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Regional Survey, Demography, and the Rise of Complex Societies in the Ancient Aegean: Core-Periphery, Neo-Malthusian, and Other Interpretive Models

John Bintliff

Durham University
Durham, United Kingdom

The historical progression of power in ancient Greece from the lowland southeast 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 interregional (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

Is it an historical accident that the focus of ancient Greek political and military history shifts from the SE mainland towards the north and west, from Classical to Hellenistic times (FIG. 1)? Or is there some deeper structural meaning?

Figure 2 shows that most of the regions that dominate later Greek history are in the more mountainous north and west—Macedonia, Epiros, 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 (*History of Alexander*, 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 NE provinces of Macedonia and Thrace do possess extensive lowland plains and hillands with dense settlement systems (discussed later in this paper), but these areas are matched or exceeded in size 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,

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 only method is through landscape archaeology and 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. Some of the available results are reviewed in the next section; the interpretations are provisional. This exploratory synthesis incorporates reviews of published sites and excavations to complement the existing coverage 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 (Al-

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.

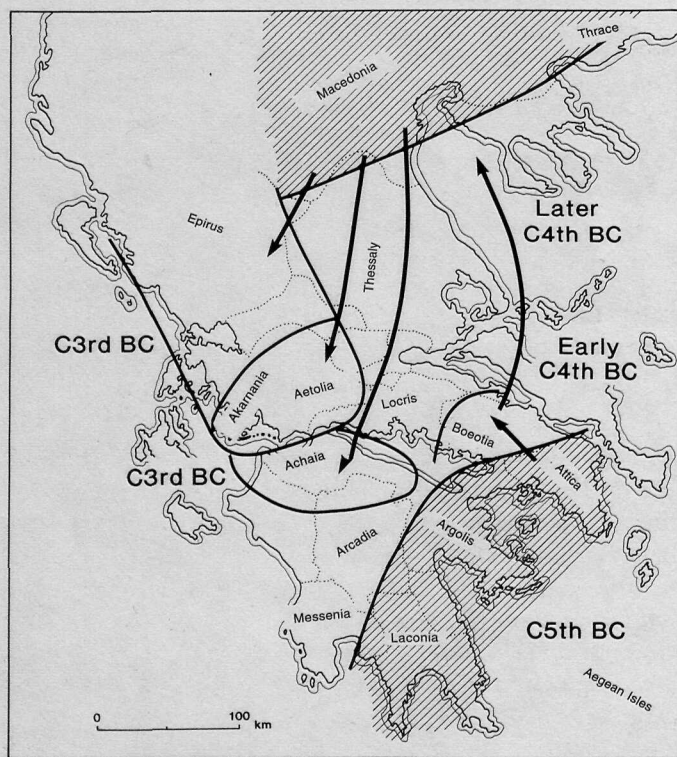


Figure 1. Power shifts in the location of dominant states in ancient Greece. Boundaries shown are the major regions of ancient Greece.

cock 1994), and land-use variation in Neolithic-Bronze Age mainland Greece (Halstead 1994).

The Regions and the Surveys of Greece and the Eastern Adriatic

The rapid development of regional survey in Greece since the 1960s has encouraged a constant process of "source-criticism" of both survey methodology and the interpretation of survey results in historical terms. Alcock (1993) provides an excellent overview of this critical tradition with many original insights of her own. I have carefully evaluated the quantitative and qualitative sources presented in this review in light of this critical approach in order to identify genuine trends in overall settlement and population density and in urbanism within each region. Problems of sampling, redistribution of population, dating, and other known sources of error are considered as well.

I shall first present histograms of available quantitative survey data (FIGS. 3-9). The numbers identifying regional survey projects refer to Figure 10, which illustrates their locations. Intensive surveys ("Int.") cover the land surface in close-order fieldwalking; extensive surveys ("Ext.") can collate settlement data through less systematic fieldwork and/or research on published archaeological sites. Generally-agreed chronological ranges for the period terms used

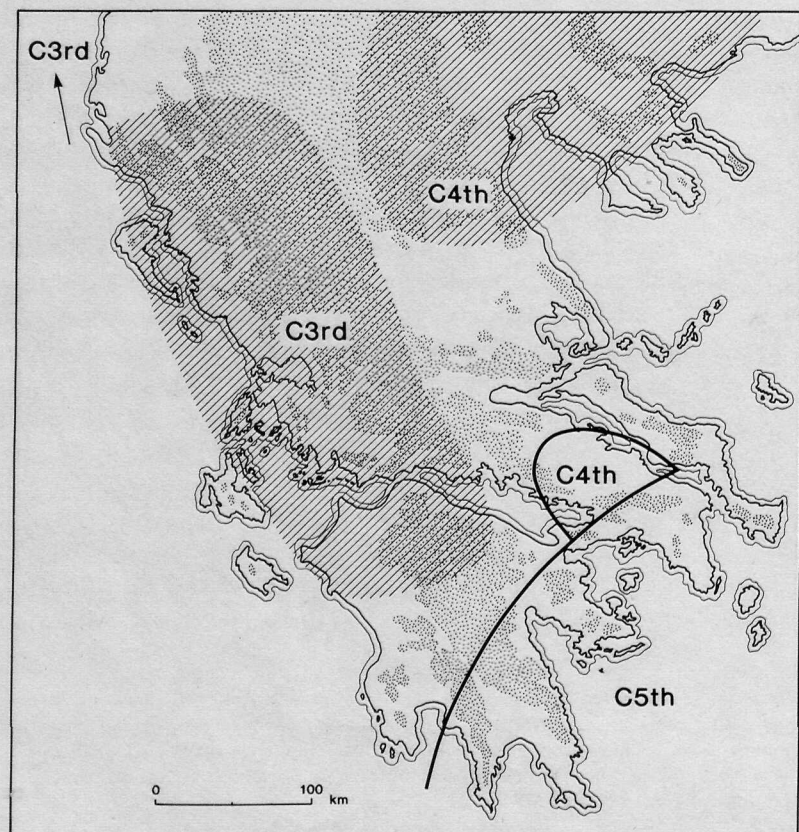


Figure 2. Power shifts in ancient Greece, with land above 500 m.

here have been published in Bintliff and Snodgrass (1985). If a survey area has urbanism confined to only one or two phases, this is indicated.

I shall now combine a discussion of the quantitative database with a summary of the qualitative database for regional settlement developments in ancient Greece.

1. Dalmatia (FIG. 3): Extensive field, published site, and literary source surveys on the mainland and islands demonstrate a rise in native urbanism in the later Iron Age, parallel to limited (Hellenistic) Greek colonization, but the maximum expansion of towns and rural settlement is Early Roman in date. This is confirmed by recent intensive surveys. Sources: Chapman, Shiel, and Batovic (1987); Chapman and Shiel (1993) [Int.]; Chapman et al. (1988) [Int.]. Data are also included from the unpublished intensive survey of the Starigrad area, Hvar Island, conducted by myself and others; Wilkes (1969, 1992) [Ext.]; Kirigin (1990) [Ext.].

2. Albania: Only extensive field survey and reviews of published sites are available, but these indicate urban takeoff in Hellenistic times and a rural expansion during the Early Roman. Sources: Blagg (1992) [Ext.]; Wilkes (1969, 1992) [Ext.].

3. Epiros (FIG. 3): Extensive field survey, excavations, and literary sources record urban increase in Hellenistic times, especially from the 3rd century B.C., and a general multiplying of all site numbers across the landscape. Sources: Doukellis (1990) [Ext.]; Dakaris (1971a, 1971b) [Ext.].

4. Levkas: Only extensive field survey and excavation results are available, but they indicate a parallel dramatic expansion of urban population and rural settlements in late Classical and early Hellenistic times, 4th–3rd centuries B.C. Sources: Dousougli and Morris (1994) [Ext.].

5. Kephallenia: Extensive rural and urban survey has indicated a clear takeoff to climax of population in town and country in the 4th century B.C., during late Classical and earliest Hellenistic times. Source: K. Randsborg (personal communication, 1996), report on the Danish Kephallenia Survey [Ext.].

6. Akarnania: Extensive field study, excavation, and literary sources suggest urban takeoff in Hellenistic times, while qualitative reports of recent intensive survey indicate a parallel takeoff of both urban and rural sites in late Classical and Hellenistic times. Sources: Kirsten (1940, 1956) [Ext.]; P. Funke and H.-J. Gehrke (personal communication), report of the first (1992) season of the Stratos Survey [Int.].

7. Aetolia (FIG. 3): Extensive survey using published sites, excavations, and literary sources suggests a notable takeoff of urban and village sites in late Classical and Hellenistic times, 4th–3rd centuries B.C. Extensive but very detailed field survey suggests an essentially early Hellenistic takeoff

of town and country, from the mid-4th century B.C. onward. Sources: Kirsten (1940, 1956) [Ext.]; Funke (1987) [Ext.]; Bommeljé and Doorn (1981, 1983, 1984) [Ext.]; Bommeljé et al. (1987) [Ext.]; Alcock (1989) [Ext.].

8. Macedonia (FIG. 3): Extensive survey of published sites, excavations, and literary sources indicates limited urban development in the entire region until Hellenistic times. Extensive field survey in southern Macedonia points to takeoff in the number of settlements in Hellenistic and Early Roman times. Intensive field survey in eastern Macedonia shows a gradual, very long-term rise in village populations from Late Neolithic to Early Iron Age times, then little change until an urban phase in Late Roman through Byzantine times. Sources: Kotsakis (1989, 1990) [Int.]; Kotsakis (personal communication), reports of the Langadas Basin intensive survey 1988, 1989 [Int.]; Andreou and Kotsakis (1994) [Int.]; French (1990–1991) [Ext.]; Kokkinidou and Trantalidou (1991) [Ext.]; Borza (1990) [Ext.]; Hammond (1991) [Ext.].

9. Eastern Phocis and Opountian Lokris (FIG. 4): Only the results of limited extensive field survey and reviews of published sites and excavations are available. The peak of settlement activity is in the Classical and Early Hellenistic eras. Sources: Fossey (1986, 1990) [Ext.].

10. Euboea (FIG. 4): A general, extensive field survey and a localized intensive field survey indicate a Classical climax in settlement numbers. Limited excavation confirms an urban highpoint in Classical and early Hellenistic times. Sources: Sackett et al. (1966) [Ext.]; Keller and Wallace (1986, 1987, 1988, 1990) [Int.]; Keller (1985) [Int.]; Rust (1978) [Ext.].

11. Boeotia (FIG. 5): Extensive field survey and reviews of excavations and published sites indicate an urban and rural climax in Classical times. Intensive field survey gives greater detail and emphasizes late Classical and early Hellenistic times. Sources: Fossey (1988) [Ext.]; Bintliff and Snodgrass (1985, 1988a) [Int.]; Bintliff (1990) [Int.]; Bintliff (in press a, c) [Int.]; Munn and Munn (1989–1990) [Int.].

12. Attica (FIG. 5): Extensive field survey and reviews of published sites and excavations indicate a major takeoff in settlement in Late Geometric to Late Archaic times (even allowing for problems with the cemetery records). Literary sources and analysis of settlement distributions indicate regional population at or near carrying capacity by final Archaic or earliest Classical times, 6th–5th centuries B.C. Peripheral rural districts on intensive field survey and analysis of settlement distribution, however, show maximum rural population increase to be late Classical. Overpopulation in and around the city of Athens was probably initially supported by agricultural intensification in the immediate urban hinterland and through food imports,

and only subsequently by agricultural intensification in peripheral districts. Sources: Lohmann (1983, 1985, 1991, 1993) [Int.]; Morris (1987) [Ext.]; Bintliff (1994) [Ext.]; Garnsey (1988) [Ext.].

13. Achaia (FIG. 6): Extensive survey demonstrates limited urban development and rural settlement in Archaic and Classical times. In the Hellenistic era there is a marked takeoff in town and country: in the western lowland this marks local demographic climax, with decline in Roman times; but in the Patras central lowlands, after a short, final Hellenistic decline, growth resumes in Early Imperial times and achieves maximum settlement density in that period. Sources: A. Rizakis (personal communication), reports of the Achaia Project, Athens, National Hellenic Research Center [Ext.]; Petropoulos (1994), Petropoulos and Rizakis (1994) [Ext.]; Alcock (1989) [Ext.].

14. Corinthia and Cleonae (FIG. 6): Extensive field survey and reviews of excavations and published sites point to a marked increase of settlement in Archaic times, peaking during the Classical period. Historic sources suggest a total population in the Classical Corinthian territory at or above local carrying-capacity. Sources: Sakellariou and Faraklas (1971) [Ext.]; Morris (1987) [Ext.]; Engels (1990) [Ext.].

15. Methana (FIG. 6): Intensive survey indicates a climax in urban and rural settlement during Classical to early Hellenistic times without a subsequent parallel in combined intensity. Sources: C. Mee (personal communication), reports on the Methana Survey 1984, 1987, 1988 [Int.]; Mee et al. (1991) [Int.].

16. Nemea Valley (FIG. 6): Overall, intensive survey demonstrates rural settlement takeoff in Archaic times and a climax in Classical times. A single small urban site, Phlius, subjected to intensive survey, reached its maximum extent and most intense use in Classical to Hellenistic times (the published interpretation that peak use is Early Roman cannot be supported on the published data of period-specific finds). Sources: Wright et al. (1990) [Int.]; Alcock (1991) [Int.].

17. The Argolid (FIG. 7): Extensive field survey and reviews of excavated and published sites indicate a Classical

to Early Hellenistic climax, with significant anticipation in high Archaic site numbers. Intensive survey in the sw district, however, combined with urban excavation, gives stronger emphasis to late Classical and early Hellenistic settlement growth and climax. In contrast, limited intensive survey in the Argive heartland also suggests precocious rural development in Archaic times. We might generalize to suggest a general late Classical to early Hellenistic climax, with perhaps significant growth in Archaic times in the Plain of Argos and its hinterland, and takeoff seen later in more peripheral areas. Sources: Foley (1988) [Ext.]; Morris (1987) [Ext.]; van Andel and Runnels (1987) [Int.]; Jameson (1994) [Int.]; Ault (1994) [Int.]; Wells, Runnels, and Zangger (1990) [Int.].

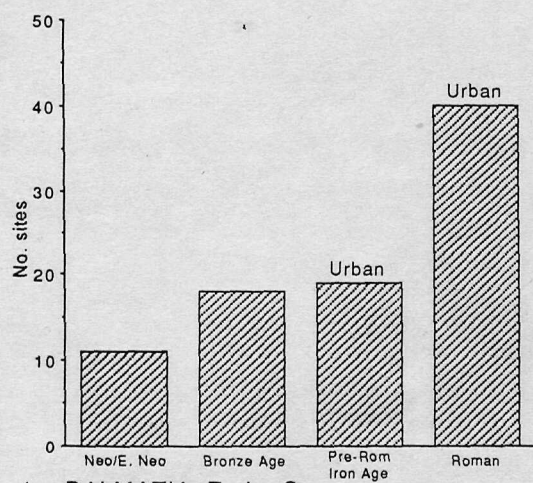
18. Laconia (FIG. 7): Intensive survey identifies an overwhelming predominance of settlement during Classical to Early Hellenistic times, at farm and village level. Sources: Cavanagh and Crouwel (1988) [Int.]; Cavanagh (personal communication), reports of the Laconia Survey, 1983 and 1984 seasons [Int.].

19. Arcadia (FIG. 7): Combining intensive and extensive field survey with extensive reviews of published and excavated sites, and historical sources indicates a rural and urban settlement climax during late Classical and early Hellenistic times. Sources: Howell (1970) [Ext.]; Lloyd and Roy (personal communication), report on the Megalopolis Survey, 1982 season [Int.]; Roy, Owens, and Lloyd (1988) [Int.]; Lloyd (1991) [Int.].

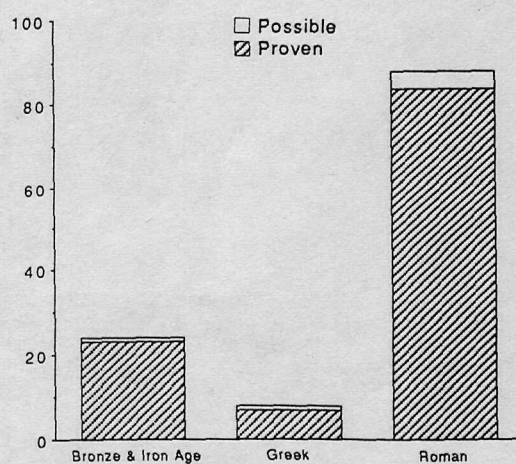
20. Messenia (FIG. 8): Extensive field survey and reviews of published and excavated sites, as well as literary sources, suggest a clear peak of rural and urban settlement during Classical and Hellenistic times, probably late Classical and early Hellenistic for the most part. Sources: McDonald and Rapp (1972) [Ext.].

21. Kea (Keos) (FIG. 8): Intensive and extensive surveys in different city areas agree in identifying rural and urban settlement climax in Classical to earliest Hellenistic times, with signs of population acceleration already in the Archaic era. Sources: Cherry, Davis, and Mantzourani (1991) [Int.]; Cherry and Davis (1991) [Int.]; Mendoni (1994) [Int. and Ext.].

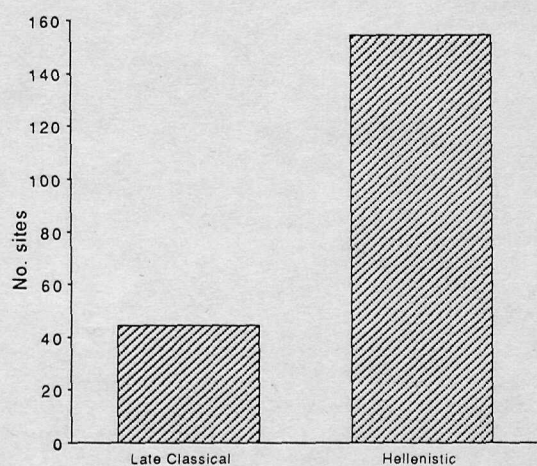
Figure 3. (facing page) Histograms of site frequencies from surveys: Dalmatia, Epiros, Aetolia, Macedonia. Definite site occupation is shaded; possible ones are left blank in the histograms. Abbreviations are as follows: E = Early, M = Middle, L = Late; NEO = Neolithic; ENEO = Eneolithic; EBA = Early Bronze Age; LBA = Late Bronze Age; E.I. Age = Early Iron Age; PREH = Prehistoric; PG = Protogeometric; GEOM/G = Geometric; ARC/A = Archaic; CLASS/C = Classical; HELL/H = Hellenistic; ROM/R = Roman; LR = Late Roman; BYZ = Byzantine; TURK = Turkish; MED-MOD = Medieval to Modern. Sources: Dalmatia Zadar Survey (Chapman and Shiel 1988); Dalmatia Hvar-Stari Grad Survey (Bintliff, Gaffney, Kirigin, Slapsak, unpubl.); Epiros Thesprotia (Dakaris 1971b); Aetolia Strouza Survey (Bommeljé and Doorn 1984); South Macedonia Grevena Survey (French 1990–1991); Eastern Macedonia Langadas Survey (Kotsakis 1989, 1990).



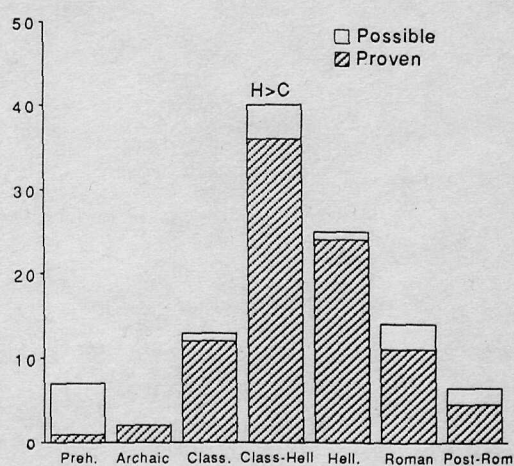
1 DALMATIA: Zadar Survey (intensive)



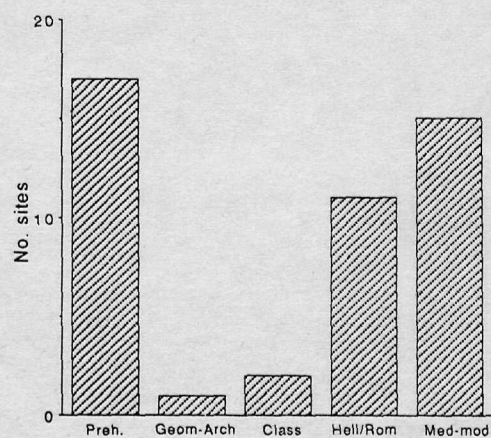
1 DALMATIA: Hvar-Starigrad Survey (intensive)



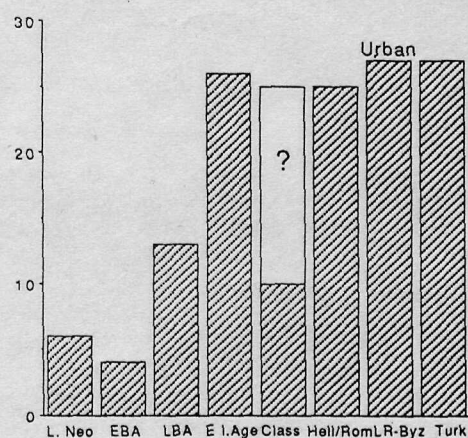
3 EPIROS: Thesprotia (extensive)



7 AETOLIA: Strouza Survey (extensive)



8 S. MACEDONIA: Grevena Survey (extensive)



8 E. MACEDONIA: Langadhas Survey (intensive)

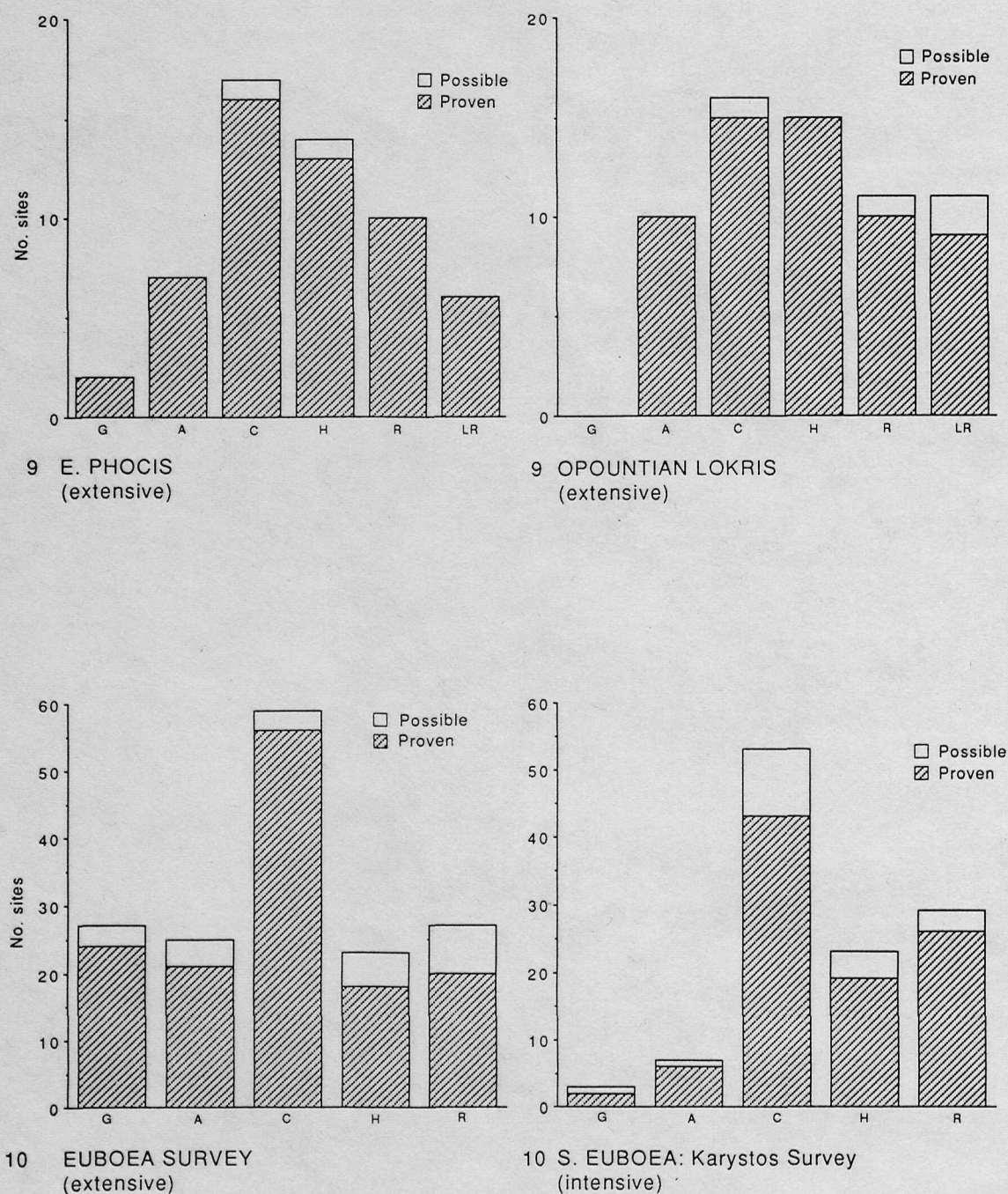
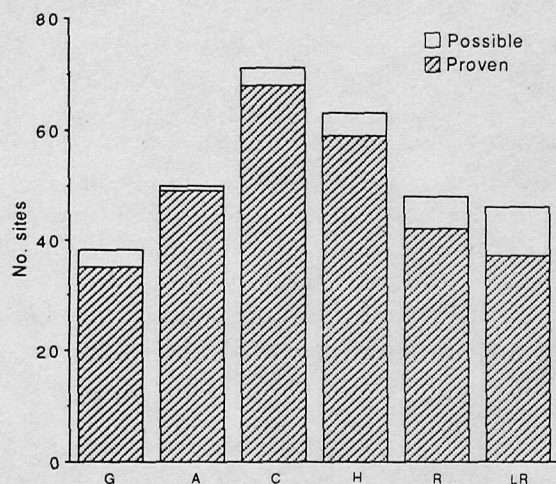
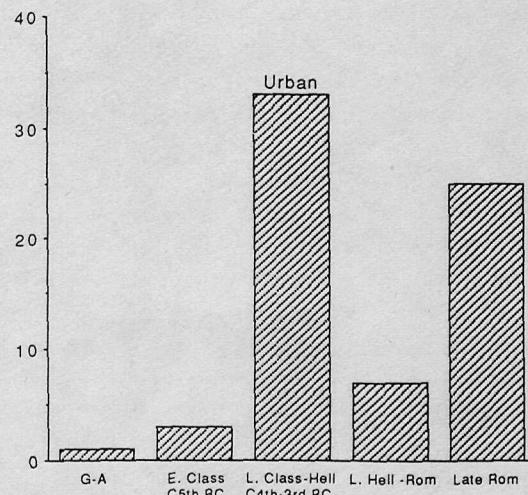


Figure 4. Histograms of site frequencies from surveys: E. Phocis, Opountian Lokris, Euboea. Definite site occupation is shaded; possible ones are left blank in the histograms. See Figure 3 for keys and abbreviations. Sources: Eastern Phocis (Fossey 1986); Opountian Lokris (Fossey 1990); Euboea Survey (Sackett et al. 1966); Southern Euboea Karystos Survey (Keller 1985).

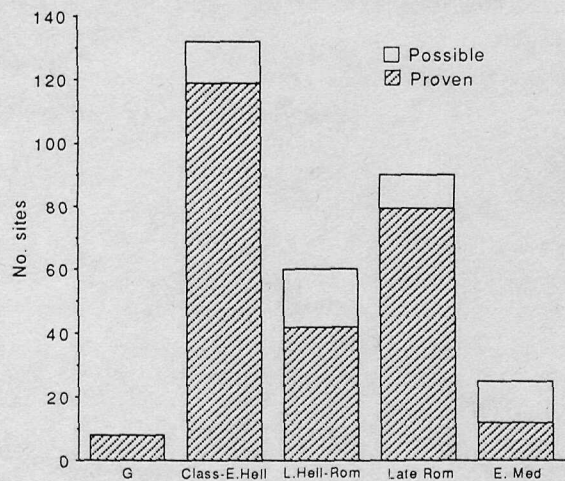
Figure 5. (facing page) Histograms of site frequencies from surveys: Boeotia, Attica. Definite site occupation is shaded; possible ones are left blank in the histograms. See Figure 3 for keys and abbreviations. Sources: Boeotia (Fossey 1988); Boeotia Skourta Survey (Munn and Munn 1989–1990); South-West Boeotia Cambridge-Bradford Survey (Bintliff 1990); Attica Atene Deme Survey (Lohmann 1993); Attica (Morris 1987).



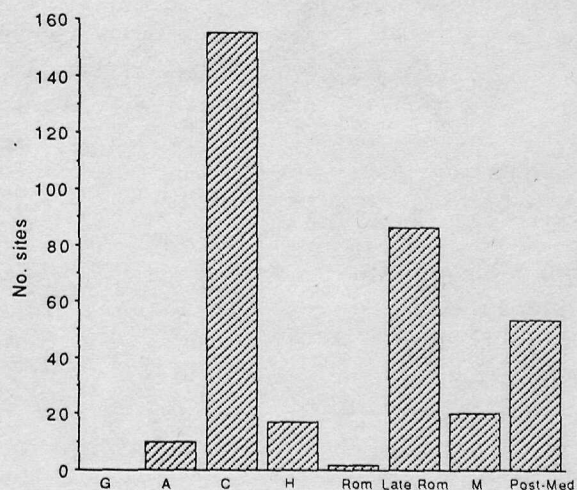
11 BOEOTIA
(extensive)



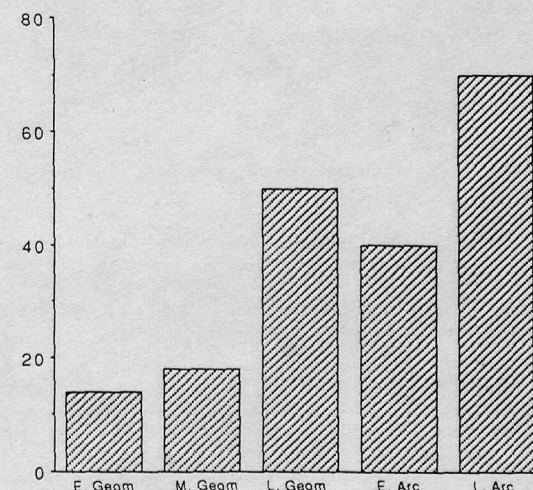
11 BOEOTIA: Skourta Survey
(intensive)



11 S.W. BOEOTIA: Cambridge-Bradford Survey
(intensive)



12 ATTICA: Atene Deme Survey
(intensive)



12 ATTICA: All Sites
(extensive)

22. Melos (FIG. 8): Intensive survey indicates both Classical and Late Roman peaks of rural settlement, while extensive research may suggest a parallel urban vigor. A clear build-up of rural sites in Geometric and Archaic times is visible as well. Snodgrass, however, has argued that the Classical devastation of the island by Athens may have severely truncated contemporary rural occupation. The approximate size of Melos city where most people probably resided, 15 ha, may indicate an urban population of around 1800 people (Bintliff 1991a), which, with a putative 30% rural population, would indicate around 2600 people on the island. This figure is close to a suggested resettlement of some 2500 Athenian colonists (Renfrew and Wagstaff 1982). These figures are near the carrying capacity of Melos with Iron Age technology (if Classical land use was as elsewhere 150% of today's, some 3000 people were supportable [Bintliff 1984a, 1991a]). A tentative summary would see a Geometric and Archaic takeoff culminating in peak Classical settlement, perhaps repeated, after an intervening decline, in Late Roman times. Sources: Renfrew and Wagstaff (1982) [Int.]; Snodgrass (1987–1989) [Int.].

23. Samos and Chios (FIG. 8): Extensive survey, chiefly of published and excavated sites, offers a limited sample for generalization. Both islands could be seen as exhibiting a long-term trend to settlement expansion from Archaic through Late Roman times, although inclusion of the possible with the definite occupations introduces a Classical climax on Samos. Information on urban population changes is lacking, and caution must be employed in accepting these apparent trends. Source: Shipley (1987) [Ext.].

24. Crete (FIG. 9): Extensive field survey and reviews of published and excavated sites, as well as literary sources, agree with all but one intensive survey in indicating a dramatic expansion of settlement numbers and site size in Hellenistic to Early Roman times. The exceptional intensive survey of upland Lasithi has a precocious Archaic rural explosion, then the district appears to become underpopulated until an all-time peak in Late Roman times, when rural site climax is accompanied by the only known urban site from antiquity. Sources: Willetts (1965) [Ext.]; Watrous (1974) [Int.]; Sanders (1976, 1982) [Ext.]; Blackman and Branigan (1975, 1977) [Int.]; R. Hope-Simpson (personal communication 1985), report of the

Kommos Survey [Int.]; J. Bennet (personal communication 1984), report of the West Mesara Survey [Int.]; Watrous et al. (1993) [Int.]; Moody (1987) [Int.]; Nixon et al. (1988, 1989, 1990) [Int.]; Van Effenterre (1991) [Ext.]; Harrison (1993) [Ext.].

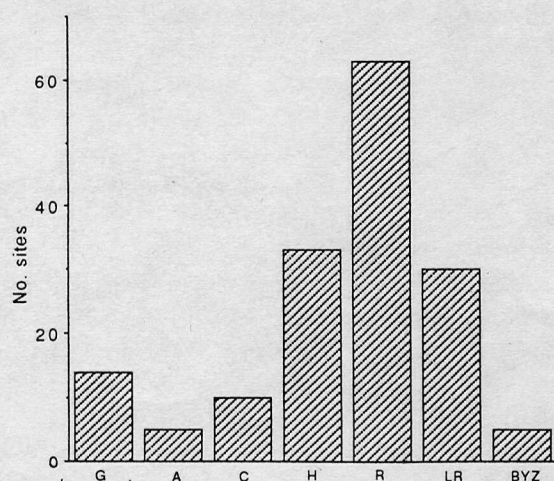
25. Thessaly: Extensive reviews of published and excavated sites, and literary sources, together with in-depth spatial analysis by a Lyon University team, suggest that the full flourishing of a dense network of hierarchical settlement dates to the Classical and early Hellenistic periods, with subsequent urban decay in late Hellenistic and Early Roman times. In the absence of intensive survey, fluctuations in non-urban sites remain poorly-known, although the modular nature of city-state territories and their small average radius, plus the likelihood that as elsewhere they contained some two-thirds of total population (Bintliff 1991a, 1994), may limit the potential distortions. Sources: Auda et al. (1991) [Ext.]; Jeffery (1976) [Ext.]; Larsen (1968) [Ext.]; Lucas (1991) [Ext.]; Marzolf (1991, 1994) [Ext.].

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 first experienced a notable increase, or reached a climax of density in town and country. Figure 10 is a first attempt to show how these developments varied regionally. In the light of this map, I shall now interpret the quantitative and qualitative regional survey database in terms of broad developmental phases.

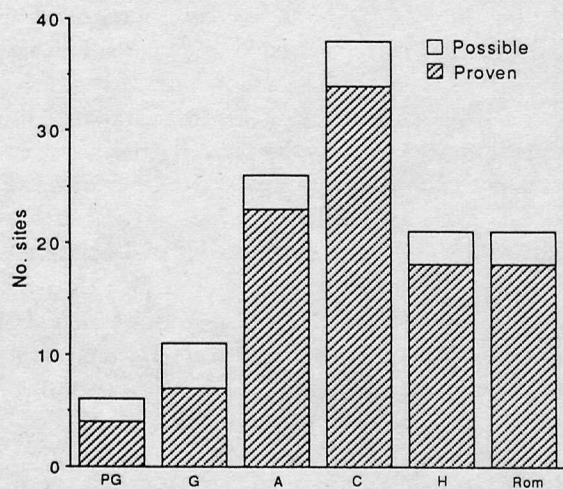
Phase 1: Late Geometric to Archaic (8th to End of 6th Centuries B.C.)

Excavation and extensive survey, together with the historical record, 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: 104) of 120,000–150,000 for Attica's carrying capacity. Spatial analysis and intensive survey in the Attic countryside (Lohmann 1993; Bintliff 1994) suggest that regional

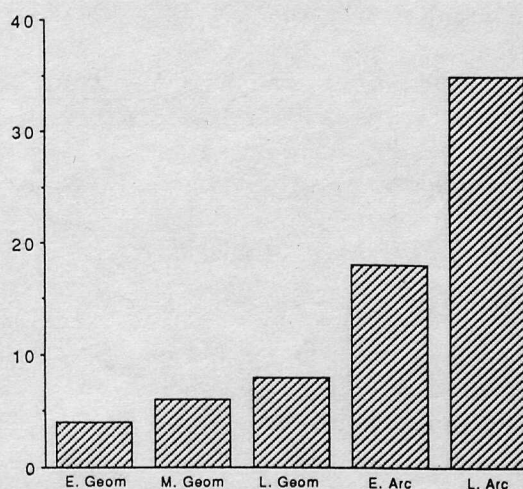
Figure 6. (facing page) Histograms of site frequencies from surveys: Achaea, Corinthia, Methana, Nemea. Definite site occupation is shaded; possible ones are left blank in the histograms. See Figure 3 for keys and abbreviations. Sources: Achaea Patras Survey (Petropoulos and Rizakis 1994); Corinthia (Sakellariou and Faraklas 1971); Corinthia (Morris 1987); Methana Survey (Mee, personal communication 1986–1987, 1987–1988; Mee et al. 1991); Nemea Valley Survey (Wright et al. 1990; Alcock 1993).



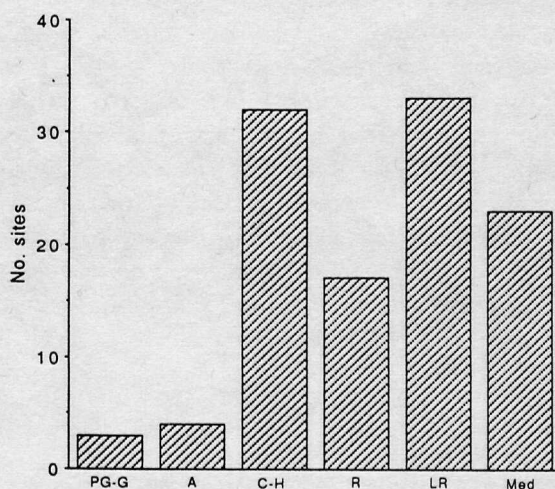
13 ACHAEA: Patras Survey (extensive)



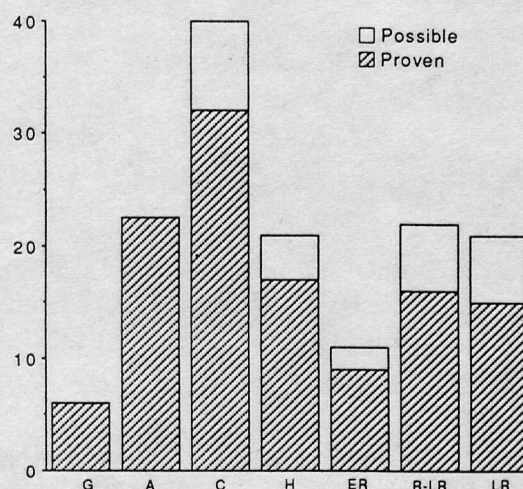
14 CORINTHIA: All sites (extensive)



14 CORINTHIA: All sites (extensive)



15 METHANA SURVEY (intensive)



16 NEMEA VALLEY SURVEY (intensive)

overpopulation was created 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 4th century B.C. It is unclear if this rural trend reflects a wave of development emanating from high urban demand, or the stimulus given to intensify local production by the 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), based on both intensive and extensive survey results, seem also to have developed rapidly during Geometric and Archaic periods, although their population climaxed in Classical and Early Hellenistic times. Intriguingly, the intensive surveys of Melos in the Cyclades (22), the upland plain of Lasithi in Crete (24, easternmost survey), and the Langadas Basin of eastern Macedonia (8, inset) indicate precocious growth in the Geometric and Archaic periods.

In Melos and Lasithi 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, while the truncation of rural settlements could reflect the Athenian massacre and resettlement program of 415 B.C., since as elsewhere in SE Greece maximum rural growth might otherwise have occurred from the later 5th into the 4th centuries B.C. (Snodgrass 1987–1989). In upland Cretan Lasithi, however, the only urban site is Late Roman, and the collapse of a promising early historical settlement system should indicate genuinely truncated development, with depopulation and economic “underdevelopment” persisting through Classical and Early Roman times. In eastern Macedonia, a stable network of villages in the Langadas Survey (8, inset), whose origin lies in Copper Age times, undergoes a pronounced phase of expansion in size and number in the Early Iron Age. Population is far below local carrying capacity, however, and no further elaboration of settlement occurs till Late Roman times when the first urban center appears.

Phase 2: Classical to Early Hellenistic (5th to Mid-3rd Centuries B.C.)

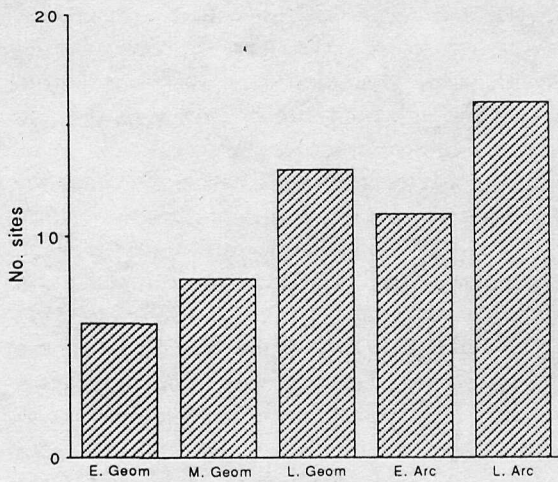
In a wide arc around this early growth focus of the SE mainland, the maximum impetus to population takeoff seems to occur in full Classical and Early Hellenistic times,

in the 5th to early 3rd centuries B.C.: this is the typical picture produced by 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 to early Hellenistic times can be cited.

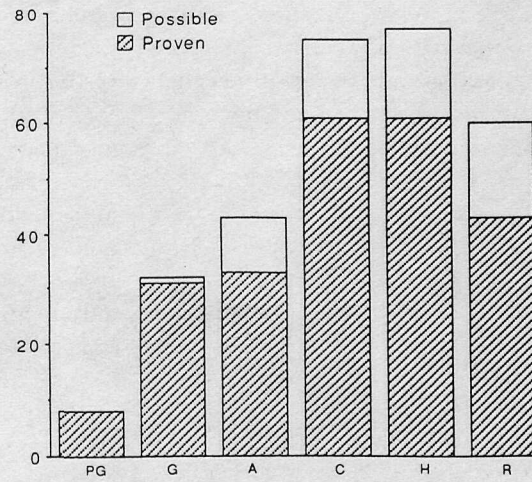
It is difficult to compare this information from largely intensive survey with recent studies by Fossey (1986, 1990) of eastern Phocis and Opountian Locris (9): here extensive study has identified a limited number of sites, usually the major ones that could have continued to be occupied when smaller localities fluctuated in number; moreover, the changing size of continuously-occupied settlements is usually unstudied. As a result, conclusions about population fluctuations are difficult to draw, even to observe, when a scant 18–20 sites are representative of a large region. One can merely note a tendency toward a Classical or Hellenistic peak in conformity with 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 does reasonably suggest that population growth may have been concentrated in the era of 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, a phenomenon that is paralleled in urban growth. Identical results have recently been obtained from the adjoining island of Kephallenia (5). On the adjacent mainland in the lowlands of Akarnania (6), a newly-initiated intensive survey has identified rural farms developing in the same time period, while urban growth is chiefly

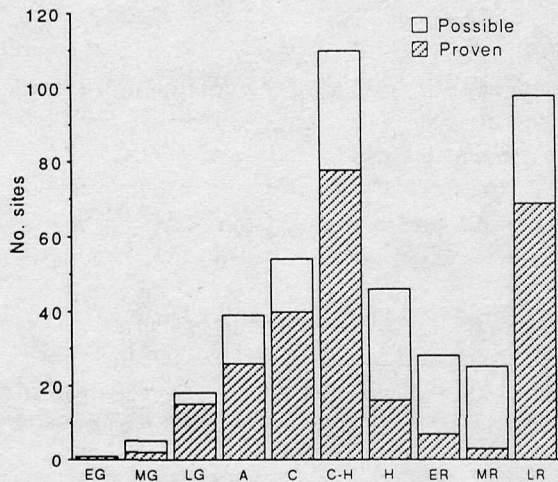
Figure 7. (facing page) Histograms of site frequencies from surveys: Argolid, Laconia, Arcadia. Definite site occupation is shaded; possible ones are left blank in the histograms. See Figure 3 for keys and abbreviations. Sources: Argolid Argive Plain (Morris 1987); Argolid (Foley 1988); South-West Argolid Survey (van Andel and Runnels 1987); Laconia Survey (Cavanagh, personal communication 1983–1984; minimal figures); Arcadia Megalopolis Survey (Lloyd 1991); Arcadia Eastern Arcadia Survey (Howell 1970; Lloyd 1991).



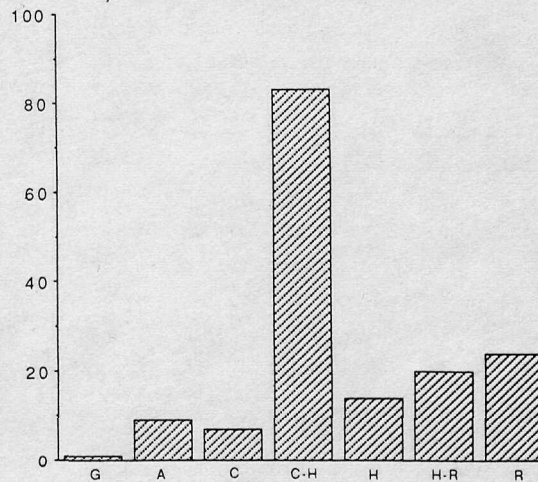
17 ARGOLID: Argive Plain (extensive)



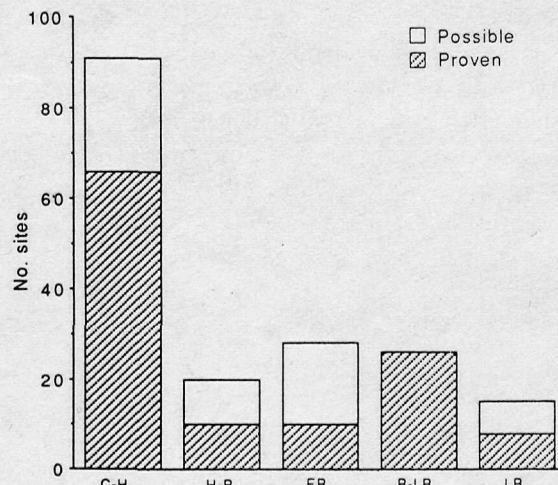
17 ARGOLID: All sites (extensive)



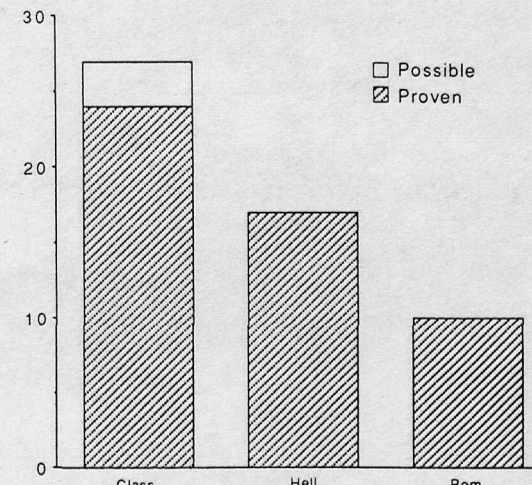
17 ARGOLID: S.W. Argolid Survey (intensive)



18 LACONIA SURVEY (intensive)



19 ARCADIA: Megalopolis Survey (intensive)



19 ARCADIA: E. Arcadia Survey (extensive)

Hellenistic. These two NW 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 became the center of the Akarnanian confederation.

Phase 3: Hellenistic (Late 4th to 2nd Century B.C.)

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

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 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 the 5th century B.C. During the latter era the larger communities develop urban institutions and their growing bodies of citizens begin to dominate the landed aristocracy that had previously controlled regional politics. These processes culminate in an urban climax and an arguably overall demographic peak during Early Hellenistic times, while the settlement system is already in decline by 200 B.C.

In NE 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 increase occurring in Hellenistic and Early Roman times, and even later in marginal districts (see below).

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 have flourished most in terms of settlement during final Hellenistic and Early Roman times (see below). Limited evidence from the large eastern 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 to Early Roman (2nd Century B.C. to 3rd Century A.C.)

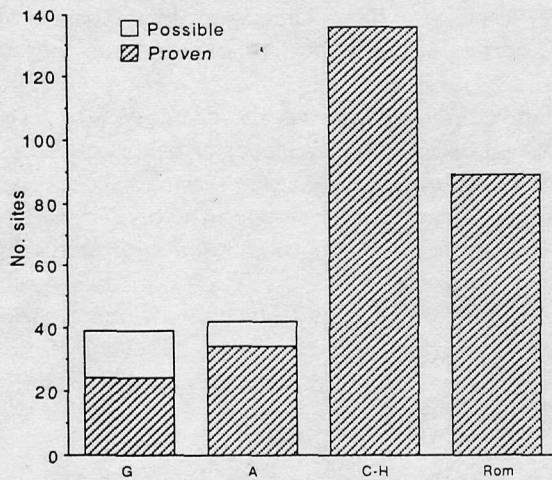
In almost all regions of Crete (24), intensive survey has produced a surprising but consistent result, and one confirming extensive survey and reviews of excavations and literary sources: although city life was widespread by Classical times, the dramatic expansion of rural population was very delayed 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 below).

In the far NW, up the eastern Adriatic in Croatian Dalmatia (1), native communities begin to develop urban features in Hellenistic times, but the full acceleration in both town and country is clearly focused on the Early Roman era.

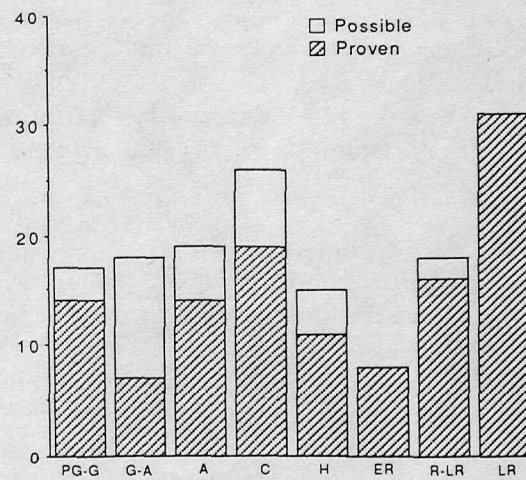
Phase 5: Late Roman (4th to 6th Centuries A.C.)

Many 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 generally appeared between Classical and Early Roman times 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

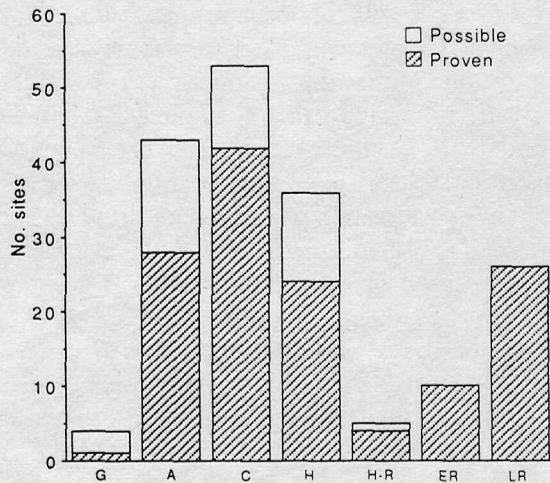
Figure 8. (facing page) Histograms of site frequencies from surveys: Messenia, Melos, Keos, Samos, Chios. Definite site occupation is shaded; possible ones are left blank in the histograms. See Figure 3 for keys and abbreviations. Sources: Messenia Minnesota Survey (McDonald and Rapp 1972); Melos Survey (Renfrew and Wagstaff 1982); North-West Keos Survey (Cherry, Davis, and Mantzourani 1991); North-West, South-West and East Keos Surveys (Mendon 1994); Samos (Shipley 1987); Chios (Shipley 1987).



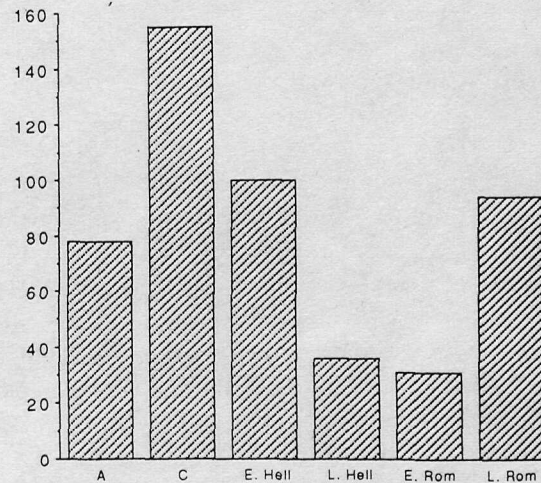
20 MESSENIA: Minnesota Survey (extensive)



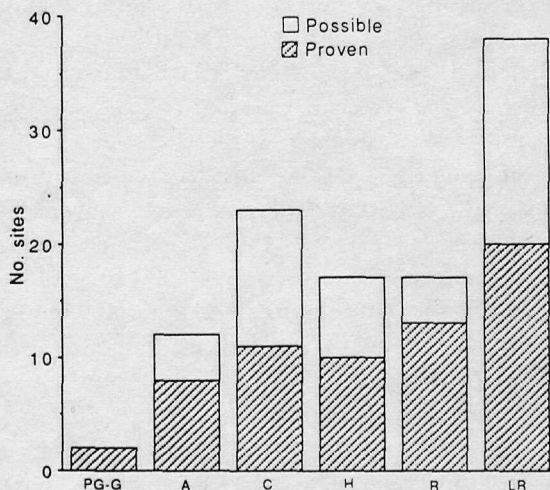
22 MELOS SURVEY (intensive)



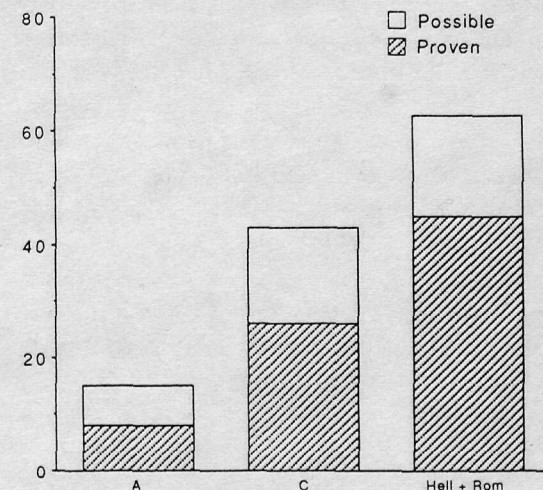
21 KEOS: N.W. Keos Survey (intensive)



21 KEOS: N.W., S.W. & E. Keos Surveys (intensive & extensive)



23 SAMOS: All sites (extensive)



23 CHIOS: All sites (extensive)

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 Lasithi Plain in central Crete (24, easternmost survey) and the Langadas Basin in eastern 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 SE lowland regions such as Corinth, Nemea, western Argolid, and the island of Kea; possibly precocious developments on the island of Melos and in central Crete may hint at a wider SE Aegean early-growth sphere, although on Crete subsequent development is blocked.

2. In a wider arc, population growth 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-Kephallenia-Akarnania 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 Akarnania to Epiros, 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 SE regions, appears to reach settlement climax in Hellenistic times. Further NE, the general picture for Macedonia indicates a Hellenistic take-off in urban and rural settlement, with growth continuing into Early Roman times.

4. In the outer NW corner of the Peloponnese in Achaea 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, like the upper Adriatic, had a limited population growth in Hellenistic times and a considerable expansion in the transition-era Late Hellenistic–Early Roman. Likewise the eastern 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

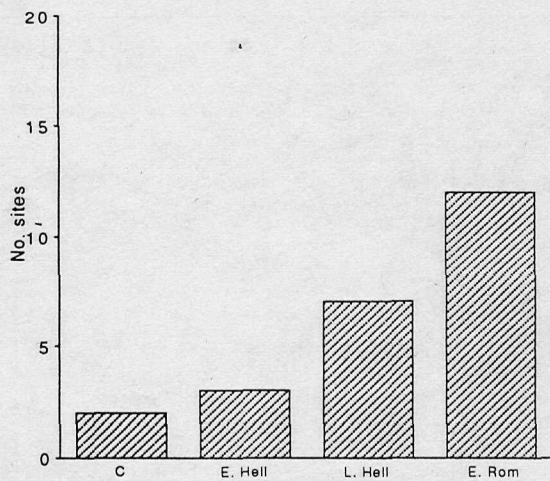
Aegean—for example upland Crete and inland basins of eastern Macedonia—population climax may be as late as Late Roman times.

By and large, the “evidence on the ground” is broadly comparable to political history: an early historical dominance of Athens, Corinth, and Argos; Spartan Laconia and Thessaly perhaps being less developed in settlement intensity and population size 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 that of Epiros, coincided with their settlement growth.

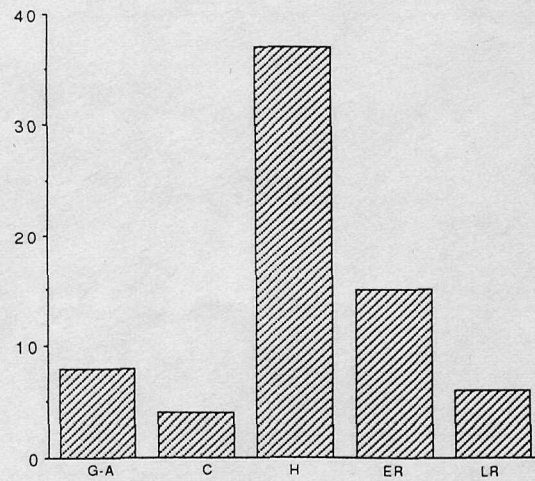
Macedonia was perhaps precociously powerful (mid-4th century B.C.) in comparison to its settlement increase (later 4th–3rd century B.C.). This supports the argument (Borza 1990) that Philip II’s initiatives in agriculture and resettlement of population, if in fact they happened, occurred too late for real effect in supporting the initial rise of the Macedonian state to hegemony over Greece. Alternatively, perhaps Macedon, Sparta, and Thessaly all relied initially on successful mobilization of a very large but thinly-spread labor pool for their significant military influence abroad rather than on intensive growth and numerous large cities. I am unconvinced by the argument sometimes raised by ancient historians that considerable Macedonian emigration for the colonies of Alexander’s empire drained that region of population, hence reducing regional growth: 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 southern Albania and Dalmatia. Similarly, the absence of a significant role for Crete in the events of Greek history, even its odd linking by Rome to Cyrene in North Africa rather than to the Aegean world in early

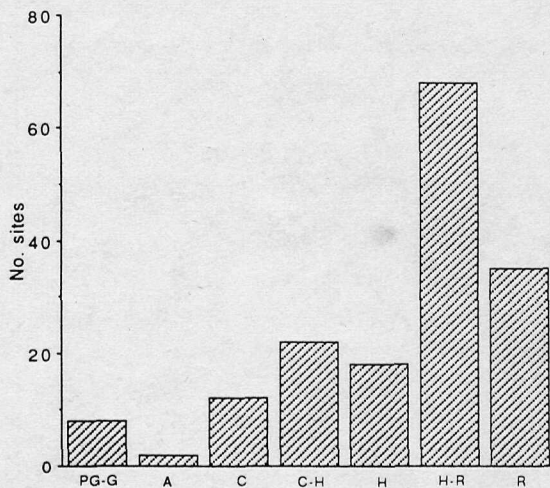
Figure 9. (facing page) Histograms of site frequencies from surveys: Crete. See Figure 3 for keys and abbreviations. Sources: Crete Agiofarango Survey (Blackman and Branigan 1977); Crete Western Mesara Survey (Bennet, personal communication 1984; minimal numbers); Crete Khania Survey (Moody 1987); Crete Kommos Survey (Hope-Simpson, personal communication 1987); Crete Lasithi Survey (Watrous 1974).



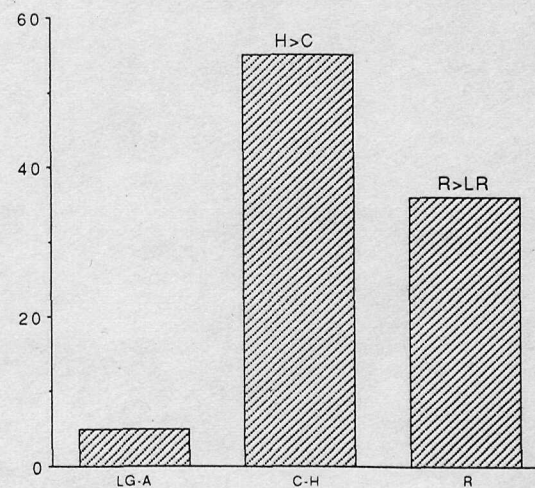
24 CRETE: Agiofarango Survey
(intensive)



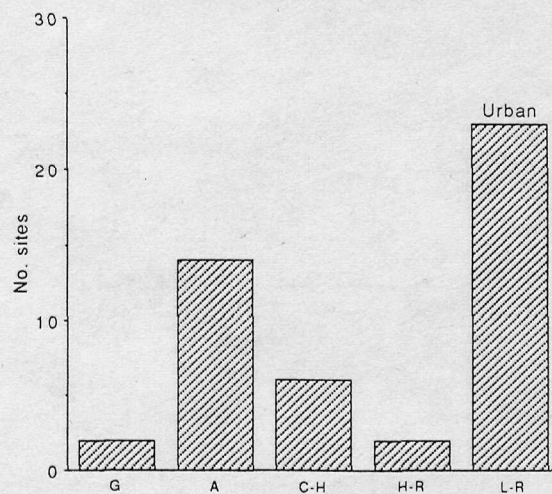
24 CRETE: W. Mesara Survey
(intensive)



24 CRETE: Khania Survey
(intensive)



24 CRETE: Kommos Survey
(extensive)



24 CRETE: Lassithi Survey
(intensive)

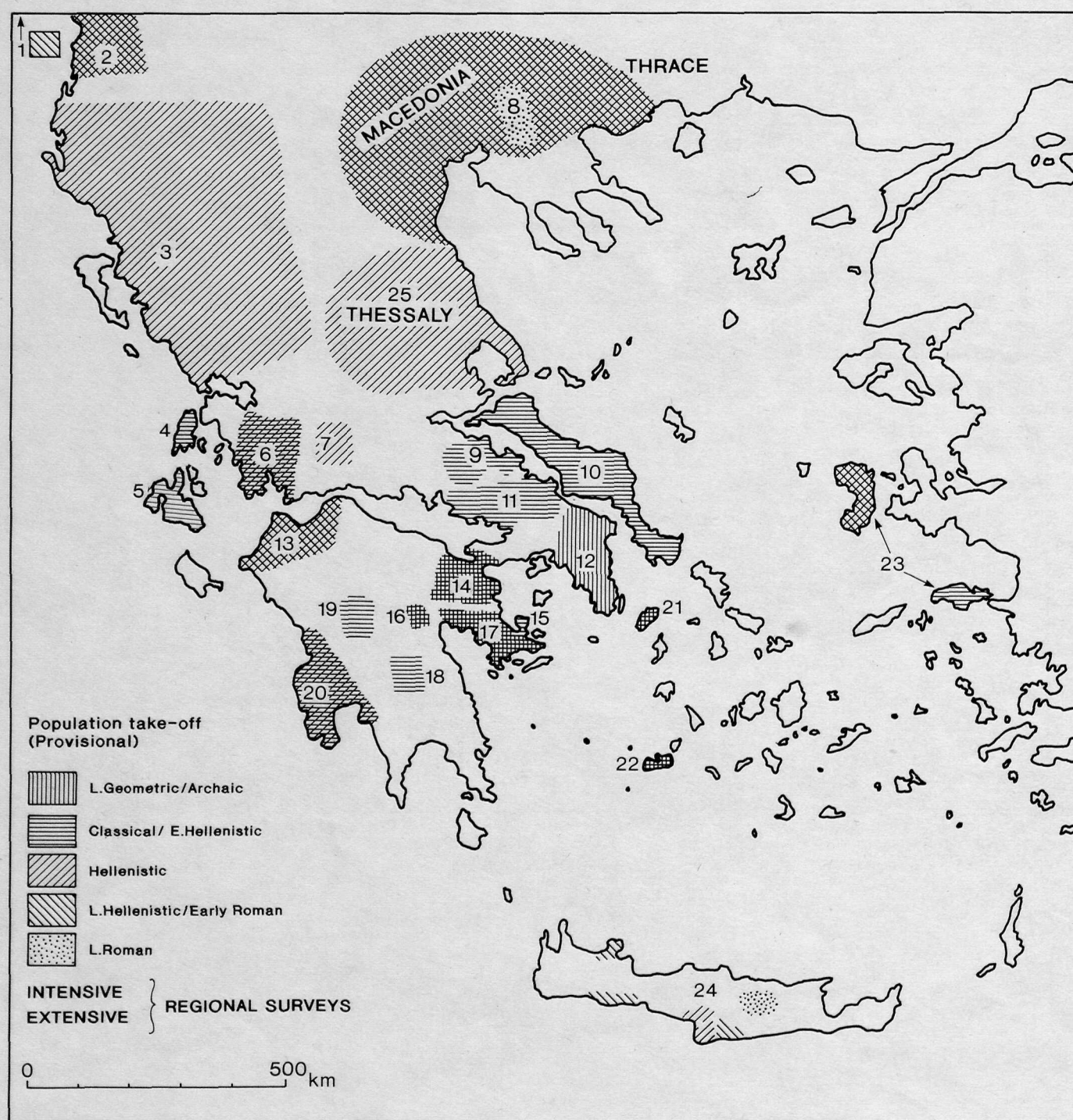


Figure 10. The distribution of primary population climax phases after the Bronze Age and before the end of Late Roman times in Greece, based on the evidence of intensive/extensive archaeological field surveys and regional settlement history syntheses. 1 = Dalmatia, 2 = Albania, 3 = Epiros, 4 = Levkas, 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.

provincial administration, is fully in agreement with the stagnation in settlement development till shortly before the Roman era.

Models of Regional Developments

The following list presents a series of models, or groups 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.

1. Region-Macroregion Model
2. Braudelien "Annaliste" Structural History Model
3. Historical Accident, "Events" Model
4. Core-periphery, World Systems Theory
5. Neo-Malthusian, Eco-demographic Model (Kirsten-Renfrew-McNeill)
6. Combination Trajectory Model
7. Socio-structural, Punctuated-equilibrium Model
8. "Boom-bust" Cyclical Evolution-devolution Model; Upland "open-closed" Model; Lowland "Ecological Crises" Model

The first two models in this list are especially helpful in clarifying our understanding of regional histories. They underpin my eventual use of the more specific models that follow in this list.

Region-Macroregion Model

The Region-Macroregion Model (Bintliff and Snodgrass 1988b) 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. It focuses on the balance between internal regional trajectory and forms of interaction with enclosing macroregions. It argues that, in evaluating regional trajectories, we should identify 1) local agricultural-demographic cycles, reflecting local human ecology or "health"; 2) the mode(s) of production operated at the local level; and 3) the mode(s) of production operated at the macroregion level, e.g., by the state or other interregional socioeconomic systems.

Structural History Model

Structural History, or the Braudelien perspective (cf. Bintliff 1991b), suggests that regional histories are the product of processes operating at different time levels: 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; and the long-term waves, of a millennium or longer, set in train by major innovations in technology, economy, or social organization.

In its developed Braudelien form, the three dominant layers of temporal processes deserving investigation are as follows:

(a) The short-term, "événements" mode. This typically deals with the history of events, with narrative and political history and individuals.

(b) The medium-term, "conjonctures" mode. The dominant time scale for social and economic history; economic, agrarian, demographic cycles; the history of eras, regions and societies; worldviews and ideologies ("mentalités").

(c) The long-term, "longue durée" mode. This is typified by geohistory, "enabling and constraining" effects of physical geography; the history of civilizations and peoples; stable or slowly-changing technologies; highly-persistent worldviews ("mentalités").

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

Historical Accident Model

This model argues that human life is unpredictable and varied, so that historical outcomes are matters of chance. This model clearly cannot explain the spatial trends apparent in our data, i.e., the structure. The world of unique events has a limited scope in the detailed understanding of ancient history. A version of this approach that 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 in our discussion of the Socio-structural, Punctuated-equilibrium Model.

Core-periphery and World Systems Models

Core-periphery and World Systems Theory (FIG. 11) represent a most influential set 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 nations and the Third World that have arisen over the last five centuries, these related models focus on the exploitative economic ties between "core"

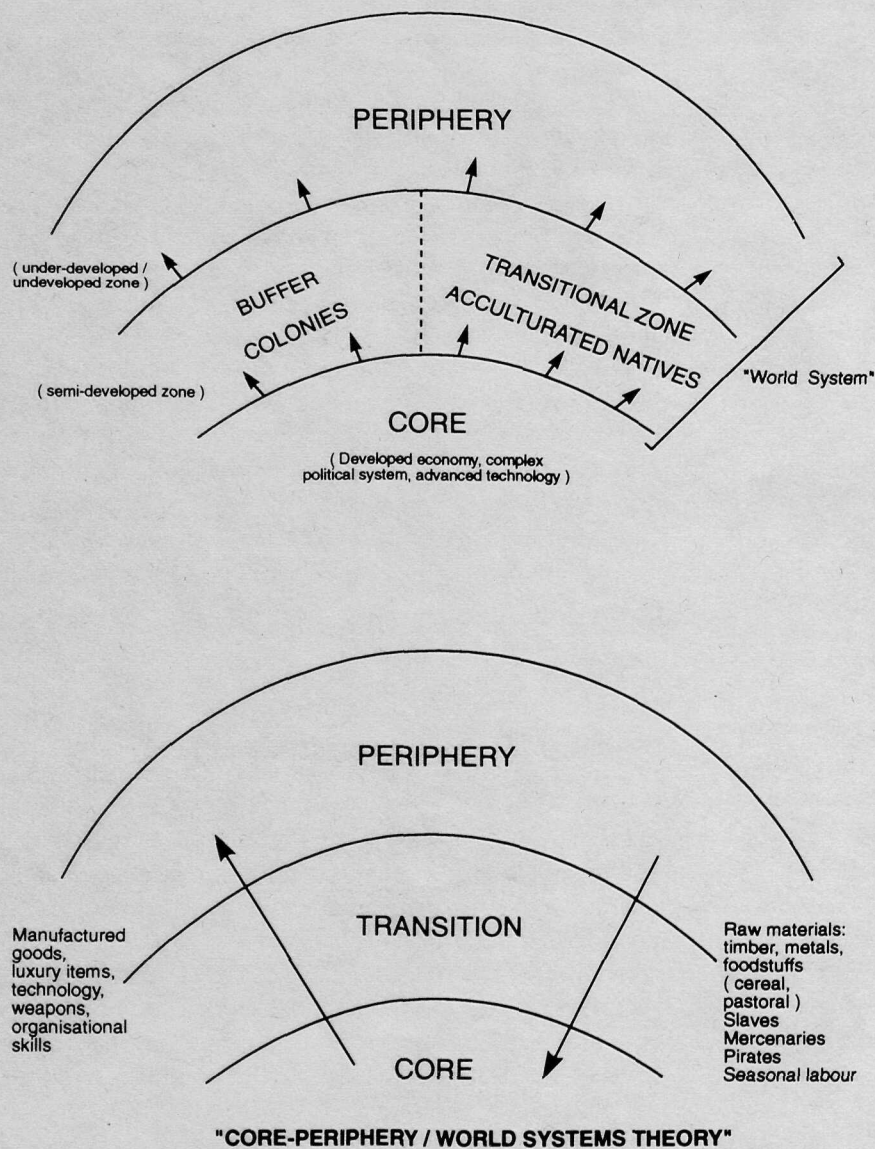


Figure 11. Diagrammatic representation of Core-periphery/World Systems Model.

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, and cheap labor) for manufactured and luxury items from the core (including weaponry, military technology, and 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, organizational 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 agents of change on native societies. A final feature of these models is that, intentionally or otherwise, these interactions may result in major sociopolitical 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 western European Early Iron Age have been used in one of the best-known applications of a Core-periphery model (Frankenstein and Rowlands 1978), where it was argued that a politically undeveloped, mature Iron Age society underwent major structural transformation into a series of large, territorial princedoms as a consequence of the development of trade with Greek colonies in southern France and Etruscan city-states. A more recent application to those tribes of Germany beyond the Roman Empire is that of Lotte Hedeager (1992), who stressed the central importance to their development of economic interactions with the highly developed Roman economy.

Before leaving our general discussion of Core-periphery/World Systems 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 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 1988b) 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 SE 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 so) 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. 12) we could define the "core" as SE 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

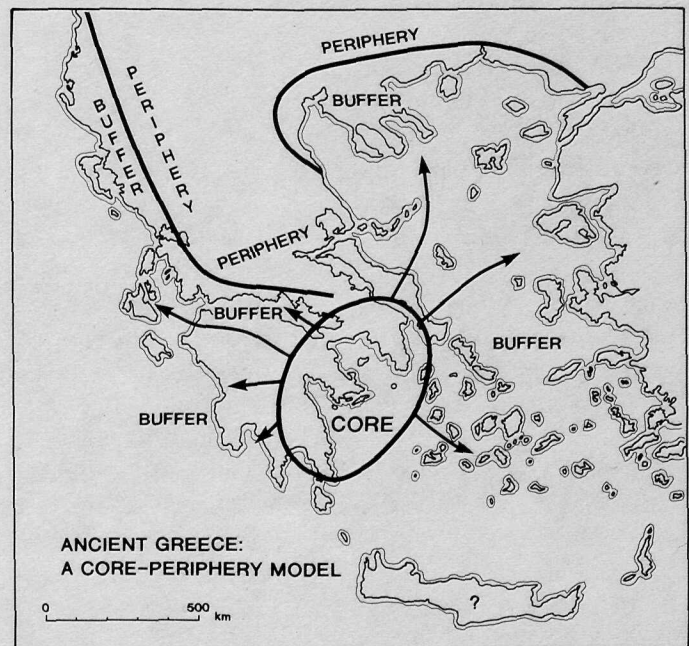


Figure 12. Ancient Greece: A Core-periphery Model.

2. Some would equally see the rise of SE 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 civilizations 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, 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 civilizations is discussed further below.

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 space-fillers 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.

This model is attractive in the Greek and Adriatic context: the precocious advance of the more powerful *SE* 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 transitional 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 southern Aegean models of urbanism and agricultural intensification. Symptomatic of this was the incorporation of southern 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 (Bommeljé et al. 1987). This stresses the transitional effects of acculturation emanating from coastal Lokrian city-states on the Corinthian Gulf lowlands, effects that 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 *sw* Peloponnese could be considered a “late developer” due to remoteness from the core zone, although (see below) inhibiting core effects are also applicable.

The well established role of the timber trade in the periphery status of Macedonia needs no elaboration (Meiggs 1982), while Aetolia’s supply of mercenaries may have been accompanied by upland pastoral products in return for offsetting the local shortage of olives and providing 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 that occur in late Classical and especially Hellenistic times throughout *nw* 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 colonies become dominated by former peripheries which have risen to core status 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); Akarnania (6) and Epiros (3); and in the Illyrian kingdom, a similar absorption of Greek colonies occurred in Albano-Dalmatia (2, 1). These processes took place from the 4th to 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 *nw* 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 *SE* 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, Achaea (13) developed small poleis from Archaic times and was well exposed to potential core effects along the Gulf of Corinth, but regional acceleration 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 Akarnania (6) indicates an advanced rural settlement takeoff in late Classical to Early Hellenistic times, perhaps affected both by colonial poleis in the Ionian Isles (e.g., Levkas [4], Kephallenia [5]) and by ones 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 from Archaic through Early Hellenistic times; takeoff was delayed until later Hellenistic and Early Roman times. Significantly the Sfakia Survey (24, far sw survey) has revealed the very low level of ceramic imports in that region until Roman times, while in the high uplands of the White Mountains the survey reports human activity in Minoan times and then not again until the late Hellenistic and Early Roman eras. Scholars of Cretan history consistently draw attention to the symptoms of demographic expansion being surprisingly late in Crete: endemic inter-city 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.

Third, 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 SE 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.

Fourth, Thessaly (25) shows a gradual urban development over several centuries, but climaxing in Hellenistic times, and like Boeotia this development 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 De-

metrios (Marzolf 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 increase. 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.

Fifth, despite well-attested effects of SE 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 easily might 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 assumptions and features of the models used 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). Prehistoric 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 based 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 (22). 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 or small city was established on Melos at Phylakopi in the mature Bronze Age, it is not an obsidian emporium, nor in my judgement an emporium of any kind—merely one of many nucleated island communities combining a primary role of self-sufficiency 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 in the nature of 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 eastern Mediterranean (Cherry 1984). I would therefore favor a “slimmed-down” form of core-periphery influence on prehistoric regional development, focusing 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/organizational 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 colonization), and that of the “Secondary Products Revolution,” olive cultivation, bronze and iron technology, and perhaps even forms of palatial organization.

Similar criticisms can be levelled at the view that developments in lowland SE 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—were essentially 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, such as 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 1984b). 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, in press 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 have been declining before late Republican wars and entrepreneurial Italians began to make their mark on Greece; Roman impact deepened the crisis. Just a few regions whose growth had been held back by natural or social factors appear to have responded 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 rea-

sons 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 Aegean Iron Age polis world were similar. Subsequently Colin Renfrew (1972) and William McNeill (1978) independently drew 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. These models also allow us to account for the continued importance of the axis of states comprising a line from Boeotia through Athens, Corinth, and the Argolid to Laconia (11, 12, 14, 17, 18) in Bronze Age and Classical times, in contrast to the slow development of NW and NE Greece, where the key environmental factors are limited or absent. Achaea (13) was 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 so, it might suggest that Messenia's geographical advantages in Classical times were effectively counterbalanced by an exploitative policy exercised by its Spartan overlords that created underdevelopment—in other words, core-periphery factors outweighed eco-demographic factors. In Laconia 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 historical 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 eating system required citizens to provide their own subsistence, which maintained an impetus to develop agricultural productivity. In contrast, in the Cretan serf system (see below), citizens were supported by state food supplies of which only a part came from inalienable citizen estates, while the rest derived 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 Mesgara. Here the local failure to take off may lead us back to an earlier interpretative model: historical circumstances in the early history of Crete, in some way, may have 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 Lasithi 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 until 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 (*Politics* ii; analyzed in Willetts 1965: 60–64), this introverted, underdeveloped society began to break down with the entry from the mid-4th century B.C. of destabilizing 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 socioeconomic 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 historical 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; yet in comparison to other regions of the SE lowlands the region of Athens is not highly fertile. Once again we might be led to seek historical factors (in addition to those eco-demographic ones seen by Kirsten, Renfrew, and McNeill) 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 below) 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 model developed by Kirsten, Renfrew, and McNeill, 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, it would be deep plain and soft-relief soils, with a warm-temperate to mild-Mediterranean climate, that should 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 NE 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 Greece until the time of the Mycenaeans in the later 2nd millennium B.C. or Late Bronze Age (Runnels and Hansen 1986). Yet 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: 46). 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-civilization" of Early Bronze Age southern Aegean Greece, represented by complex sites of village or "mansion" character, as well as by an increase 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 until 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.

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

Current ecofact evidence, however, 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 trends—north and south—separately. In the south by the (2nd millennium B.C.) Middle to Late Bronze Age, a stimulus to rapid economic growth and social change was certainly present in the form of 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, with its greater aridity and climatic unpredictability, 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 time span it can be argued that the "Mediterranean climate" first became fully established in terms of 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 until much later in northern Greece.

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, and 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-centered, exploitative reading of the same mechanism is equally plausible (especially as the evidence from the type-site for Aegean "egalitarian" social storage—Assiros—has now evaporated; cf. below). It may be significant that "central places" in the Early Bronze Age of southern Mainland Greece are increasingly associated with evidence for elite-centered redistribution of stored products from surrounding districts (Pullen 1994).

From the dramatic spread of new settlements and their rise in numbers in Early Bronze Age southern Greece 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 that includes the use of pastoral dairy and textile resources, and perhaps metal tools (cf. Pullen 1992). It must be admitted 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 stimulated organizational changes in society not paralleled in 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 reorganization of settlement and social life into hierarchical forms, as the crucial emergent civilizational process, rather than postulating an unconfirmed demographic imbalance between south and north, at least until polyculture arrived to provide a firmer basis for differential prosperity.

One result of these considerations is to narrow the gap between perceived development potential in SE lowland and NE lowland Greece (Thessaly to Thrace). Using 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-to-Iron Age southern Aegean. South Aegean societies achieved 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 is coastal Thessaly, which appears to participate in

4. Particularly pertinent to the Aegean 3rd millennium case is the evidence from Israel. Here, the contemporary 4th–3rd millennium B.C. era saw 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).

these developments; elsewhere village-focused society dominates.

In the north, hitherto unknown factors had already caused 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 centered on the largest villages. In the Langadas Basin the excavator of Assiros (Wardle 1989) has suggested that it served as a district storage center (with hierarchical connotations) 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 the evolution of 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 the lowland southern and northern 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 2000–3000 citizens crammed into a territorial radius of around 5 km (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" (Bintliff 1994). As for the abnormally large city-state of Athens (12) and the federal state of Boeotia (11), in comparably sized regions of around 1000 sq mi, estimates of maximum Classical population are of the order of 200,000–250,000 people (Bintliff and Snodgrass 1985: 140–142; Garnsey 1988: 90).

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, town life began to develop in Thessaly and Macedonia during Archaic times, but its florescence 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 specific 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 below) 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 Braudel perspective of the longest wave of time processes, the *longue durée* (FIG. 13), we might give the population of every region a roughly similar starting point in population and socioeconomic complexity. We could then activate our growth model to consider the effects on a natural "core" region possessing high values for fertility, access, and communication, 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 and bronze-working and then iron-working. 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

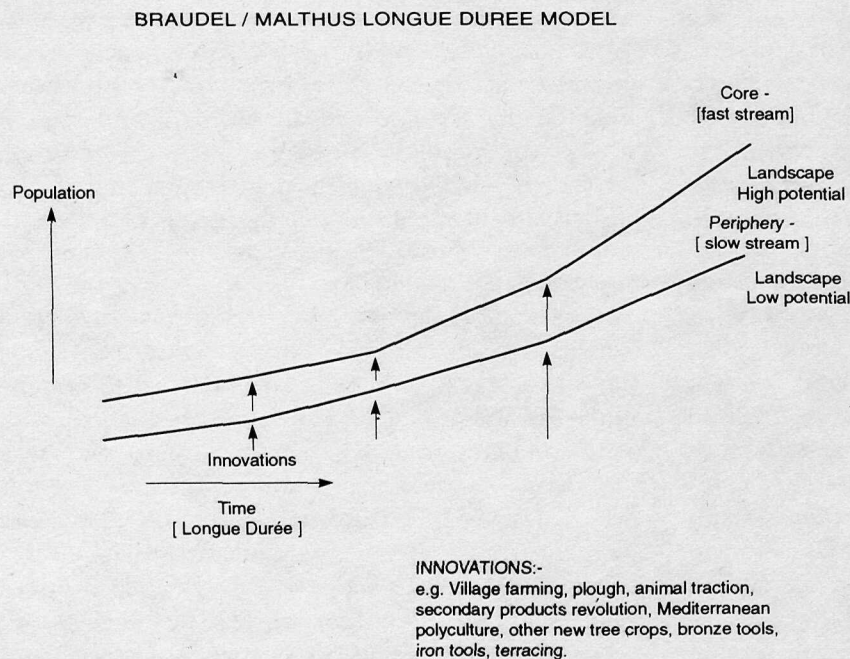


Figure 13. The Braudel-Malthus *Longue Durée* Model.

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. The first justification argues that 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. Secondly, 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 Stephen Jay Gould has several times remarked (e.g., Gould 1993: 322–323), 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 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 (Frankenstein and Rowlands 1978), some years ago I criticized at length (Bintliff 1984b, Ch. 7) the way in which that study had ignored the evidence for 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 such 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 invoking core-periphery effects, 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 my last comment, an intermediate or combination model (FIG. 14B), may be constructed, linking eco-demography to the core-periphery approach, and focusing on crop or technology transfer between advanced and less developed regions. It is particularly relevant here to 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, or vines; these features appear, e.g., 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, Shiel, and Batovic 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, while enhancing surplus favors increased exchange and the associated elaboration of local elite material culture.

In NE Greece the highly-hellenized Macedonian kingdom (8) was associated with agricultural intensification through major land improvements and planned settlement. But in the celebrated passage (Arrian, *History of Alexander* 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.

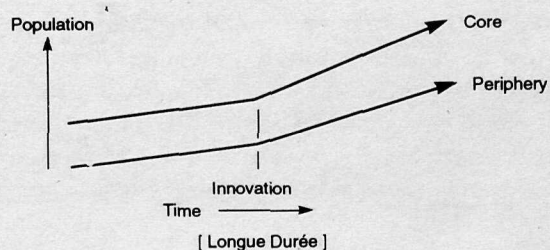
The clearest message from the archaeology of these regions is a clear “no.” Since the arrival of the domestication of plants and animals in Greece and the east Adriatic in the 7th and 6th millennia B.C., the basic economy of the southern Balkans has been mixed farming, with varying proportions of cultivation and herding 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. 13). 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, in the richer-soiled plains and hill country in the lowlands of southern and northern 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 (see Efstratiou 1993 for an excellent case study in upland Thrace). Settlement concentrations in the upland regions of Greece, at any time in the past, always developed within the context of a mixed farming economy with a substantial arable component based in settled villages. The Aetolia Project has shown this very clearly for the development of a non-Mediterranean peripheral society.

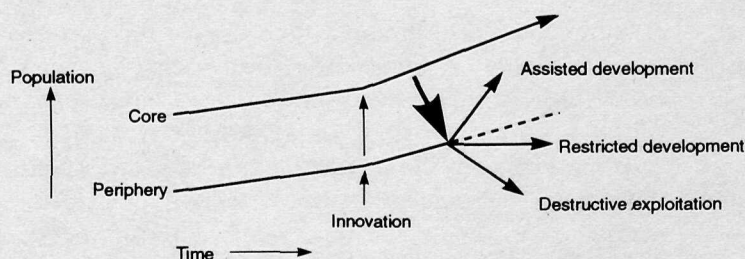
If, then, later Bronze Age and Early Iron Age Greece and the Illyrian lands are mosaics of upland and lowland regions typified by the mixed farming village—the product of essentially indigenous development punctuated by the general diffusion of innovations—we must reconsider the real significance of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

REGIONAL DEVELOPMENT MODELS

A: 'SEPARATE DEVELOPMENT'



B: 'CORE-PERIPHERY MODIFICATION'



C: 'CORE-PERIPHERY ROLE INVERSION' - eg Ecological overkill

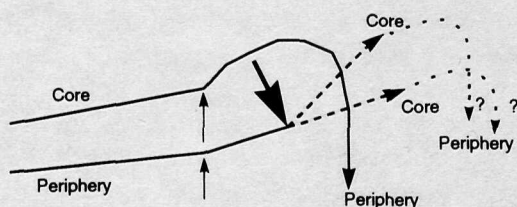


Figure 14. Regional development models.

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 that modified the south Balkan mixed farming village in the SE Aegean lowlands into the Minoan and 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 socioeconomic organization adaptive to the stress of more arid and unpredictable environments 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 all the Greek and east Adriatic regions that in the long-term all were moving—though with cyclical disruptions (see below)—towards more complex forms of society and higher productivity (FIGS. 13, 14A-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 historical Aegean lowlands were able to introduce destabilizing forces into the peripheries, altering their trajectories into more rapid or less rapid growth and elaboration (FIG. 14B).

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 for 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 Laconian (Spartan) and Thessalian dominance over serf (helot, penestai) and secondary-citizen (perioeci) communities, the fact is that these integrated systems still 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 labor 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 the Langadas Basin of eastern 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 have been able to isolate with some confidence a socio-structural effect as being primarily responsible in the Cretan case, and might hypothesize a similar explanation for eastern 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. 15), 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 press b). In this approach, many biological systems are argued to stabilize into a certain deep structure with only surface change for long periods of time, but undergo irregular, rare, and short-lived perturbations that totally destabilize and restructure the system. Subsequently such systems restabilize 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 behavior 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 press 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 eastern Macedonia. 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 influences on community behavior.

The Upland Boom-bust Model

In our earlier discussion of the Eco-demographic Model, we 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 SE 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

SOCIO - STRUCTURAL / PUNCTUATED - EQUILIBRIUM VERSION

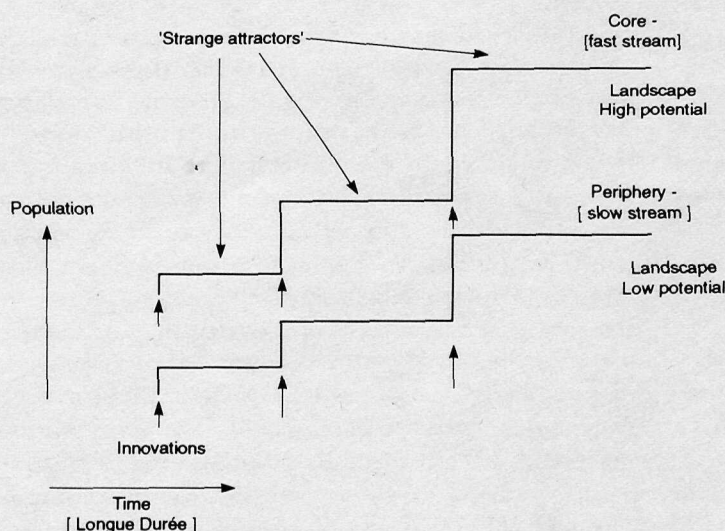


Figure 15. The Socio-structural, Punctuated-equilibrium Model.

[8]) and those regions whose natural disadvantages permanently inhibited internally stimulated demographic takeoff and urbanism. The latter group included rugged mountain regions such as Epiros (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 SE core regions either through separate (FIG. 14A) or assisted development (FIG. 14B), 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 communities in the rugged uplands around the Mediterranean and elsewhere. An illuminating synthesis of this research is available in P. P. Viazzo's *Upland Communities* (1989). Viazzo notes how percipient was that pioneer of historical demography, Thomas Malthus, in his 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 (Mode 1).

It was Malthus again who singled out incipient trends in Swiss upland community lifeways during his time that

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 (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.

In summary form, then, Viazzo's revised version of Malthus provides the following oscillatory model of the historical demography of high upland or otherwise marginal regions:

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

Viazzo demonstrates how detailed case studies of historical mountain communities in Europe and elsewhere largely bear out Malthus's 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 predominant 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 labor, 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's and Malthus's 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 1996) and the large-scale export of mercenaries.

Epiros (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/Epirote kingdom culminating in the reign of Pyrrhus in Hellenistic times; the Medieval Despotate of Epiros 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 and Classical times. It was suggested earlier that the "natural" development of Iron Age population growth to climax in this fertile island was blocked from the 6th–3rd centuries B.C. if not before, by the fossilization of an archaic political structure that promoted economic and demographic stagnation. Effectively, this converted Cretan agricultural potential into a pattern more characteristic of the upland marginal regions discussed above. It was already argued 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 destabilization; to this 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 beyond purely ecological contexts.

The Core-collapse Model

In our critique of the core-periphery approach we pointed to the need to treat each region in terms of its own potential for rapid or gradual growth. Likewise we can observe that in Braudel's *moyenne durée*, or medium-term time scale, regional population and socioeconomic florescences frequently lead to striking downturns and into periods of decline (FIG. 14C). It was not merely the pressure of late developing, powerful states on the Aegean peripheries that threatened the primacy of core states in the SE lowlands, but their own internal difficulties which 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 inter-city warfare in Classical to Early Hellenistic times; such "political" factors, however, could well be a direct result of overpopulation and territorial competition, and are 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 over-exploitation 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 sociopolitical 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 for this purpose than excavation and extensive survey. Through the accumulation of survey evidence it can be shown that the political and military history of ancient Greece, as a succession of different dominant powers, reflects fundamental demographic 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 cycles. It was found that only a range of models, even if limited in number, 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 that 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 long-term perspective the former also conform to cycles of growth and decline. This tendency towards economic cycles 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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