

John Bintliff

The Mountain Peoples of Ancient Greece: The Relevance of World-Systems Theory and Neo-Malthusianism to their Development

Abstract

The historical progression of power in ancient Greece from the lowland south-east to the more upland north and west is compared with settlement trends derived from recent archaeological surveys. A series of models is introduced to provide insight into the developmental paths identified for different regions of Greece. It is suggested that individual regional trajectories are generally the product of complex interactions between the local effects of widespread technological and agricultural diffusions in the Braudelian long-term (*Longue Durée*), and inter-regional (Core-Periphery/heartland-marginal land) interactions in the Braudelian medium-term (*Moyenne Durée*). Comparison and contrast are drawn with regional developments in Neolithic to Bronze Age Greece.

Introduction

"Every schoolboy knows..." (or perhaps "used to know"), that the focus of ancient Greek political and military history shifts from the S. E. mainland towards the north and west, from Classical to Hellenistic times (Fig. 1). Is this an historical accident? Or is there some deeper structural meaning?

Familiarity with the broad lines of Greek geography (Fig. 2) will also make one aware that most of these regions that dominate in the power-games of later Greek history are in the more mountainous north and west — Macedonia, Epirus, Aetolia, — hinting at some historical priority to lowland versus upland peoples in "making history". From here it is not a long step to highlighting the well-known historical passage (*topos*) of the ancient historian Arrian (*Anabasis* 7,9,1-6) where Alexander is reported to have celebrated the role of Philip II in civilizing the upland Macedonians in the mold of lowland southern Greece.

By "lowland" I refer to those regions where the great preponderance of human settlements, and their mixed farming resources, have always been concentrated below 400-500 m asl, irrespective of the high relief that may lie between such settlements and regions.¹

1 The North-East provinces of Macedonia and Thrace do possess extensive lowland plains and hillands with dense settlement systems, (discussed later in this paper), but these

But how truly does the focus of political history and power shifts reflect population increase, urbanism, and economy in the different regions of Greece? From rhetorical statements of ancient historians and the realities of military power we need to see all this on the ground, in settlement patterns and their transformation over time. The one and only method is through landscape archaeology, through excavation but increasingly, and perhaps especially, through field survey of an intensive kind.

Since the 1960s the number of field surveys in Greece has continued to grow, but very few are yet published in full. Earlier examples and some still operating are of the "extensive" type, offering less detailed information about settlement numbers and size compared to intensive surveys where such data are a priority. A review of some of the available results from regional surveys (Fig. 3, Appendix) will therefore understandably be provisional, and it is still necessary for this exploratory synthesis to incorporate reviews of published sites and excavations to complement the existing cover of modern field surveys. Similar attempts to compare regional trends have recently been published for the Roman Mediterranean (BARKER and LLOYD 1991), Roman Greece (ALCOCK 1993), the Hellenistic world (ALCOCK 1994) and land-use variation in Neolithic-Bronze Age Mainland Greece (HALSTEAD 1994).

It is helpful to try to group regions by the period in which, after the Bronze Age but before the end of Late Roman times, local populations experienced a notable increase, or reached a climax of density in town and country. Figure 3 is a first attempt to show how this has varied regionally. The sources for the survey database are listed separately in an appendix. Numbers in the text that follows refer to numbered regions on figure 3 and in the appendix.

Growth Phase I: Late Geometric to Archaic (8th to end of 6th centuries B. C.)

Excavation and extensive survey, together with historical records, suggest that the most precocious area of early historic population growth in town and country was in and around Attica (12), the territory of the city of Athens. Perhaps by the Kleisthenic period (late 6th century B. C.) Attica was nearing maximum carrying-capacity, regularly requiring food importation in the early 5th century B. C. Certainly most authorities have suggested an Attic population of around 180,000 by 480 B. C., well above GARNSEY's recent estimates (GARNSEY 1988) of 120-150,000 for Attica's carrying-capacity. Spatial analysis and intensive survey in the Attic countryside (LOHMANN 1993, BINTLIFF 1994) suggest that regional overpopulation was created

areas are matched or exceeded by areas of upland landscape with their own characteristic settlement networks. The important region of Thessaly, in North-Central Greece, however, is a striking and genuine exception to our 'North-South' dichotomy, its geography being dominated by vast 'lowland' plains. It will be of great interest to learn how that region's long-term settlement history unfolds, whenever an enterprising field survey team takes on the long-awaited task of intensive multi-period survey in some district of that province. In the absence of such information, comments made later in this paper based on extensive survey and reviews of published sites are necessarily speculative.

by exaggerated urban growth in Athens and its immediate hinterland. In the outer country districts of Attica the climax of population and settlement intensity peaks in the late Classical 4th century B. C. It is unclear if this rural trend reflects a wave of development emanating from high urban demand, or the later waning of Athens' empire and the loss of her ability to control food imports. Adjacent Kea island (21), Corinth (14), Nemea (16) and the western heartland of the Argolid (17), seem also, based on both intensive and extensive survey results, to have developed rapidly in Geometric/Archaic times, although they experienced population climax in Classical and Early Hellenistic times. Intriguingly the intensive surveys of Melos in the Cyclades (22), the upland plain of Lassithi in Crete (24, easternmost survey), and the Langadhas Basin of Eastern Macedonia (8 inset), indicate precocious growth in the Geometric/Archaic period. In Melos and Lassithi rural settlement is severely restricted in subsequent Classical to Early Roman times. On Melos it is likely however that a Classical climax was focused on the single city site, whilst the truncation of rural settlements could reflect the Athenian massacre and resettlement programme of 415 B. C., since as elsewhere in S. E. Greece maximum rural growth might otherwise have occurred from the later 5th into the 4th centuries B. C. (SNODGRASS 1987-1989). In upland Cretan Lassithi, however, the only urban site is Late Roman, and the collapse of a promising early historic settlement system should indicate genuine truncated development, with depopulation and economic "underdevelopment" persisting through Classical and Early Roman times. In E. Macedonia, a stable network of villages in the Langadhas Survey (8, inset), whose origin lies in Copper Age times, undergoes a pronounced phase of expansion in size and number in Early Iron Age times. However population is far from local carrying-capacity and no further elaboration of settlement occurs till Late Roman times when the first urban centre appears.

Growth Phase 2: Classical-Early Hellenistic (5th to mid 3rd centuries B. C.)

In a wide arc around this early growth focus of the S. E. mainland, the maximum impetus to population takeoff seems to occur in full Classical and Early Hellenistic times, in the 5th to early 3rd centuries B. C.: this is the picture typical for surveys in Boeotia (11), Euboea (10), Laconia (18), and perhaps unexpectedly, upland Arcadia (19) and rugged peninsular Methana (15). Across the Aegean Sea, east of the growth core, on the island of Samos (23, lower), limited evidence for a first peak of settlement in Classical-Early Hellenistic times can be cited.

It is difficult to compare this information from largely intensive survey with recent studies by FOSSEY of E. Phocis and Opuntian Locris (9): here extensive study makes available a limited number of sites, usually the major ones which could continue to be occupied when smaller localities fluctuated in number; moreover the changing size of continuously-occupied settlements is usually unstudied. As a result, conclusions about population fluctuations appear difficult to draw, even to observe, when a scant 18 or 20 sites are representative of a large region. One can merely observe a tendency toward a Classical-Hellenistic peak in conformity to fuller-researched areas lying adjacent. A rather different problem emerges in a large-scale extensive survey

carried out in the 1960s in Messenia (20). Clearly there was a climax in the Classical to Hellenistic centuries, followed by Roman decline; unfortunately this project did not achieve differentiation between material of the 5th–3rd centuries B. C. (i. e. Classical-Early Hellenistic) and the transitional era Late Hellenistic/Early Roman (of the 2nd and 1st centuries B. C.), a division often associated in recent intensive surveys with a radical change in settlement and economy in Greece (BINTLIFF and SNODGRASS 1985, ALCOCK 1993). The Minnesota team do reasonably suggest that population growth may have been concentrated in the era of post-independence from Spartan control after 369 B. C., which would imply that the final Classical and especially the Hellenistic periods were the time of urban and rural takeoff.

Limited, ongoing field research on Levkas (4) in the Ionian Islands, suggests a clear rise in rural settlement, especially tower-house farms, in late Classical to Early Hellenistic times, paralleled in urban growth. On the adjacent mainland in the lowlands of Acarnania (6), a newly-initiated intensive survey has identified rural farms developing in the same time period, whilst urban growth is chiefly Hellenistic. These two N. W. zones appear precocious in the context of other provinces in that region, and their linking here in settlement developments is made more significant by the fact that in Hellenistic times Levkas becomes the center of the Acarnania Confederation.

Phase Three: Hellenistic (late 4th to 2nd century B. C.)

Aetolia (7) was well settled by Classical times but the population takeoff in town and country seems to have been in the Early Hellenistic era. Such a dating would be consistent with the evidence from the other side of the Corinth Gulf, where the Greek Achaea Project (13) has shown a remarkable rise in population beginning in Hellenistic times and rising to a peak in Early Roman times. This western Greek picture is strikingly harmonious with similar transformations during Hellenistic times in town and country in Epirus (3) occurring within long-settled Greek village communities, but this also holds true further north amongst the Illyrian people of Albania (2), where long-established village and hillfort societies underwent visible changes towards town life and population rise during the Hellenistic period. Some time-lag in the full expansion of settlement, northwards, can be suggested from the fact that rural farmsteads and other country sites are recorded in Epirus for the Hellenistic era but do not appear regularly till Roman times in Albania. This trend can be confirmed from the even later settlement takeoff in Dalmatia (1) (see *infra*).

The large fertile province of Thessaly (25) in North-Central Greece, lacks intensive survey evidence, but recent extensive research, excavation and reviews of published sites and literary sources allow us to offer a tentative sketch of settlement history. A dense network of nucleated settlements essentially of village character seems to have developed through the Archaic era, to be in place by Classical, 5th century B. C. times. During the latter era the larger communities develop urban institutions and their growing citizen bodies begin to dominate over the landed aristocracy that had previously controlled regional politics. These processes culminate

in an urban climax and arguably overall demographic peak during Early Hellenistic times, whilst the settlement system is already in decline by 200 B. C.

In the N. E. of Greece intensive field survey is only in its infancy. Extensive survey and reviews of published sites suggest that the general picture in Macedonia (8) is one of widespread town life and population takeoff occurring in Hellenistic and Early Roman times, and even later in marginal districts (see *infra*)

On the island of Crete (24), surveys in and around the most fertile district, the Mesara Plain, indicate population growth and climax in Hellenistic times, although the island as a whole seems to be most flourishing in settlement during final Hellenistic and Early Roman times (see *infra*). Limited evidence from the large E. Aegean island of Chios (23, upper), may point to a climax of urban and rural development in Hellenistic and Early Roman times.

Phase 4: Final Hellenistic/Early Roman (2nd century B. C. to 3rd century A. C.)

In almost all regions on the island of Crete (24), intensive survey has produced a surprising but consistent result, and one confirming extensive survey and reviews of excavations and literary sources: although city life was widespread by Classical times, the dramatic expansion of rural population was very delayed in the Cretan countryside, being Late Hellenistic and Early Roman in date. In remote districts, the peak of settlement may even be in Late Roman times (see *infra*).

Similarly delayed seems to be the Ionian island of Kephallenia (5), where a new Danish intensive survey has demonstrated an expansion of open country sites in Late Hellenistic and Early Roman times. Further north, up the Eastern Adriatic in Croatian Dalmatia (1), native communities begin to develop urban features in Hellenistic times, but the full takeoff in both town and country is clearly focused on the Early Roman era.

Phase 5: Late Roman (4th to 6th centuries A. C.)

Many surveyed regions of Greece bear witness to a proliferation of rural sites during this period, but urban fortunes rarely match the apparent prosperity of estates. It is highly unlikely that the climax populations that were generally achieved between Classical and Early Roman times in most regions, were sustained or reached in this fascinating 'afterglow' of the Roman Empire (cf. BINTLIFF and SNODGRASS 1988b, ALCOCK 1993). For our purposes it is more important to note that there are two districts remote from the natural developmental heartlands in their regions, where intensive survey appears to show such delayed growth throughout Antiquity that they only achieve their peak of development in urban and rural terms during this final pre-Medieval era: they are the upland Lassithi Plain in central Crete (24, easternmost survey), and the Langadhas Basin in E. Macedonia (8, inset).

In broad summary then:

1. There is support for an early growth focus in the key province of Athens, and

other adjacent S. E. lowland regions such as Corinth, Nemea, Western Argolid, and the island of Kea; possibly precocious developments on the island of Melos and in C. Crete may hint at a wider S. E. Aegean early growth sphere, although on Crete subsequent development is blocked.

2. In a wider-arc takeoff occurs in the following phase of Classical to Early Hellenistic times, incorporating central Greece, Euboea, and a broader zone of the central and eastern Peloponnese, e. g. Methana, Arcadia, Laconia, and perhaps many of the Aegean isles such as Samos (23, southern island), as well as a precocious growth zone in the Levkas-Acarmania axis of coastal western Greece.

3. In the more peripheral Peloponnesian province of Messenia, as well as in the upland dominated regions of western Greece from Aetolia via Acarnania to Epirus, we witness a Hellenistic expansion of town life and population growth or climax in town and country. Thessaly, on the northern periphery of the core South-East regions, appears to reach settlement climax in Hellenistic times. Further north-east, the general picture for Macedonia indicates a Hellenistic takeoff in urban and rural settlement, with growth continuing into Early Roman times.

4. In the outer north-west corner of the Peloponnese in Achaëa, on the adjacent island of Levkas, and further up the Adriatic coast in southern Albania and Dalmatia, population increase and town growth occurs in Hellenistic or Early Roman times but full countryside infilling is Roman. Crete had a limited population growth in Hellenistic times and a considerable expansion in the transition era Late Hellenistic-Early Roman, like the upper Adriatic. Likewise the E. Aegean island of Chios may reach peak settlement in Hellenistic and Hellenistic-Roman times, although the limited available evidence suggests this is the culmination of steady growth since Archaic times.

5. In peripheral districts of the outer regions of the Aegean, for example upland Crete and inland basins of eastern Macedonia, population climax may be as late as Late Roman times.

By and large, the "evidence on the ground" is broadly comparable to political history: an early historical dominance of Athens, Corinth, Argos; Spartan Laconia and Thessaly perhaps less developed in settlement and demography than their high early status in Archaic era politics would lead us to expect (they reach settlement peaks in Classical and Hellenistic times respectively); Boeotia emerging to power in later Classical times, coincident with a 4th century climax of population; even later, in Hellenistic times the novel rise to power of the Aetolian and Achaean Leagues, and Epirus, coincided with their settlement takeoff.

Macedonia was perhaps precociously powerful (mid 4th century B. C.) in comparison to its settlement takeoff (later 4th-3rd century B. C.). This supports the argument (BORZA 1990) that Philip II's initiatives in agriculture and resettlement of population, if true, occurred too late for real effect in supporting the initial rise of the Macedonian state to hegemony over Greece. Alternatively, perhaps Macedonia, Sparta and Thessaly, all relied initially on successful mobilisation of a very large but thinly-spread manpower for their significant military influence abroad rather than intensive growth and numerous large cities. I am unconvinced by the argument that

considerable Macedonian emigration for the colonies of Alexander's empire drained that region of population: in an expanding state, homeland demography should be stimulated rather than depressed. Also, Thessalian power in Archaic times should not be exaggerated: its military failures against Boeotia and Phocis are significant, and it is only in the 4th century B. C. with Jason of Pherae's aspirations for hegemony over Greece that ambition may have been matched to dramatic growth in Thessalian manpower and economy.

The expansion of an aggressive Illyrian power in the Adriatic, swallowing up Greek colonies in the 3rd century B. C., is congruent with observed settlement transformations in S. Albania and Dalmatia. Similarly the absence of a significant role for Crete in the events of Greek history, even its otherwise odd linking by Rome to Cyrene in North Africa rather than into the Aegean world in early provincial administration, are fully in agreement with the appearance of stagnation in settlement development till shortly before the Roman era.

Interpretative Modelling of Regional Developments

What interpretative models can be suggested for these patterns? Table 1 presents a series of models which I shall discuss in turn, as different approaches we can use to gain further insight into the structures we have revealed in Greek regional development trajectories.

I will begin by introducing two helpful approaches (Tables 2-3) to clarify our understanding of regional histories. These underpin my use of the more specific models that will follow:

— The Region Model (BINTLIFF and SNODGRASS 1988b). This reminds us to look at the region's own "health" and economic-demographic trajectory as well as its place in a wider interregional interactive framework (Table 2).

— Structural History or the Braudelian perspective (cf. BINTLIFF 1991a). Regional histories are the product of processes operating at different time levels (Table 3): the short term political events mode; the cycles of growth and decline, or alternatively eras of 'motionless history', local and wider-ranging, which are most strongly manifested in the medium term of several centuries; the long term waves, of a millennium or longer, set in train by major innovations in technology, economy or social organization.

Let us now move on to more specific models for Greek regional trends:

The Model of Historical Accident

This argues that human life is unpredictable and varied, so that historical outcomes are matters of chance. This clearly cannot explain the spatial trends which are apparent in our data — the structure. The world of unique events has scope in the detailed understanding of ancient history but only a limited one. A version of this approach which is less random asserts that human communities, faced with similar situations of developmental possibilities, exercise a wide variety of choices; hence historical outcomes, while not infinitely variable and inexplicable, are at least

normally diverse, even from the same initial set of conditions. This "softer" model is one worth returning to when other models have cleared away most of the dominant structure and left unresolved residuals. It may become apparent that the cumulative decision-making of human societies, consciously or otherwise, directs regional development into recurrent structures of either stability or steady transformation. Possible examples will be raised later under a discussion of the Socio-Structural, Punctuated-Equilibrium Model.

Core-Periphery and World Systems Models

Core-periphery and World Systems Theory (Fig. 4), represent one of the most influential sets of models for the socioeconomic dynamics of historical and later prehistoric societies (ROWLANDS, LARSEN, and KRISTIANSEN 1987; WALLERSTEIN 1974).

Chiefly inspired by the very unequal economic relations between the Developed World and the Third World that have arisen over the last five centuries, these related models focus on the exploitative economic ties between "core" regions with advanced economies, technology and political structures, and adjacent "periphery" regions less developed in all these aspects. Particularly important is the unequal exchange of raw material commodities from the periphery (such as basic foodstuffs, timber, metals, slaves/mercenaries/cheap labor) for manufactured and luxury items from the core (including weaponry and military technology, exotic foodstuffs). In its most militaristic form, core-periphery relations may be little more than the enforced exaction of tribute in kind or currency from a periphery lacking some or all of the following: economic strength, organisational complexity, high manpower resources and advanced military technology in comparison to the core.

An additional feature of these models is the existence of transition or buffer zones between Core and Periphery, where native societies are being strongly transformed through contact, or else colonies of the core are acting as forcing factors on native societies. A final feature of these models is that intentionally or otherwise, these interactions may result in major socio-political changes in the periphery, often towards more complex power structures; indeed the stimulus given towards higher economic productivity and political centralization in the periphery may ultimately result in the once-peripheral area coming to dominate the core, either through that periphery rising to core status in its own right, or through military conquest of the original core by forces from the periphery.

Rich chieftains' burials of the West European Early Iron Age have been used in one of the best-known applications of Core-periphery theory (FRANKENSTEIN and ROWLANDS 1978). It has been argued in this instance that a politically undeveloped, mature Iron Age society underwent major structural transformation into a series of large, territorial principalities as a consequence of the development of trade with Greek colonies in southern France and Etruscan city states. A more recent application is that of LOTTE HEDEAGER (1992) to the tribes of Free Germany beyond the Roman Empire, who stresses the central importance to their development of economic interactions with the highly developed Roman economy.

Before leaving our general discussion of Core-periphery/World System models, it is worth returning to that classic study where "World Systems" first made their appearance on the intellectual stage — IMMANUEL WALLERSTEIN's 'The Modern World System' (1974), — in order to remind ourselves how far the original model has been overused and even misused by prehistorians and ancient historians in subsequent years. According to WALLERSTEIN, a "world system" represents a spatially widespread network of communities or societies typified by important mutual interactions. Two forms of world system are distinguished, "world empires" and "world economies". World empires are sociopolitical networks of power and influence in which economic relations play a major role; yet until post-Medieval times they lacked an integrated economy and consisted of weakly-interacting local economies. World economies, on the other hand, do represent integrated economic systems over a large-scale network of societies. It was the chief conclusion of Wallerstein that until Early Modern times world systems in medieval, ancient and much earlier times were dominated by the "world empire" variety. In other words, political spheres consistently expanded well beyond their effective economic control. Thus the current consensus concerning the Roman Empire (cf. WOOLF 1990, 1992; BINTLIFF and SNODGRASS 1988) provides us with a fine example of a "world empire" fragmented into numerous local "world economies". Only with the rise of capitalist Western Europe in the early post-medieval centuries did one particular "world economy" break out of its encompassing world empires to become an ever-expanding world system that has all but integrated the entire Earth in the late 20th century.

Even tightly-controlled "world empires" such as the Spartan conquest-state, or the Athenian and Macedonian empires, are therefore unlikely to have integrated dependent regional economies into their own core economy. Even less likely is an economic integration in the cases of core-periphery interactions between the lowland south-eastern advanced states and those outer Aegean regions where core political dominance was rare and fleeting.

These reflections should act as a powerful brake on over-emphasizing the significance of economic flows in pre-modern core-periphery systems, without considering the equally important (and often more important) development of the internal economy of the individual regions under study.

Nonetheless, if we were to apply this model to Greece and adjacent regions (Fig. 5) we could define the "core" as S. E. lowland Greece, and characterize the surrounding regions as "peripheries" coming under progressive dependency on advanced core states, either in economic exchange involving manufactured items and luxury goods in return for primary products, or through ties of tribute following military domination from the core.²

2 Some would equally see the rise of S. E. lowland Greece in both the Bronze Age and the Geometric-Archaic era of the Early Iron Age as a periphery stimulated by more advanced core civilisations of the Middle East (cf. SHERRATT and SHERRATT 1993). In straightforward economic terms this view has little to recommend it in the Bronze Age, and is of only limited validity for accounting for the rise of Classical Greek city-state societies (with the exception of the economically-crucial diffusion of iron-working,

In the ancient Greek context likely candidates for unequal exchange would be core supply of high quality weaponry and military technology (e. g. fortification techniques); luxury goods such as bronzes, and decorated pottery (although modern scholarship suggests fine tableware was more likely to have been spacefillers for more valuable shipments, cf. GILL 1991); and, depending on regional ecology, lowland surpluses in olive oil and high quality wine.

In return, the periphery might exchange primary products in special demand in the core, such as timber, grain, metal, mercenary or slave manpower, or supply direct tribute in similar products.

As we have seen it is also part of this body of theory that cores can become peripheries as the outer regions reach a critical stage of development — evolution and devolution overlapping — so that in the course of Greek history one could explain the progressive displacement outwards of effective power.

There are instant attractions to this model in the Greek and Adriatic context: the precocious advance of the more powerful S. E. lowland “poleis” (city-states) (Athens, 12; Corinth, 14; Argos, 17 west) initially might have drawn into economic or military dependency (from Late Geometric into Classical times) their nearest neighbors in Methana (15), Kea (21), Euboea (10), Arcadia (19), Nemea (16), the Argolid peninsula (17) and the islands of the Cyclades such as Melos (22), especially when there were not strong urban centers in these regions (and considering the need in Arcadia to import olive products to its uplands).

In the next stage (final Classical and Hellenistic times), it is generally accepted that “lowland Macedon” of the Argead dynasty acted as a transition zone between southern Greek culture and politics and the less developed interior of Macedonia, creating a forceful stimulus for the expansion of the Macedonian (8) state and its developmental trajectory towards the S. Aegean models of urbanism and agricultural intensification. Symptomatic of this was the incorporation of local Greek (buffer) colonies on the Aegean coast into the growing Macedonian state. A strikingly parallel process characterizes the model of Dutch scholars for the rapid development of more complex society in mountainous Aetolia (7) during Hellenistic times (BOMMELÉ and DOORN 1987). This stresses the transition effects of acculturation emanating from coastal Lokrian city states on the Corinth Gulf lowlands, which were funnelled through an Aetolian proto-*polis* at Aigion, modifying Aetolian village life in the direction of the lowland Aegean centralized and urbanized forms. The fertile province of Messenia (20) in the S. W. Peloponnese could be considered a late developer due to remoteness from the core zone, although (see *infra*) inhibiting core-effects are also applicable.

one sees cultural borrowing, and no significant social imitations). The Oriental core-periphery effect has a certain role however if we consider Greek imperial ambitions (e. g. Athenian, Macedonian) to have been defined in terms of competition for territory and resources with the rival Persian Empire, as well as with other Greek states. But I consider it unnecessary to invoke emulation of the Orient to account for hegemonic rivalry within Greece. The revival of *ex oriente lux* explanations for Aegean civilisations is discussed further *infra*.

The well-established role of its timber trade in the periphery status of Macedonia needs no elaboration (MEIGGS 1982), whilst Aetolia's supply of mercenaries may have been accompanied by upland pastoral products in return for filling the local shortage of olives and of luxury imports for its elite. For both regions, Greek military fortification is a clear core import, together with urban planning, and, in the Macedonian case, infantry tactics learned in Boeotia and elsewhere. The same story can be repeated for developments in town planning, walling, and centralization which occur from late Classical and especially in Hellenistic times throughout N. W. Greece (6, 3), in coastal Albania (2) and in Dalmatia (1), associated with close interactions between native communities and local Greek colonies, and imports of Greek luxury wares into local wealthy graves and hillforts; the indigenous Illyrians were also widely armed by the Greeks.

The negative side of this core-periphery activity, predicted by the models, is the evolution/devolution cycle, where cores or their buffer/filter colonies become dominated by former peripheries which have risen to core status in their own right through core-stimulated development. In the Greek context this is especially relevant to buffer units sent out by core states such as Corinth in the form of colonies, which although autonomous, act as transition filters for catalyzing factors developed in the core lands. We can observe the progressive swallowing up of such colonies into increasingly powerful native states, e. g. Aetolia (7); Acarnania (6) and Epirus (3); and in the Illyrian kingdom, a similar absorption of Greek colonies in Albanian-Dalmatia (2,1). These processes took place from the 4th to the 3rd centuries B. C., but with lags reflecting the time-progressive inception of intensive core interference in native societies: thus, for example, Athenian and other core powers conducted military interventions in N. W. Greece in the mid-to late 5th century B. C., whereas the main Greek colonial spread in Dalmatia was in the 4th century B. C. In addition, colonies can rise to independent core-status and challenge core influence in their own sphere of influence (e.g. Corfu, Syracuse).

As for the core heartlands themselves, the shift of power from the core to periphery in Hellenistic Greece produced a characteristic inversion in which, as we have seen, the states of S. E. lowland Greece usually became subordinate to the will of newly-powerful states in northern and western Greece.

An alternative form of core-periphery relationship avoids the replacement of core by former periphery, through actively restricting the growth of the periphery. A dramatic example noted earlier is that of the Athenian massacre of the male population of Melos (22), a state in its periphery that refused to bow to tribute demands. Another potential example is the Laconian (Spartan) dominance of Messenia (20), which may have inhibited town growth and economic expansion in that province till Hellenistic times.

There are, however, some serious limitations to Core-periphery/World Systems models for providing a total explanation for Aegean regional growth patterns. To take one example, Achaia (13) developed small *poleis* from Archaic times and was well exposed to potential core effects along the Gulf of Corinth, but regional takeoff was very late in Hellenistic to Early Roman times, and even then, cannot clearly

be accounted for by core-periphery economics of dependence. This is all the more surprising as current work in lowland Acarnania (6) indicates an advanced rural settlement takeoff in late Classical-Early Hellenistic times, perhaps affected both by colonial *poleis* in the Ionian Isles (e. g. Levkas (4)) and along the mainland coast.

A second problem arises with Crete (24), a very large island with plenty of fertile land and widespread *polis* development from Archaic times — yet at least in those small zones intensively surveyed, nothing like its dramatic Minoan Bronze Age rural-settlement growth pattern is observable in Archaic to Early Hellenistic times, with takeoff delayed till later Hellenistic and Early Roman times. Significantly the Sfakia Survey (24, far S. W. survey) has revealed the very low level of ceramic imports in that region until Roman times, whilst in the high uplands of the White Mountains the survey reports human activity in Minoan times and then not again till the late Hellenistic-Early Roman era. Scholars of Cretan history consistently draw attention to the symptoms of demographic expansion being surprisingly late in Crete: — endemic intercity warfare, widespread boundary disputes, colonies, and that other sign of economic expansion — an outpouring of pirates and mercenaries — all of which are typically later Hellenistic phenomena for Crete.

Thirdly, Boeotia (11), although some of its inhabitants are known to have supplied eels and some fresh vegetables to Athens itself, was very much an internalized economic system, reasonably self-sufficient in everything, rather than spurred on by interactions from core partners; its slower growth and takeoff in comparison to its neighbors in the S. E. mainland (peaking probably in the 4th century B. C. at the time of the Boeotian hegemony of Greece) cannot easily be seen as stimulated from Athens or Corinth.

Fourthly, Thessaly (25) shows a gradual urban development over several centuries, but climaxing in Hellenistic times, and like Boeotia this is focused on internal agricultural resources. Its coastal zone is no more developed than its deep hinterland, until the external influence of Hellenistic superpower monarchs such as Demetrios (MARZOLFF 1994). At irregular intervals Thessalian armies threaten, or significantly intervene in the affairs of, core states, such as on Euboea in the early Archaic era, in Boeotia, Phocis and Athens in late Archaic and Classical times, and in the entire core zone in late Classical times (under Jason of Pherae) — all but the last before Thessaly's settlement takeoff. This military precociousness, based on a highly-internalized economy, fits very poorly with core-periphery theory, and will be dealt with more fully under Eco-Demographic Models.

Fifthly, despite well-attested effects of S. E. lowland culture on Macedonia from Classical times onwards, it is striking that southern Greek colonies had been settled in the adjacent Chalcidike peninsula since Geometric times (BOARDMAN 1980), but hardly any of their material culture appears in indigenous contexts till the late 6th century B. C.

Recently some prehistorians (VAN ANDEL and RUNNELS 1988; PERLÈS 1989) have suggested that diverse regional developments in Neolithic Greece and in the subsequent era of Bronze Age civilizations were significantly, if not primarily, created

by intra- and inter-regional trading systems. We might easily be tempted to compare this approach to the economic flows characteristic for the Core-periphery/World Systems approach discussed above, and found helpful in interregional relations during historical times in Greece, except that certain features of the models used and assumptions made make it far more difficult to support these authors' conclusions.

VAN ANDEL and RUNNELS, and to a lesser extent PERLÈS, implicitly adopt a position on pre-Industrial economics that can be labelled "Formalist" (DALTON 1981), stressing modern concepts of disembedded production and exchange and a centrality of commercial and entrepreneurial ethics (even in the Mesolithic). Pre-historic village production and the location and importance of major communities were supposedly controlled by such entrepreneurial, intra- and inter-regional exchanges. The modern consensus on pre-Capitalist economics however, not least in the Greco-Roman world (GARNSEY, HOPKINS and WHITTAKER 1983), has tended to give Formalism only limited scope and found empirical justification in greater quantity for the opposing "Substantivist" position, which stresses the "embeddedness" of production and exchange into pre-existing sociopolitical systems. The latter, in turn, are predominantly grounded on control over regional, and even more localized, resources of land, labor, subsistence foodstuffs, and primary raw materials.

A striking example of the explanatory advantage provided by Substantivist over Formalist approaches is offered by the Cycladic island of Melos. From late Mesolithic times onwards its high-quality obsidian mines provided enormous quantities of lithic supplies for mainland Greek communities, yet actual settlement on the island took place only in the Early Bronze Age and was clearly focused on local agriculture. Even when a large fortified village ("city") was established on Melos at Phylakopi in the mature Bronze Age, it is not an obsidian emporium, nor an emporium of any kind — merely one of many nucleated island communities combining a primary role of auto-subsistence with minor exchange activity.

Without wishing to deny the well-evidenced movement of scarce raw materials, and more rarely, finished artifacts, exchange-centered and commercial models for the prehistoric Aegean appear unconvincing to this writer, in comparison to the traditional view that regional and local settlement density and complexity are primarily responses to the quality and quantity of local subsistence production and the degree of sophistication of the social superstructure that diverted surplus production to itself. Emulation of other communities within the same region or in other regions, which can be part of core-periphery systems or more equal-partner social and economic networks, may indeed on occasion have given rise to the transference of a more complex form of local socioeconomic system to an area typified by less complex forms. This approach has long been adopted to offer insight into the development of Mycenaean civilization on mainland Greece in the wake of Minoan civilization on Crete, and that same process could also apply to the proliferation of fortified villages or "townships" on the Aegean islands in the mature Bronze Age. It is also relevant to the dramatic rise of Minoan palace states themselves at a time of increased contact with the more advanced states of the E. Mediterranean (CHERRY 1984). I would therefore favour a "slimmed-down" form of Core-periphery influence on prehistoric regional develop-

ment, focussing on the diffusion of innovations likely to enhance local agricultural productivity, rather than on implausible commercial exchanges involving a major part of a region's "GNP". These technological/agricultural/organisational transfers could have occurred in the context of trade, diplomatic contacts, or "down-the-line" village to village communication. Striking examples will have been the spread of settled village farming (with or without peasant colonisation), that of the Secondary Products Revolution, of olive cultivation, bronze and iron technology, perhaps even forms of palatial organisation.

Similar criticisms can be levelled at the view that developments in Greece during the Dark Age and Archaic eras of the Early Iron Age — in particular the great economic and demographic growth and the unparalleled elaboration of sociopolitical structures, beginning in the Late Geometric period — are fundamentally put in motion and sustained by the Aegean's economic core-periphery status in relation to city-states and empires in the Near East. This "ex oriente lux" model relies overmuch on acknowledged, important technical diffusions from the east in terms of the alphabet, or artistic skills and styles. It ignores the fact that Iron Age societies throughout Europe bear witness to the same boom phenomena, mostly in areas well beyond effective Near Eastern economic influence (BINTLIFF 1984a). It also flies in the face of the fundamental links between the Greek city state as a physical town, a society of citizens, a form of land-based economy focused on a circumscribed territory around that town, and a primarily endogamous biological community inheriting land within it (BINTLIFF 1994 and in prep.(a)).

The case of Roman Greece offers a further illuminating corrective to simplistic core-periphery, world-systems approaches. Incorporation into the Pax Romana should have offered tremendous stimulus to regional growth. Indeed as we have seen, a minority of regions do reach their ancient population climax in Roman times. But most regions of Greece exhibit stagnation or decline in the Early Imperial period (clearly shown by ALCOCK's [1993] review of the detailed evidence). The most likely explanation for these divergent trends is to be sought in the long- to medium-term regional growth cycles for the separate regions of Greece. Regions peaking in Classical or Hellenistic times appear to be declining before late Republican wars and entrepreneurial Italians begin to make their mark on Greece; Roman impact deepens the crisis. Just a few regions whose growth had been held back by natural or social factors appear to respond very positively to the stimulus of wider markets, foundation of Roman colonies and the (ultimate) blessing of political and military security. Parallels for a 'fertile growth environment' conducive to Roman population climax include late Iron Age Britain and Iberia, and Illyrian Dalmatia (1), in all of which the Roman impact encountered a growing population and economy, and expanding urbanism. Contra ALCOCK, the military disruption, dislocation of landholding, and foreign economic intervention associated with incorporation into the Empire, produced widely-differing effects in the various conquered provinces.

Neo-Malthusianism and Eco-Demographic Models

These models emphasize ecological and related demographic factors. ERNST KIRSTEN (1956), in his classic analysis of the ancient Greek city-state, laid a critical emphasis on the origins of the phenomenon among Mediterranean polyculture (olive/wine/cereal) societies with good marine connections and crop surpluses, such societies being almost entirely concentrated in southern Greece for reasons of natural geography. These stronger economies and trade possibilities combined, for KIRSTEN, to explain why the broad distribution of the centers of Bronze Age Minoan-Mycenaean civilization and the Classical Aegean Iron Age *polis* world were similar. Subsequently COLIN RENFREW (1972) and WILLIAM MCNEILL (1978) have independently drawn similar conclusions about the preeminent advantages available to settled communities in the Mediterranean climatic zone of the Aegean littoral, compared to societies in more temperate and/or inland regions. Most recently, CHAPMAN and SHIEL (1993) have underlined the same advantages of the 'eu-Mediterranean' littoral in Dalmatia (1) for Iron Age societal complexity.

Such insights allow us to comprehend better the precocious development of the Aegean core zones, and their natural colonizing expansion into comparable ecological and geographical contexts. It clearly allows us to account for the continued importance of the axis of states running from Boeotia-Athens-Corinth-Argolid-Laonia (11-12-14-17-18) in Bronze Age and Classical times, and in contrast the slow development of N. W. and N. E. Greece, where the key environmental factors are limited or absent. Achaea (13) is unimportant in both peak Mycenaean and Classical eras since its overall productivity was restricted by having limited coastal lowland expanses and a dominance of upland topography. Arcadia (19), also low in power and influence in both periods, was even more disadvantaged from its predominantly inland, upland and olive-less geography. As noted earlier, Macedonia may owe its late application of southern lowland innovations to its slow internal economic growth, limited by the same geographical factors, despite the presence of coastal colonies from the Geometric era.

There remain, however, some exceptions to this geographical logic. The fertile province of Messenia (20) was certainly a large, highly-centralized and very populous state in Mycenaean times (MCDONALD and RAPP 1972; CHADWICK 1976). A settlement climax in Classical-Hellenistic times is as yet undifferentiated, so that we cannot test the Minnesota Survey's argument that most of this growth postdates, and reflects, the freeing of the region from the repressive Spartan political and economic regime. If that were to be so, it might suggest that the status that Messenia's geographical advantages offered in Classical times, was effectively counterbalanced by an exploitative policy exercised by its Spartan overlords that created underdevelopment — in other words, Core-periphery outweighed eco-demographic factors. In Laonia itself, however, the Spartan homeland, the same Classical regime is clearly associated in recent intensive survey with a rural settlement climax, and we may recall historic evidence for Spartans accumulating considerable wealth on their country estates. Part of the explanation for this divergence could lie in the fact that the Spartan communal mess system required citizens to provide their own subsistence, which

kept an impetus to develop agricultural productivity. In contrast, in the Cretan mess system (cf. *infra*), citizens were supported by state food supplies of which only a part came from inalienable citizen estates, the rest from public land and serf dues. In Thessaly (25), another Classical serf society, gradual economic growth (constrained by the general absence of polyculture) may have been the result of the inferior classes having adequate status and economic incentive, serving for example as cavalry in the Federal army.

Cretan underdevelopment (24) remains especially hard to explain, as no significant external interference can be documented, and there are a number of potential core zones of fertility and marine access across the island, notably around Knossos and in the Mesara. Here the local failure to take off may lead us back to an earlier interpretative model: historical circumstances in the early history of Crete, which in some way held down the natural growth of the island that an eco-demographic perspective would predict. Hints that such may be the case come from observations such as the curious collapse of Lassithi population noted earlier, and fragmentary cemetery evidence for population standstill or even contraction in Classical times (HARRISON 1993). Detailed research into Cretan history provides good reason to argue that the survival of an archaic social and economic system on Crete created an effective brake on economic and demographic growth till Hellenistic times. Central factors in the stagnation of the Cretan economy (WILLETTS 1965) were: the serf-status of the majority of peasants, the inalienability of land, citizen subsistence based on communal food supply, and a monopoly of power and landholding by a limited citizen body dominated by a few leading families.

According to Aristotle this introverted, underdeveloped society began to break down with the entry from the mid-4th century B. C. of destabilising outside forces, especially mercenaries, into Cretan politics. More clearly, during the 3rd century B. C. there was an explosion of Cretan citizens into mercenary service and piracy outside of the island, coincident with a dramatic rise in inter- and intra-city strife on Crete itself. The inherent contradictions of the archaic socio-economic structure finally broke it apart and it gave way to a more typical form of city-state life, bringing with it rapid development in town and country as clearly demonstrated in the archaeological and historic sources (WILLETTS 1965, LARSEN 1968, JEFFERY 1976, VAN EFFENTERRE 1991, HARRISON 1993).

Crete therefore points to a certain inevitability in eco-demographic pressure, yet at the same time exhibiting the power of a 'socio-structural' factor in blocking its operation for a prolonged period. The particular effect of the archaic socioeconomic structure of Crete in containing a development natural to Crete's fertility was to constrain Cretan society into a form of underdevelopment more proper to a marginal landscape such as mainland Aetolia.

Athens (12) provides a different problem: the region possesses a good maritime location, lowland polyculture, and, as expected, a precocious population rise. But demographic and urban takeoff were especially early in Attica, and in comparison to other regions of the S. E. lowlands the region of Athens is not highly fertile. Once again we might be led to seek for historical factors, in addition to eco-demographic

ones of the KIRSTEN/RENFREW/MCNEILL variety, which gave it an early push toward high growth, and which then precipitated (as the regional food supply was prematurely overextended) the imperial experiment to live off an expanding periphery through colonies (cleruchies) and tribute.³ Ecological stress (see *infra*) may also have been a contributory factor in Attica.

More substantial difficulties arise when, for comparison, we consider the regional profiles of a remoter era — Neolithic Greece. This long period of early farming societies (some three millennia in duration), preceded the development of Bronze Age polyculture, so any precocious development in southern lowland Greece along the lines proposed by the eco-demographic model need not be expected at this time. The problem consists, rather, in an apparently precocious development of parts of Neolithic northern Greece: the archaeological settlement record contrasts a dramatic imbalance of population density between dense concentrations of long-lived “tell” villages in the plains of Thessaly, lowland Macedonia and Thrace, and the more scattered and short-lived settlements of the southern mainland and islands.

To comprehend this phenomenon, and set it apart from the main thrust of the KIRSTEN/RENFREW/MCNEILL model, we need to qualify our schematic description of the geography of Greece. In terms of the basic Neolithic “package” of cereals, legumes, and domestic animals, — deep plain and soft-relief hilland soils, with a warm-temperate to mild-Mediterranean climate, would have provided the most fertile environments for early farming communities. Although the coastal, Mediterranean-climate provinces of southern Greece and the islands, as noted earlier, have traditionally been dominated by lowland economies and settlement systems, the available plain and hill-country of this broader ideal type is much less extensive than in the lowland sectors of Macedonia and Thrace (despite the latter regions possessing equally large or larger sectors of upland economy and settlement, cf. note 1). And in Thessaly (25), such lowland landscapes provided the predominant settled area in a province dwarfing the individual regions of the southern mainland.

From the above considerations it is not at all surprising that Neolithic Greece appears to have had its population focus in the plains and rolling hills of Thessaly, lowland Macedonia and lowland Thrace. Indeed this situation, and the subsequent shift of the population and development foci away from the N. E. down into Aegean lowland Greece was a central context for RENFREW’s model for the rise of Aegean civilization in the Bronze Age. A hitherto less-ideal southern environment was transformed by the development of Mediterranean polyculture, whose central component for economic growth and stability — olive cultivation — was little suited to the typical landscapes of Thessaly and more northerly provinces.

At the time RENFREW’s major theory (1972) was presented the evidence for Bronze Age crops was poor in quantity and detail, and subsequent criticism has led to the suggestion that olive culture may not in fact have been widespread in mainland

3 One historic factor to explore could be the potential survival of an elite-based society at Athens from Mycenaean times, inferable from the archaeology of this unusually large Dark Age community and legendary accounts.

Greece until the time of the Mycenaean civilization in the later 2nd millennium B. C. or Late Bronze Age (RUNNELS and HANSEN 1986). On the other hand the evidence still supports the view that on Crete the Minoan palace civilization arose in association with olive culture, around the beginning of the 2nd millennium B. C. or Middle Bronze Age (DICKINSON 1994). As regards the two major Bronze Age civilizations in Greece, therefore, RENFREW's thesis can still be said to stand (with positive implications for KIRSTEN's and MCNEILL's versions of the model).

The remaining problem rests with Renfrew's claim that the "high culture" or "proto-civilisation" of Early Bronze Age southern Aegean Greece, represented by complex sites of village or "mansion" character, as well as by a takeoff in settlement numbers on a massive scale, likewise rested on Mediterranean polyculture. Such developments certainly seem an advance on the apparently stagnant village societies of early to mid Bronze Age northern Greece, which show few signs of population growth beyond Neolithic levels or political elaboration till late in the 2nd millennium B. C.; indeed between the Neolithic and the Bronze Age there are widespread relocations of settlement and other signs of possible "devolution" in population density and social organization in those northerly regions. However, current ecofact evidence does not support the application of the polyculture model to account for Early Bronze Age southern Greece "overtaking" the north.

It seems to me necessary to look at the two — north and south — trends separately. In the south by the (2nd millennium B. C.) Middle to Late Bronze Age, a stimulus to rapid economic growth and social change is certainly present with Mediterranean polyculture, a major factor in the rise of palatial civilizations. For the 3rd millennium B. C. Early Bronze Age, however, other stimuli must now be postulated to account for undeniable symptoms of demographic growth and sociopolitical elaboration in Mediterranean southern Greece.

One is tempted to look to the negative side of Aegean southern Greece, its greater aridity and unpredictability of climate, and tie this in with evidence accumulating in many different parts of the Mediterranean for secular shifts in climatic parameters in the 4th–3rd millennia B. C., over which timespan it can be argued that the "Mediterranean climate" first became fully established in its modern distribution (BINTLIFF 1992).⁴ In response to the onset of the characteristically stressful, full Mediterranean climate in the more arid regions of Aegean lowland southern Greece, economic and social adaptations were made and spread among farming communities, with the result that these societies not only became more prosperous and stable but were encouraged to develop forms of social hierarchy hitherto undocumented till much later in Northern Greece.

4 Particularly pertinent to the Aegean 3rd millennium case is the evidence in Israel. Here, the contemporary 4th–3rd millennium B. C. era sees a shift from village-hamlet life in a wide range of environments, including areas now too arid for dry-farming (the Chalcolithic), towards a distribution of Early Bronze Age farming communities particularly concentrated in the more confined zone of true Mediterranean climate where dry-farming is viable today. This shift is associated with evidence for climatic change (LEVY 1995, 241).

PAUL HALSTEAD (1981; HALSTEAD and O'SHEA 1982) has described one variety of mechanism which he believes may have been critical in high-risk Aegean environments — "social storage" — a buffering system deploying communal food surpluses for "neighbourhood mutual scarcity support" within networks of villages. It can therefore be argued that the threat of severe food shortages could stimulate redistribution, trade, exploration, with associated effects on the elaboration of more hierarchical forms of society and settlement. MANNING (1994) has suggested that the population of the Early Bronze Age Cycladic islands was too low both for demographic needs and resource stability, causing strong inter-island social ties linked to exchange systems. Such ideas echo earlier suggestions by HALSTEAD (1981) for food exchange systems in Bronze Age Crete and the Cyclades to cope with scarcity. A more elite-centred, exploitative reading of the same mechanism is equally plausible (especially as the evidence from the type-site for Aegean social storage — Assiros — has now evaporated, cf. *infra*). It may be significant that 'central-places' in the Early Bronze Age of S. Mainland Greece are increasingly associated with evidence for elite-centred redistribution of stored products from surrounding districts (PULLEN 1994).

From the dramatic spread of new settlements and their rise in numbers I think we must also consider major changes in land use, certainly fundamentally assisted by the spread into Greece of traction plows, SHERRATT's (1981) "secondary products" revolution in the use of pastoral dairy and textile resources, and perhaps metal tools, (cf. PULLEN 1992). It must be admitted immediately that all these innovations were available in northern Greece, and with the exception of central-place "social storage" were almost certainly being adopted there from the 3rd millennium if not earlier. All that might be claimed is that the higher-risk lowland Aegean environment produced organizational changes in society not paralleled to the north, in which these innovations were instrumental but not determinative. And we would still see inherent limitations to the precociousness of southern Greece, only overcome by Mediterranean polyculture in a maturer phase of the Bronze Age.

I believe in any case that it remains to be shown that the regional populations of Early Bronze Age southern Greece were in fact significantly larger than those of the fertile lowlands of northern Greece, since long-lived nucleated villages could represent higher average densities than the innumerable shorter-lived farmsteads characteristic of the south. Our attention should perhaps be drawn more to the role of a reorganisation of settlement and social life into hierarchical forms, as the crucial emergent civilisational process, rather than postulating an unconfirmed demographic imbalance between south and north, at least until polyculture provides a firmer basis for differential prosperity.

One result of these considerations is to narrow the gap between perceived development potential in S. E. lowland and N. E. lowland Greece (Thessaly to Thrace). On the eco-demographic model we might therefore predict a similar long-term development north and south but at a greatly-enhanced pace in the Bronze-Iron Age southern Aegean. South Aegean societies achieve palace-focused states in the Middle to Late Bronze Age. Significantly, the only northern area where all the characteristic

factors believed central to Southern Aegean palace florescence could operate, coastal Thessaly, appears to participate in these developments; elsewhere village-focused society dominates.

In the north, hitherto unknown factors cause settlement dislocation within formerly-prosperous Neolithic settled landscapes, but growing evidence points to an overall continuity in our picture of suitable farming landscapes being covered with a network of village/hamlet communities throughout the succeeding Bronze and Early Iron Ages. In the absence of polyculture, but with the increasing availability of bronze technology, development in the north is slow but steady: site numbers rise from Early to Late Bronze Age. By the final period of the Late Bronze Age in lowland Macedonia (8, inset) elementary settlement hierarchies or small polities may have begun to emerge within geographically-confined local village networks, probably centred on the largest villages. In the Langadhas Basin the excavator of Assiros (WARDLE 1989) has suggested that it served as a district storage centre for the surplus food production of surrounding villages (the absence of residential quarters now undermines the earlier view of the site (JONES et AL. 1986) as a village with its own communal social storage quarter). In inland Thessaly, a long-term trend to larger populations and an elementary settlement hierarchy can be traced from early Neolithic to Late Bronze Age times (HALSTEAD 1977, 1994).

With the advent of iron technology and its boost to agricultural productivity, communities in both lowland south and north Aegean might be expected to exhibit population increase. Southern Aegean lowland societies recovering from Bronze Age civilizational collapse were now in a position to reconstitute state societies on an even higher productive base than had been the case in the Bronze Age, and therefore the state could arise from much smaller territories. The "normal" city-state had an average of 2-3000 citizens crammed into a territorial radius of around 5 kilometres (RUSCHENBUSCH 1991). It is appropriate at this point to stress the essential truth of Kirsten's crowning insight in his monograph 'Die Griechische Polis' (1956), that the fundamental origin of the ancient Greek city-state or *polis* is the village: the "Normalpolis" is a politicization of the village in conditions of enhanced growth, a "Dorfstadt". For the abnormally-large city-state of Athens (12) and the federal state of Boeotia (11), in comparable-sized regions of around 1000 square miles, estimates of maximum Classical population are of the order of 200-250,000 people (BINTLIFF and SNODGRASS 1985; GARNSEY, 1988).

The village networks of north lowland Greece were also boosted by the iron revolution. Settlements rose dramatically in number and also in size in the Early Iron Age. Predictably at a slower rate than the south, and with arguably smaller climax populations, townlife began to develop in Thessaly and Macedonia during Archaic times, but its flourishing was Hellenistic in date. In Thessaly in particular recent research has shown the gradual transformation of village networks, across the great plains and intervening hilland, into countless city-states. The typical Greek city-state as a "village" projected into an abnormal economic-demographic growth by a more intensive exploitation of its countryside, and ultimately forming a building block in larger territorial states, was therefore a developmental outcome latent in

the stable village systems of both north and south lowland Greece, which I would term "proto-poleis". So it is therefore much less extraordinary a step for villages in some regions of ancient Greece (the core zones) to metamorphose into city-states during Geometric and Archaic times, a process which then extended progressively into peripheral regions during the Classical and Hellenistic centuries.

After this lengthy diversion into the Neolithic and Bronze Ages and their contrast with Iron Age Greece, it is time to focus more closely on our specifically historical application of the Eco-demographic Model. If we recall the two general models introduced earlier, emphasizing regional growth trajectories and a structural history viewpoint of different time levels, and make an assumption (see *infra*) of a natural trend of demographic and economic growth in the long term, we might envisage each region of Greece developing along rather similar paths, yet achieving comparable levels of complexity at varying points in history as a consequence of natural geographic potential. Thus if we were to adopt the Braudelian perspective of the longest wave of time processes, the *Longue Durée*, (Fig. 6), we might give the population of every region a roughly similar starting point in population and socio-economic complexity. We could then activate our growth model to consider the effects on a natural "core" high-fertility/high-access/high-communication region, and in contrast, the effects on a region far less favored in all these respects, of a series of major innovations diffusing from region to region of Europe. These would include: the inception of village farming, the "Secondary Products Revolution", plow agriculture, Mediterranean polyculture, bronze and then ironworking. As these effects can be considered to have had far more rapid growth consequences in certain zones of the Aegean favorable to high productivity and high interconnectivity, the two contrasted types of region gradually diverge over time.

Our model has deliberately oversimplified the situation into two contrasting regions that are fixed in their relative potential. This may well be appropriate to the overall contrast between southern lowland Greece and northern Greece from Middle Bronze Age to Iron Age times, but as we have just seen, in other periods such as the Neolithic, these roles may have been reversed. We have also suggested that exceptionally, a regional disability such as climate stress, could prove a stimulus to greater social complexity and hence economic growth, provided that the resulting circumvention of that barrier to growth releases a strong natural takeoff potential.

For the purposes of retrospective analysis of Greek settlement history I have taken population and economic growth to be "natural". It is necessary to try and justify using such an assumption in my models, because although it is fundamentally generated by empirical observation, the theoretical basis for seeing such a trend as "natural" is extremely weak. Firstly, societies which in the medium-term have adjusted to low-stress use of resources could be diverted into "Malthusian" boom-bust cycles through the destabilizing effects of the introduction of innovations such as those listed earlier in this paper. Second, let us take an anti-deterministic stance, and argue for a constant random fluctuation in human socioeconomic life. If human societies consist of interactive networks in which such randomness can operate systematically to modify the network or "society", then as the Harvard evolutionary

theorist STEPHEN JAY GOULD has several times remarked, the only direction that a simple system can mutate into is towards greater complexity. No directional desirability is thus implied, and certainly no "progress" in this intriguing reformulation of a central Darwinian model.

Combination Models

Taking the post-Neolithic regional trends in Greece as our prime subject for investigation, is the slower development of peripheral Aegean regions now to be seen to be as much due to the more gradual impact of a widely diffused series of technical advances and lower natural potential, as to the stimulus of economic exchanges with more naturally-endowed cores? Is the achievement of increasing complexity an inevitable phenomenon for both core and periphery regions, regardless of their mutual interactions? Does faster regional growth in some areas encourage intervention into slower growth regions, accelerating local growth trajectories?

A case study from Western Europe is worth recalling in this context. Returning momentarily to the well-known application of Core-periphery theory to the rise of West Hallstatt princedoms in the Early Iron Age, some years ago I criticised at length (BINTLIFF 1984a) the way in which that case-study ignored out-of-phase cycles of largely internal growth in different regions of continental Europe. There is good reason to highlight the widespread effect of innovations in the technological and agricultural realms in creating these regional cycles. In particular the impact of iron technology in stimulating the parallel rise of complex societies in Hallstatt/early La Tène continental Europe, Etruscan Italy, and Proto-Historic Greece can be strikingly brought out. A strong case can also be made that excessive demographic growth in several of these regions culminated in the migration and colonization phenomena typical for this latter phase of the Early Iron Age (Celtic migrations, Etruscan and Latin colonization).

Of course a gradual diffusion of innovations stimulating population growth can happen without core-periphery effects being invoked, such as the key innovations noted earlier (settled farming, secondary products, metalworking). On the other hand, just to complicate the picture, especially in the Iron Age, these or additional agricultural innovations can spread as a direct or indirect result of economic interactions between cores and peripheries (as for example with the spread through the West Mediterranean of olive and vine cultivation, with other trees, and for Iberia even iron technology itself, via Greek and Phoenician colonies).

To take account of the complexity revealed by our last comment, an intermediate or combination model (Fig. 7B), may be constructed, linking eco-demography to the core-periphery approach, and focusing on crop/technology transfer between advanced and less developed regions. In particular we may usefully consider the process of agricultural intensification and the diffusion of technologies for land drainage, terrace construction, or the spread of new crops such as walnut, olives, vines; these features appear in protohistoric native societies in the western Mediterranean and Adriatic in the context of close relations with Greek and Phoenician colonies (for Illyria [1-2] cf. CHAPMAN et al. 1987, CHAPMAN and SHIEL 1993). Economic

and technological innovations may be accepted by peripheral populations as a whole for their productive potential, or fostered by native elites to increase regional manpower and food surpluses; a stronger military machine protects a periphery from greater core encroachment and offers the attractive possibility of a reverse movement of periphery predation, whilst enhancing surplus favours increased exchange and the associated elaboration of elite material culture.

In N. E. Greece the highly-hellenized Macedonian kingdom (8) was associated with agricultural intensification through major land improvements and planned settlement. However, in the celebrated passage (Arrian, *Anabasis* 7,9,1-6) where Alexander the Great addresses his army on the achievement of his father Philip II in bringing the rude, pastoral Macedonians down to settled life in the civilized plains, we seem to be witnessing a truly dramatic transformation in 4th century B. C. Macedonia. Indeed when we consider the predominance of hilly or mountain land in the Aegean and Adriatic periphery regions, can we generalize from the Alexander passage to envisage the much wider transformation of nomadic mountain herders into settled farmers civilized in the *polis* ways of the south? Such striking effects of core-periphery relations would decisively restrict the independent value of the eco-demographic model for genuine upland landscapes and effectively collapse it into a variant of the core-periphery model.

The clearest message from the archaeology of these regions is a positive "no". Since the arrival of the domestication of plants and animals in Greece and the East Adriatic in the 7th and 6th millennia B. C., the fundamental economy of the southern Balkans has been mixed farming, with varying proportions of farming and herding components according to local geography. The spread of farming sites in Neolithic Greece was universal to all regions of moderate altitude, regardless of olive limits. Archaeology reveals the infill of potential arable landscapes throughout Greece in the "longue durée"; subsequent advances in productivity occasioned by the spread of secondary products, the plow, and metalworking, everywhere lift the level of supportable population in mixed farming (Fig. 6). By the Late Bronze Age and Early Iron Age in all the regions we have examined we find evidence for a system of settled farming villages, often comparable in distribution to the traditional village network of a few generations ago. As we have seen in the preceding section (*supra*), in the richer-soiled plains and hill-country of both lowland south and lowland north Greece, the latent potential of these "proto-*polis*" villages requires respectively, small, and moderate, technological stimulus for the creation of regional polities in the medium-term.

There were almost certainly high upland communities throughout Greece by the Late Bronze Age, with farming a minor component subordinated to herding, but equally certainly this economy was necessarily extensive in land use and resulted in low population densities (cf. EFSTRATIOU 1993 for an excellent case study in upland Thrace). If we find settlement concentrations in the upland regions of Greece, at any time in the past, this has always developed out of an enhanced productivity from mixed farming with a substantial arable component based in settled villages.

The Aetolia Project (7) has shown this very clearly for the development of a non-Mediterranean peripheral society.

If, then, later Bronze Age and Early Iron Age Greece and the Illyrian lands are mosaics of upland and lowland regions typified by the mixed farming village, the product of essentially indigenous development punctuated by the general diffusion of innovations, we must reconsider the real significance of the observed core-periphery or out-of-phase growth patterns of the Greek regions.

Settlements in core and periphery had a fundamental similarity. Whether growing in number and size due to the plow, or ironworking, they were mainly nucleated and part of long-established networks. The vital factors which modified the south Balkan mixed farming village in the S. E. Aegean lowlands into the Minoan-Mycenaean palace societies, or the aggressive, colonizing Iron Age *polis* system, were not operating out of nothing, but merely seem to have pushed this pre-existing system into a critical change of gear.

I come back to scale and economics, and to KIRSTEN. Let us consider once more those geographically restricted elements identified by him, and subsequently by RENFREW and MCNEILL, — polyculture for a stronger subsistence economy, high-value storable crop surpluses like olives and wine, and excellent marine communications, added to which are those changes in socio-economic organisation adaptive to the stress of more arid and unpredictable environments which we discussed at length earlier. Do they lift the ubiquitous village in certain regions only (the cores) at an earlier date than elsewhere into something more economically powerful, perhaps through a boost to local population, military status and trade opportunities? If we accept the basic truth of this proposition, then how could peripheries ever compete, lacking by nature those advantages?

It is a corollary of our underlying concept of parallel, but out-of-phase development for Greek and East Adriatic regions, that in the long-term all were moving — though with cyclical disruptions (see *infra*) — towards more complex forms of society and higher productivity (Figs. 6, 7A-B). Left to separate development, apart from shared reception of innovations from the wider world, peripheral regions would have achieved a settlement hierarchy and some form of central place organization comparable to the lowland Aegean Bronze Age palace system or the Iron Age city-state. The pace of that development, and its scale, would be both slower and less impressive. As a result of this growth imbalance, the precocious states of the early historic Aegean lowlands were able to introduce destabilizing forces into the peripheries, altering their trajectories into more rapid or less rapid growth and elaboration (Fig. 7B).

The Socio-Structural, Punctuated-Equilibrium Model

The Eco-Demographic Model emphasizes the inherent developmental impetus given to a region by the introduction of important innovations in agricultural technology or crop/animal practices. Core-periphery models likewise identify regional development impetus through the invasion of underdeveloped local economies by high

surplus-demand, external trading or tribute systems. Both imply a continuing process of regional demographic and economic growth following innovation/core contact. Even where exploitation of peripheral populations is politically-defined and the development of non-core producers artificially restricted, as in Spartan and Thessalian dominance over serf (Helot, Penestai) and secondary citizen (Perioeci) communities, the fact is that these integrated systems appear to grow to a climax in Classical or Hellenistic times, in parallel with non-serf regions elsewhere in Greece (where tenant, wage or slave labour plays the counterpart of lower-class productive forces). This makes it plausible that sufficient stimulus to the economy is being created by the expansion of citizen demand in town and country, and/or that sufficient surplus is being retained by the inferior classes, to drive the system continuously upwards to regional climax.

In contrast, however, in the case of Archaic to Early Hellenistic Crete (24), and in the Langadhas Basin of E. Macedonia (8 inset), the initial effect of innovation to a region (in these examples chiefly the stimulus of iron technology to farming productivity), after pushing the population and settlement system to a higher level, loses momentum as human communities appear to stabilize into an apparent equilibrium well below the growth potential exploitable locally. In the absence of limiting ecological factors, or "underdevelopment" provoked by external political or economic forces, we can isolate with some confidence a socio-structural effect as primarily responsible in the Cretan case, and suspect a similar explanation for E. Macedonia. In both examples subsequent settlement history demonstrates the breakdown of restrictive processes and the achievement of far higher levels of settlement density or complexity (respectively in the Late Hellenistic to Early Roman, and Late Roman eras). Perhaps oversimplifying (Fig. 8), we might suggest that a dominant social structure absorbs a certain growth stimulus without fundamental change through inhibiting continuous economic development, or arises during the process of innovation and then exerts a braking force essential to its control over power and resources. Two concepts that may be appropriate to understand this postulated phenomenon can be mentioned. One is the Punctuated-Equilibrium model of ELDREDGE and GOULD (1972), devised for long-term evolutionary history but arguably applicable to medium- to long-term human societal development (BINTLIFF in prep. (b)). In this approach, many biological systems can stabilise into a certain deep structure with only surface change for long periods of time, but undergo irregular, rare and short-lived perturbations that totally destabilise and restructure the system. Subsequently such systems restabilise for a further lengthy era of apparent equilibrium. Another concept derives from the rapidly-expanding field of Complexity Theory in the sciences (LEWIN 1993), that of "Strange Attractors", a property identified in very complex systems that 'pulls' potentially infinitely-variable behaviour into a limiting structure with a capacity for prolonged stability. Social science and specifically archaeological applications are at a very preliminary stage of development (BINTLIFF in prep. (a), LEWIN 1993).

I consider that these approaches are currently the most profitable to pursue in further investigation of the persistent "stagnation" of Classical Crete and the "unchanging" advanced village society of Early Iron Age to Roman era E. Macedo-

nia. Ultimately trying to account in historical terms for the persistence of "strange attractors" in the face of forces promoting change might speculatively involve self-reinforcing processes of class development, control over military technology and sociobiological community behaviour.

The Upland Boom-Bust Model

In our earlier discussion of the Eco-demographic model, we have offered predictive generalizations in order to account for the general hastening of regional development in Iron Age Greece that seems to have occurred in the peripheries as a consequence of interactions with S. E. lowland *polis* societies and their colonies. But we must make a distinction between those peripheral regions which, regardless of core-periphery relations, were maturing more slowly due to limited operation of the favorable eco-demographic package (Achaea (13), Thessaly (25), Macedonia (8)) and those regions whose natural disadvantages permanently inhibited demographic takeoff and urbanism. The latter group included rugged mountain regions such as Epirus (3), Aetolia (7), Albania (2) and perhaps Arcadia (19). Whereas we can expect the first type of peripheral region to have achieved comparable complexity to the S. E. core regions either through separate (Fig. 7A) or assisted development (Fig. 7B), we need to explain how it is that at certain points of history members of our second type of peripheral region — the mountainous zones proper, appear to have been unexpectedly populous and powerful.

It is helpful at this point to introduce a summary of current theory concerning rugged upland communities around the Mediterranean and elsewhere. An illuminating synthesis of this research is available in P. P. VIAZZO's 'Upland Communities' (1989) (Table 4).

VIAZZO notes how percipient was that pioneer of historical demography, THOMAS MALTHUS, in his fundamental essays on population dynamics (MALTHUS 1986 [1803]). Although in recent centuries European mountain lands have appeared permanently overpopulated, impoverished, and the source of massive out-migration, MALTHUS argued that the normal, long-term demographic regime for such regions around the world was very different, with fertility kept low to accommodate population size to limited resources (Table 4, Mode 1).

It was MALTHUS again who singled out incipient trends in Swiss upland community lifeways during his time which might shift such behavior into a much less stable and self-sufficient form — the development of a cottage industry and emigration. Both established the potential for a previously-autonomous mountain economy to be tied into dependence on other, lowland regions, breaking the circular constraint on population, and shifting behavior into an "open" system (Table 4, Mode 2). Mountain populations in which external factors become a major demographic stimulus, MALTHUS hypothesized, can grow well beyond their subsistence potential, but only through sustained income from outside or high out-migration.

VIAZZO demonstrates how detailed case studies of historical mountain communities in Europe and elsewhere largely bear out MALTHUS' insights into the two

dominant modes of demographic and economic behavior. He does, however, point out that mountain communities are never, in practice, cut off from the richer lowlands, so that the "closed" mode is a dominant result of limited interaction, in contrast to the dominance of intensive external interaction in fuelling overpopulation in the "open" mode.

The many and varied ways in which naturally-disadvantaged mountain regions grow into dependence on lowlands are worth listing, as they can be seen to be repeatedly observed in the historical "boom-bust" cycles of such regions:

1. Raiding by mountain people overland or by sea, possibly developing into conquest of lowlands, enhancing local economies through seizure/tribute of portable wealth and foodstuffs.
2. Emigration on a seasonal, temporary, or permanent basis from the mountains into lowland regions, through hired labour, mercenary service, export of slaves/domestics, removing surplus population and/or bringing in additional wealth.

It can be seen that the conditions favoring such dependence are likely to be unstable, with the expected result that the demographic history of mountainous regions is one of "punctuated equilibrium": long periods of "closed" economy and demography are interrupted by shorter episodes of dramatic population overflows and eruption of mountain folk into the life of the lowlands. This model could perhaps be considered a specialized case of a Core-periphery relationship where the main stimulus may in fact come from the periphery.

Applying VIAZZO and MALTHUS' insights to some of the marginal regions of Greece mentioned earlier, we find a good correspondence. Aetolia (7) is particularly appropriate: the Dutch Project team comment that Aetolia had only one moment of fame, in late Hellenistic times; then it sank back into total unimportance lasting to the present day. Its rise to major power status in ancient Greece was the culmination of an ever-expanding and highly-organized series of raiding campaigns by land and sea (BAKHUIZEN in press) and the major export of mercenaries.

Epirus (3), one of the most mountainous and least agriculturally-favored regions of Greece, features more frequently than Aetolia in historical records, but each phase of importance coincides with a strongly outward-orientated politics and economy: the military expansion of the Molossian/Epirot kingdom culminating in the reign of Pyrrhus in Hellenistic times; the Medieval Despotate of Epirus with its wide military, political, and economic strategies; and finally the famous Early Modern specialization in the production of pastoral products for export relying on very wide-ranging transhumance into distant lowlands.

Finally, let us return to the case of Crete in Archaic-Classical times. We have earlier suggested that the 'natural' operation of Iron Age population growth to climax in this fertile island was blocked from the 6th-3rd centuries B. C. if not from earlier, by the fossilisation of an archaic political structure that promoted economic and demographic stagnation. Effectively, this converted Cretan agricultural potential into that more characteristic of one of the upland marginal regions discussed above. It was argued, already in Antiquity, that one of the processes that shattered this static

underdevelopment was the disruption to the island's traditional military balance created by importing mercenaries from abroad, which led to internal destabilisation; to which we should add the opening up of the island population to participation in mercenary service and piracy overseas. Through cultural factors, therefore, Cretan development mirrors the Upland model, broadening its potential operation beyond purely ecological contexts.

The Core-Collapse Model

In our critique of the Core-periphery approach we pointed to the need to allow each region its own potential for rapid or gradual growth. Likewise we can observe that in BRAUDEL's "Moyenne Durée" or medium-term timescale, regional population and socioeconomic florescences frequently lead to striking downturns and into periods of decline (Fig. 7C). It was not merely the pressure of late-developing powerful states on the Aegean peripheries which threatened the primacy of core states in the S. E. lowlands, but their own internal difficulties that may well have been a consequence of early and dramatic growth.

Thus it has been shown that Classical and Early Hellenistic high populations in Attica (12), the Argolid Peninsula (17), and the island of Euboea (10), utilizing their landscapes to a degree of intensity not matched since that time, were associated with massive soil erosion (BINTLIFF 1992, BRÜCKNER 1990; POPE and VAN ANDEL 1984; RUST 1978). At present we cannot distinguish between two alternative scenarios: erosion causing rural collapse, or rural abandonment exposing the landscape to devastating erosion. In the latter case depopulation may have resulted primarily from the social, political and demographic disruption caused by the increasing scale of intercity warfare in Classical to Early Hellenistic times; however such "political" factors could well be a direct result of overpopulation and territorial competition, hence ultimately ecological. In other regions as my own survey region of Boeotia (11) has shown, serious depopulation in Late Hellenistic and Early Roman times may have been a consequence of overexploitation of land producing nutrient deficiency in soils (CLARK 1992). In such cases, weakening of core state resources would enhance the ability of rising periphery states to dominate them.

An alternative factor in core decline might stem from the prevalent view that "world empires" are economically heterogeneous. Over-extension of resource use by the core into distant areas might create dislocation and imbalance, due to undeveloped supply-lines, political and military disruption, or the growing power of the periphery. A different form of core collapse might focus on growing socio-political stresses within state systems that have outgrown their ability to manage complexity.

Summary

- Intensive archaeological survey is a powerful tool for analyzing regional history, more reliable and nuanced than excavation and extensive survey. Through accumulating survey evidence it can be shown that the political and military history of ancient Greece, as a succession of different dominant powers, reflects fundamental demogra-

phic and economic growth patterns highly specific to particular regions and periods. This "regionalist" perspective confirms the view that in pre-Capitalist societies regional economies were weakly integrated into wider networks and maintained their own significant momentum and cyclicities. It was found that only a range of models, each with varying validity in time and space, could account adequately for the complex trends observed in regional developmental trajectories. Nonetheless it can be claimed that regional geography, combined with levels of available technology, exercised a profound influence in the medium- to long-term upon the timing and intensity of regional demographic and economic growth; this supports the geographical "possibilism" of VIDAL DE LA BLACHE and FEBVRE, where regional landscapes are both constraining and enabling (HOLT-JENSEN 1988: 31-36). Secondary in importance are core-periphery interactions, usually operating in the short- to medium-term, between regions of precocious growth and regions that are either moving at a slower rate or are affected by naturally-induced or artificially-induced underdevelopment. More rarely, but for some regions critical, are sociocultural effects which insulate local societies from both geographical opportunity and external stimuli to development, reminiscent of LADURIE's "motionless history" (LADURIE 1977), and with medium- to long-term manifestations. Other structures appearing recurrently in regional histories are steady-growth trends and medium- to short-term "boom-bust" cycles; seen in the perspective of the long-term the former also conform to cycles of growth and decline. Cyclicity can be the product of internal ecological crises, internal contradictions in sociopolitical structure, or the fragility of interregional political and economic networks.

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Appendix: Source database for the Regional Survey Analysis

NB: The numbers identifying regional survey projects refer to Figure 3 in the text, where their location can be seen. "Int." and "Ext." refer to intensive survey, and extensive (the latter includes literature reviews and excavation syntheses).

1. *Dalmatia*: CHAPMAN, SHIEL et AL. 1987, CHAPMAN and SHIEL 1993 (Int.); CHAPMAN, BINTLIFF and GAFFNEY eds. 1988 (Int.); J. BINTLIFF et AL. unpubl. records of the Starigrad Survey, Hvar Island (Int.); WILKES 1969, 1992 (Ext.); KIRIGIN 1990 (Ext.).
2. *Albania*: BLAGG 1992 (Ext.); CONDI and DOUKELLIS 1992 (Ext.); WILKES 1969, 1992 (Ext.).
3. *Epiros*: DOUKELLIS 1990 (Ext.); DAKARIS 1971 Thesprotia, 1971 Cassopaia (Ext.).
4. *Levkas*: DOUSOUGLI and MORRIS 1994 (Ext.).
5. *Kephallenia*: K. RANDBORG et AL. , 1992, unpublished report on the first season of the Danish Kephallenia Survey (Ext.).
6. *Akarnania*: KIRSTEN 1940, 1956 (Ext.); P. FUNKE/H.-J. GEHRKE, unpubl. re-

- port of the first, 1992 season of the Stratos Survey (Int.).
7. *Aetolia*: KIRSTEN 1940, 1956 (Ext.); FUNKE 1987 (Ext.); BOMMELÉ and DOORN 1981, 1983, 1984, 1987 (Ext.); ALCOCK 1989 (Ext.).
 8. *Macedonia*: KOTSAKIS 1989, 1990 (Int.); KOTSAKIS, unpublished reports of the Langadas Basin intensive survey 1988, 1989 (Int.); ANDREOU and KOTSAKIS 1994 (Int.); Grevena Survey, French 1990-1 (Ext.); KOKKINIDOU and TRANTALIDOU 1991 (Ext.); BORZA 1990 (Ext.); HAMMOND 1991 (Ext.).
 9. *E. Phocis and Opountian Lokris*: FOSSEY 1986, 1990 (Ext.).
 10. *Euboea*: SACKETT 1966 (Ext.); KELLER and WALLACE 1986-1988, 1990 (Int.); KELLER 1985 (Int.); RUST 1978 (Ext.).
 11. *Boeotia*: FOSSEY, 1988 (Ext.); BINTLIFF and SNODGRASS 1985, 1988 (Int.); BINTLIFF 1990 (Int.); BINTLIFF, in prep. a,c; MUNN 1989-90 (Int.).
 12. *Attica*: LOHMANN 1983, 1985, 1991, 1993 (Int.); MORRIS 1987 (Ext.); BINTLIFF 1994 (Ext.); GARNSEY 1988 (Ext.).
 13. *Achaea*: A. RIZAKIS et AL. unpublished reports of the Achaea Project, Athens, National Hellenic Research Center; PETROPOULOS 1994, PETROPOULOS and RIZAKIS 1994 (Ext.); ALCOCK 1989 (Ext.).
 14. *Corinthia and Cleonae*: SAKELLARIOU and FARAKLAS 1971 (Ext.); MORRIS 1987 (Ext.); ENGELS 1990 (Ext.).
 15. *Methana*: C. MEE et AL. 1984, unpublished report on the Methana Survey (Int.); MEE et AL. 1991 (Ext.).
 16. *Nemea Valley*: WRIGHT et AL. 1990 (Int.); ALCOCK 1991 (Int.).
 17. *The Argolid*: FOLEY 1988 (Ext.); MORRIS 1987 (Ext.); VAN ANDEL and RUNNELS 1987 (Int.); JAMESON 1994 (Int.); AULT 1994 (Int.); WELLS et AL. 1990 (Int.).
 18. *Laconia*: CAVANAGH and CROUWEL 1988 (Int.); CAVANAGH, unpublished reports of the Laconia Survey, 1983 and 1984 seasons (Int.).
 19. *Arcadia*: HOWELL 1970 (Ext.); LLOYD and ROY 1982, unpublished report on the Megalopolis Survey, 1982 season (Int.); ROY et AL. 1988 (Int.); LLOYD 1991 (Int.).
 20. *Messenia*: MCDONALD and RAPP 1972 (Ext.).
 21. *Kea*: CHERRY et AL. 1991 (Int.); CHERRY and DAVIS 1991 (Int.); MENDONI 1994 (Int. and Ext.).
 22. *Melos*: RENFREW and WAGSTAFF 1982 (Int.); SNODGRASS 1989 (Int.).
 23. *Samos and Chios*: SHIPLEY 1987 (Ext.).
 24. *Crete*: WILLETTS 1965 (Ext.); WATROUS 1974 (Int.); SANDERS 1976, 1982 (Ext.); BLACKMAN and BRANIGAN 1975, 1977 (Int.); R. HOPE-SIMPSON et AL., unpublished report of the Kommos Survey, 1985 (Int.); J. BENNET unpublished report of the West Messara Survey, 1984 (Int.); WATROUS et AL. 1993 (Int.); MOODY 1987 (Int.); NIXON et AL. 1988-1990 (Int.); VAN EFFENTERRE, 1991 (Ext.); HARRISON, 1993 (Ext.).
 25. *Thessaly*: AUDA et AL. 1991 (Ext.); JEFFERY 1976 (Ext.); LARSEN 1968 (Ext.); LUCAS 1991 (Ext.); MARZOLFF 1991, 1994 (Ext.).

General Bibliography

- S. E. ALCOCK 1989 — Archaeology and Imperialism: Roman Expansion and the Greek City, *Journal of Mediterranean Archaeology* 2, 87–135
- S. E. ALCOCK 1991 — Urban survey and the Polis of Phlius, *Hesperia* 60, 421–463
- S. E. ALCOCK 1993 — *Graecia Capta. The Landscapes of Roman Greece*, Cambridge
- S. E. ALCOCK 1994 — Breaking up the Hellenistic world: survey and society, in I. MORRIS ed., *Classical Greece: Ancient History and Modern Archaeology*, Cambridge, 171–190
- S. ANDREOU and K. KOTSAKIS 1994 — Prehistoric rural communities in perspective: the Langadas Survey Project, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 17–25
- Arrian, *History of Alexander (Arrian II)* — P. A. BRUNT ed., Cambridge 1983
- Y. AUDA et AL. 1991 — Espace géographique et géographie historique en Thessalie, *Archéologie et Espaces*, Juan-les-Pins: Editions APDCA, 87–126
- B. A. AULT 1994 — Koprone and oil presses, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 197–206
- S. C. BAKHUIZEN, in press: Men, mountains, raiding. The Aitolian way of life, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 5
- G. BARKER and J. LLOYD, eds. 1991 — *Roman Landscapes. Archaeological Survey in the Mediterranean Region*, London: British School at Rome
- J. L. BINTLIFF, ed., 1984a — *European Social Evolution: Archaeological Perspectives*, Bradford: University of Bradford
- J. L. BINTLIFF, 1984b — Review of C. RENFREW and M. WAGSTAFF, eds., *An Island Polity*, *Journal of Historical Geography* 10, 88–89
- J. L. BINTLIFF, 1990 — The Roman countryside in Central Greece, in G. BARKER and J. LLOYD, eds., *Roman Landscapes. Archaeological Survey in the Mediterranean Region*, London: British School at Rome, 22–132
- J. L. BINTLIFF, ed., 1991a — *The Annales School and Archaeology*, London
- J. L. BINTLIFF 1991b — Die Polis-Landschaften Griechenlands: Probleme und Ausichten der Bevölkerungsgeschichte, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 2–3. Bonn, 149–202
- J. L. BINTLIFF 1992 — Erosion in the Mediterranean lands: A reconsideration of pattern, process and methodology, in J. BOARDMAN and M. BELL, eds., *Past and Present Soil Erosion*. Oxford: Oxbow Books, 125–131
- J. L. BINTLIFF 1994 — Territorial behaviour and the natural history of the Greek polis, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 4, Amsterdam 1990, 207–249 and Tafel XIX–LXXIII
- J. L. BINTLIFF in prep. a — The origins and nature of the Greek city state, in M. BATS and P. RUBY, eds., *Les Princes de la Protohistoire et l'Emergence de l'Etat*, Paris: CNRS

- port of the first, 1992 season of the Stratos Survey (Int.).
7. *Aetolia*: KIRSTEN 1940, 1956 (Ext.); FUNKE 1987 (Ext.); BOMMELÉ and DOORN 1981, 1983, 1984, 1987 (Ext.); ALCOCK 1989 (Ext.).
 8. *Macedonia*: KOTSAKIS 1989, 1990 (Int.); KOTSAKIS, unpublished reports of the Langadas Basin intensive survey 1988, 1989 (Int.); ANDREOU and KOTSAKIS 1994 (Int.); Grevena Survey, French 1990-1 (Ext.); KOKKINIDOU and TRANTALIDOU 1991 (Ext.); BORZA 1990 (Ext.); HAMMOND 1991 (Ext.).
 9. *E. Phocis and Opountian Lokris*: FOSSEY 1986, 1990 (Ext.).
 10. *Euboea*: SACKETT 1966 (Ext.); KELLER and WALLACE 1986-1988, 1990 (Int.); KELLER 1985 (Int.); RUST 1978 (Ext.).
 11. *Boeotia*: FOSSEY, 1988 (Ext.); BINTLIFF and SNODGRASS 1985, 1988 (Int.); BINTLIFF 1990 (Int.); BINTLIFF, in prep. a,c; MUNN 1989-90 (Int.).
 12. *Attica*: LOHMANN 1983, 1985, 1991, 1993 (Int.); MORRIS 1987 (Ext.); BINTLIFF 1994 (Ext.); GARNSEY 1988 (Ext.).
 13. *Achaea*: A. RIZAKIS et AL. unpublished reports of the Achaea Project, Athens, National Hellenic Research Center; PETROPOULOS 1994, PETROPOULOS and RIZAKIS 1994 (Ext.); ALCOCK 1989 (Ext.).
 14. *Corinthia and Cleonae*: SAKELLARIOU and FARAKLAS 1971 (Ext.); MORRIS 1987 (Ext.); ENGELS 1990 (Ext.).
 15. *Methana*: C. MEE et AL. 1984, unpublished report on the Methana Survey (Int.); MEE et AL. 1991 (Ext.).
 16. *Nemea Valley*: WRIGHT et AL. 1990 (Int.); ALCOCK 1991 (Int.).
 17. *The Argolid*: FOLEY 1988 (Ext.); MORRIS 1987 (Ext.); VAN ANDEL and RUNNELS 1987 (Int.); JAMESON 1994 (Int.); AULT 1994 (Int.); WELLS et AL. 1990 (Int.).
 18. *Laconia*: CAVANAGH and CROUWEL 1988 (Int.); CAVANAGH, unpublished reports of the Laconia Survey, 1983 and 1984 seasons (Int.).
 19. *Arcadia*: HOWELL 1970 (Ext.); LLOYD and ROY 1982, unpublished report on the Megalopolis Survey, 1982 season (Int.); ROY et AL. 1988 (Int.); LLOYD 1991 (Int.).
 20. *Messenia*: MCDONALD and RAPP 1972 (Ext.).
 21. *Kea*: CHERRY et AL. 1991 (Int.); CHERRY and DAVIS 1991 (Int.); MENDONI 1994 (Int. and Ext.).
 22. *Melos*: RENFREW and WAGSTAFF 1982 (Int.); SNODGRASS 1989 (Int.).
 23. *Samos and Chios*: SHIPLEY 1987 (Ext.).
 24. *Crete*: WILLETTS 1965 (Ext.); WATROUS 1974 (Int.); SANDERS 1976, 1982 (Ext.); BLACKMAN and BRANIGAN 1975, 1977 (Int.); R. HOPE-SIMPSON et AL., unpublished report of the Kommos Survey, 1985 (Int.); J. BENNET unpublished report of the West Messara Survey, 1984 (Int.); WATROUS et AL. 1993 (Int.); MOODY 1987 (Int.); NIXON et AL. 1988-1990 (Int.); VAN EFFENTERRE, 1991 (Ext.); HARRISON, 1993 (Ext.).
 25. *Thessaly*: AUDA et AL. 1991 (Ext.); JEFFERY 1976 (Ext.); LARSEN 1968 (Ext.); LUCAS 1991 (Ext.); MARZOLFF 1991, 1994 (Ext.).

General Bibliography

- S. E. ALCOCK 1989 — Archaeology and Imperialism: Roman Expansion and the Greek City, *Journal of Mediterranean Archaeology* 2, 87–135
- S. E. ALCOCK 1991 — Urban survey and the Polis of Phlius, *Hesperia* 60, 421–463
- S. E. ALCOCK 1993 — *Graecia Capta. The Landscapes of Roman Greece*, Cambridge
- S. E. ALCOCK 1994 — Breaking up the Hellenistic world: survey and society, in I. MORRIS ed., *Classical Greece: Ancient History and Modern Archaeology*, Cambridge, 171–190
- S. ANDREOU and K. KOTSAKIS 1994 — Prehistoric rural communities in perspective: the Langadas Survey Project, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 17–25
- Arrian, *History of Alexander (Arrian II)* — P. A. BRUNT ed., Cambridge 1983
- Y. AUDA et AL. 1991 — Espace géographique et géographie historique en Thessalie, *Archéologie et Espaces*, Juan-les-Pins: Editions APDCA, 87–126
- B. A. AULT 1994 — Koprones and oil presses, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 197–206
- S. C. BAKHUIZEN, in press: Men, mountains, raiding. The Aitolian way of life, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 5
- G. BARKER and J. LLOYD, eds. 1991 — *Roman Landscapes. Archaeological Survey in the Mediterranean Region*, London: British School at Rome
- J. L. BINTLIFF, ed., 1984a — *European Social Evolution: Archaeological Perspectives*, Bradford: University of Bradford
- J. L. BINTLIFF, 1984b — Review of C. RENFREW and M. WAGSTAFF, eds., *An Island Polity*, *Journal of Historical Geography* 10, 88–89
- J. L. BINTLIFF, 1990 — The Roman countryside in Central Greece, in G. BARKER and J. LLOYD, eds., *Roman Landscapes. Archaeological Survey in the Mediterranean Region*, London: British School at Rome, 22–132
- J. L. BINTLIFF, ed., 1991a — *The Annales School and Archaeology*, London
- J. L. BINTLIFF 1991b — Die Polis-Landschaften Griechenlands: Probleme und Ausichten der Bevölkerungsgeschichte, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 2–3. Bonn, 149–202
- J. L. BINTLIFF 1992 — Erosion in the Mediterranean lands: A reconsideration of pattern, process and methodology, in J. BOARDMAN and M. BELL, eds., *Past and Present Soil Erosion*. Oxford: Oxbow Books, 125–131
- J. L. BINTLIFF 1994 — Territorial behaviour and the natural history of the Greek polis, in E. OLSHAUSEN and H. SONNABEND, eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 4, Amsterdam 1990, 207–249 and Tafel XIX–LXXIII
- J. L. BINTLIFF in prep. a — The origins and nature of the Greek city state, in M. BATS and P. RUBY, eds., *Les Princes de la Protohistoire et l'Emergence de l'Etat*, Paris: CNRS

- J. L. BINTLIFF in prep. b — Structure, contingency, narrative and timelessness, in J. L. BINTLIFF, ed., *Structure and Contingency in the Evolution of Life, Human Evolution and Human History*
- J. L. BINTLIFF, in prep. c — Further considerations on the population of ancient Boeotia, in J. L. BINTLIFF, ed., *Recent Developments in the History and Archaeology of Central Greece*, BAR International Series, Oxford: B. A. R.
- J. L. BINTLIFF and A. M. SNODGRASS 1985 — The Cambridge/Bradford Boeotia Expedition: The first four years, *Journal of Field Archaeology* 12, 123–161
- J. BINTLIFF and A. M. SNODGRASS 1988a — Mediterranean survey and the city, *Antiquity* 62, 57–71
- J. BINTLIFF and A. M. SNODGRASS 1988b — The end of the Roman countryside: A view from the East, in R. F. J. JONES/J. H. F. BLOEMERS, S. L. DYSON and M. BIDDLE, eds., *First Millennium Papers: Western Europe in the First Millennium AD*, Oxford: British Archaeological Reports, 175–217
- D. J. BLACKMAN and K. BRANIGAN 1975 — An archaeological survey of the south coast of Crete, *BSA* 70, 17–36
- D. J. BLACKMAN and K. BRANIGAN 1977 — An archaeological survey of the lower catchment of the Ayiofarango Valley, *BSA* 72, 13–84
- T. F. BLAGG 1992 — Archaeology in Albania, *J. Roman Archaeology* 5, 341–8
- J. BOARDMAN 1980 — *The Greeks Overseas*, 3rd Ed. London: Thames and Hudson
- L. S. BOMMELJÉ and P. K. DOORN eds. 1981 — *Strouza Region Project*, First Interim Report; 1983 Second Interim Report; 1984 Third Interim Report, Utrecht: Instituut voor Geschiedenis, Rijksuniversiteit
- L. S. BOMMELJÉ and P. K. DOORN eds. 1987 — *Aetolia and the Aetolians*, Utrecht: Parnassos Press
- E. N. BORZA 1990 — *In the Shadow of Olympus. The Emergence of Macedon*, Princeton: Princeton University Press
- H. BRÜCKNER 1990 — Changes in the Mediterranean ecosystem during antiquity. A geomorphological approach as seen in two examples, in S. BOTTEMA/G. ENTJES-NIEBOURG/W. VAN ZEIST, eds., *Man's Role in the Shaping of the Eastern Mediterranean Landscape*, Rotterdam: A. A. Balkema, 127–137
- W. G. CAVANAGH and J. CROUWEL 1988 — *Laconia Survey 1983–1986*, Lakonikon Spoudon 1988, 77–88
- J. CHADWICK 1976 — *The Mycenaean World*, Cambridge: Cambridge University Press
- J. CHAPMAN, J. BINTLIFF, V. GAFFNEY, B. SLAPSAK, eds., 1988 — *Recent Developments in Yugoslav Archaeology*, BAR Int. Ser. 431, Oxford: BAR
- J. C. CHAPMAN, R. S. SHIEL and S. BATOVIC 1987 — Settlement Patterns and Land Use in Neothermal Dalmatia, Yugoslavia: 1983–1984 Seasons, *Journal of Field Archaeology* 14, 123–146
- J. C. CHAPMAN and R. S. SHIEL 1993 — Social change and land use in Dalmatia, *Proceedings of the Prehistoric Society* 59, 61–104
- J. F. CHERRY 1984 — The emergence of the state in the prehistoric Aegean, *Proceedings of the Cambridge Philological Society* 210, n. s. 30, 18–48

- J. F. CHERRY et AL. 1991 — Landscape Archaeology as Long-Term History, Los Angeles: UCLA Institute of Archaeology
- J. F. CHERRY and J. L. DAVIS 1991 — The Ptolemaic base at Koressos on Keos, *Annual of the British School at Athens* 86, 9–28
- G. CLARK 1992 — The economics of exhaustion, the Postan thesis, and the agricultural revolution, *Journal of Economic History* 52, 61–84
- D. CONDI, and P. N. DOUKELLIS 1992 — Agricultural installations in the Bouthrotos region, unpubl. paper, international conference Rural Structures and Ancient Societies, Corfu
- S. DAKARIS 1971 — Thesprotia, *Ancient Greek Cities* 15. Athens: Center of Ekistics
- S. DAKARIS 1971 — Cassopaia and the Elean Colonies, *Ancient Greek Cities* 4, Athens: Center of Ekistics
- G. DALTON 1981 — Anthropological models in archaeological perspective, in I. HODDER, G. ISAAC and N. HAMMOND, eds., *Pattern of the Past*, Cambridge: 17–48
- O. DICKINSON, 1994 — *The Aegean Bronze Age*, Cambridge
- P. DOUKELLIS 1990 — Actia Nicopolis, *J. Roman Archaeology* 3, 399–406
- A. DOUSOGLI and S. MORRIS, 1994 — Ancient towers on Leukas, Greece, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 215–225
- N. EFSTRATIOU 1993 — The archaeology of the Greek uplands: the Early Iron Age site of Tsouka in the Rhodope Mountains, *Annual of the British School at Athens* 88, 135–171, pls. 7–16
- N. ELDRIDGE and S. J. GOULD 1972 — Punctuated equilibria: An alternative to phylogenetic gradualism, in T. J. M. SCHOPF, ed., *Models of Paleobiology*. San Francisco, 82–115
- D. ENGELS 1990 — *Roman Corinth*, Chicago
- A. FOLEY 1988 — The Argolid 800–600 BC, *Studies in Mediterranean Archaeology* 80
- J. M. FOSSEY 1986 — *The Ancient Topography of Eastern Phocis*, Amsterdam
- J. M. FOSSEY 1988 — *Topography and Population of Ancient Boeotia*, Chicago
- J. M. FOSSEY 1990 — *The Ancient Topography of Opountian Lokris*, Amsterdam
- S. FRANKENSTEIN and M. J. ROWLANDS 1978 — The internal structure and regional context of early iron age society in south-western Germany, *Bulletin of the Institute of Archaeology, University of London* 15, 73–112
- E. B. FRENCH 1990–1 — Grevena Project, *Archaeological Reports for 1990-1*, 47, London: Hellenic Society and British School at Athens
- P. FUNKE 1987 — Zur Datierungen befestigter Stadtanlagen in Aitolien, *Boreas* 10, 87–96
- P. GARNSEY 1988 — *Famine and Food Supply in the Graeco-Roman World*, Cambridge
- P. GARNSEY, K. HOPKINS, C. R. WHITTAKER, eds. 1983 — *Trade in the Ancient Economy*, Cambridge
- D. GILL 1991 — Pots and trade: spacefillers or objets d'art?, *Journal of Hellenic Studies* 111, 29–47

- P. HALSTEAD 1977 — Prehistoric Thessaly: the submergence of civilization, in J. L. BINTLIFF (ed.) *Mycenaean Geography*, 23-29
- P. HALSTEAD 1981 — From determinism to uncertainty: social storage and the rise of the Minoan palace, in A. SHERIDAN and G. BAILEY, eds., *Economic Archaeology*, BAR International Series 96, Oxford, 187-213
- P. HALSTEAD and J. O'SHEA 1982 — A friend in need is a friend indeed: social storage and the origins of social ranking, in C. RENFREW and S. SHENNAN, eds., *Ranking, Resource and Exchange*, Cambridge, 92-99
- P. HALSTEAD 1994 — The north-south divide: regional paths to complexity in prehistoric Greece, in C. MATHERS and S. STODDART (eds.), *Development and Decline in the Mediterranean Bronze Age*, Sheffield 194-219
- N. G. L. HAMMOND 1991 — *The Miracle That Was Macedonia*, London
- G. W. M. HARRISON 1993 — *The Romans and Crete*, Amsterdam
- L. HEDEAGER 1992 — *Iron Age Societies: From Tribe to State in Northern Europe, 500 BC to AD 700*, Oxford
- A. HOLT-JENSEN 1988 — *Geography. History and Concepts*, 2nd Ed. London
- R. HOWELL, 1970 — A survey of Eastern Arcadia in Prehistory, *BSA* 65, 79-127
- M. H. JAMESON 1994 — Class in the ancient Greek countryside, in P. N. DOUKELLIS and L. G. MENDONI, eds., *Structures Rurales et Sociétés Antiques*, Paris, 55-63
- L. H. JEFFERY 1976 — *Archaic Greece. The City-States c. 700-500 B. C.*, London
- G. JONES et AL. 1986 — Crop storage at Assiros, *Scientific American* 254, 3: 84-91
- D. R. KELLER and M. B. WALLACE 1986-1988 — The Canadian Karystos Project, *Echos du Monde Classique N. S.* 5: 155-159, 6: 225-227, 7: 151-157
- D. R. KELLER and M. B. WALLACE 1990 — Pre-Modern Land Routes in S. Euboea, *Echos du Monde Classique N. S.* 9: 195-199
- D. KELLER 1985 — *Archaeological Survey in Southern Euboea, Greece*, PhD dissertation: Indiana University
- B. KIRIGIN 1990 — The Greeks in Central Dalmatia: Some New Evidence, in J.-P. DESCOEUDRES, ed., *Greek Colonists and Native Populations*, Oxford, 291-321
- E. KIRSTEN 1940 — Aitolien und Akarnanien in der älteren griechischen Geschichte, *N. JB. f. Ant. u. Deutsche Bild.* 3, 278-319
- E. KIRSTEN 1956 — *Die Griechische Polis als historisch-geographisches Problem des Mittelmeerraumes*, Bonn: *Colloquium Geographicum* 5
- D. KOKKINIDOU and K. TRANTALIDOU 1991 — Neolithic and Bronze Age settlement in Western Macedonia, *Annual of the British School at Athens* 86, 93-106
- K. KOTSAKIS 1989 — The Langadas Basin intensive survey ... the 1986 season, *Egnatia* 1, Thessaloniki University, 3-14; 1990 — The Langadas Basin intensive survey ... the 1987 season, *Egnatia* 2, Thessaloniki University, 175-185
- E. LEROY LADURIE 1977 — Motionless history, *Social Science History* 1, 115-136
- J. A. O. LARSEN 1968 — *Greek Federal States*, Oxford
- T. E. LEVY ed. 1995 — *The Archaeology of Society in the Holy Land*, London
- R. LEWIN 1993 — *Complexity. Life at the Edge of Chaos*, London

- J. LLOYD 1991 — Farming the Highlands, in G. BARKER and J. LLOYD eds., *Roman Landscapes. Archaeological survey in the Mediterranean Region*, London: British School at Rome, 180–193
- H. LOHMANN 1983 — Atene: eine attische Landgemeinde klassischer Zeit, *Hellenika Jahrbuch* 1983, 98–117
- H. LOHMANN 1985 — Landleben im klassischen Attika, *Jahrbuch Ruhr-Universität Bochum* 1985, 71–96
- H. LOHMANN 1991 — Zur Prosopographie und Demographie der attischen Landgemeinde Atene, in E. OLSHAUSEN and H. SONNABEND eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums*, Bonn, 203–258
- H. LOHMANN 1993 — Atene, Köln
- G. LUCAS 1991 — Askyris, une cité dans le Bas-Olympe, *Zeitschrift für Papyrologie und Epigraphik* 89, 135–144 and Tafel XI–XII
- T. MALTHUS 1803 — *An Essay on the Principle of Population*. In E. A. WRIGLEY and D. SOUDEN eds., *The Works of Thomas Robert Malthus* (1986). London
- S. W. MANNING 1994 — The emergence of divergence: development and decline in Bronze Age Crete and the Cyclades, in C. MATHERS and S. STODDART eds., *Development and Decline in the Mediterranean Bronze Age*, Sheffield, 221–270
- P. MARZOLFF, 1991 — Städtische und ländliche Siedlungsstrukturen im Bereich der hellenistischen Kapitale Demetrias, in E. OLSHAUSEN and H. SONNABEND eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 2–3, 337–352 and Tafel XLVI–LV, Bonn
- P. MARZOLFF 1994 — Antike Städtebau und Architektur in Thessalien, in *La Thessalie. Quinze Années de Recherches Archéologiques, 1975–1990*, Athens, 255–276
- W. A. McDONALD and G. R. RAPP 1972 — *The Minnesota Messenia Expedition*, Minneapolis
- W. H. McNEIL 1978 — *The Metamorphosis of Greece since World War II.*, Oxford
- C. MEE et AL. 1991 — Rural settlement change in the Methana peninsula, Greece, in G. BARKER and J. LLOYD eds., *Roman Landscapes. Archaeological Survey in the Mediterranean Region*, London: British School at Rome, 223–232
- R. MEIGGS 1982 — *Trees and Timber in the Ancient World*, Oxford
- L. G. MENDONI 1994 — The organisation of the countryside in Kea, in P. N. DOUKELLIS and L. G. MENDONI eds., *Structures Rurales and Sociétés Antiques*, Paris, 147–161
- J. A. MOODY 1987 — *The Environmental and Cultural Prehistory of the Khania Region of West Crete*. PhD dissertation, University of Minnesota
- I. MORRIS 1987 — *Burial and Ancient Society*, Cambridge
- M. MUNN and M. L. Z. MUNN 1989–90 — Skourta Plain project, *Archaeological Reports for 1989–1990*, 35–36, London: Hellenic Society and British School at Athens
- L. NIXON et AL. 1988–1990 — Archaeological survey in Sphakia, Crete, *Echos du Monde Classique N. S.* 7, 159–173; 8, 201–215; 9, 213–220
- C. PERLÈS 1989 — From stone procurement to Neolithic society in Greece, *The David Skomp Distinguished Lecture in Anthropology*, Indiana University: Department of Anthropology Publications

- M. PETROPOULOS 1994 — Agrikies Patraikis, in P. N. DOUKELLIS and L. G. MENDONI eds., *Structures Rurales et Sociétés Antiques*, Paris, 405-424
- M. PETROPOULOS and A. D. RIZAKIS 1994 — Settlement patterns and landscape in the coastal area of Patras. Preliminary report, *Journal of Roman Archaeology* 7, 182-207
- D. PLANCK et AL. eds. 1985 — *Der Keltenfürst von Hochdorf*, Stuttgart
- 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* 11, 281-306
- D. J. PULLEN 1992 — Ox and plow in the Early Bronze Age Aegean, *American Journal of Archaeology* 96, 45-54
- D. J. PULLEN 1994 — A lead seal from Tsoungiza, Ancient Nemea, *American Journal of Archaeology* 98, 35-52
- A. C. RENFREW 1972 — *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium B. C.*, London
- C. RENFREW and J. M. WAGSTAFF eds. 1982 — *An Island Polity: The Archaeology of Exploitation in Melos*, Cambridge
- M. ROWLANDS, M. LARSEN and K. KRISTIANSEN eds. 1987 — *Centre and Periphery in the Ancient World* Cambridge
- J. ROY et AL. 1988 — Tribe and polis in the chora at Megalopolis, *Praktika tou XII Diethnous Synedriou Klassikis Archaeologias*, 179-182. C. N. RUNNELS and J. HANSEN 1986 — The olive in the prehistoric Aegean, *Oxford Journal of Archaeology* 5, 299-308
- E. RUSCHENBUSCH 1991 — Phokis, Lebensraum und Bevölkerungszahl, in E. OLSHAUSEN and H. SONNABEND eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums* 2-3, 299-312
- U. RUST 1978 — Die Reaktion der fluvialen Morphodynamik auf anthropogene Entwaldung stliches Chalkis (Insel Euboea, Griechenland), *Zeitschrift für Geomorphologie*, Supplement Band 30, 183-203
- L. H. SACKETT et AL. 1966 — Prehistoric Euboea: Contributions towards a survey, *Annual of the British School at Athens* 61, 33-112
- M. SAKELLARIOU and N. FARAKLAS 1971 — Corinthia and Cleonaea. *Ancient Greek Cities* 3, Athens
- I. F. SANDERS 1976 — Settlement in the Hellenistic and Roman periods on the plain of the Mesara, Crete, *Annual of the British School at Athens* 71, 131-137
- I. F. SANDERS 1982 — *Roman Crete*, Warminster: Aris and Phillips
- A. SHERRATT 1981 — Plough and pastoralism: aspects of the secondary products revolution, in I. HODDER, G. ISAAC and N. HAMMOND eds., *Pattern of the Past*, Cambridge, 261-305
- S. SHERRATT and A. SHERRATT 1993 — The growth of the Mediterranean economy in the early first millennium BC, *World Archaeology* 24,3: 361-378
- G. SHIPLEY 1987 — *A History of Samos*, Oxford

- A. M. SNODGRASS 1987-1989 — The rural landscape and its political significance, *International Journal for the Social and Economic History of Antiquity*, VI-VIII, 53-70
- T. H. VAN ANDEL and C. RUNNELS 1987 — Beyond the Acropolis, Stanford
- T. H. VAN ANDEL and C. N. RUNNELS 1988 — An essay on the 'emergence of civilization' in the Aegean world, *Antiquity*, 62, 234-247
- H. VAN EFFENTERRE 1991 — Die von den Grenzen der ostkretischen Poleis eingeschlossenen Flächen als Ernährungsspielraum, in E. OLSHAUSEN and H. SONNABEND eds., *Stuttgarter Kolloquium zur Historischen Geographie des Altertums 2-3*, 393-406
- P. P. VIAZZO 1989 — Upland Communities. Environment, Population and Social Structure in the Alps since the Sixteenth Century, Cambridge
- I. WALLERSTEIN 1974 — The Modern World-System. Capitalist Agriculture and the Origins of the European World Economy in the Sixteenth Century, London
- K. A. WARDLE 1989 — Excavations at Assiros Toumba 1988, *Annual of the British School at Athens*, 84, 447-463 and plates 68-71
- V. L. WATROUS 1974 — An Archaeological Survey of the Lasithi Plain in Crete from the Neolithic to the Late Roman Periods, PhD University of Pennsylvania: University Microfilms
- V. L. WATROUS et AL. 1993 — A survey of the Western Mesara Plain in Crete, *Hesperia* 62,2: 192-248 and Plates 44-55
- B. WELLS et AL. 1990 — The Berbati-Limnes Archaeological Survey. The 1988 season, *Op. Atheniensiensia* 18, 207-238
- J. J. WILKES 1969 — Dalmatia, London
- J. J. WILKES 1992 — The Illyrians, Oxford
- R. F. WILLETTS 1965 — Ancient Crete: A Social History, London
- G. WOOLF 1990 — World-systems analysis and the Roman Empire, *Journal of Roman Archaeology* 3, 44-58
- G. WOOLF, 1992 — Imperialism, empire and the integration of the Roman economy, *World Archaeology* 23, 283-293
- J. C. WRIGHT et AL. 1990 — The Nemea Valley Archaeological Project. A preliminary report, *Hesperia* 59, 579-659

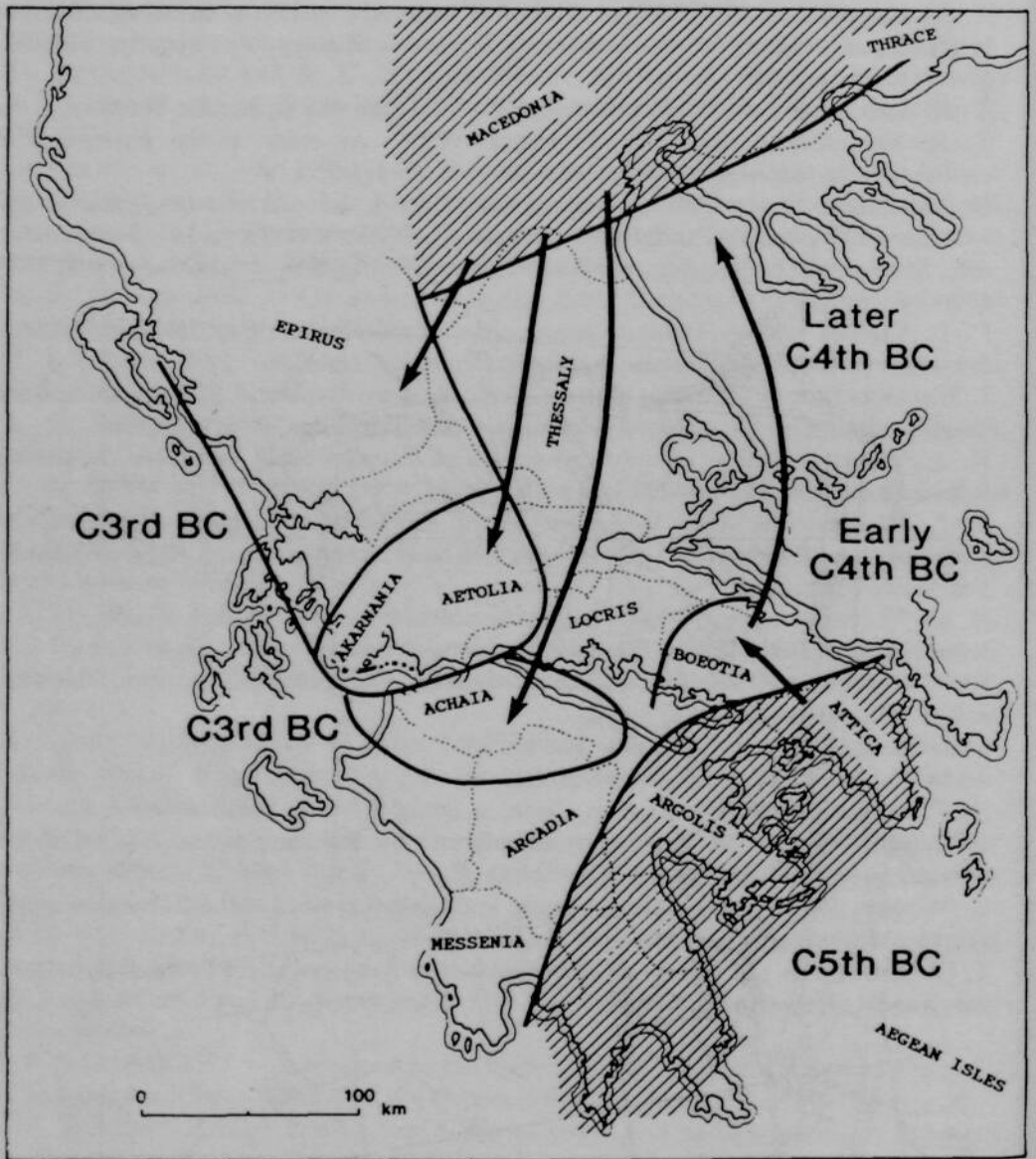


Figure 1: Power shifts in the location of dominant states in ancient Greece. Boundaries shown are the major regions of ancient Greece

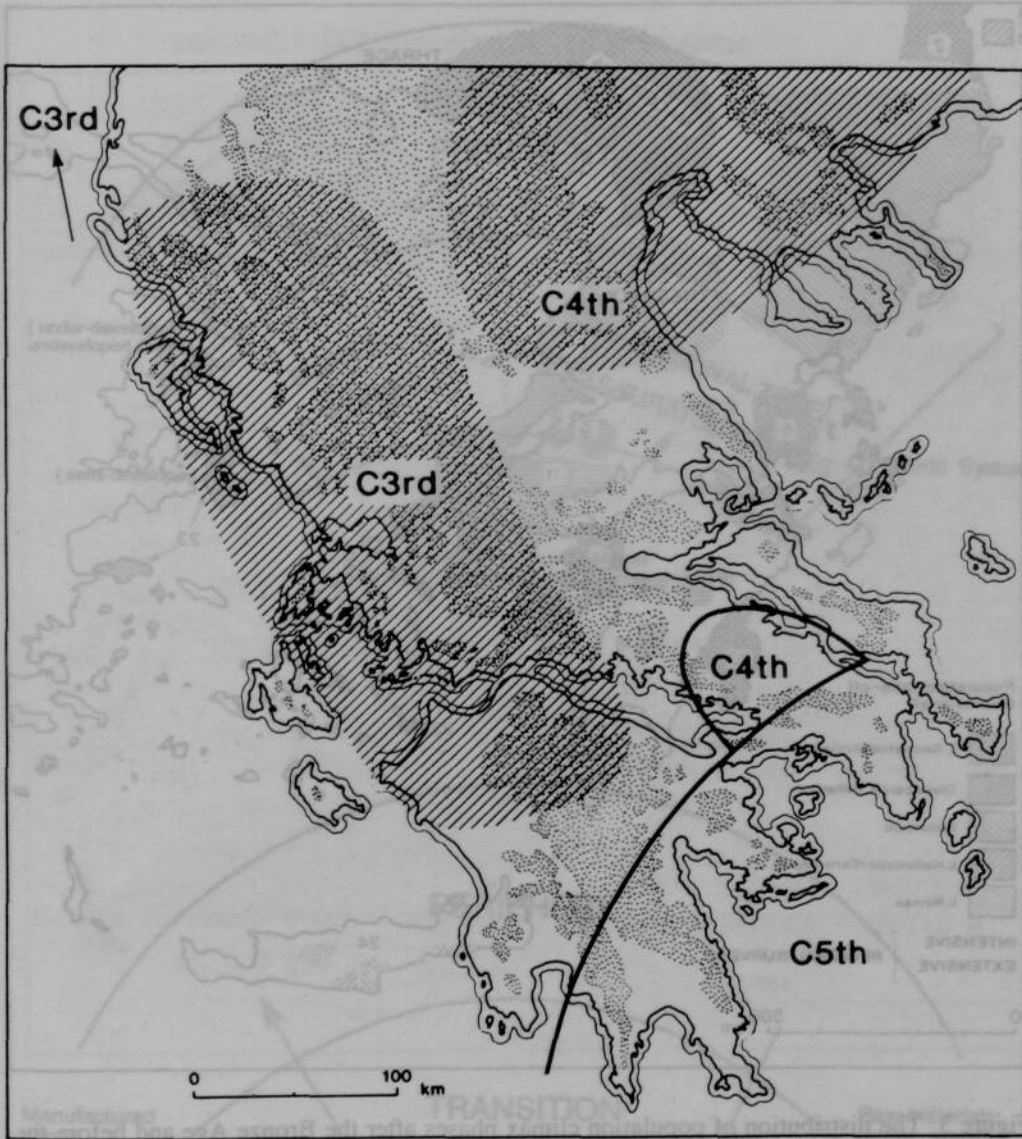


Figure 2: Power shifts in ancient Greece with land above 500m

Figure 4: Core-Periphery/World Systems Theory

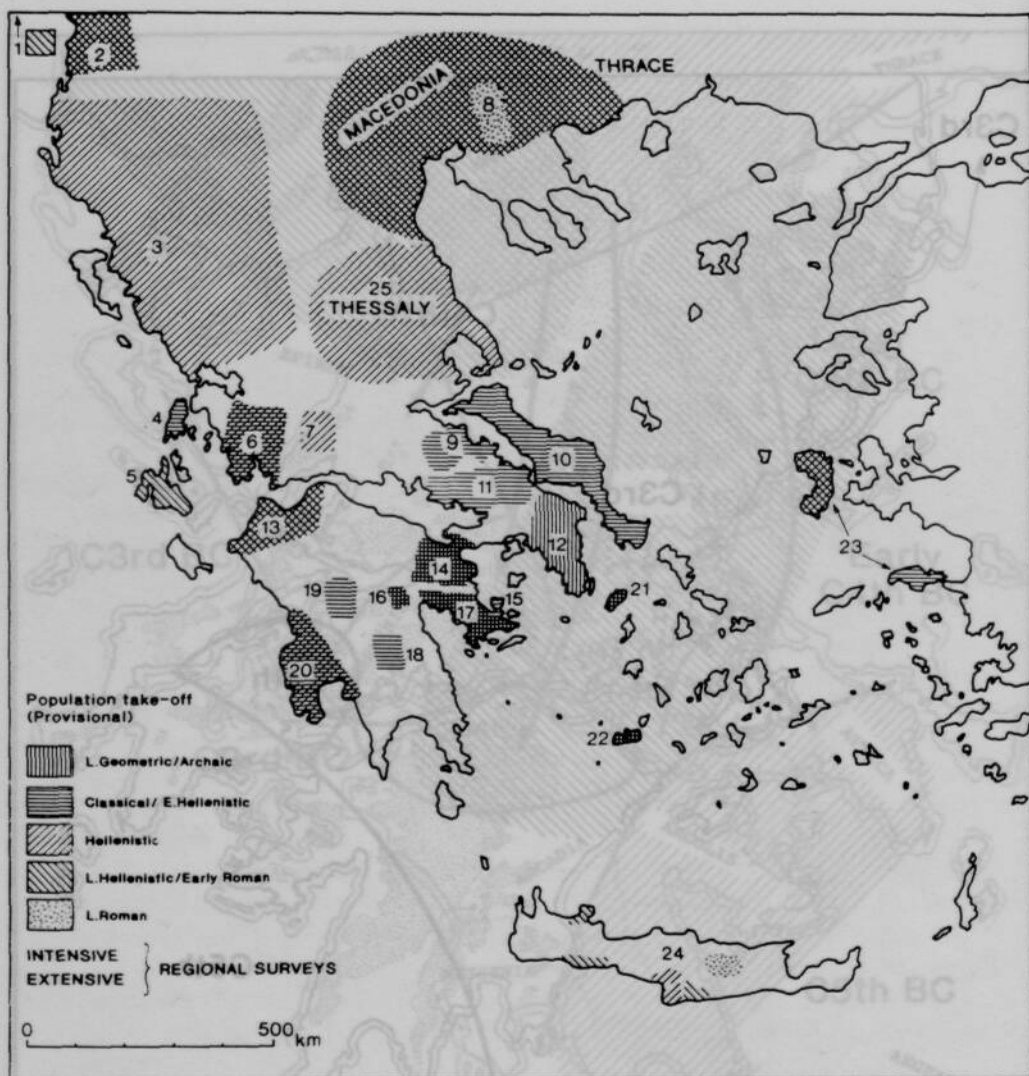


Figure 3: The distribution of population climax phases after the Bronze Age and before the end of Late Roman times in Greece, based on the evidence of intensive/extensive archaeological field surveys and regional settlement history syntheses. 1=Dalmatia. 2=Albania. 3=Epiros. 4=Levkas. 5=Kephallenia. 6=Akarnania. 7=Aetolia. 8=Macedonia. 9=Phocis/Lokris. 10=Euboea. 11=Boeotia. 12=Attica. 13=Achaea. 14=Corinthia. 15=Methana. 16=Nemea. 17=Argolid. 18=Laconia. 19=Arcadia. 20=Messenia. 21=Kea. 22= Melos. 23=Samos/Chios. 24=Crete. 25=Thessaly.

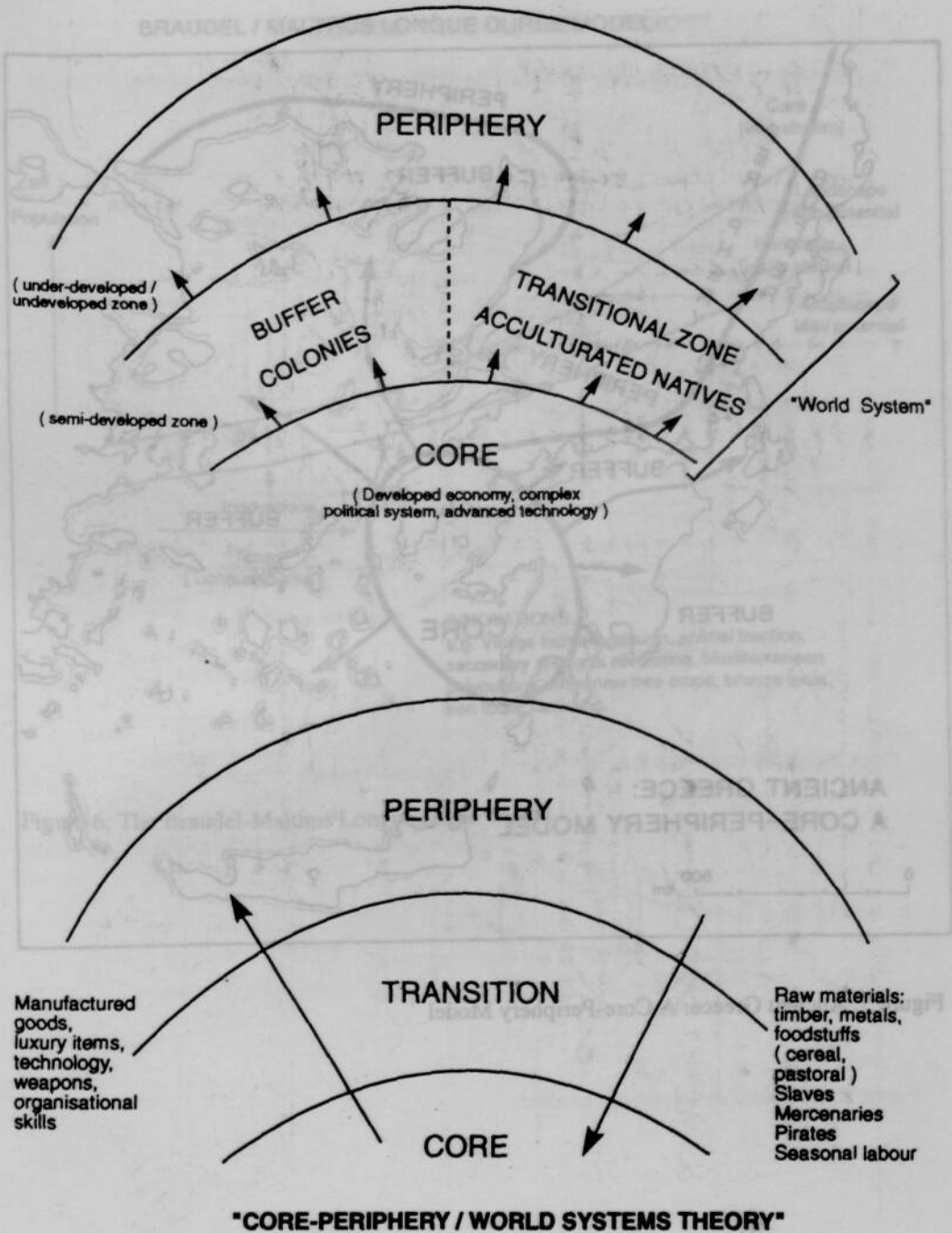


Figure 4: Core-Periphery/World Systems Theory

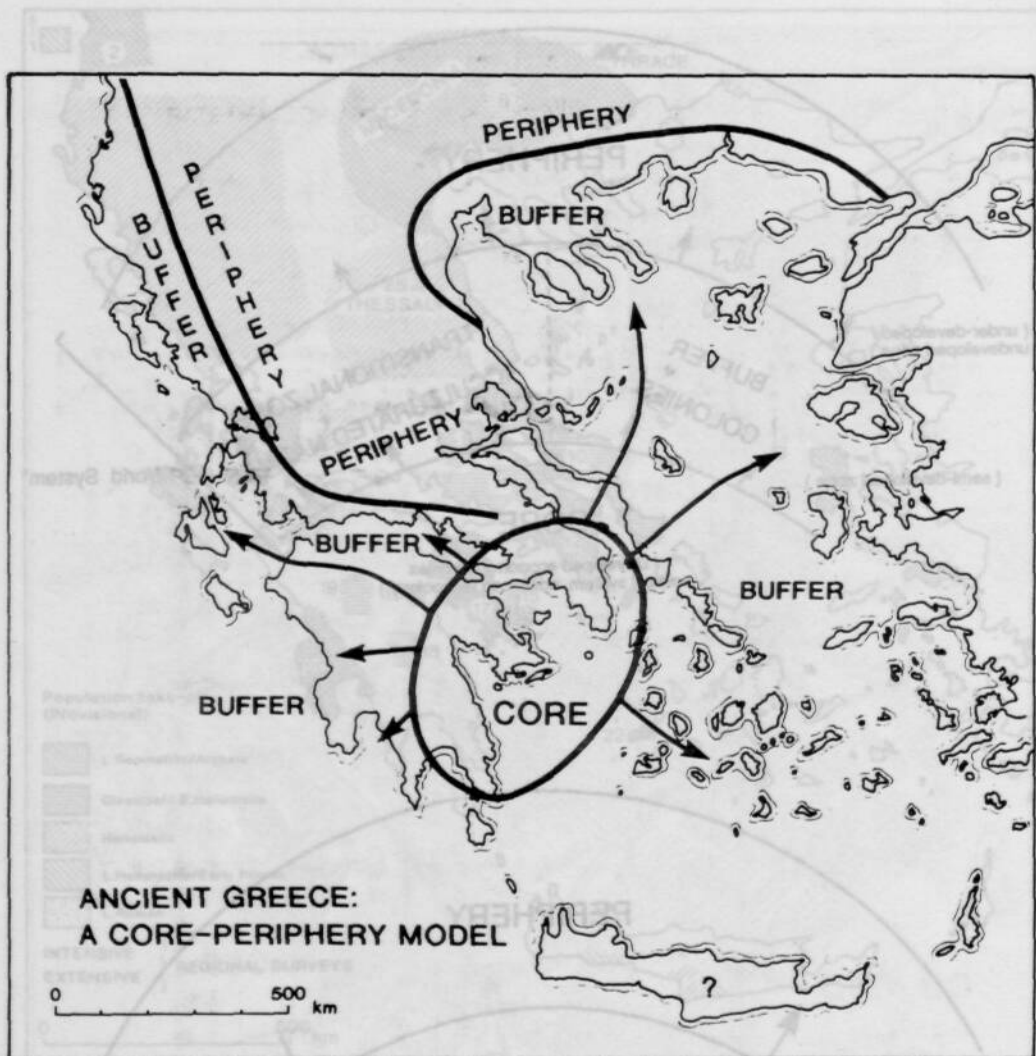


Figure 5: Ancient Greece: A Core-Periphery Model

BRAUDEL / MALTHUS LONGUE DUREE MODEL

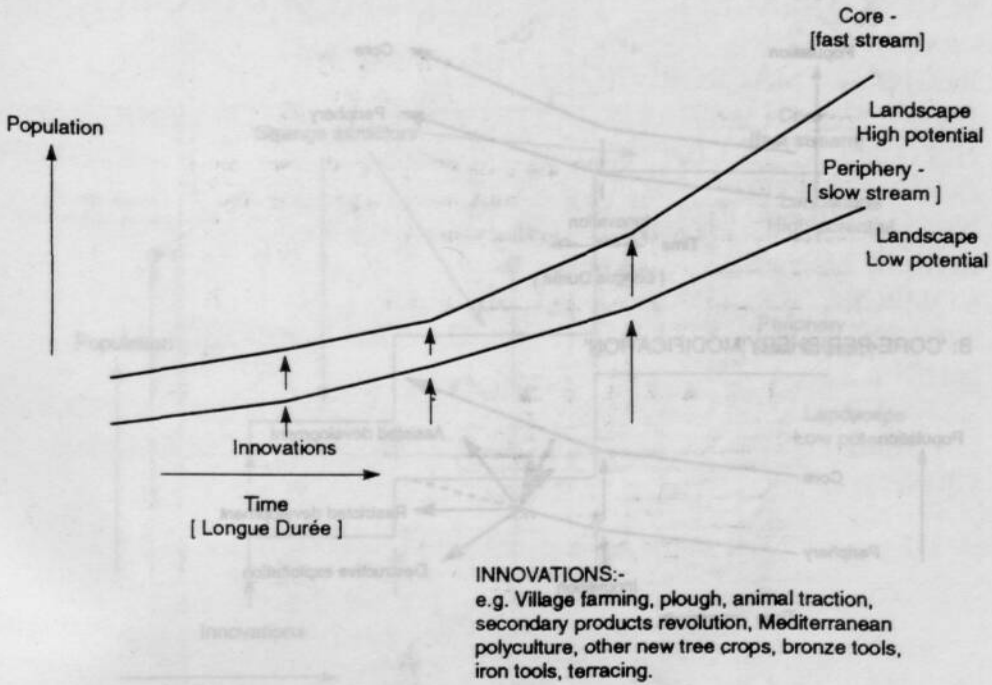


Figure 6: The Braudel-Malthus Longue Durée Model

REGIONAL DEVELOPMENT MODELS

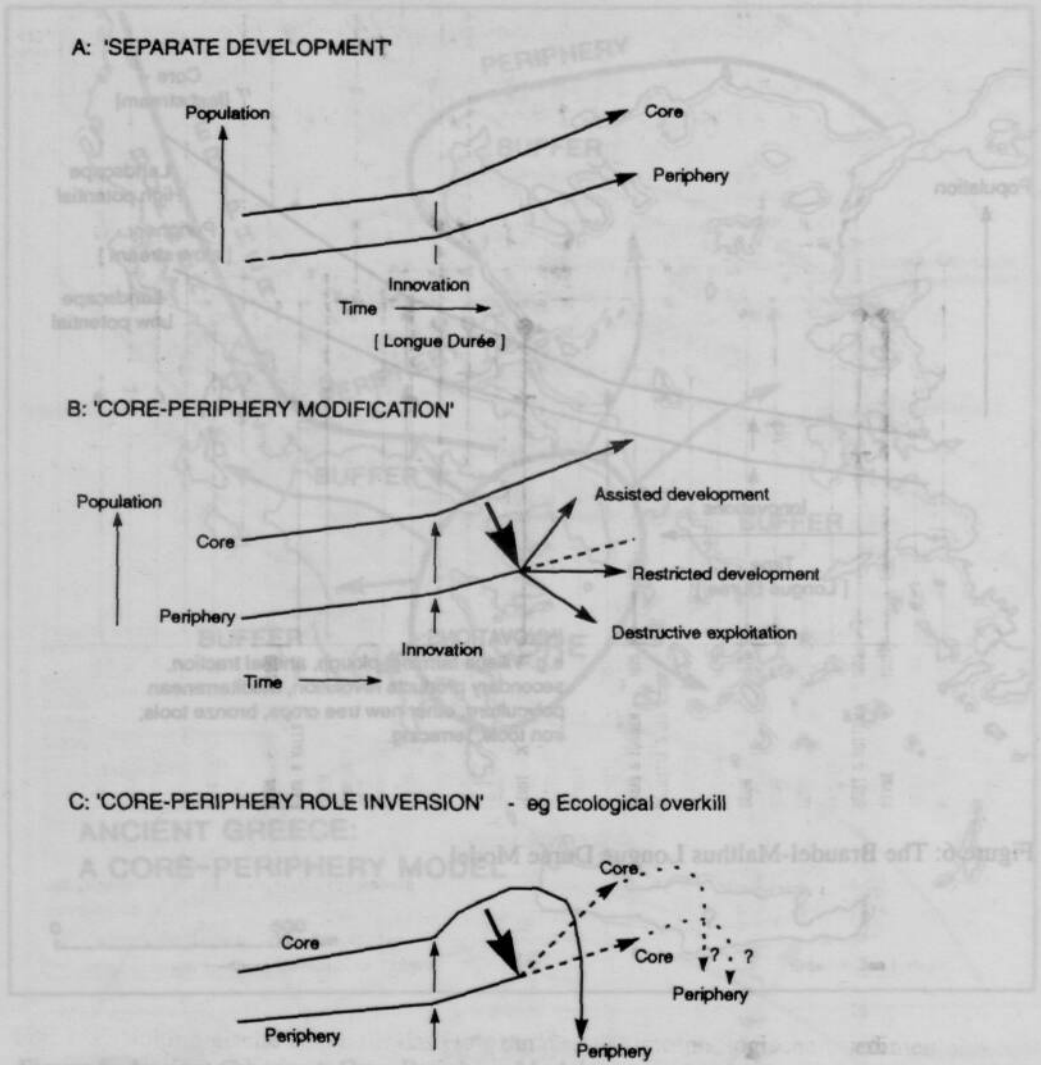


Figure 7: Regional development models

SOCIO - STRUCTURAL / PUNCTUATED - EQUILIBRIUM VERSION

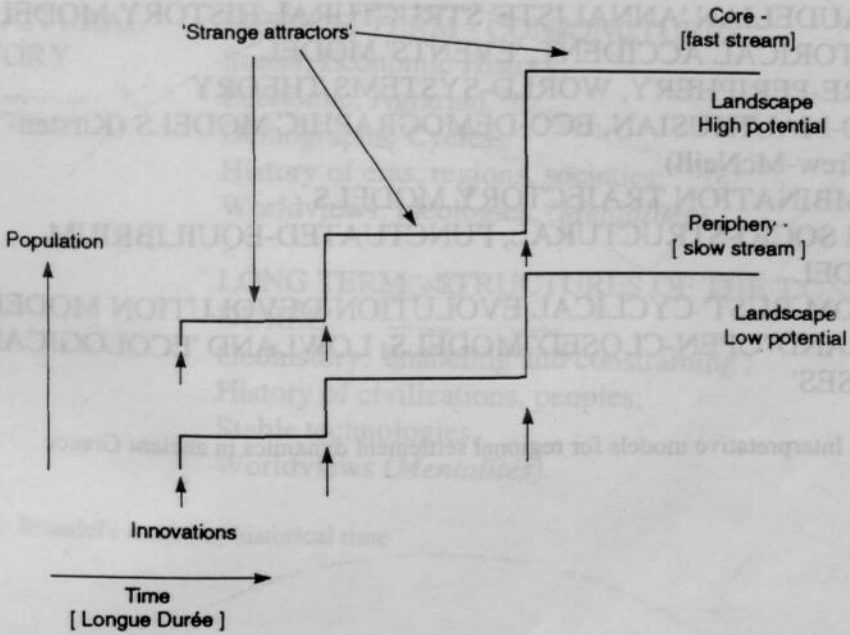


Figure 8: The Socio-structural, Punctuated-Equilibrium Model

REGIONAL DEVELOPMENT MODELS

ANCIENT GREECE: REGIONAL SETTLEMENT DYNAMICS

Interpretative Models:

1. REGION ↔ MACROREGION MODEL
2. BRAUDELIAN 'ANNALISTE' STRUCTURAL HISTORY MODEL
3. HISTORICAL ACCIDENT, 'EVENTS' MODEL
4. CORE-PERIPHERY, WORLD-SYSTEMS THEORY
5. NEO-MALTHUSIAN, ECO-DEMOGRAPHIC MODELS (Kirsten-Renfrew-McNeill)
6. COMBINATION TRAJECTORY MODELS
7. THE SOCIO-STRUCTURAL, PUNCTUATED-EQUILIBRIUM MODEL
8. 'BOOM-BUST' CYCLICAL EVOLUTION-DEVOLUTION MODELS; UPLAND 'OPEN-CLOSED' MODELS; LOWLAND 'ECOLOGICAL CRISES'

Table 1: Interpretative models for regional settlement dynamics in ancient Greece

REGION ↔ MACROREGION MODEL

In evaluating regional trajectories, focus on:

- (1) LOCAL AGRICULTURAL-DEMOGRAPHIC CYCLES; LOCAL HUMAN ECOLOGY - 'HEALTH'
- (2) MODE(S) OF PRODUCTION OPERATED AT LOCAL LEVEL
- (3) MODE(S) OF PRODUCTION OPERATED AT MACROREGION LEVEL (eg by the STATE or other inter-regional socioeconomic systems)

Table 2: A model for relating regional trajectory to enclosing macroregions

HISTORY OF EVENTS	SHORT TERM - ÉVÉNEMENTS Narrative, Political History; Events; Individuals.
STRUCTURAL HISTORY	MEDIUM TERM - CONJONCTURES Social, Economic History; Economic, Agrarian, Demographic Cycles; History of eras, regions, societies; Worldviews, ideologies, (<i>Mentalités</i>).
	LONG TERM - STRUCTURES OF THE 'LONGUE DURÉE' Geohistory: 'enabling and constraining'; History of civilizations, peoples; Stable technologies, Worldviews (<i>Mentalités</i>).

Table 3: Braudel's model of historical time

AN OSCILLATORY MODEL FOR THE HISTORICAL DEMOGRAPHY OF HIGH UPLAND / MARGINAL REGIONS

(After THOMAS MALTHUS, 1803, *An Essay on the Principle of Population*;
and P.P. VIAZZO, 1989, *Upland Communities*)

MODE 1 'CLOSED'

1. Low Birthrate
Late Marriage
2. High Celibacy
3. Low Populations
Low Emigration
4. External Connections
Low
5. Economics Mainly
Internal, Independent

MODE 2 'OPEN'

1. High Birthrate
Early Marriage
2. High Marriage Rate
3. High Populations
High Emigration
4. External Connections
High
5. Economics Dependent
on External Income

Table 4: A model for high upland / marginal regions