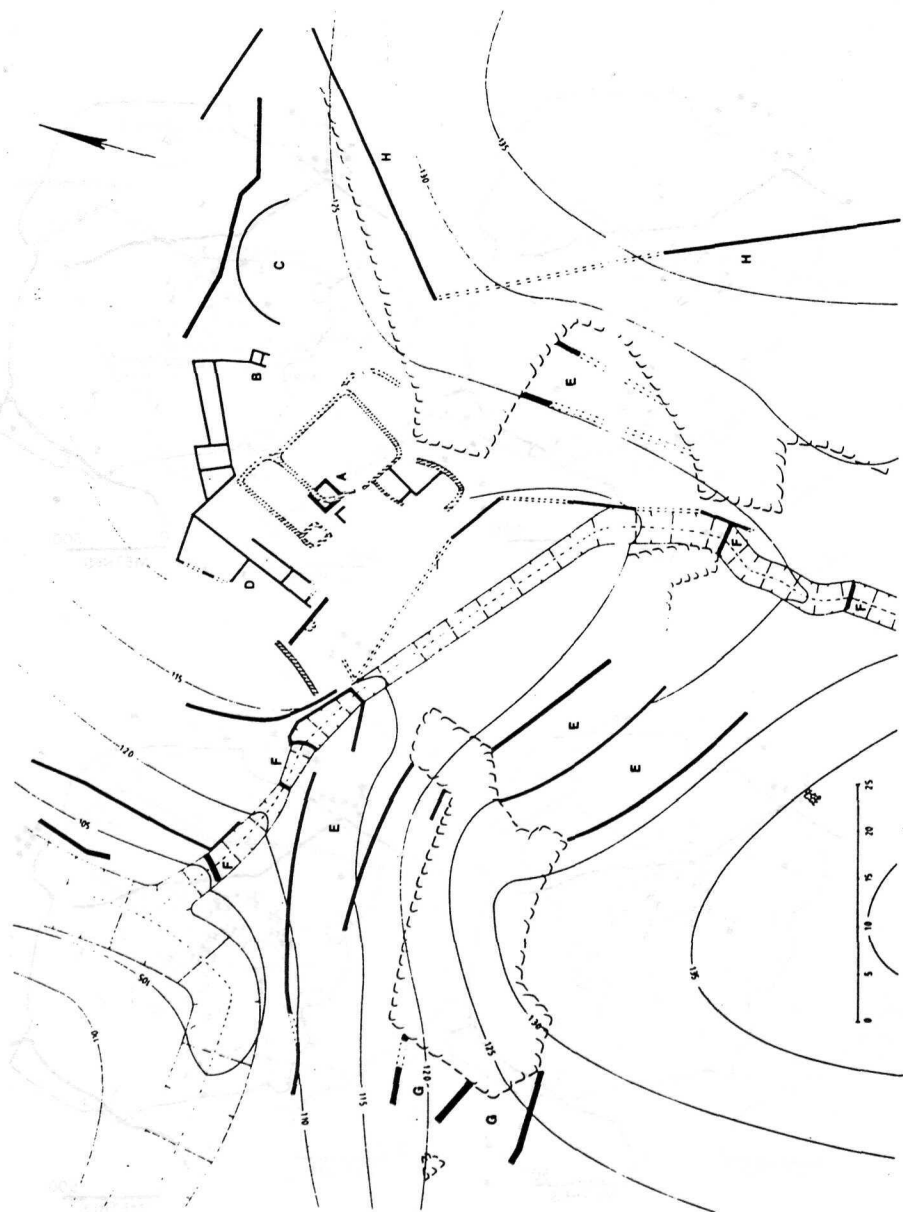


Figure 40b Cemeteries and settlement at Athens: (a) Late Geometric II; (b) Protoattic and Transitional; (c) Black Figure; (d) Early Red Figure.



Klassisches Turmgehöft in Hagia Photini.

Figure 41 Attic isolated farmstead of Classical date with associated field system and agricultural installations (from Lohmann 1985).

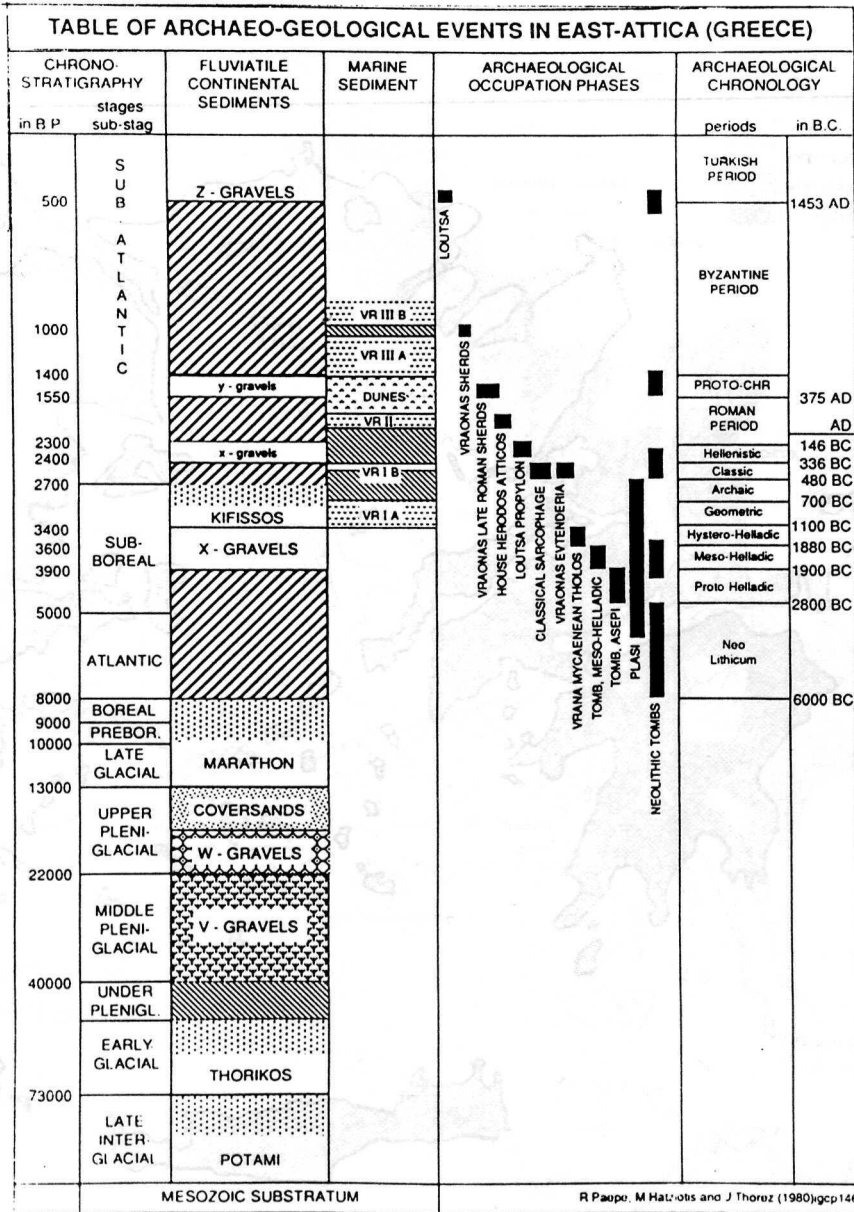


Figure 42 Geomorphological history of Eastern Attica over the last 80,000 years (after Paepe et al. 1980). In the Holocene era (the last 10,000) the landscape has been predominantly stable and characterised by soil development (dark shaded zones). But at long intervals short episodes of extreme erosion have occurred (the Lower X Gravels at the end of the Early Bronze Age, the Upper X gravels in Hellenistic times, the Y Gravels in Later Roman times, and the Z Gravels in post-Medieval times).

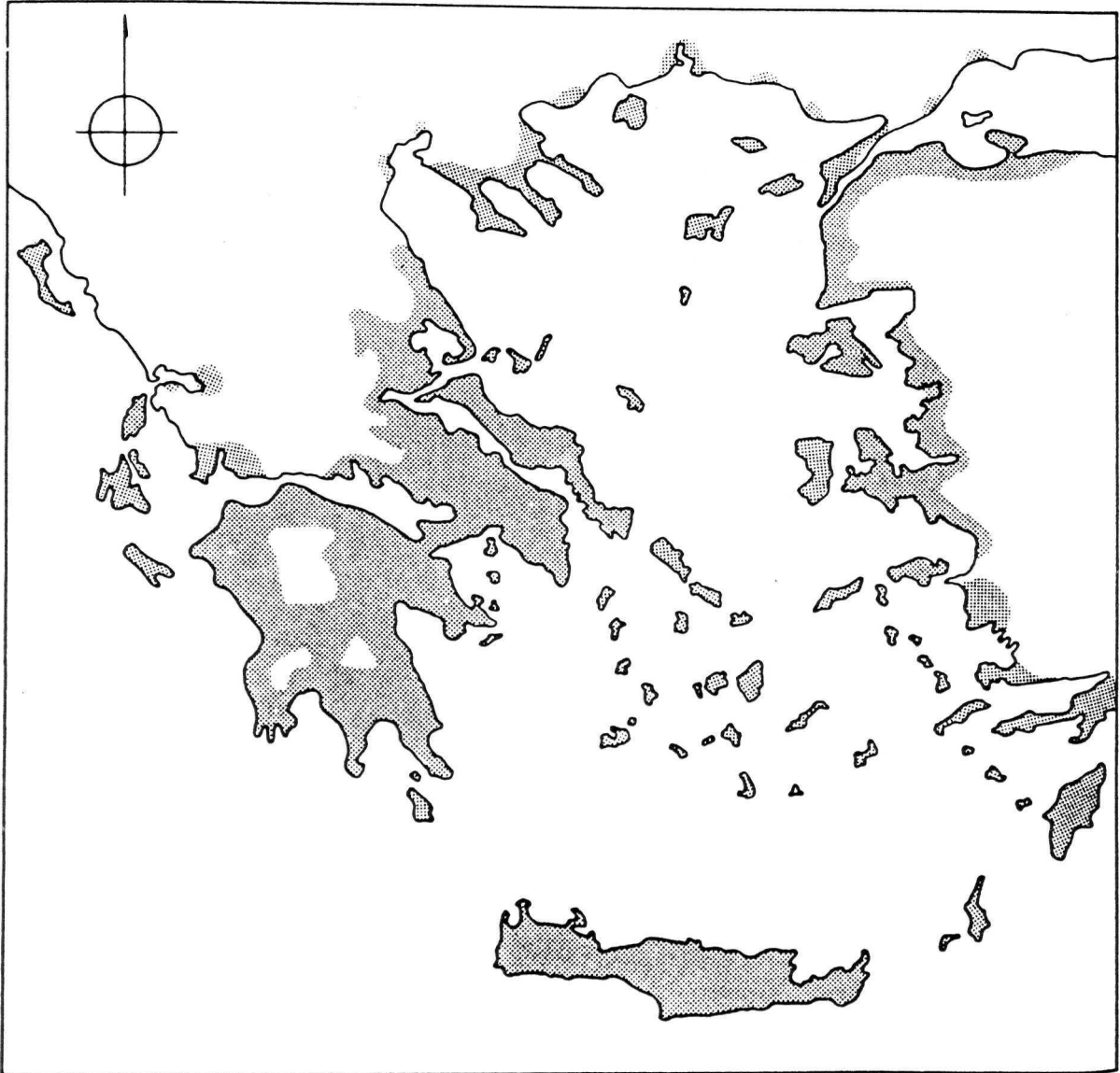
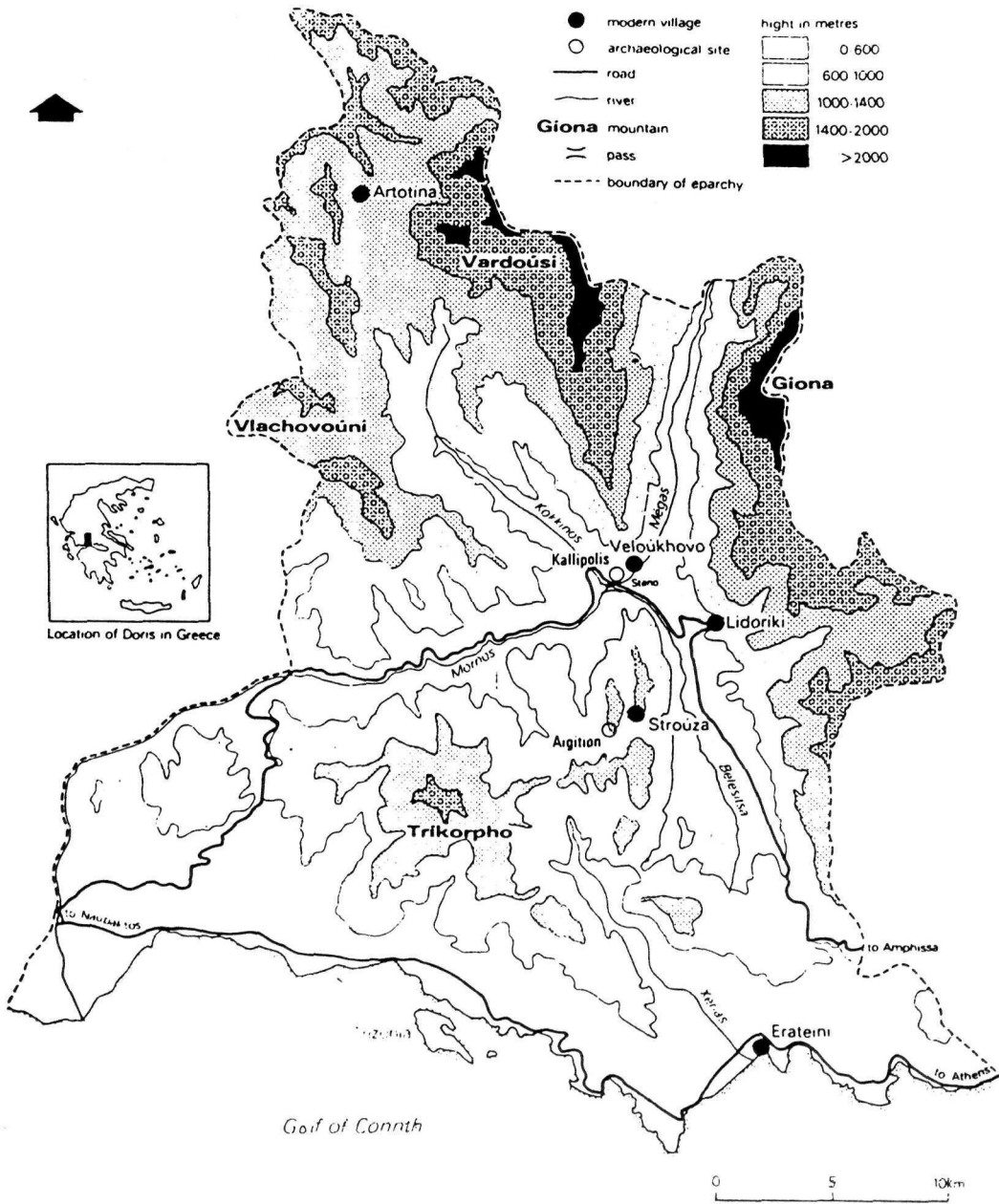


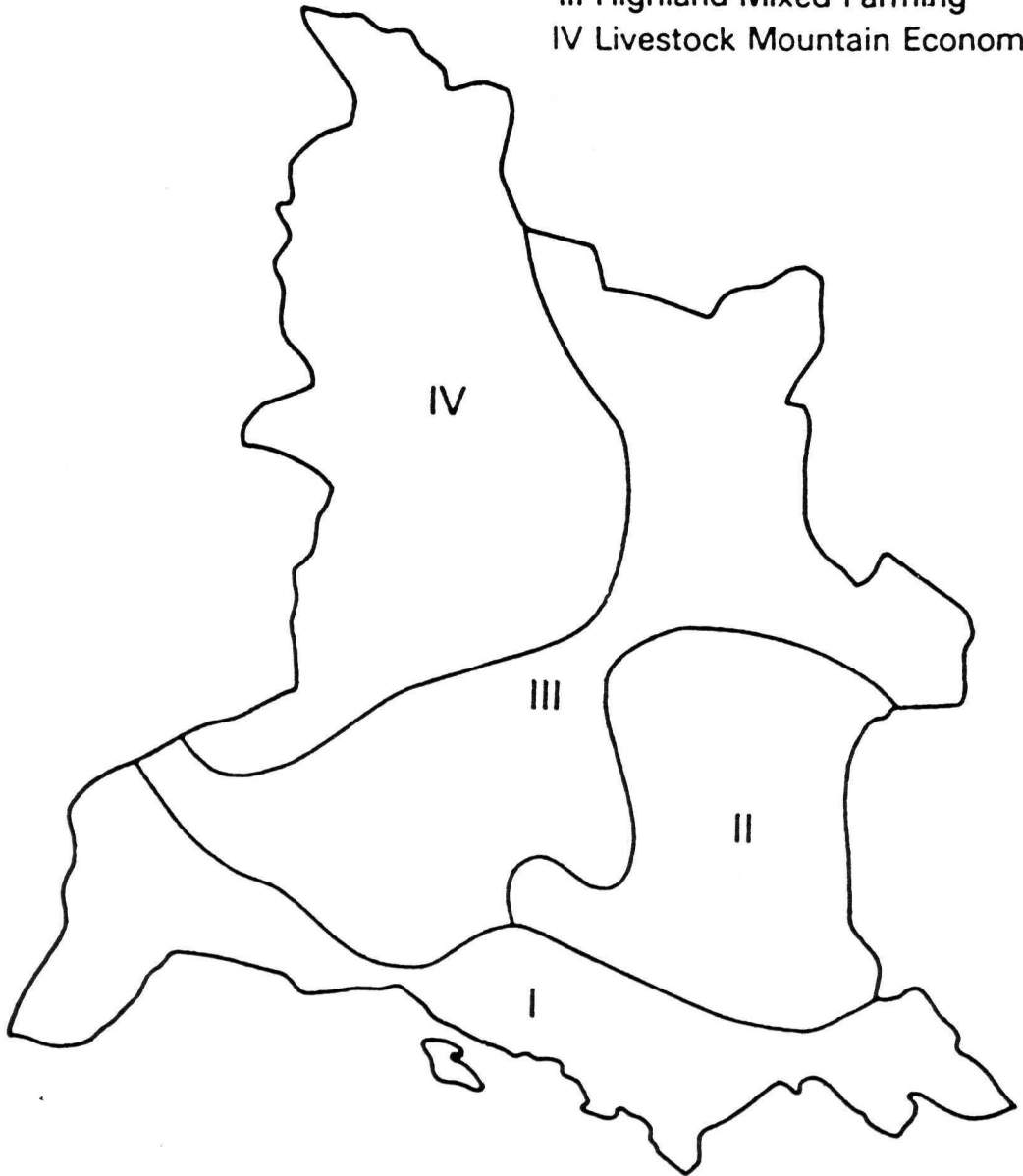
Figure 43 Greece: the extent of city life (drawn after E. Kirsten *Die griechische Polis als historisch-geographisches Problem des Mittelmeerraumes* (1956), figure 13).



The eparchy of Doris in Central Greece

Figure 44 Location of the Dutch Aetolian Project (from Doorn 1985).

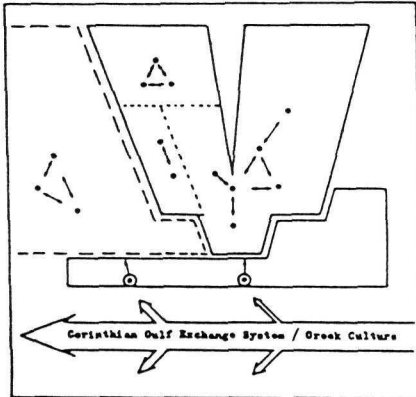
- I Coastal Mediterranean Agriculture
- II Valley Mixed Farming
- III Highland Mixed Farming
- IV Livestock Mountain Economy



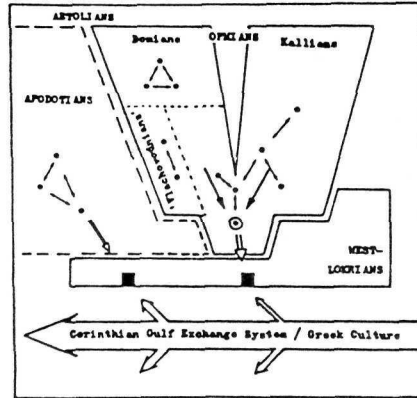
Agricultural regionalisation in exploitation systems, the *eparchy* of Doris.

Figure 45 From Doorn 1985.

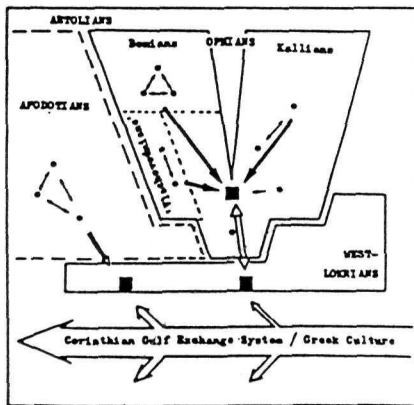
EARLY STATE FORMATION IN EASTERN-AETOLIA : A MODEL



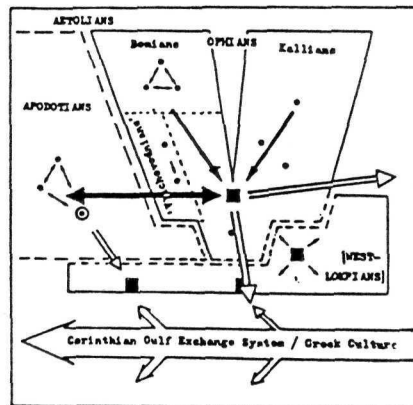
1. (Archaic till Classical times) unranked villages in mountainous inland; higher ranked settlements in coastal region



2. (Classical times) structural orientation of East-Aetolian inland toward higher ranked coastal resource province with poleis, and military safety organized by means of small centre (proto-polis) Aigion



3. (late Classical till Hellenistic times) centralization of main socio-political functions in Eastern-Aetolia in prime urban centre near Stenô, the polis Kallipolis



4. (Hellenistic times) Kallipolis predominant East-Aetolian centre, with far-reaching external contacts; West-Lokris part of Aetolian League

• settlement
 ⊙ proto-polis
 ■ polis

— local relations
 → hierarchical relations
 ⇌ external relations
 ↔ intra-Aetolian relations

Figure 46 From Bommeljé et al. 1987.

Intramax Clusters

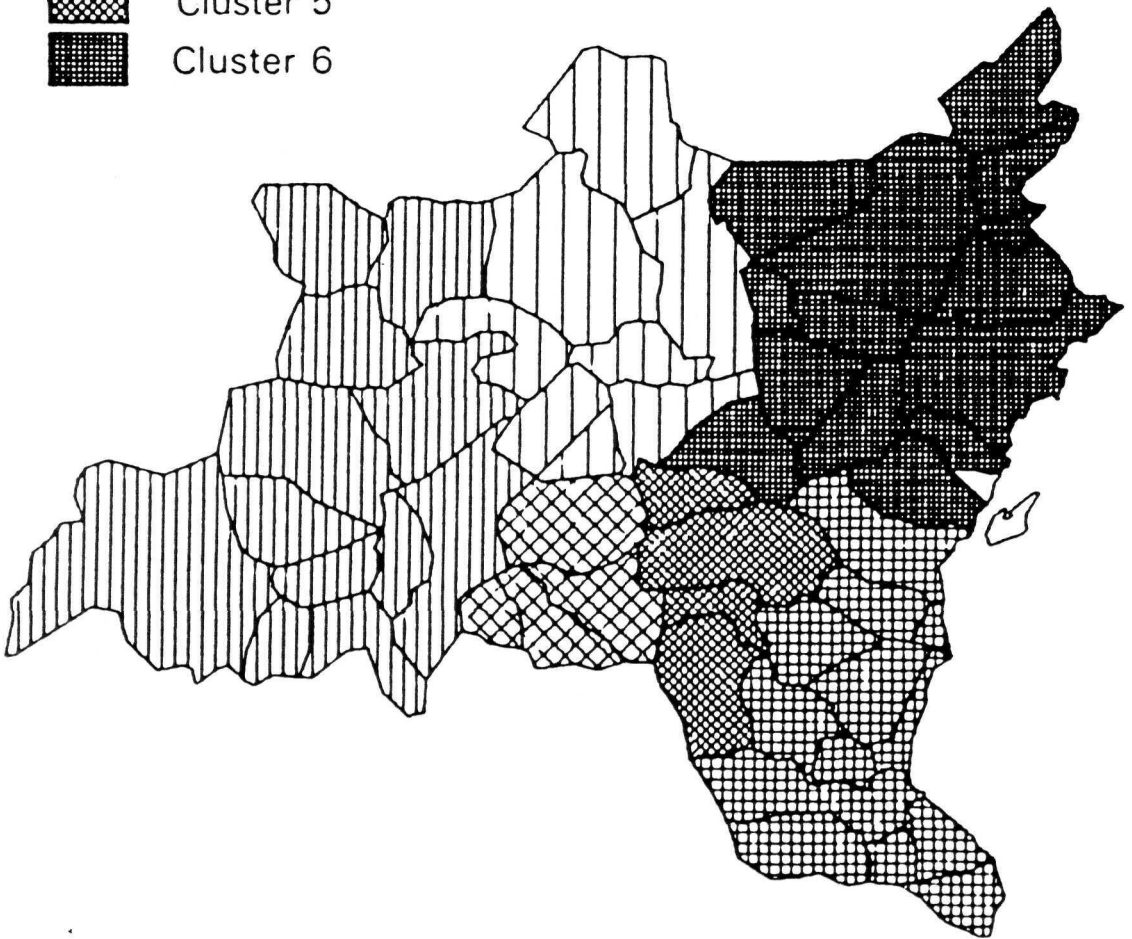
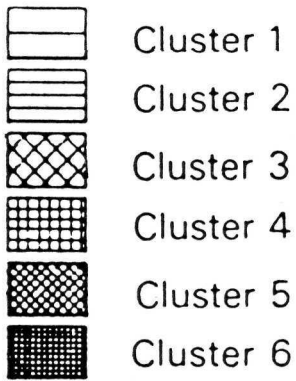
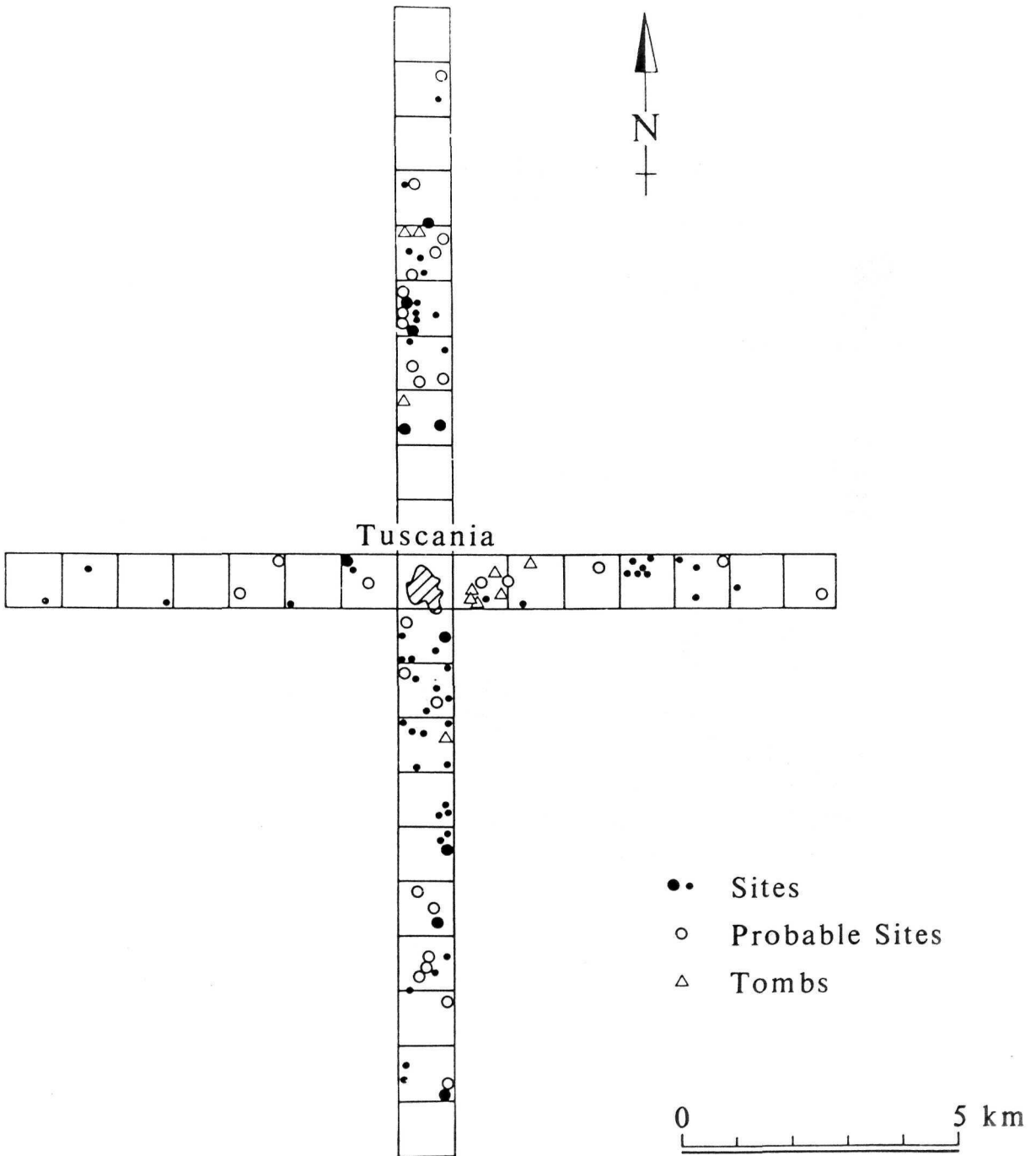


Figure 47 Intramax regionalization of potential interaction 1879, the *eparchy* of Doris (From Doorn 1985).



Figure 49 Villanovan settlement scatters identified from surface ceramics across the Etruscan city of Veii (from Spivey and Stoddart 1990).



The results of the Tuscania survey for the Archaic period (after Baker 1988).

Figure 50 Proliferation of rural sites in the territory of the minor Etruscan city of Tuscania during the Archaic period (from Spivey and Stoddart 1990).

A TYPICAL BOEOTIAN DENSITY PLOT

In the northern sector, the ground slopes steadily from north to south;
in the southern it is virtually level

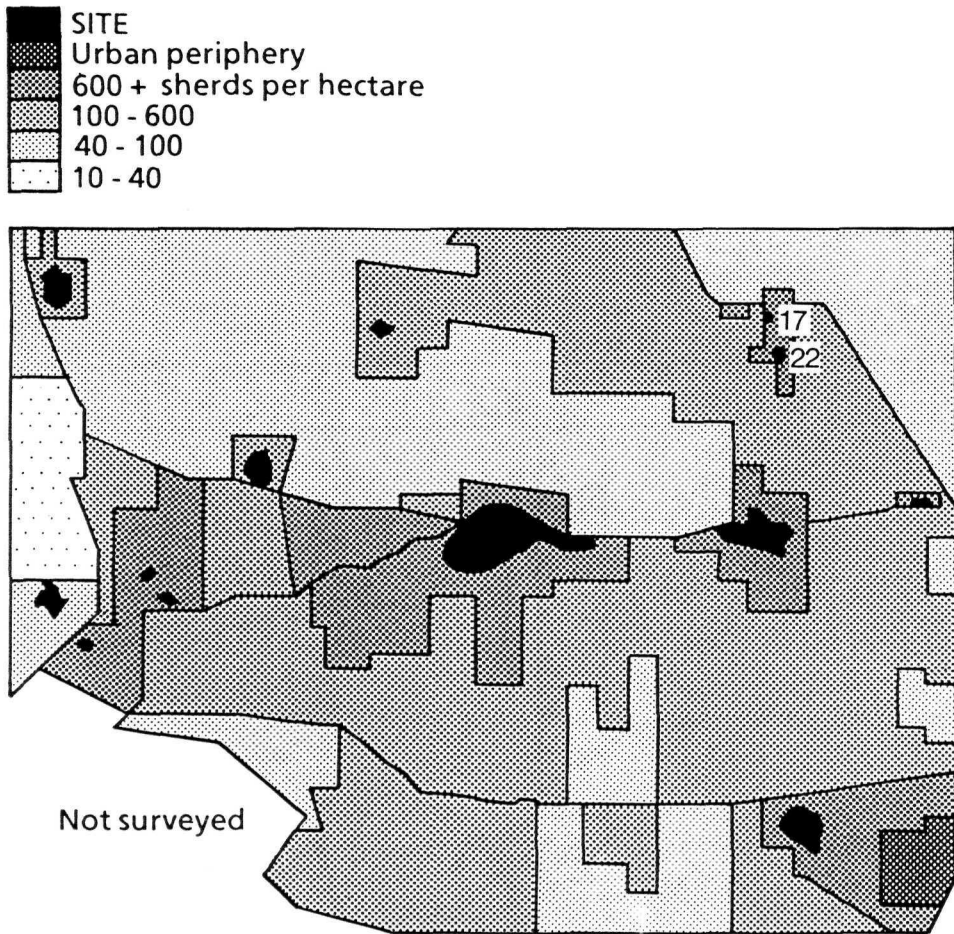


Figure 51 Offsite surface pottery density plots for a district immediately west of the ancient city of Thespieae in Boeotia.

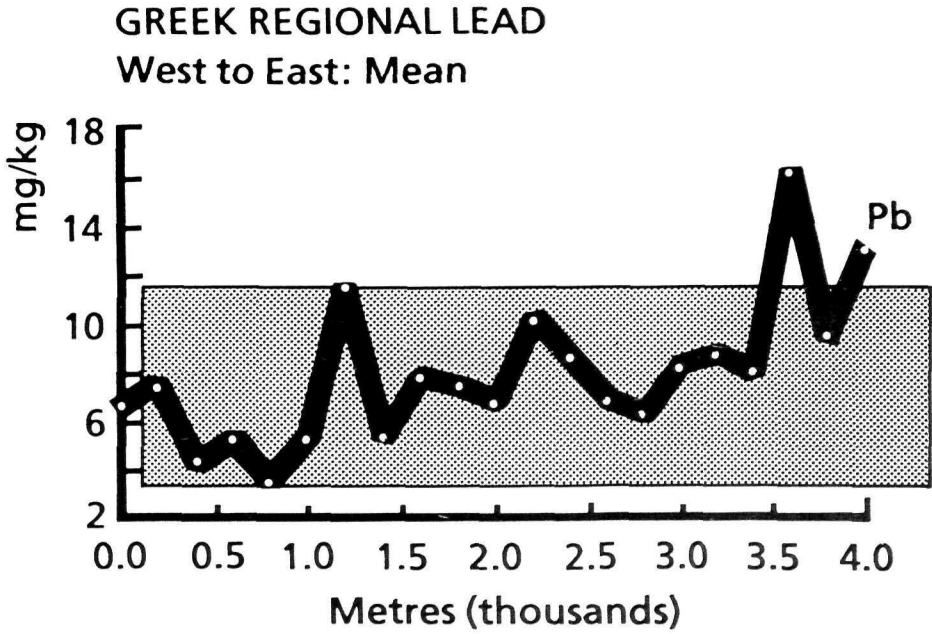


Figure 52 Trace metal Lead values in soil samples taken over a distance of 4 kilometres in a transect running eastwards towards ancient Thespieae.