

## THE DEVELOPMENT OF SETTLEMENT IN SOUTH-WEST BOEOTIA

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### RÉSUMÉ

Depuis 1979, les Universités de Bradford et de Cambridge, sous la direction conjointe des Professeurs J. Bintliff et A. Snodgrass, ont procédé à une exploration de surface dans le Sud-Ouest de la Béotie, destinée à localiser et étudier les sites habités entre l'ancienne Thisbé, Thespies et Haliarte. L'observation des changements intervenus depuis l'époque néolithique jusqu'à l'occupation turque amène l'auteur à faire des observations sur l'évolution démographique, l'occupation des sols, la géographie politique, et surtout l'arrière plan économique et social du développement historique de la Béotie antique. L'exposé montre les techniques et les limites de l'exploration de surface dans le contexte béotien, avec les cartes les plus récentes.

### INTRODUCTION

One of us (J.B.) conducted during the 1970's a series of individual regional studies in the Greek mainland and islands, concentrating especially on those aspects specified in the title of the work incorporating the results, *Natural environment and human settlement in prehistoric Greece* (1977). These operations both produced their own substantial results, and pointed the way for extending their basis : In particular, if the chronological range were to be enlarged to cover the whole of antiquity, or even perhaps the whole human past, in a given region, and both all known archaeological sites and all un-recorded but still visible surface sites were to be located and analysed, then a team of some size was clearly going to be needed. The archaeological range alone would demand a combination of expertise not to be found in one person's competence ; several of the non-archaeological aspects, such as vegetational history, involved specialisms of their own ; the study of settlement patterns, if brought down to very recent times, would demand anthropological as well as historical experience ; while the basic work of field-walking, if it was to be extended over an area of significant size without loss of intensity, would require many pairs of feet. Meanwhile, such lessons were in any case being learned and applied by others in different parts of the Greek landscape. The pioneering work of the University of Minnesota Messenia Expedition in the 1960's, though theirs was not an intensive survey, has served as a paradigm for all subsequent work of this kind in Greece. The full publication of their work, *The Minnesota Messenia Expedition : reconstructing a Bronze Age environment* (edd. W.A. McDonald and G.R. Rapp, 1972) was followed a decade later by the next full-length survey publication from Greece, *An island polity : the archaeology of exploitation in Melos* (edd. C. Renfrew and M. Wagstaff, 1982). But there are major differences of approach between the two. The Minnesota project covered, by Aegean standards, a huge area (about 3800 sq.km) but, as the title of the volume indicates, with a concentration on one period ; the Melos project started with an area of less than 3 % of that size and then surveyed intensively a 20 % sample, chosen on a 'systematic random' basis ; but it did so for *all* periods of the pre-Medieval era. Meanwhile, briefer publications had been appearing, which showed that at any rate American and British archaeologists working in Greece were becoming converted to survey in its broad sense. One of us again, (J.B.) was fortunate

to be involved in the most thorough and imaginative of these projects, the Agiofarango Survey (Blackman D.J. and Branigan K. 1977, Eds).

An intensive, all-period archaeological survey of a well-chosen region can form the basis for a range of historical inference that is both broad and deep. It will inevitably throw at least as much light on rural as on urban settlement. Most experienced field-workers in Greece today would agree that, of all the regions of the Greek mainland, Boeotia could claim one of the highest priorities for a field survey operation. The settled agricultural population of ancient Boeotia which was once the butt of sardonic Athenian comment has not only survived, to an unusual extent, even into the 1980's ; it also provides a near-ideal setting for the application of an archaeological technique like intensive survey.

A further strong case can be made for employing less traditional techniques. Boeotia, besides being a predominantly agricultural region throughout its history, was also for much of antiquity a federation of cities. This means that the excavation of a single urban centre, which in the case of unitary city-states like Athens, Corinth or Sparta would at least be likely to throw light on the central organisation of government and cult, would have to be repeated many times over before any such picture could be obtained of the organisation of Boeotia. Some more extended technique than excavation, embracing at least a part of the territory of several cities, is therefore more appropriate. Intensive survey seems a natural choice for the task and, conversely, Boeotia seems to offer a good testing-ground for intensive survey.

#### SURVEY METHODOLOGY AND THE PROGRESS OF THE PROJECT 1978-1982

*Why chose to conduct an intensive rather than an extensive survey in the first place ? Intensive survey, wherever it has been tried, has brought to light a density of sites vastly higher than that revealed by extensive survey.* To make an extreme comparison, the density which we have regularly found over four years and in all types of terrain, between three and four sites per square kilometre, is about fifty times as high as that produced by the extensive coverage of the Minnesota Messenia Expedition.

Before initiating the intensive survey, four members of the eventual survey party undertook, in July 1978, an exploratory study of Boeotia from a central base in Thebes.

##### *The 1979 season*

In July/August 1979, we took the field for our first full season of survey. By this time we had settled on a sample area for survey (Fig. 1). We had decided that the choice of area should be governed more by judgment than by probabilistic means, whether random or systematised. In other words, ours was to be a stratified sample, of a kind in which a diversity of land-types, as far as possible in proportion to their incidence in Boeotia as a whole, would be guaranteed. More specifically, we wanted our sample to include, not only a representative range of soils, but also parts of the territories of more than one ancient state ; to cover both terrain known to have been favoured for prehistoric settlement and terrain *not* known to have been so favoured ; and so on.

Our method of proceeding was to lay over the geological and soil maps of Boeotia a grid of large, 100-square-mile units, with the idea that our sample should overlap more than one of these squares, yet include substantial sectors of each major soil and rock type. We should then have a substantial area of up to 500 square kilometres (or, administratively speaking, about half a dozen parishes), for which we could apply for a permit to survey, and *within* which we could choose a smaller, equally representative sub-sample for actual intensive examination. In a region as large as Boeotia (some 2580 square kilometres in all), it seemed to us that a single block of territory, rather than a scatter of smaller units, would be the more convenient form for the 'outer sample' provided that one could be found to incorporate the full range of Boeotian land-types (Fig. 2 and 3 ; the area covered hitherto, belonged to several city-states — Thespieae, Haliartos and Thebes).

At this point we should explain our preference for a single block of territory, rather than a scatter of quadrates or a series of systematically-spaced transects. The experience of other surveys which had employed one of these

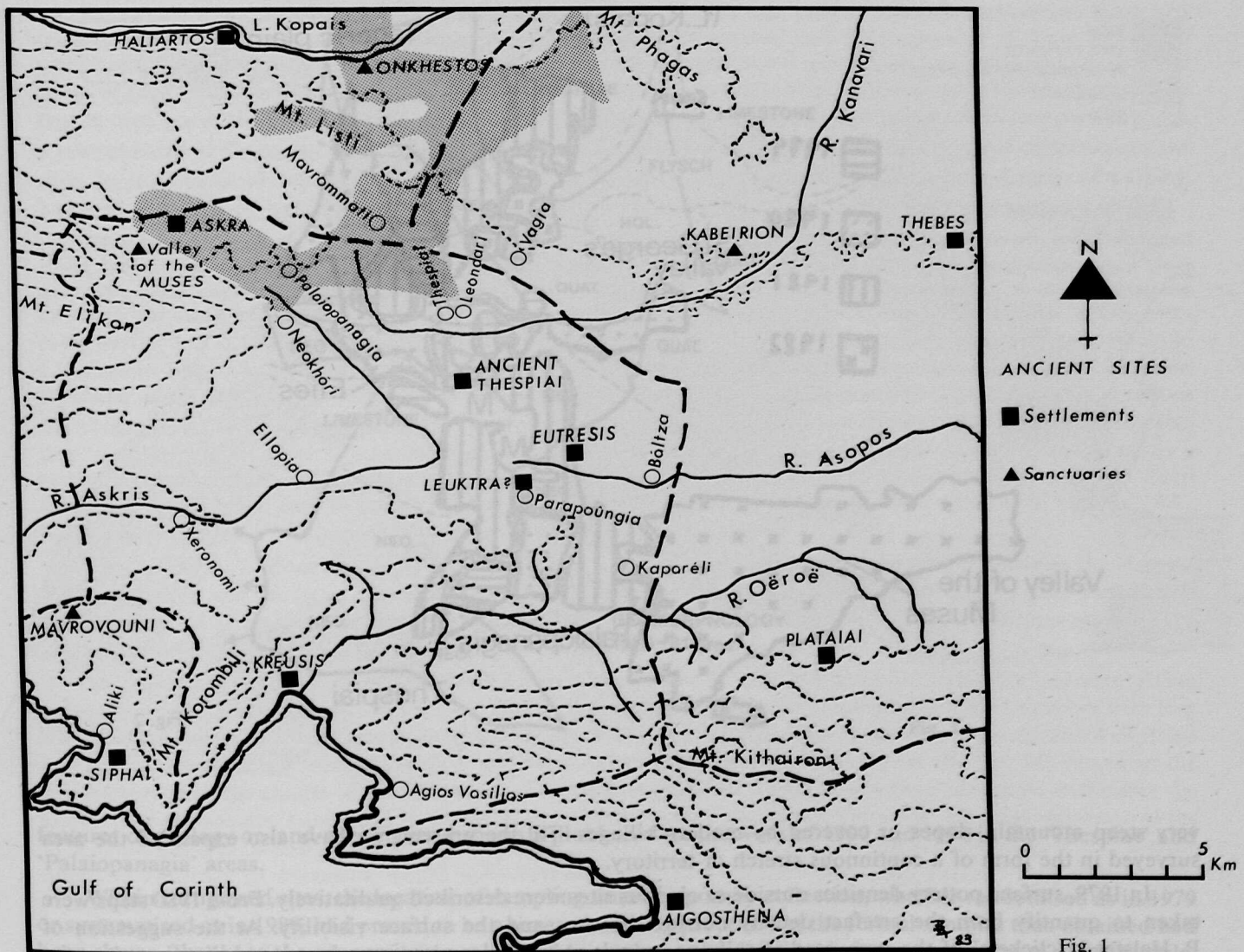


Fig. 1

latter methods suggested to us that, while they are successful in picking up a sample of the smaller, commoner and more dispersed units of settlement, they are less so in discerning the *hierarchy* of settlement; whereas a single block of territory, if it is substantial enough, can hardly fail to represent most or all of the range extending from the urban centre to the small isolated farmstead. Many examples could be given from British or Mesoamerican archaeology to illustrate this point; but perhaps we could take one from archaeology in Greece. The Melos Survey, which covered a 20% sample of an island of 105 square kilometres and discovered about fifty new sites, shows every sign of having assessed the small-site-density correctly; but its findings in respect of the later Bronze Age, part of which was represented by not a single site, have proved more controversial. The inference that the urban centre of Phylakopi was, during this phase, the *only* centre of habitation on the island is surprising on many grounds, but it would have been more convincing if it had been based on survey of a substantial block of land in some part of the island well away from Phylakopi.

To return to the techniques employed by us in 1979. Our aim in the field-walking was to achieve a hundred-per-cent coverage of the chosen area and it is worth stating now that, although we have since modified such aspects as the spacing of the field-walkers, we have adhered to this aim apart from a few areas located on

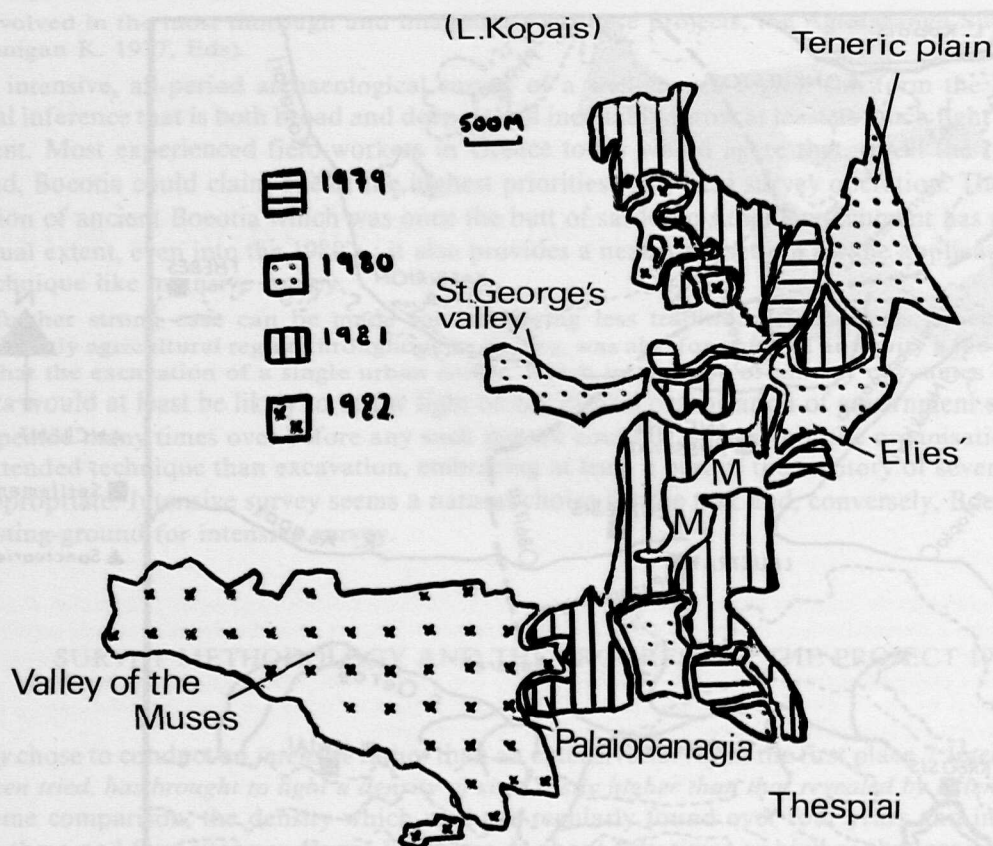


Fig. 2

very steep mountain slopes or covered by modern villages. Till the present, we have also expanded the area surveyed in the form of a continuous stretch of territory.

In 1979, surface pottery densities outside of obvious sites were described qualitatively. From 1980 steps were taken to quantify both the artefact density outside the sites and the surface visibility. At the suggestion of P. Halstead, 'clickers' of the type used in tallying crowds at turnstiles were introduced and distributed to the field-walkers: this proved a most effective innovation, enabling the number of artefacts seen in each transect to be totalled without difficulty. Each team leader having meanwhile paced the sides of the transect as it was being walked, a figure of density per square metre was readily obtained. In areas of fairly high density, the walkers called out the sherds and other finds at the same time as 'clicking' them, so that the vicinity of a site was proclaimed both by the crescendo of voices and the subsequent tally counts. At the end of a transect, walkers were also asked to grade the visibility encountered in their particular strip of ground, on a scale of 1 to 10. These figures too were recorded, enabling us to 'filter out' the effect of surface visibility on sherd density.

As a result, it was possible at the end of the 1980 season to produce, for the first time, total pre-modern surface pottery density plots for the land-scape, which showed the expected 'halo' effects round most of the sites. Where the 'halo' was absent, the sites in question — mostly small, and with pottery of unusually high quality — could often be recognised as burial locations. Where there was a 'halo effect' without an accompanying site, the possible explanations were either that a 'non-site' — that is, a location of activity without permanent settlement — had been detected, or that there was in fact a site there, but one whose visibility happened to be poor in the season in which it was discovered. Needless to say, these data are susceptible of considerable further analysis; there can be no immediate or simple understanding of the variations in density away from the obvious sites. But we believe that these density plots provide a foundation on which an entirely new application of field survey can be built; for example, the density figures can be plotted against topographical features, such as slope, as well as against

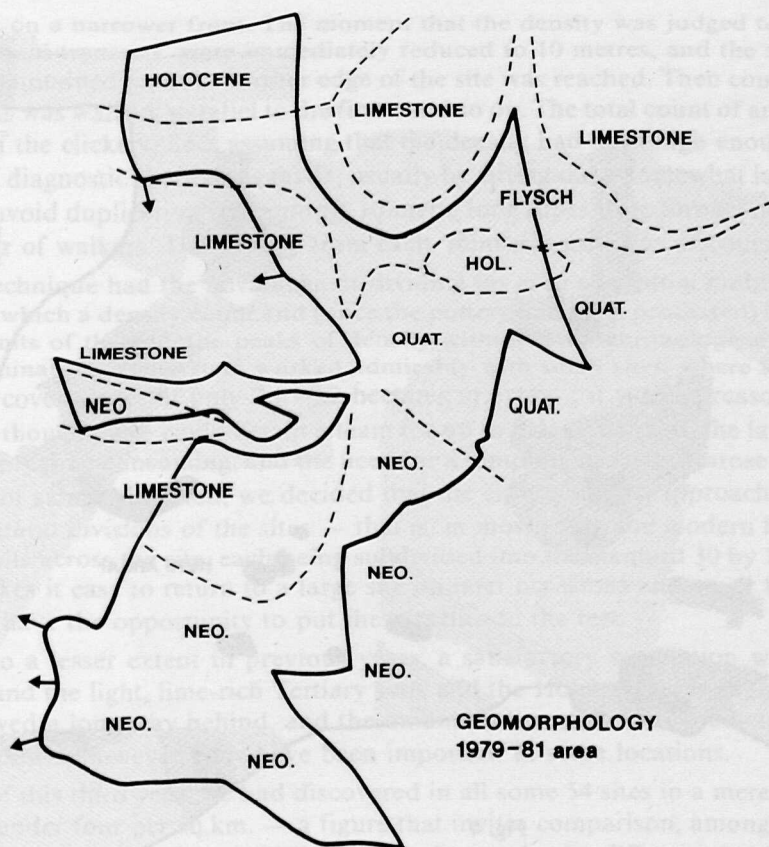


Fig. 3

features of geology or land-use. Figure 4 shows a plot based on the work of 1980 and 1981 in the 'Thespieae' and 'Palaiopanagia' areas.

Within recognised sites, the location of sampling units for pottery collection, whether randomised as in 1979 or systematised as in 1980, had proved to be a time-consuming process. Yet the formal samples thus obtained had been shown (thanks to the concomitant use of 'grab' samples) to be deficient in important respects: for example, whole periods were missed by them, but later found to be represented on the site. Their function was thus reduced to that of forming a basis for inferences as to the density and extent of a site; yet even the analysis of density was affected by their chronological weakness since evidence exists to show that, not surprisingly, a longer duration of occupation produces a higher density of surface finds. If, therefore, it proved possible to carry out a hundred-per-cent coverage of a site about the same length of time as it took to lay out the samples (with their coverage of only 3 to 8%), then surely this would better serve the purpose of elucidating density, extent and chronology together. Such, in the event, proved to be the case for the small and medium-sized sites which comprise the great majority of those discovered by us. A system of total site coverage was employed in 1981 which, with the significant exception of the largest site found that year, enabled us to deal with new sites in rather less time than in the previous two years.

The system (Fig. 5) amounted to a scaling-down of the field-walking transect, which in 1980 had proved successful at least for the calculation of surface densities, to a size appropriate to a site of up to 1 hectare in area. When in the course of a standard field transect — which on the new 15-metre spacing between field-walkers would typically be a rectangle of 60 metres by, say, 50 metres of length — the calls of the field team indicated a notable increase in density, then the line would be halted and the size of transect reduced in two stages. First, the team would retrace its steps to the point where the rise in density was first apparent; then the frontage would be halved to 30 metres, the spacing thus being reduced to 7.5 metres; then walking would be resumed, but in much shorter

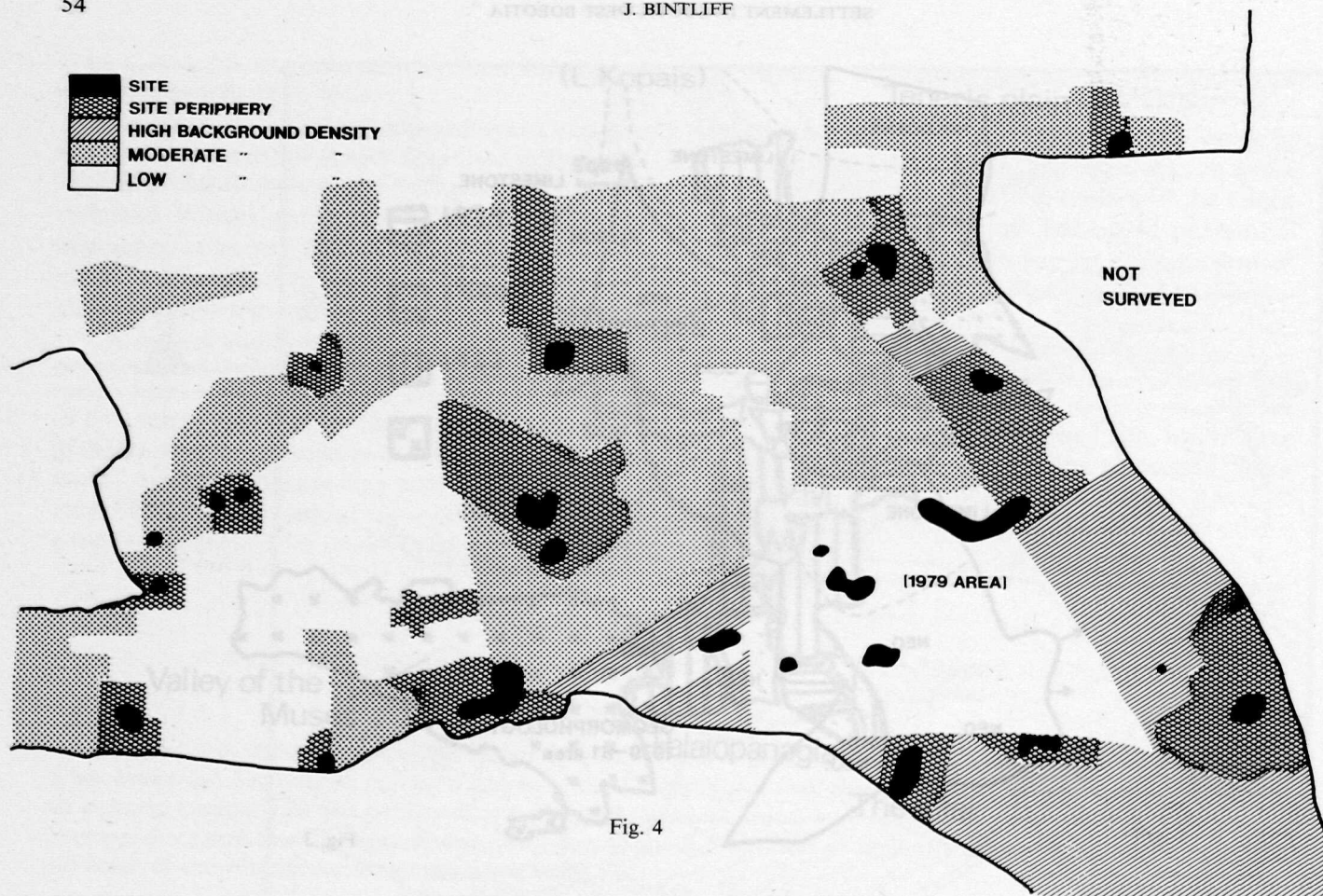
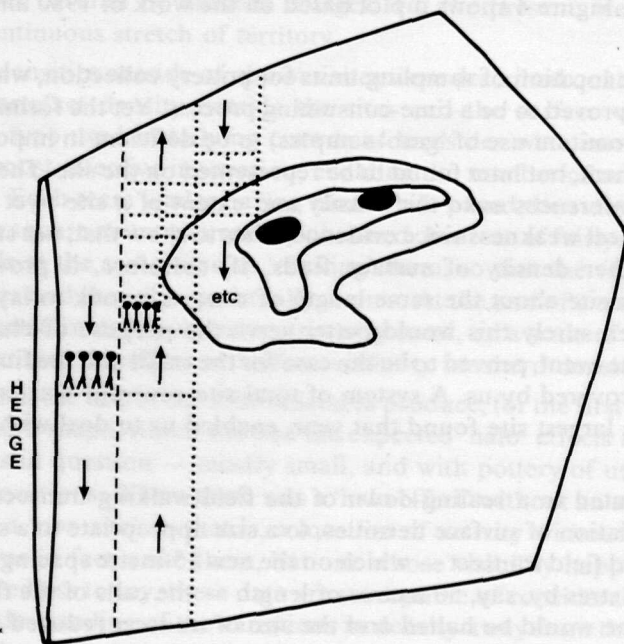


Fig. 4



SITE ANALYSIS 1981 →

Fig. 5

lengths as well as on a narrower front. The moment that the density was judged to have reached 'site level', the lengths of these 'mini-transects' were immediately reduced to 10 metres, and the succession of these 300-square-metre units was maintained until the farther edge of the site was reached. Then course was reversed and a second series of such units was walked, parallel to the first; and so on. The total count of artefacts for each unit was taken (again with use of the clickers) and, assuming that the density had been high enough to constitute part of a site, a selective cull of diagnostic sherds was made, usually by sifting out a somewhat larger original collection on the spot. In order to avoid duplication of counting, 10-metre long ropes were thrown down along the axis of walking, between each pair of walkers. The pottery from each 'mini-transect' was of course bagged separately (Fig. 6).

This rapid technique had the advantage of dividing up each site into a multiplicity of small, easily located units, for each of which a density count and (once the pottery had been processed) chronological indications were available. The limits of the site, the peaks of density within it, the chronological changes of focus, all became apparent on examination. The system worked admirably with small sites, where half-a-dozen units in two rows often sufficed to cover a site of only 0.1 - 0.2 hectares in extent; it worked reasonably well with sites of up to 1 hectare in area, though these could detain a team for up to a day; but with the large sites of 4 hectares or more, it proved impossibly time-consuming, and the need for a sampling procedure arose once again. In order to reduce the complexities of sample-location, we decided that the easiest way to approach large sites on the new system was to use the natural divisions of the sites — that is, in most cases, the modern fields — and to cover totally a scatter of such units across the site, each being subdivided into the standard 30 by 10 metre 'mini-transects'. Such an approach makes it easy to return to a large site on later occasions and cover fresh areas of it. Only in 1982, however, did we have the opportunity to put these tactics to the test.

In 1981 as to a lesser extent in previous years, a satisfactory correlation was noted between the densest site-distribution and the light, lime-rich Tertiary soils and the Holocene soils round the Copais; the Pleistocene plain clays followed a long way behind, and the mountain limestone was predictably even thinner in sites. The pre-limestone deposits, however, may have been important in some locations.

By the end of this third year, we had discovered in all some 54 sites in a mere 13.7 square kilometres, giving a density of just under four per sq.km. — a figure that invites comparison, among other Greek surveys with that from the equally intensive Ayiofarango Valley survey. It must be the *difference in intensity of survey* which explains the gulf between such a level of density, and those represented by other surveys on the list. We return to the comparison with the results of the Minnesota Messenia Expedition. Here, in a region one-and-a-half times the size of ancient Boeotia, a total of 136 Classical to Hellenistic sites was found, although informed estimates of the then population of Messenia place it at a level of 100,000 or more. One could reasonably suggest that a more intensive coverage of Messenia would have revealed a mass of smaller sites, and support this argument by comparing the Messenia Expedition's cumulative plot of site sizes for the Late Helladic III B period with our all-period plot of site sizes to 1981. (Unfortunately we cannot make direct comparison of all periods as the Messenia survey did not record site areas for the post-prehistoric period). In fact the Boeotian plot shows a very high percentage of sites so small that they barely enter the lower end of the range of site-sizes recorded for Messenia.

A prediction based on our first three years's results would suggest that an intensive survey of the whole of Boeotia, even though it might take well over a century to carry out, would produce at least 10,000 surface sites, a large majority of which would have been occupied within the time-span of Classical Greek to late Roman. As our sampled area proved to have been disproportionately rich in arable land, this total doubtless needs to be lowered (perhaps to the order of c.45000 ?). But the calculation serves to bring home the magnitude of the problem that we have tackled. If the current project can be continued for ten years, it will still on present projections end with a coverage of only some 4 % of the surface of Boeotia. In such circumstances, the initial aim of covering parts at least of two or three ancient city territories and studying their comparative development still seems to us the soundest.

#### *The 1982 season*

The main outstanding problem, to devise a sampling strategy for the largest sites, was presented to us in extreme form by the site of Askra. Its surface-area proved to be about 25 hectares, comparable with that of the

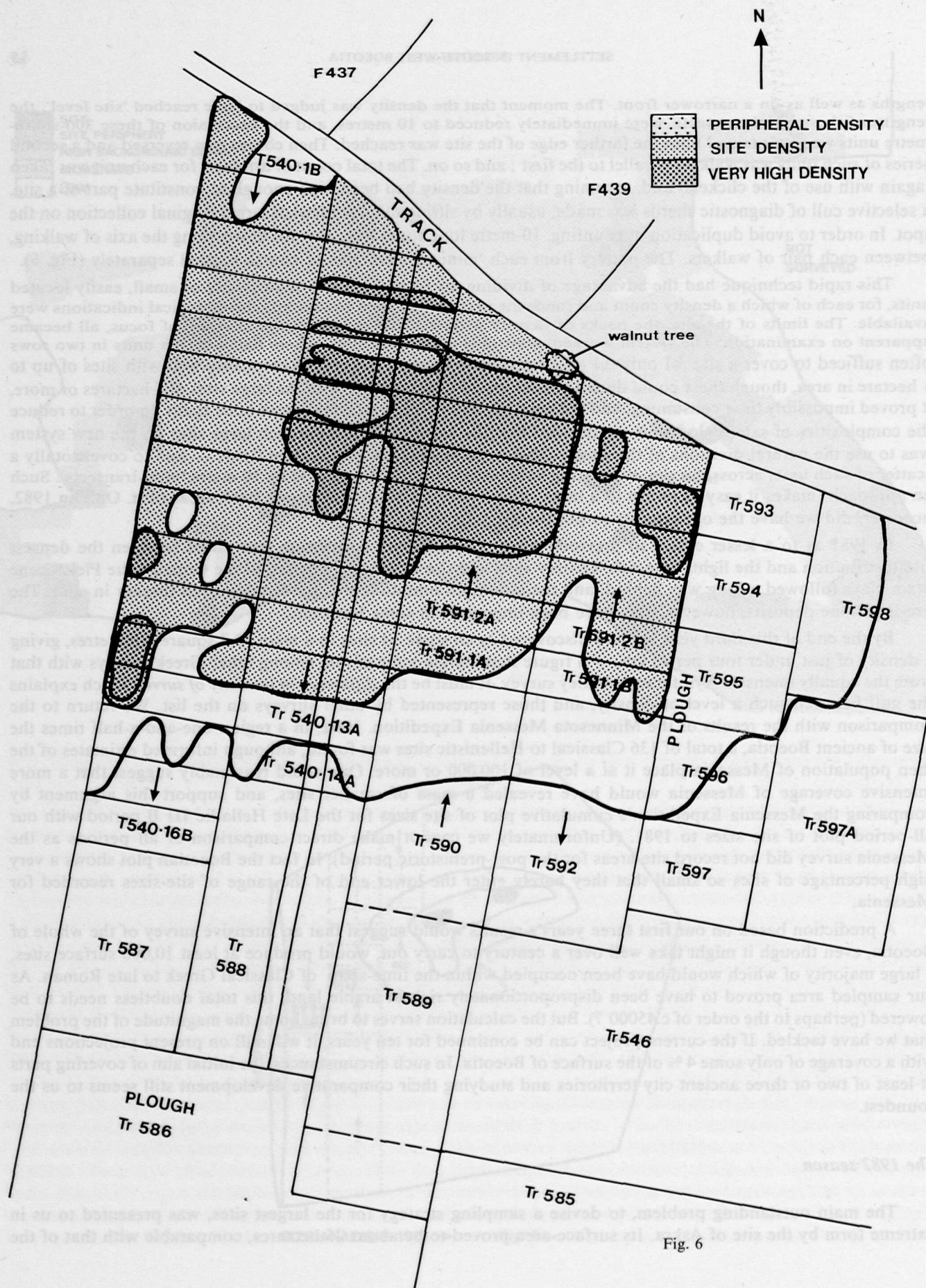


Fig. 6

city-area of Thisbe and actually larger than the combined area of citadel and lower town at Haliartos, a neighbouring *polis*. For a site on such a scale, the technique of sampling a scatter of individual field-units was employed — so far as we can judge, with success. The density of sites revealed in the 1982 season continued to be a rich harvest over many periods of the past. Our cumulative site-density figure of just under 4 per square kilometre was thus reaffirmed. Figure 2 gives a conspectus of the coverage in each of the four seasons.

## PERIOD ANALYSIS

### Prehistoric

The adjacent figures 7 - 9, giving first of all the distribution of *all* prehistoric sites over the whole area so far surveyed and then a period break-down over the same area (shown this time on a larger scale and in two parts), bring out the first salient feature of our results here : the relatively thin and very uneven distribution of prehistoric sites of any period. The total number stands in a ratio of only about 1 : 5.5 (13 as against 73) to the number of Archaic to early Hellenistic sites from the same area (despite the fact of representing a period many times as long), and the rich tertiary soils in the central band of our survey area, so much favoured in later periods, are totally neglected. Correspondingly, our ratio of site-density to that obtained by the Messenia expedition is only about 10 times as high (or even, if one allows for the higher proportion of *cultivable* land in our area and calculates the number of sites per square kilometre of such land *only*, perhaps 5 times as high), as against the much bigger 'multiplier' of about 50, obtained from the counts of sites of all periods. This may in part reflect the Messenia expedition's determined search for prehistoric, especially Late Helladic sites. Such findings may to a certain degree reflect reality ; the very high site-density, and the correspondingly high level of population inferred there

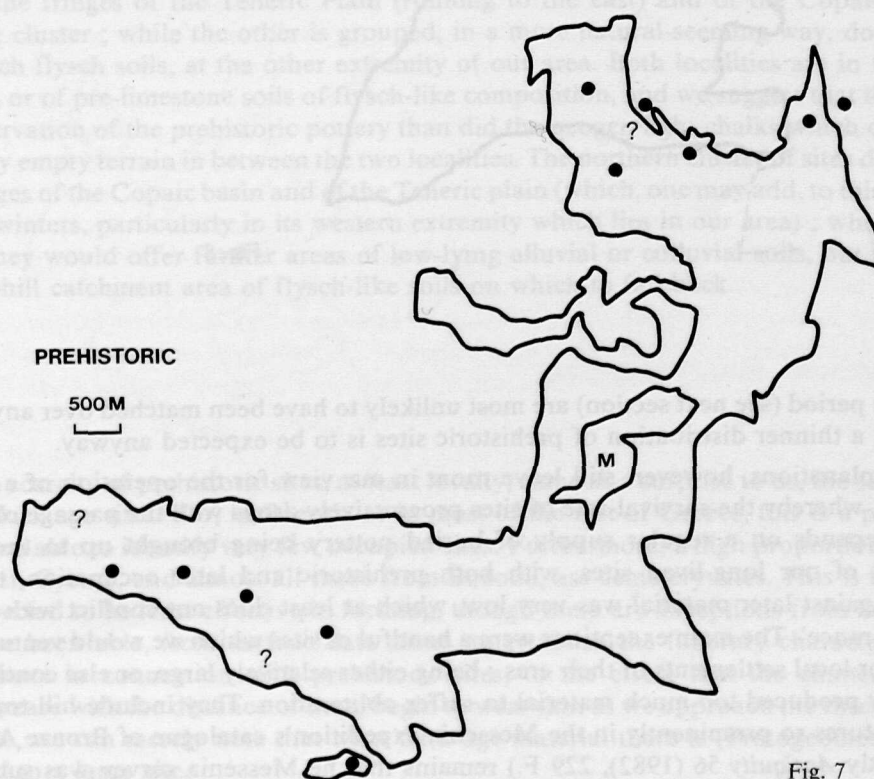


Fig. 7

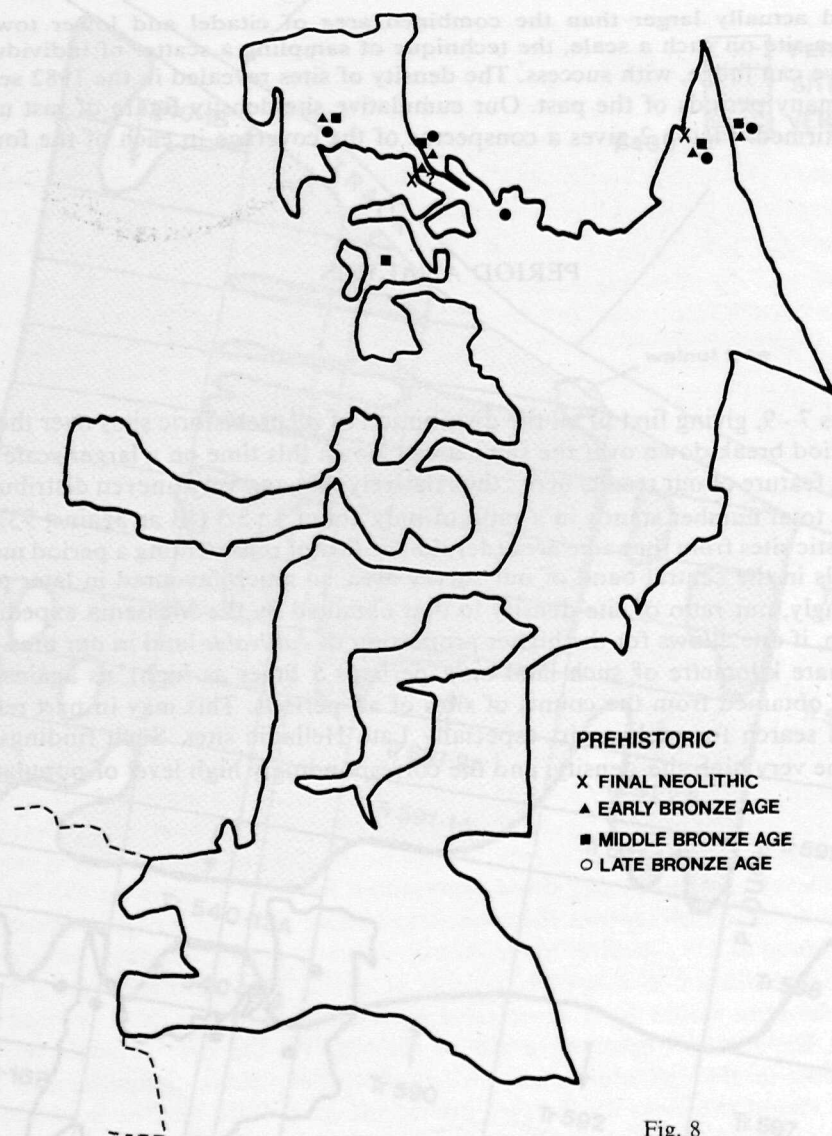


Fig. 8

from, in the Classical period (see next section) are most unlikely to have been matched over any sustained period in prehistory, so that a thinner distribution of prehistoric sites is to be expected anyway.

These partial explanations, however, still leave room in our view for the operation of a further factor : a 'cumulative site-loss', whereby the survival-rate of sites progressively drops with the passage of time. In the long term, site survival depends on a regular supply of buried pottery being brought up to the surface by later cultivation. On most of our long-lived sites, with both prehistoric and later occupation, the proportion of prehistoric finds as against later material was very low, which at least does not conflict with the hypothesis of 'progressive disappearance'. The main exceptions were a handful of sites which we would venture to suggest, may have formed the major local settlements of their eras ; being either relatively large, or else continuously occupied for long periods, they produced too much material to suffer obliteration. They include hill-top 'acropolis' sites, of the kind which features so prominently in the Messenia expedition's catalogue of Bronze Age sites. Our own view (see most recently *Antiquity* 56 (1982), 229 F.) remains that the Messenia survey was successful mainly in

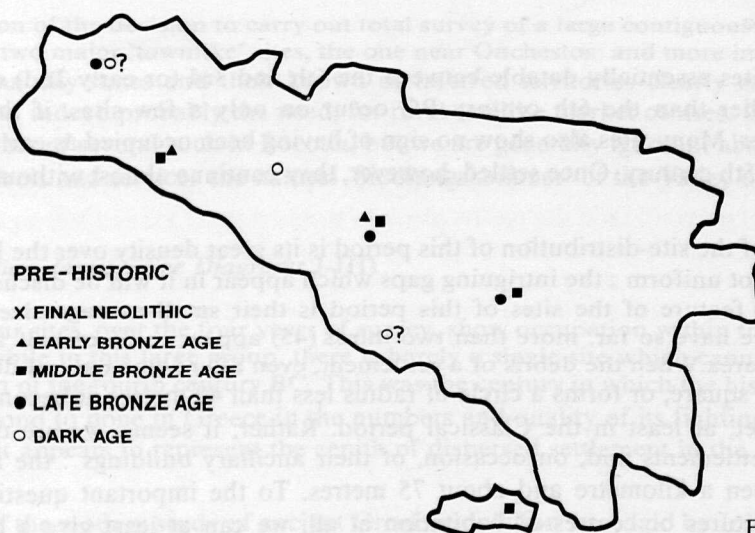


Fig. 9

locating the prehistoric sites at the *upper* end of the hierarchy. This view would be more convincing if backed with a wide scatter of minor sites in our own survey ; but even now we can point to a modest prehistoric element on some 8 relatively low-lying sites, to set alongside the 5 'major' sites, mainly on hill-tops, mentioned above. For more detailed hypothetical speculations on these points of prehistoric site density, see Diagram III.

It will be seen that our prehistoric sites are concentrated in two groups : at the northern extremity of the area surveyed, round the fringes of the Teneric Plain (running to the east) and of the Copaic basin (lying to the north-west) is one cluster ; while the other is grouped, in a more natural-seeming way, down the Valley of the Muses, with its rich flysch soils, at the other extremity of our area. Both localities are in fact characterised by deposits of flysch, or of pre-limestone soils of flysch-like composition, and we suggest that this may have worked better to the preservation of the prehistoric pottery than did the neogen light chalks which compose much of the rich but apparently empty terrain in between the two localities. The northern cluster of sites does suggest a definite interest in the fringes of the Copaic basin and of the Teneric plain (which, one may add, to this day suffers seasonal flooding in most winters, particularly in its western extremity which lies in our area) ; when and if these basins were cultivable, they would offer further areas of low-lying alluvial or colluvial soils, but most of the sites had in any case an uphill catchment area of flysch-like soils on which to fall back.

### *The dark age*

If the relative scarcity of prehistoric sites, at least locally, came as a surprise to us, the same could not be said in respect of the dark age sites. For, in Boeotia as in most of the rest of Greece, this is a period for which even excavation has been able to identify very few occupied sites. Furthermore, a high proportion of the dark age sites which *are* known in Greece, and almost all those from Boeotia, are cemetery-sites. This is the type of site which survey can be expected to be least effective in locating, though there are exceptions from later periods where we think that we have been able, from surface data alone, to establish the funerary character of a few sites. The argument used above in connection with prehistoric sites, to the effect that the chances of total or partial disappearance increase with the distance of time, begin to wear thin as we approach the threshold of the historical period. Meanwhile, we can merely note that what dark age material there is (Protogeometric and Geometric at Askra) is confined to a large site.

*Archaic to early Hellenistic*

By this we refer to sites essentially datable between the 6th and 3rd (or early 2nd) centuries BC. Wares of a date demonstrably earlier than the 6th century BC occur on only a few sites, if those with a prehistoric occupation are disregarded. Many sites also show no sign of having been occupied as early as the 6th, or in some cases even as early as the 5th century. Once settled, however, they continue almost without exception into the 4th and 3rd centuries BC.

The striking feature of the site-distribution of this period is its great density over the landscape (see Fig. 10). The density is, however, not uniform: the intriguing gaps which appear in it will be discussed presently. Perhaps the next most significant feature of the sites of this period is their small average size. Of the sample of 66 measurable sites which we have so far, more than two-thirds (45) appear to be of half a hectare (5 000 square metres) or less in surface area. When the debris of a settlement, even after some natural dispersal, covers an area less than about 70 metres square, or forms a circle of radius less than 40 metres, it becomes difficult to see it as a village or even a hamlet, at least in the Classical period. Rather, it seems, we are dealing with a mass of independent farmstead settlements and, on occasion, of their ancillary buildings: the intervals between two adjacent sites vary between a kilometre and about 75 metres. To the important question whether our 'sites' represent permanent structures or centres of habitation at all, we can at least give a confident answer: the invariable discovery, on all our 'Classical' sites (to use this shorthand term for the more cumbersome 'Archaic to early Hellenistic'), of terracotta roof-tiles, can only mean that they housed buildings of durable construction in stone, brick or timber. The evidence of Mr. Maude's (Manchester University) electrical resistivity testing, where it has been applied has reinforced this view, as does the high incidence of household pottery-shapes.

Not all our Classical sites, however, are of this small size. A group of some half-dozen, ranging between 1.0 and 2.5 hectares in area, are perhaps to be ranked as small settlements. In a separate category we may tentatively place sites several hectares larger again, which include sanctuaries and major rural settlements. In a distinct category, finally, in terms of both magnitude and artefact-density, belongs the newly discovered town site of 'Askra' at 25 hectares — a satellite of the city of Thespieae (to the south-east off the map).

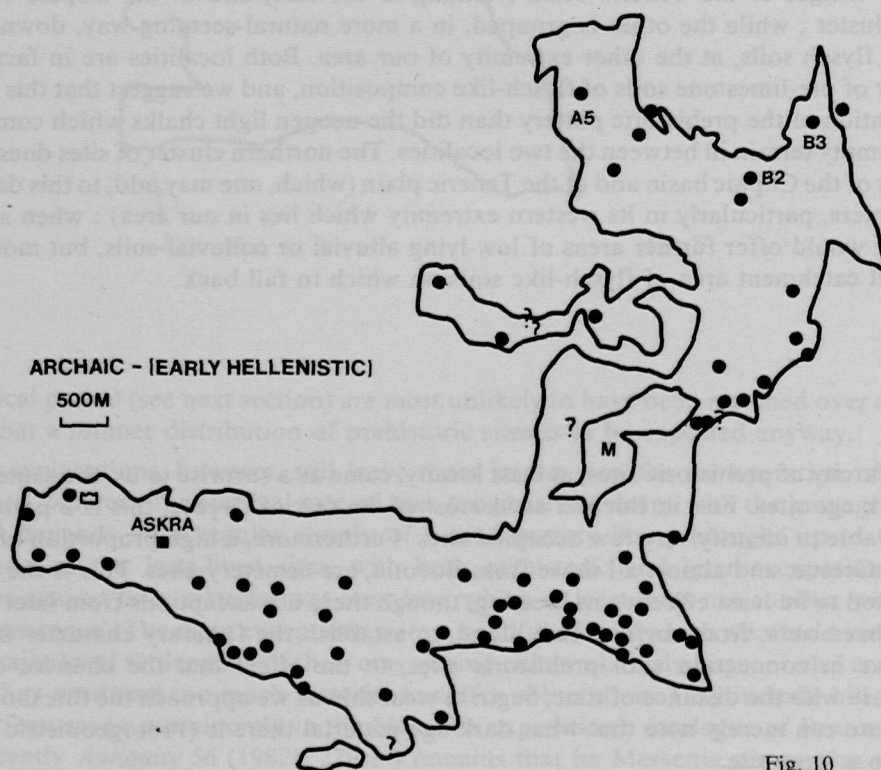


Fig. 10

A notable validation of the decision to carry out total survey of a large contiguous block of land can be seen in the discovery of the two major 'townlike' sites, the one near Onchestos and more importantly the great Askra site. A map of Boeotian city-states and their known or inferred territories clearly reveals amongst the larger territories the scope, and indeed probably the need, for rural satellite market centres. Literary sources do indeed provide us with the names of several such in Boeotia, but we are generally ignorant about the scale of these rural foci. Askra clearly controls and services the natural 'Siedlungskammer' of the Valley of the Muses for Thespieae.

*An excursus on population density (See Diagrams I-III)*

Close to 90 % of our sites, over the four years of survey, show occupation within the bracket of 'late Archaic to early Hellenistic' ; while in this large group, there is barely a single site which cannot be shown to have been occupied in at least part of the fourth century BC. This was the century in which the historian Ephoros described Boeotia as a region second to none in Greece in the numbers and quality of its fighting men, and it is gratifying that, on our evidence, it appears to represent the zenith of dispersed settlement in the entire recorded history of the region.

The foundations of the modern study of ancient Greek population were laid by Julius Beloch's work in 1886. Beloch's conclusion was that in the latter part of the fifth century BC, the total population of Boeotia was in the region of 150,000.

Twenty years after the publication of Beloch's work, the discovery of the papyrus containing the fragmentary text of the 'Oxyrhyncus Historian' gave a new basis for discussion (Diagram I) (cf. P. Roesch, 1965). The extant passages give clear figures for the main land army levy of the Boeotian Confederacy at about 395 BC : each of the eleven districts was to provide 1,000 hoplites (heavy infantry) and 100 cavalry. To this total of 12,100 men we have first to add a figure for the light-armed troops (for which no quota is given) : it seems a safe inference that the numbers will have at least matched those of the hoplites. Indeed, at the battle of Delion in 424 BC, the light-armed had considerably outnumbered the hoplites.

If we content ourselves with a figure of 11,000 for light-armed, our total reaches 23,100 but to this must then be added a figure for the number of seamen serving in the Boeotian fleet. P. Salmon (1953) reached the conclusion that the mean strength of the Confederacy's fleet in the later fifth century was about 50 triremes, and the evidence of several episodes in the Peloponnesian War makes this seem a fair estimate ; later, in the time of Epaminondas, there were to be twice that number of ships. Reckoning the company of each trireme at 200, we have a further 10,000 men to add, giving an approximate total of 33,100 under arms in the later fifth century. If we then use a multiplier of 5 to reach the figure of total population (allowing equal number of men and women, two children per family and a slave for each household), we obtain a total of 165,500. The resemblance between this figure and the one which Beloch reached without the aid of the Oxyrhyncus Papyrus is, however, partly fortuitous ; for J. Beloch assumed a quite different figure for the slaves, the most controversial element in the sum. He estimated a slave component that was 50 %, not 25 %, of the total *free* population, so that his method, when applied to the Oxyrhyncus figures, would presumably have yielded a total of 198,600. Further, the recent work of M.H. Jameson (1977/8) on agricultural slavery has suggested that Beloch's high ratio of slaves to freemen, even in a predominantly agrarian society like Classical Boeotia, may not be a gross over-estimate.

Recent work, notably that of A.B. Cooper (1977/8), has suggested that a common range of size for Classical land-holdings was between 3.6 and 5.4 hectares ; the upper end of the range is most frequently represented and must lie (as perhaps the whole of this range does) within the bracket of qualification for the 'hoplite census', the level of property needed to place its owner in the ranks of the heavy infantry who provided their own armour. 5.4 hectares might thus be taken as a 'typical' hoplite holding. M.H. Jameson, in the paper referred to above, adopts a very low assumed corn yield of 400 kilograms per hectare, and an estimated annual requirement of 1000 kg of 'wheat-equivalent' for a family of five. But careful study of these figures leads to the inevitable conclusion : such a plot, with one-third to one-half of the land lying fallow simply cannot meet the family's needs, let alone provide a surplus to help furnish the hoplite's armour (even less so, if it included a small vineyard). But other studies have suggested a cereal yield at least twice as high as that assumed by M.H. Jameson : between 9 and 12 bushels per acre, as against his equivalent of a little over 4 bushels. On this basis, a 'standard' farm of 5.4 hectares, even with a 50 % fallow, incorporating for example cereals grown under olives, could feed its family

of five on some two-thirds of the cultivated land, leaving the rest to generate a smallish surplus. The importance of the fallow, "guardian against ruin and soother of children", is underlined by Hesiod *Works and Days*, 464.

Of the modern *nomos* of Boeotia, some one-third was at the time of the 1961 census classified as cultivable land ; but this figure included virtually all of the reclaimed Kopais lake-bed, some 213 square kilometres. If the same ratio were carried over to the smaller Boeotia of antiquity (2580 sq.km), and a deduction made for some part of the area of the lake (assuming, as our own findings suggest, that it was not entirely flooded to 19th century levels at all times in the Classical period), then the cultivable area would not far exceed 800 sq.km. But 12,100 hoplites and cavalry, each with a 'standard' 5.4 hectares of farming land, would on their own account for 653 sq.km, leaving a miserable residue to be distributed among the remaining majority. No allowance can be safely made for imported grain : the evidence leads one to expect that Boeotia would be largely self-supporting.

Somehow it seems the figure for agricultural production in Boeotia has to be raised still further (thus incidentally ruling out altogether the low cereal yields assumed by M.H. Jameson). If a sizeable area of present-day marginal land was in the Classical period under plough — then perhaps the cultivated proportion would have been closer to one-half than to one-third of the total. This would make some 1200 sq.km, rather than 800, available, and would leave a more credible area at the disposal of the poorer classes.

It is not too early to bring into this discussion the entirely fresh data-base of our own survey results (Diagram II). In the 21.5 square kilometres so far covered, we have found a total of over 70 sites occupied in this period of the fifth and fourth centuries, even when the few recognisable cemetery-sites are set on one side. We have interpreted the great majority of these as independent farmsteads. With allowance made for a minority of medium-large settlements, with the standard household of five assumed for each of the farmstead sites, and with the overall density exceeding 3 sites per square kilometre in this period, a general population density seems to emerge, over *all* types of land, at some 50-60 % of the density arguable from the Classical sources. Our recovery of Classical sites, high though their density may seem in relative and indeed in absolute terms, may yet represent less than three-fifths of the original site — and population-density over the landscape.

Once again, it is not difficult to suggest ways in which this finding could be explained. Actually, it is highly unlikely that all of our sites were in simultaneous occupation, as was provisionally assumed in the rough calculation just made ; in other words, the shortfall of sites may be very much more serious than was there suggested. Whatever the truth of that matter, it is all too likely that one of the occupational hazards of site-survey, the short- or long-term disappearance or destruction of sites, has been operating ; some sites have been found to 'vanish' between the year of their discovery and the next, so that an unknown number will have been 'invisible' in the year in which we covered the relevant piece of land ; others again are likely to have been more permanently buried, and yet others destroyed by human or natural agency.

It is in any case a secure conclusion that Boeotia in the fifth and fourth centuries BC was densely, perhaps very densely populated. If, as some ethno-historical records suggest, a 'safe' ratio of exploitation to potential carrying-capacity of a landscape is about 30 %, then the Classical Boeotians for whom it is difficult to reach a figure of less than 80 % exploitation were living dangerously close to the limits of capacity of a semi-arid region. Results obtained in other parts of Greece — for example, those of the Argolid Exploration Project — suggest that these critical conditions were not confined to Boeotia.

Many episodes in Boeotian history become all too readily intelligible if set against such a background of maximal exploitation of land and population-pressure. External expansion was the invariable means for achieving, in M.I. Finley's words, "what passed for economic growth in antiquity". The historical record shows that, while the Boeotians abstained from using the external outlet of colonisation, individual cities of the Confederacy, and above all Thebes, made repeated inroads upon each others' land. The pattern of the 'Early State Module' in Boeotia, detectable in the original state boundaries of the Archaic period (cf. P. Roesch, 1965) which match quite closely the theoretical boundaries described by Thiessen polygons, had by Classical times been forcibly fused into a very different pattern (Figure 11), at least in the areas bordering on Theban territory.

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We may return for a moment to the general distribution of Classical sites. Much of the large gap between the two groups of prehistoric settlements is thickly filled in at this period ; the upland neogen soils of the areas

CLASSICAL BOEOTIA

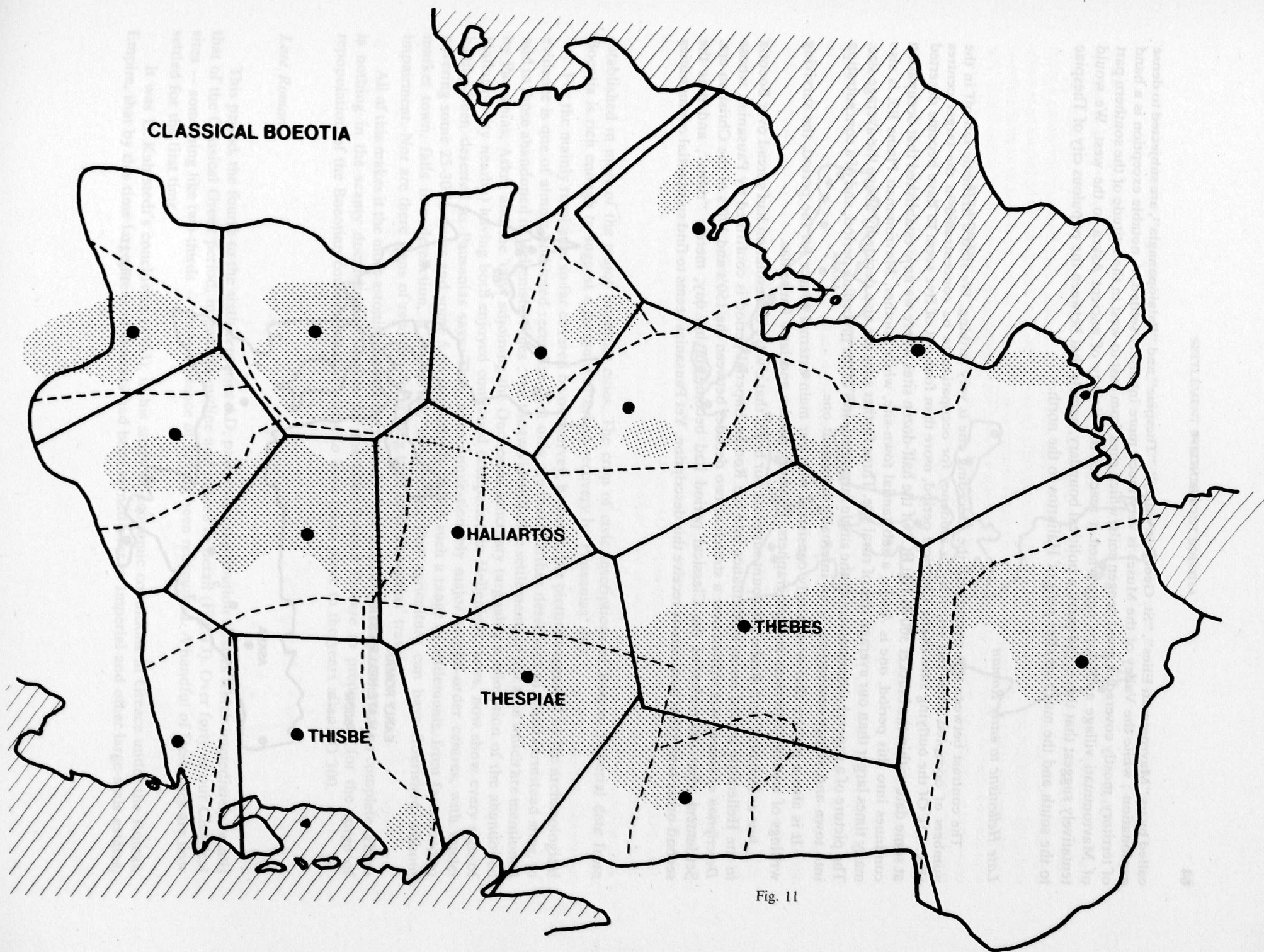


Fig. 11

called by us "Mavrommati Elies", "St. George's Valley", "Thespieae" and "Palaiopanagia", are subjected to dense exploitation ; while the Valley of the Muses is very much more intensely settled. A notable exception is a band of territory, mostly covered in good neogen soils, which runs from east to west in the latitude of the southern part of Mavrommati village and stops only when it reaches the vicinity of ancient Askra to the west. We would tentatively suggest that this could mark a political boundary, namely that between the populous city of Thespieae to the south and the much smaller *polis* of Haliartos to the north.

#### *Late Hellenistic to early Roman*

The contrast between this period and the preceding one is very striking. We find a dramatic fall-off in the numbers of occupied sites and secondly, a tendency for occupation to be concentrated in the larger centres (Fig. 12). Of the outlying sites of the Classical period, more than four out of five seem to have become deserted at some date within the bracket 300 to 100 BC. Of the half-dozen sites where we *have* established that occupation continues into this period, one is Askra, a substantial town-site, while another, Mavrommati Plains B3, is also many times larger than our average size of rural site. Three further sites are also decidedly above the average size. The picture of a general abandonment of the single farmstead sites of the preceding period, and of a concentration into town and village settlements, is an internally consistent one.

It is also a picture that is strikingly consistent with our main external source for the period, the surviving writings of ancient historians and geographers, Polybius, Strabo and later Pausanias.

Just as Polybius' and Strabo's account supports our belief that a wave of desolation had spread over Boeotia in the Hellenistic period, so its continuance into the Roman Imperial period is confirmed by Pausanias, whose *Description of Greece* was written over a stretch of two decades between the 150's and 170's of the Christian era. Settlement after settlement of the Classical period had become, in his day, merely "ruins", and it is the second-order towns that particularly receive this description. Yet Pausanias seems to find substantial communities

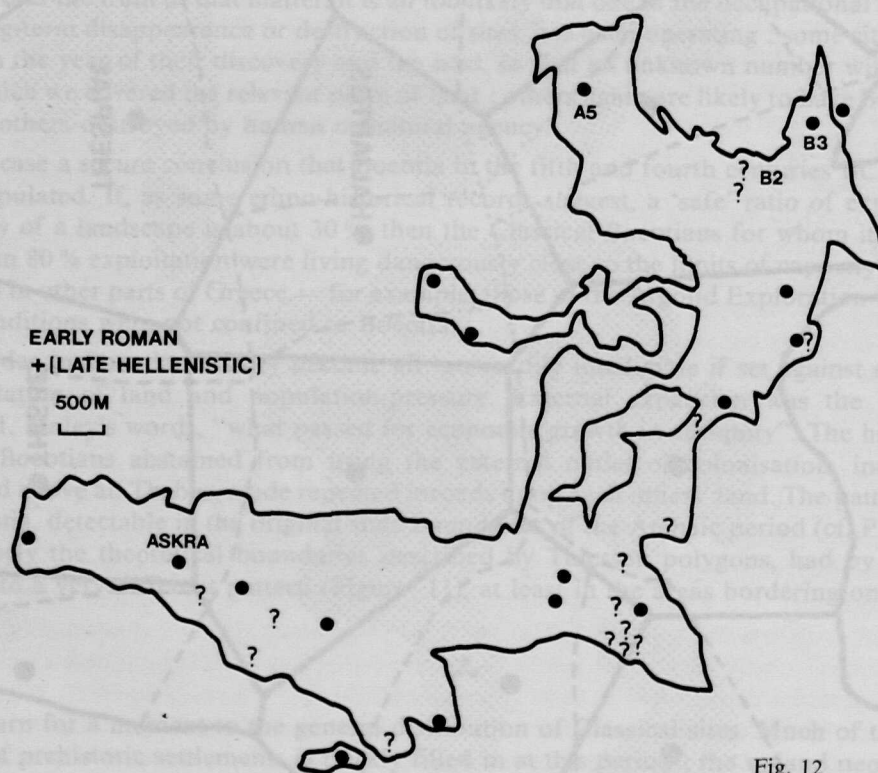


Fig. 12

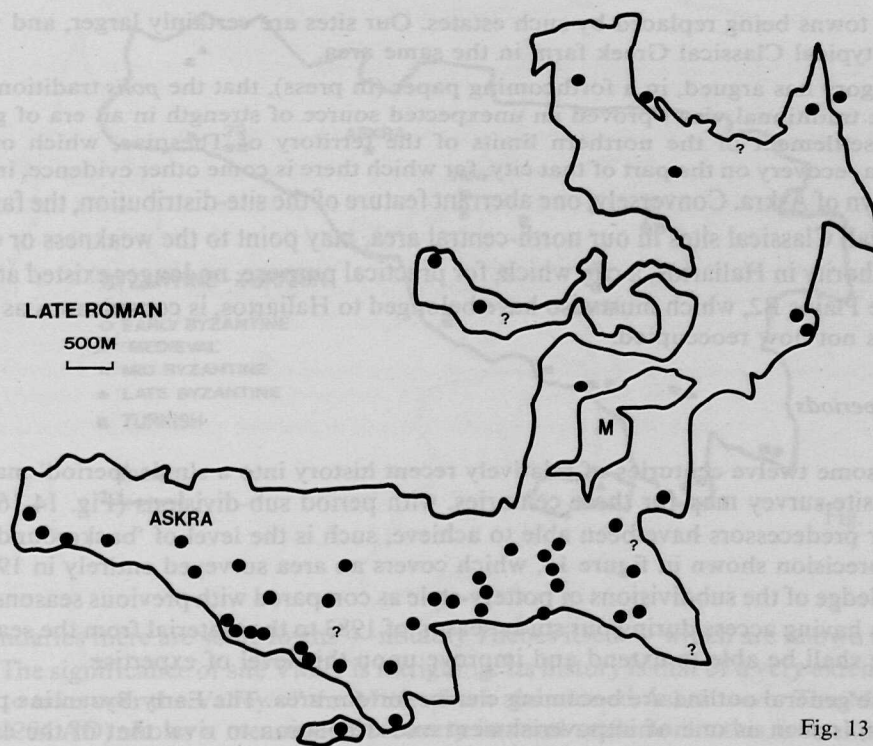


Fig. 13

established in most of the major Boeotian cities. The crop of civic inscriptions of Roman Imperial date from Boeotia is rich enough to suggest a measure of urban recovery by Pausanias' day.

For the mainly rural area so far covered by our survey, however, the picture suggested by the archaeological evidence is one of almost undiluted recession. Not only are there further desertions of small farmstead sites, to add to those abandoned in Hellenistic times; but the two identifiable settlements in our area which are mentioned by Pausanias, Askra and the 'city' adjoining the Onchestos sanctuary (arguably a relocation of the abandoned Haliartos city nearby) having both enjoyed continued occupation in Hellenistic times, now show every sign of having been deserted as Pausanias says. They were unquestionably major second-order centres, with nuclei covering some 25-30 hectares and some 5-10 respectively. When such a range of settlements, from farmstead to market town, falls into dereliction, it is scarcely conceivable that agriculture can have flourished without impairment. Nor are there signs of recovery for a long time after Pausanias' travels.

All of this makes it the more astonishing that the revival, when it did eventually come, was so complete. There is nothing in the scanty documentary sources for the later Roman Empire to prepare us for the surge of repopulation of the Boeotian countryside that seems to have taken place in the years after AD 300.

#### *Late Roman*

This period, the fourth to the sixth centuries AD, produces a distribution of sites which immediately recalls that of the Classical Greek period, in general outline and indeed in detail (Fig. 13). Over forty of our Classical sites — something like two-thirds — show evidence of having been reoccupied. A handful of fresh sites are now settled for the first time.

It was U. Kahrstedt's conclusion (1953), in his study of economic conditions in Greece under the Roman Empire, that by this time large areas of Boeotia had been turned over to Imperial and other large-scale estates,

with some of the lesser towns being replaced by such estates. Our sites are certainly larger, and with more land around them, than the typical Classical Greek farm in the same area.

Professor T.E. Gregory has argued, in a forthcoming paper (in press), that the *polis* tradition of the Eastern Empire (contrary to the traditional view) proved an unexpected source of strength in an era of general decline. Certainly the dense resettlement of the northern limits of the territory of Thespieae, which our map clearly demonstrates, suggests a recovery on the part of that city, for which there is some other evidence, including a great revival of its satellite town of Askra. Conversely, one aberrant feature of the site-distribution, the failure to re-settle a single one of eight small Classical sites in our north-central area, may point to the weakness or even the virtual absence of a central authority in Haliartos, a city which, for practical purpose, no longer existed at this times. The presumed sanctuary site Plains B2, which must also have belonged to Haliartos, is conspicuous as one of the very few large Classical sites not now reoccupied.

### *Byzantine and Turkish periods*

To lump together some twelve centuries of relatively recent history into a single 'period' may seem crude ; but even to produce a site-survey map for these centuries, with period sub-divisions (Fig. 14-16), is something which few if any of our predecessors have been able to achieve, such is the level of 'background' knowledge in this field. The greater precision shown in figure 15, which covers an area surveyed entirely in 1982, reflects our steadily increasing knowledge of the subdivisions of pottery-style as compared with previous seasons. We hope that, with our pottery experts having access during our study season of 1983 to the material from the seasons 1979-1981 in Thebes Museum, we shall be able to extend and improve upon this level of expertise.

Already parts of the general outline are becoming clearer for our area. The Early Byzantine period, from the 7th to the 9th centuries, is seen as one of impoverishment and desolation to rival that of the earlier phases of decline : only one very large site in the Valley of the Muses (VM21) is seen to survive through this period, though

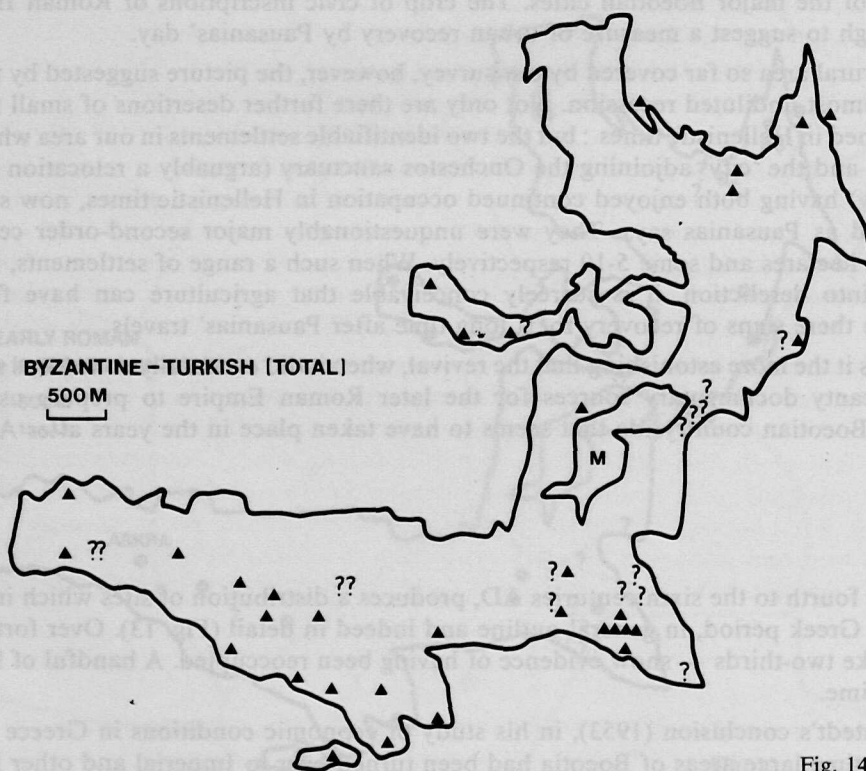


Fig. 14

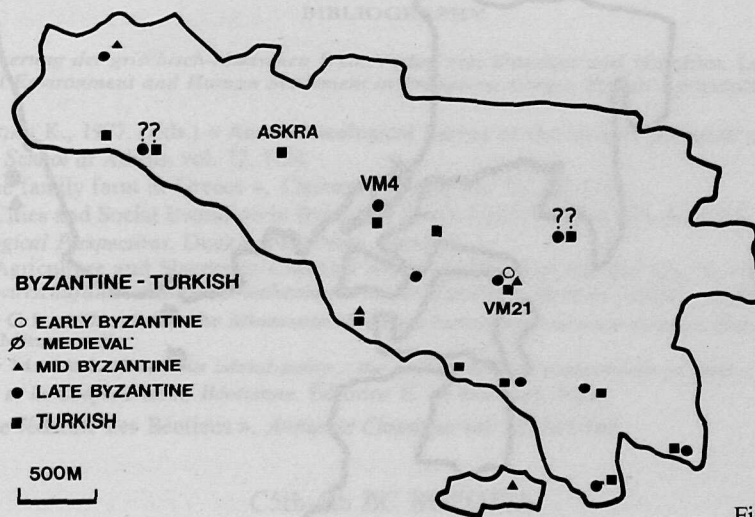


Fig. 15

beyond our boundaries there are some towns — notably Thebes itself — which are known to have preserved some of their vitality. The significance of site VM21 is intriguing. Its history is that of a very extensive Late Roman estate that now seems to take over the Valley of the Muses from abandoned Askra town. The Middle Byzantine period (9th century to 1204 AD) shows a measure of recovery in rural settlement ; this is the time (9th century) of the building of the Skripou church at Orchomenos, and of the foundation through a Theban initiative of the church and monastery of Osios Loukas (10th century) to the west, two independent signs of returning stability and recovering prosperity in Boeotia. The Late Byzantine period after 1204 shows, at least in our better-documented 1982 area, a relatively impressive density of settlement : Here we move into the era of the successive occupations by the Frankish powers, of which the most durable physical trace is provided by the surviving Frankish Towers which dot the landscape of Boeotia ; while the most significant historical legacy, for our region, was the settlement of the Albanian immigrants, mainly under Catalan auspices. It is significant that the ruined Frankish tower in the Valley of the Muses forms the nucleus of another of our large sites, VM 4, which from the 13th to the 17th centuries seems to have taken over the role of the principal settlement of the valley from VM 21 (which itself can be seen as the post-Classical successor of Askra). Our findings suggest that the Albanian settlement, traditionally within garrison-type villages, may have been firmly based on the earlier pattern of settlements : an example is our own base-village of Mavrommati, on the north-western edge of which we found a Late Roman and Byzantine site, but which is recorded by its present-day inhabitants as having been chosen as the site for an Albanian 'stratochori', by transplantation from another site nearby in the fourteenth century.

To the Turkish period, finally, we can assign not only a density of sites that reflects a further population increase, but also a number of surviving monuments, notably watermills, which suggest that era of relatively stable and efficient garden-agriculture that some of the early travellers saw.

#### DISCUSSION

Remarques de P. Salmon sur le chiffre de la population servile et sur les rendements de l'agriculture béotienne ; de P. Roesch, J.M. Fossey et R.J. Buck sur la difficulté d'évaluer la population de la région et sa densité.

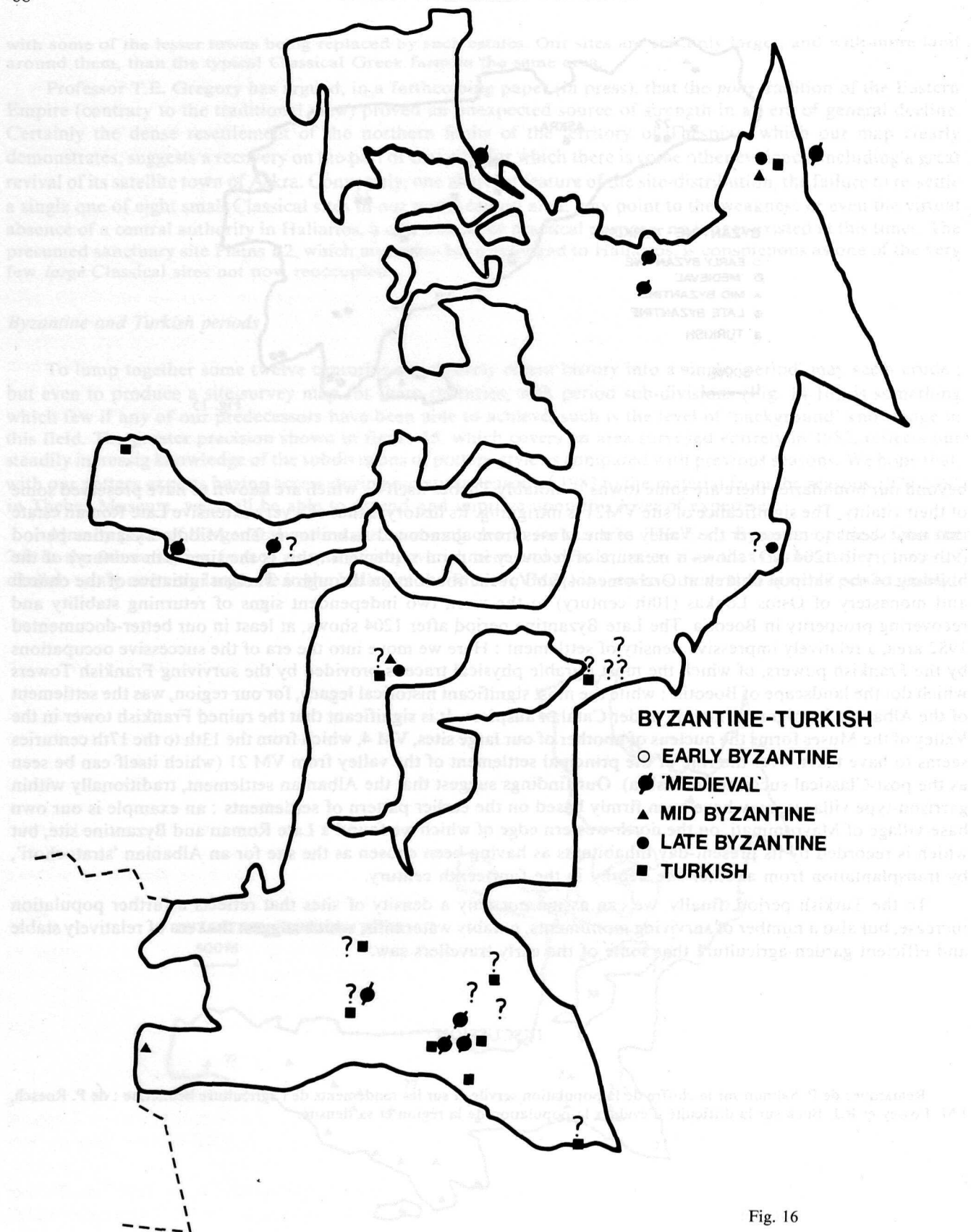


Fig. 16

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C5th-4th BC BOEOTIA  
POPULATION - LAND USE DATA

1. 11 regions each 1 000 Hoplites
  - 1 000 Psiloi (light-armed troupes)
  - 100 Cavalry
  - + fleet of 50 Triremes = 10,000 men

Total forces = 33,100  
× 5 for family + slave = 165,500 Population total
2. Ancient Boeotia — 2 580 sq.km  
1961 = 1/3 cultivable land  
Anciently 1/3 → 1/2 ?
3. Hoplite Plot — 5.4 ha  
50 % or 33 % Fallow  
Yields 9-12 Bushels per acre  
Food needs, 1 000 kg. 'Wheat equivalent' per family (+ 250 for slave)
4. 12,100 Hoplites/Cavalry × 5,4 ha = 653 km<sup>2</sup>  
1/3 Boeotia = 860, 1/2 Boeotia = 1 290 km<sup>2</sup>  
Hoplite-Psiloi = 1/1 ?

CLASSICAL BOEOTIA  
A PROVISIONAL SETTLEMENT HIERARCHY

1. TOTAL BOEOTIAN FORCES = 33,100 (= 165,500 TOTAL PEOPLE).
2. CITY TOTAL (14-15 CITIES), IF THESPIAI IS 5,000 AND =  $\frac{1}{11}$  OF BOEOTIAN CITY POPULATION = 55,000.
3. SATELLITE TOWNS SUCH AS ASKRA, IF 1,000 PEOPLE EACH, SAY 12 OR SO IN BOEOTIA = 12,000.
4. 165,000 MINUS (55,000 + 12,000) = 98,000 'RURAL' POPULATION.
5. AREA OF BOEOTIA 2 580 SQ.KM = 38 RURAL INHABITANTS PER SQ.KM. IF 40 % OF BOEOTIA CULTIVABLE IN ANTIQUITY, RURAL DENSITY PER CULTIVATED SQ.KM = 95.
6. BOEOTIA PROJECT — 21 SQ.KM SURVEYED. SHOULD CONTAIN EITHER 798 (AVERAGE FOR TOTAL SQ.KMS) OR 1 805 (AVERAGE FOR CULTIVABLE SQ.KMS) RURAL INHABITANTS (9/10 OF LAND SURVEYED CULTIVABLE).

7. EXCEPTING ASKRA, WE HAVE A POSSIBLE 1 250 IN LARGE - MEDIUM SITES, (11 + ASKRA), LEAVING 61 'FARMS' AT C. 5 OCCUPANTS = C. 305 PEOPLE.
8.  $1\ 250 + 305 = 1\ 555$ . SHORTFALL FROM  $1\ 805 = 250$  RURAL INHABITANTS = C. 50 SMALL FARMS.
9. OVERALL RECOVERY (IF ALL MEDIUM - LARGE SITES FOUND) IS  $73:123 = 59\%$  OF CLASSICAL SITES.
10. RECOVERY OF SMALL, SINGLE PERIOD SITES IS  $61:111 = 55\%$ .
11. IN GENERAL RECOVERY IS AT C.  $57\%$  LEVEL.

#### BRONZE AGE SETTLEMENTS - RARETY PROBLEM

1. BOEOTIA SURVEY - 13 BZ. AGE TO 73 CLASSICAL =  $1:5\frac{1}{2}$   
AS PERIODS ARE 2 500:500 YEARS, ONE MIGHT EXPECT 5:1 SURVIVAL!  
i.e. 365:73 SITES  
BZ. AGE : CLASSICAL.
2. IF CLASSICAL SOURCES RELIABLE, WE DISCOVER c.  $57\%$  OF ORIGINAL CLASSICAL SITES. IF SITE EROSION/BURIAL IS CUMULATIVE, A FURTHER 2 800 YEARS COULD LOSE A FURTHER  $43\%$ , i.e. 13 BZ. AGE WERE ONCE 23 SITES (:73).
3. FREQUENT CONTINUITY EXISTS BETWEEN PERIODS OF THE BRONZE AGE, WOULD SUGGEST WE USE A FACTOR OF 2-3 NOT 5 FOR SITE NOS. COMPARISON, i.e. BRONZE AGE : CLASSICAL expect 183:73.
4. CLASSICAL ERA ARGUABLY DANGEROUSLY OVER-POPULATED, 80-90% OF CARRYING CAPACITY, UNLIKELY SUSTAINED OVER BRONZE AGE MILLENNIA. PREFER AVERAGE BETWEEN THIS FOR SHORT PERIODS AND 'SAFE' LEVEL OF  $30\%$  i.e.  $50\%$ . WOULD REDUCE EXPECTED NUMBERS TO 108:73.
5. RATIO OF EXPECTATION TO SURVIVORS IS 23:108 SITES FOR THE BRONZE AGE. AT FACE VALUE, THIS WOULD SUGGEST THAT BRONZE AGE POPULATION DENSITY WAS LOWER BY A FACTOR OF 4-5 TO THAT OF THE CLASSICAL PERIOD, AVERAGED OUT.
6. IT IS CONCEIVABLE THAT THE INTRODUCTION OF IRON TECHNOLOGY AND IMPROVED CROPS COULD ACCOUNT FOR A GROWTH OF PERHAPS 2-3 X, AND OTHER ELEMENTS COULD BE:
  - A WE COULD ASSUME THAT SOME CLASSICAL SITES WERE NOT CONTEMPORARY,  $\therefore$  OUR RECOVERY IS POORER THAN  $57\%$  (COROLLARY REQUIRED, THAT SUCH ONE-PERIOD SITES UNLIKELY TO SURVIVE WELL IN BZ. AGE SITES DISCOVERED).
  - B EROSION/BURIAL HAS SLOWED DOWN SINCE ANCIENT TIMES.
  - C 'URBAN' DENSITIES EXAGGERATED FOR CLASSICAL TIMES, SO RECOVERY RATE AGAIN POORER THAN  $57\%$ .