

Recognising polities in prehistoric Crete.

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I. Re-considering polities in prehistoric Crete.

For most of the first century of Minoan archaeology, a reconstruction of the political structure of palatial period Crete, structured around the three major palaces identified at Knossos, Phaistos and Malia, was universally accepted. This picture became naturalised, generating the expectation that the agrarian Minoan states were necessarily centred on the major lowland basins, in what are today prime agricultural zones (e.g. Renfrew 1972: fig. 14.4). This led to the further expectation that additional palace centres might be discovered in only a few comparable locations, such as the major coastal plains near the medieval and modern centres of Rethymnon and Khania in the archaeologically under-explored west of the island (e.g. Younger and Rehak 2008a: 150; 2008b: 178). Anomalies to these expectations were explained as subordinate centres (Haghia Triadha, Gournia), or exceptional (Zakros) (e.g. Warren 1985: 74; Younger and Rehak 2008a: 150-2).

Palaces discovered in recent decades at Petras and Galatas, and elaborate structures at Kommos, Archanes, Mochlos, Protopia, Makrygialos and Khania (and re-investigated at Monastiraki) have generally been subsumed within this accepted structure as either representing subordinate centres, or side-lined as non-canonical centres (e.g. Kommos). However, the chronologies of these newly recognised centres, and detailed re-assessments of the history of the three major palaces (e.g. Macdonald 2002; 2010; 2012; La Rosa 2002; 2010a; Pelon 2005; Driessen 2010), have created problems for the temporal as well as spatial reconstruction of Minoan political organisation. As our chronological understanding of individual sites improves, it is increasingly difficult to align the history of any of the palaces with the basic Prepalatial, Protopalatial and Neopalatial temporal scheme, or accept that this encapsulates major island-wide organisational transformations in Cretan political history.

This long-standing framework was constructed on the perceived parallel development of the three major palaces, based far

more on assumption than evidence. With limited attention to the Protopalatial levels at the major palatial sites until recently, the final Neopalatial picture (with ideas on the administrative structure retrodicted from the deciphered Linear B tablets from the Final Palatial phase at Knossos) was projected back to the foundation of the palaces at the start of the second millennium. This inevitably created a very static picture of the palaces and palatial society (Bennet 1990: 198), and also required a fundamental transformation at their inception. As the long accepted spatial and temporal frameworks are challenged by new evidence and ideas, debates are increasingly targeting the starting date for the process, the nature and scale of the states which developed, the pace of the transformations, and the universality of these characteristics and processes across the island.

The overall interpretive problem is to document and explain the transformation of Cretan societies from ubiquitous small, independent communities, to at least a limited number of integrated, bureaucratic states during the first half of the second millennium BC. The start and end points of this process are clearest, at least for the polities centred on the three major palaces of central Crete. I have argued elsewhere that the communities at Knossos, Phaistos and Malia, large but not exceptional by Aegean standards in EMII, each witnessed rapid population growth in the final Prepalatial phase (EMIII-MMIA) (Whitelaw 2004; 2012). This corresponds to the evidence now widely accepted for the earliest monumental constructions at each site (Macdonald 2010: 532; La Rosa 2010a: 583-4; Driessen 2010: 559). These dramatic transformations mark, if not the start, then certainly a fundamental step-change in the processes of state formation on Crete.

At the other end of the trajectory, our clearest understanding of the nature of a state on prehistoric Crete comes from the LMIIIA2 period, as documented through the deciphered Linear B tablets recovered from Knossos. These demonstrate the integration of at least the central and western two-thirds of the island into a single

polity, administered from the palace at Knossos (Bennet 1985). Debates remain about the dates of establishment and collapse of this polity, and its full extent, since it is anchored in space by only a limited number of toponyms which can be linked convincingly to the names of later Classical cities.

Did this extensive polity represent an inheritance by the LMIIIA administration at Knossos, of a pre-existing LMIB state centred on Knossos, or was this a new creation sometime during the phases LMII-III A2? Any answer is complicated by several recent arguments, first, for the preservation of an early Linear B archive in the Room of the Chariot Tablets at Knossos, possibly documenting a smaller, simpler administration, which would then have expanded to the scale documented by the remainder of the archive by the time the place was destroyed (Driessen 2000; 2001b). Support for such an expansion has been built on the changing distribution of ceramics in the Knossian LMII to LMIIIA1 styles (Popham 1980; Bennet 1985: 242-5; Rehak and Younger 2001: 441-2) and perhaps changing burial practices (Preston 2004: 333-7). Secondly, as ceramic assemblages from recent excavations are studied more comprehensively, stylistic regionalism is increasingly being proposed for LMIB (e.g. van der Moortel 2002; Floyd 1998; Barnard et al. 2003; Platon 2002; Hatzaki 2007; MacGillivray 2007; Knappett and Cunningham 2006; Brogan and Hallager 2011), and now LMII (Arvanitakis 2007). While caught in the problematic equation of pottery style with political affiliation (see below), such regionalism is thought by some to question the assumption of a major Knossos-centred state, and therefore any continuity of political structure from LMIB through LMII to LMIIIA1-2.

Pushing this uncertainty one phase back, we also have to recognise the 'Troubled Island' model which interprets the LMIB phase not as the apogee of Minoan Crete, but as a period of crisis and possibly political fragmentation (Driessen and Macdonald 1997). While vigorously disputed, this has usefully questioned a wide range of assumptions which deserve critical attention.

An overall scenario often alluded to, and one that I expect most Minoan archaeologists would broadly agree with, posits that states in central Crete developed at the very start of the Protopalatial period at, and only at, the three centres of Knossos, Phaistos and Malia, which

during all or most of the period, divided central Crete amongst them. These were unified into a single polity, controlled by Knossos, by some point within the Neopalatial period (Younger and Rehak 2008a: 150). Debates then revolve around the extent of such a polity, whether just encompassing central Crete, or how far to the east or west it extended. To assess this scenario or propose alternatives, we need to be able to define the territories of polities, and track their development in space and time.

While recognising the variety of state societies which have been defined by anthropologists, social and political theorists, within the restricted scope of prehistoric Crete, as an initial step, discussion can usefully focus on the distinction drawn by Trigger between city-states and territorial states (Trigger 2003: 92-119). He explores a wide range of differences between these; the most relevant points here are structure, scale and integration. City-states are essentially single-city political entities, which dominate a restricted hinterland necessary to support the inhabitants of that city, and provide goods and services to the population of the city and its hinterland. Small city-states may have their population wholly resident within the central city, or also distributed across the hinterland in much smaller communities. In larger city-states, subsidiary communities develop to enable more effective exploitation of the larger territory, with resources to support the urban population channelled up through a more developed settlement hierarchy (Steponaitis 1981; Wright 2000). The cities themselves are constrained in scale due to agricultural productivity and the effectiveness of bulk transport technology to provision the city's residents (Falconer 1987; Wilkinson 1994; Bintliff 1999; 2002).

Territorial states are more extensive, will include multiple urban centres, and encompass more territory than the hinterland necessary to support the central city alone. It has been noted cross-culturally that city-states usually develop in the competitive context of similar polities (Price 1977; Renfrew 1975; 1986; Griffeth and Thomas 1981; Yoffee 1991; Feinman 1994; 1998; Nichols and Charlton 1997; Hansen 2000a; Wright 2005), and that territorial states are often created through the unification by alliance or conquest of neighbouring city-states (Trigger 2003: 92-119; Marcus 1998). These larger polities are usually unstable and short-lived, disaggregating into individual city-states which

are more effectively integrated social, economic and political entities.

What is far less often explored, is just how difficult it is archaeologically to detect political unification, and therefore to define the extent of territorial states, without written records. In large part, this is because the cultural units which can be defined archaeologically through variability in material culture are usually considerably more extensive than individual city-states. Material culture differences tend to mark broad cultural units (e.g. Yoffee 1991; Lightfoot and Martinez 1995; Emberling 1997; 1999; Feinman 1998: 101; Brumfiel 2005; Trinkaus 1987), but can represent identities at a wide range of social and spatial scales (Jones 1997; Stark 1998; Lucy 2005). Compounding the difficulty of recognition, such political amalgamations are usually dynamic, expanding or contracting more rapidly than material culture distributions change, and crucially, tend to be shorter-lived than the resolution of most archaeological artefact-based chronologies.

A clear illustration of this recognition problem is the contrast in models for Classic Maya territorial organisation proposed before the decipherment of the Mayan glyphs. Some analysts used broad ceramic and architectural styles and the scale of sites, architectural complexes or monuments to infer a small number of large-scale hierarchically-organised polities across the Mayan lowlands (e.g. Adams 1991: 170-4; Adams and Jones 1981; Marcus 1983), whereas others proposed that the dozens of cities were politically independent city-states (e.g. Mathews 1985; Sharer 1994: 494-512). The situation has been considerably clarified, though not entirely resolved (e.g. Flannery 1998: 17-21) through the decipherment of the Mayan glyphs, allowing the reading of genealogies and histories, themselves of course subject to propagandist construction and interpretive ambiguity. These paint a picture of complex and fluid relations among a wide range of small to large independent and quasi-independent city-states, with short-term amalgamations and alliances constructed through inter-dynastic marriages and conquests, almost entirely invisible archaeologically (Mathews 1991; Schele and Mathews 1991; Grube 2000).

In a limited number of archaeological examples, settlement pattern data documenting gaps between clusters of settlements have been argued to represent buffer zones between

competing polities (Adams 1981: 63-7; Feinman 1998; Whitelaw 1998). This usually requires a larger scale and finer resolution of survey data than are available for most regions; in these examples, such interpretations were inspired by historical or ethnohistorical accounts of polity independence.

The different nature and scale of city-states and territorial states may require very different approaches for archaeological recognition. A variety of approaches have been used to define polities on prehistoric Crete, usually without explicit theoretical or methodological justification. These will be reviewed, and a further approach explored, assessing its potential strengths and limitations.

II. Topography and territories.

The traditional model of the political structure of Minoan Crete, focused on the three major palaces, assumes they 'make sense' in terms of natural divisions of the central Cretan landscape. Most of a century of investigation without revealing additional palatial centres, encouraged the view that these were the only centres, and less explicitly, that all of at least central Crete was divided amongst them (e.g. Warren 1985: 74; Cherry 1986: fig.2.2; Bennet 1990: 195-8).

In fact, the island has supported a diversity of political divisions (Fig. 1: Bennet 1990; Faraklas *et al.* 1998; Perlman 2004; Chaniotis 1996; Sanders 1982; Harrison 1993; Detorakis 1994), with the four-fold north-coast structured model significant only when the island has been politically dominated from outside, by north Mediterranean-based empires (Bennet 1990). Figure 2 schematically represents the scale and number of independent polities on Crete through time. City-states of various sizes were the norm, with territorial states relatively infrequent, and island unification extremely rare, except when the island was incorporated within a much larger state or empire. The one prehistoric episode of large-scale unification, during LMII-III A2, was extremely short-lived, probably reflecting the difficulty of establishing and maintaining an indigenous integration of the entire, attenuated island. This documented historical diversity of political entities on Crete suggests that there is no 'natural' structure to the political organisation of the island; geography and topography are relevant, but not determining, as is commonly assumed.

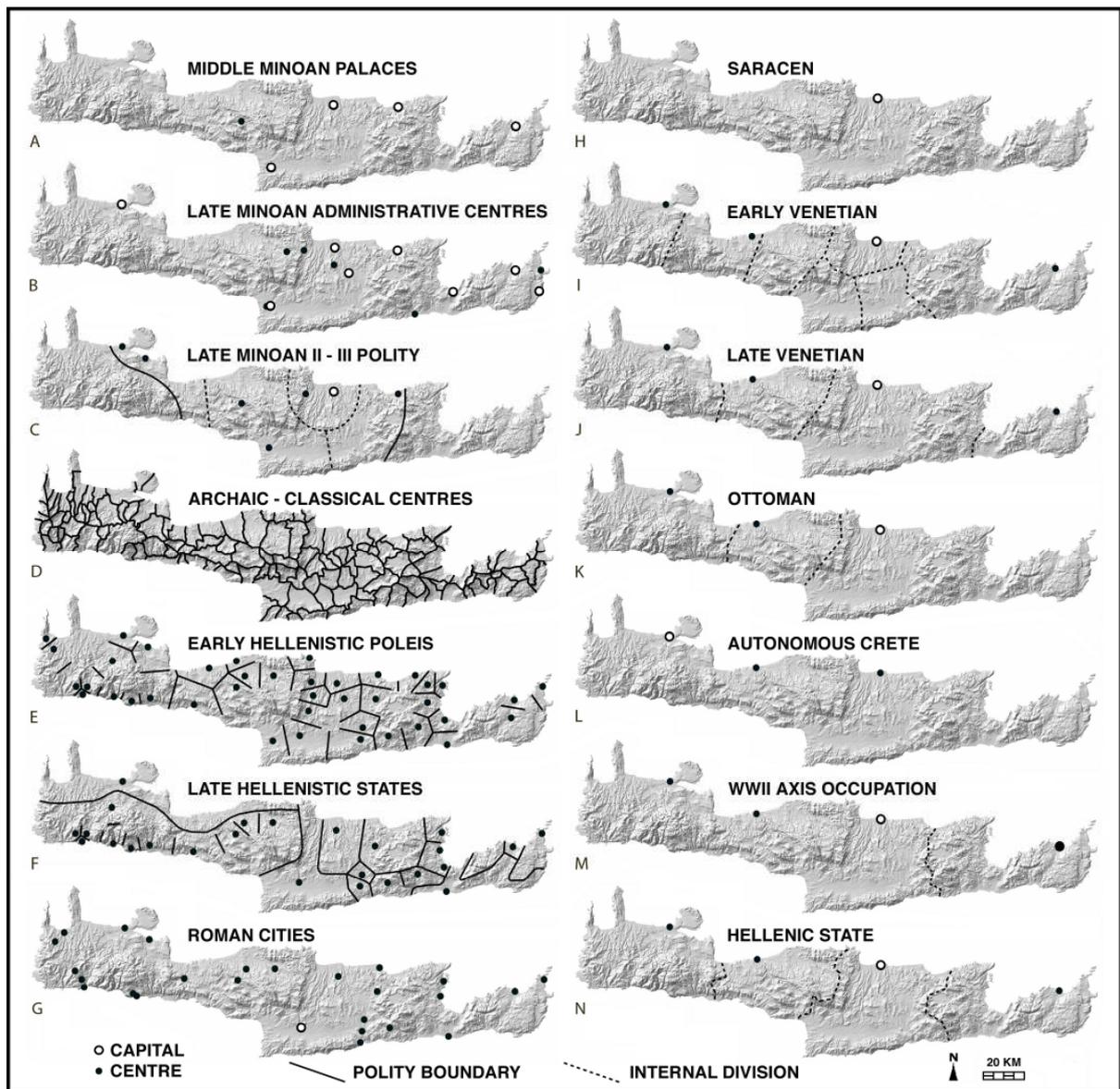


Fig. 1. The political organisation of Crete, prehistory to the present: A. Principal MM sites; B. LM administrative centres; C. Linear B organisational structure; D. Archaic centres; E. Early Hellenistic cities; F. Late Hellenistic states; G. Roman cities; H. Saracen; I. Early Venetian; J. Late Venetian; K. Ottoman; L. Autonomous Crete; M. Axis occupation; N. Hellenic state.

Turning from environmental determinism to historical contingency, if we simply accept the locations of the known early palatial centres as given, can these be used to predict the extent of their associated polities? This is what Cherry's well-known map of Thiessen polygons imposed on the distribution of known and potential palaces represents (1986: fig. 2.2).

This has recently been re-examined critically, using GIS techniques to update the Thiessen polygon approach with modelled walking time, dividing central Crete among the three known early and principal palaces (Bevan 2010). But is this how people actually interact across the Cretan landscape? Various categories

of social and biological data (e.g. dialects, marriage patterns, genetic data) should document ways in which recent populations have socialised the same landscape. These do not dictate how earlier populations would have behaved, but analogically, may alert us to new possibilities, or challenge our intuitive assumptions. A recently published study of local differences in vocabulary in 1960s-70s Crete (Kontosopoulos 2006), documents variants of 172 words or phrases recorded for 163 communities across the island. The degree of shared usage can arguably be considered a rough index of the intensity of inter-community interaction between residents at different locations, and allows us to investigate the assumed relevance of distance and topography to inter-community interaction on

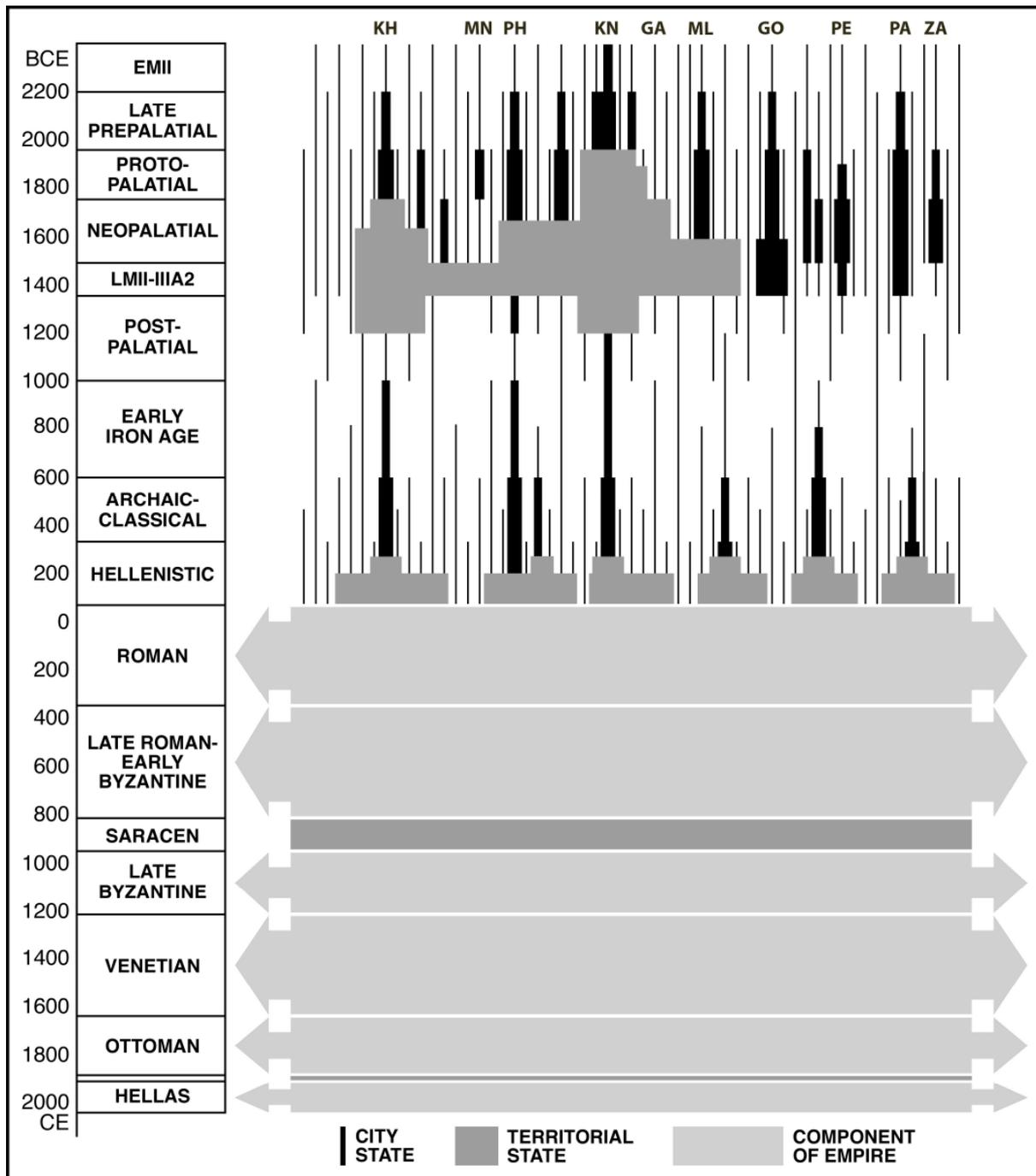


Fig. 2. Schematic representation of scale and duration of polities on Crete, through time.

Crete, before the widespread impact of tourism and personal motorised transport on mobility.

To explore the potential division of the central Cretan landscape among the three major palace sites, in Figure 3, the degree of similarity in word use is assessed for each community in the study, in relation to the modern communities nearest to each of the three palatial centres. The fourth map compares these datasets to define which communities are most similar in vocabulary to each of these centres.

Overall, this indicates that vocabulary differences increase systematically with distance,

providing support for the assumption that GIS walking-time calculations provide a realistic base-line for analysing inter-community interactions. Not surprisingly, the major massifs of Lasithi and Ida represent strong barriers to interaction. More surprisingly, there are only very low levels of differentiation within central Crete, with no clear boundaries reflecting the topography commonly assumed to define territories for the three major palaces. In fact, the eastern Mesara is slightly closer in terms of vocabulary, to both the Knossos and Malia areas, than it is to Phaistos, also predicted by the walking-time models.

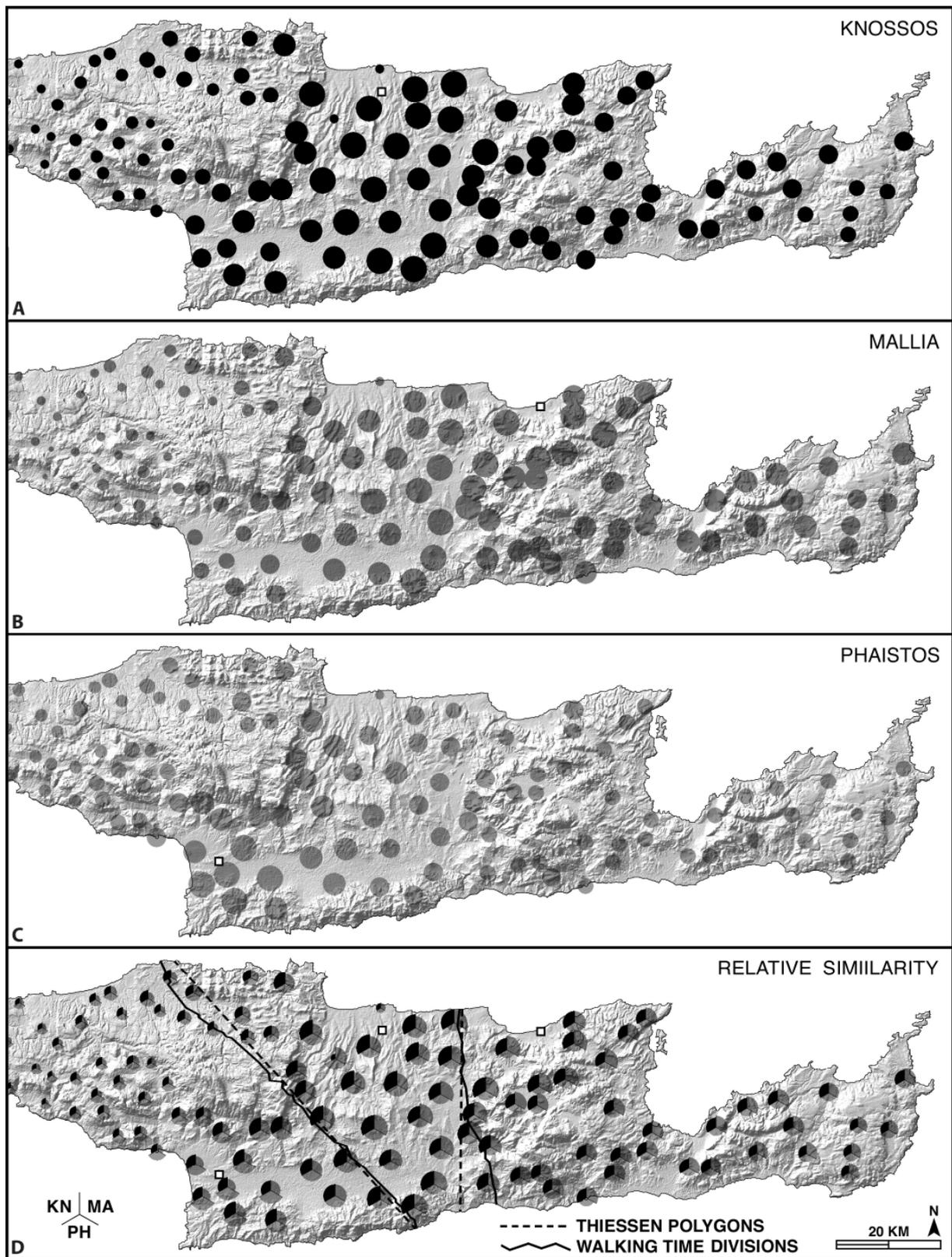


Fig. 3. Recent vocabulary variants: A. similarity with Knossos; B. similarity with Malia; C. similarity with Phaistos; D. partition among three palace sites, compared with territories estimated by Thiessen polygons and walking times (Bevan 2010, fig.4).

From this preliminary exploration, it seems clear that the major topographic barriers should be relevant to understanding how people interact across the Cretan landscape. But previous studies have mapped additional

expectations onto the past landscape which seem unjustifiable, at least viewed against one proxy measure of recent patterns of interaction on the ground.

Of course, this approach to predicting polities from centres only makes sense if we have confidence that we have recognised all the relevant polity centres, which the discoveries of the past few decades should call into question, particularly acknowledging how much of the island has never received systematic or intensive archaeological investigation. Additionally, as a top-down, partitive approach, it can only divide the territory among known centres, it cannot establish whether parts of the landscape lay outside the political control of those or any other centres.

Before leaving geography and topography, it is possible to work in a more exploratory and systematic way, from the bottom up, to define potential landscape units on the island (see also Bevan and Wilson 2013). As pre-industrial societies, agriculture was fundamental to supporting Minoan polities, of whatever scale. While many characteristics will affect agricultural production, surface slope severely constrains the areas available for agriculture in the Mediterranean prior to the widespread construction of agricultural terraces. Figure 4 maps areas of less than 10° slope, revealing numerous agriculturally productive landscape blocks at a variety of different scales. As we shall see, the palatial centres could have been supported from fairly limited territories (Figs. 5-7). Simply taking the Malia plain as an example, we can identify a considerable number

of low-slope basins on that sort of scale across the island, far more than have ever been considered as potential prehistoric palatial territories. While this does not predict that all or even most will have supported a palatial centre, it seems premature to assume that the additional palaces discovered in the past 25 years will not be supplemented by others, when more of Crete receives intensive archaeological investigation.

Over the first century of Minoan archaeology, a model imposed top-down from assumptions about the three major central Cretan palace sites, has generated a remarkably resilient conceptualisation of the Minoan political landscape. This 'understanding' in turn encouraged assumptions about the determinist nature of Cretan geography which are not supported by historical patterns, unbiased analyses of topography or patterns of recent social interaction, and have been challenged by recent archaeological discoveries. Island geography and topography, and the mechanical constraints they impose on communication, interaction and transport, will be relevant to how past communities constructed their social and political landscapes, but in far less deterministic ways than have been assumed.

III. Defining polities through administrative evidence.

Administrative systems need to be considered on a sliding scale, and while the nature and content

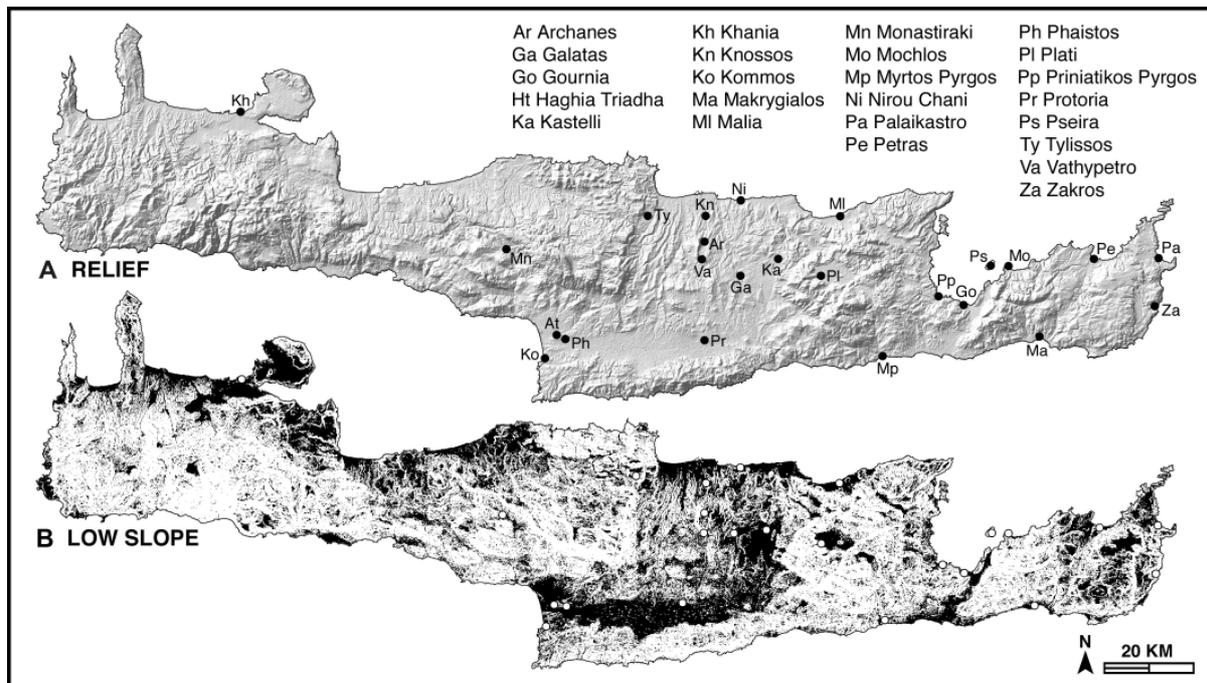


Fig. 4. Island topography and centres: A. topographic relief and known palaces and other major centres; B. low-slope land.

of the existing records are accepted as demonstrating a state level administrative structure in Neopalatial Crete (Schoep 1999; 2002), they only hint at its existence before the end of the Protopalatial period. The very limited Hieroglyphic and Linear A records of that date give little idea of the nature or scale of administration. The control over access to several storerooms documented by the abundant sealings from Phaistos (Weingarten 1986), need not represent a state-level administration, being anticipated by centuries in the sealing system in use at EHII Lerna. The scale of the Protopalatial palace structures themselves (Macdonald 2010; 2012; La Rosa 2010; Militello 2012), and the differentiated society they represent, support an assumption of state administration for their construction, maintenance, and the specialised activities they housed, but tell us little about their regional dominance or how they were organised or functioned.

For the Protopalatial period, the use of two different script systems at Phaistos vs Knossos, Malia and Petras, suggests at least two independent administrations, distinguishing Phaistos, though not necessarily differentiating any of the north coast sites.

Turning to the Neopalatial period, where we have considerably more abundant evidence, the political interpretation of the administrative artefacts is far from clear. Differences in administrative practices have been well documented, particularly between Haghia Triadha and Zakros, the two sites with substantial samples of administrative artefacts (Weingarten 1986; Hallager 1996; Schoep 1999). Unfortunately, these assemblages largely represent different types of specialised administrative activities, and are not directly comparable for an assessment of differences in overall administrative practices; they simply emphasise how partial our evidence is for administration at each site. There are minor differences in administrative practices at different sites (Weingarten 1986; Schoep 1999), but their significance is difficult to assess without comprehensive documentation of the overall variability within and between each local system. Additionally, is it realistic to expect uniform administrative practices at different centres within the same political system (Schoep 1999: 203-13, 220-1)? If the system works locally, will a newly dominant centre necessarily change it, and even if so, how much standardisation will be imposed, and how long will such changes take to percolate down the levels of the administrative

hierarchy? We simply do not know, so whereas identity of practices might be argued as evidence for a common administration, the differences documented to date need not indicate the inverse.

A specific category of administrative artefact is represented by the 'look-alike' sealings recovered from a number of sites, and often considered to document the involvement of a Knossian administration across much of the island (Betts 1967; Hallager 1996: 207-13; Wiener 2007: 236), now also documented by sealings at Akrotiri (Karnava 2008; Weingarten 2010). While a range of arguments is regularly assembled to support the idea of Knossian political hegemony, their ambiguity is usually recognised, and the look-alike sealings have been proposed as the conclusive evidence for political domination (e.g. Niemeier 2004: 394), so they take on exceptional significance. Recent petrographic analyses confirm the similarity of the clay used in the sealings at different sites, and its mineralogical compatibility with central Cretan geology, providing support for the earlier iconographic interpretations (Goren and Panagiotopoulos 2010). While these artefacts document contact between (probably) Knossos and other communities, without being able to read the organic documents they originally sealed, we don't know what, if anything, they indicate about political or administrative organisation (Cherry 1986: 26; Weingarten 1986: 296, n. 26; 1991; 2010; Wiener 1987: 266, n. 46; Schoep 1999: 213-7; Krzyszkowska 2005: 167-8). Were these necessarily official palace-issued administrative documents, and even if so, were they communications between individuals at independent polities (cf. the Amarna letters between Egypt and Hatti), instructions from a dominant power (cf. the Amarna letters from the pharaoh to subordinate rulers in the southern Levant), or different types of communications between individuals at different sites; without the documents themselves, we have no idea.

While administrative artefacts should ideally provide our most direct indications of political integration and polity extent, their interpretation is clear only if the documents themselves can be tied directly to identifiable sites, and provide information about the nature of their interactions. The Knossian Linear B tablets do this, recording administrative transactions linking the centre to a large number of locations through a variety of interactions involving large quantities of materials (documenting the scale and nature of administration), and can be anchored to specific locations by a very small

number of toponyms in the centre and west of the island (documenting its minimal extent). Equivalent information is not clearly recorded among the very limited preserved Linear A documents (Bennet 1990: 198-99; Schoep 2001; 2002), nor is it recognisable among the even more limited Hieroglyphic documents.

IV. Defining polities through material culture distributions.

Various types and characteristics of Protopalatial and Neopalatial material culture have been invoked to support reconstructions of Minoan political structure and history. Except for the Linear B texts, all other arguments are problematic: theoretically, methodologically and empirically. For reasons of space, not all can be reviewed here, but the examples considered (elite prestige artefacts, ceramic style) outline problems which apply to all attempts to define states in prehistoric Crete on the basis of material culture distributions.

Three types of argument have been developed:

1. specific types or traits document exchange or diffusion from a single source, assumed to indicate political influence or dominance, usually argued or assumed to be Knossian;
2. contrasts are drawn between regional and island-wide styles, usually in ceramics, and the latter are assumed to imply political unification, the former fragmentation;
3. essentially a development from 2, specific ceramic distributions are interpreted as mapping political territories.

The first approach considers the distribution of specific types or styles of material culture as evidence of influence, regularly assumed to represent political dominance, whether the materials are exchanged or locally imitated (Wiener 1987: 266; 1990: 134-43, 150-1; 2007; Niemeier 2004: 393-4). Material culture interpreted this way includes ashlar masonry, mason's marks, lustral basins and Minoan halls (distributions documented by Driessen 1982; 1989-90), figured frescoes (Rehak 1997), and the finest ceramics (Betancourt 2004a; 2004b). A fundamental empirical and methodological problem arises because Knossos is the most intensively investigated palatial site, and documents most fully the range and sequence of development of Minoan elite material culture. It therefore provides abundant comparanda for many categories of material evidence, but this does not necessarily demonstrate Knossian

precedence, inspiration, production or control, which are usually assumed (however, see Bevan 2010: 40-3). There is an almost inevitable Knossian sampling bias which needs to be acknowledged and assessed critically in each case (see also Knappett 2011:393-96). Illustrating the compound nature of the assumptions, pictorial fresco fragments recovered at Galatas are identified as the earliest known on the island, but are also assumed to have been painted by artisans trained at Knossos (Rethemiotakis 2002: 57). As other sites are more thoroughly investigated, they may reveal examples which antedate the earliest known Knossian examples, such as the early forms of lustral basin and Minoan Hall at Quartier Mu at Malia (Driessen 1982: 54-5; Poursat 2007), though both are regularly suggested to be evidence for Knossian influence elsewhere on the island (Wiener 1990: 140; 2007: 234).

More fundamentally, even if Knossian precedence can be securely documented, how do we establish that the adoption of such a trait elsewhere represents political imposition or domination, rather than passive diffusion or active emulation? That the spread of such traits can be variously taken to represent Knossian political dominance, cultural hegemony, peer-polity competition (Cherry 1986), or the decentralisation of elite power (Driessen and Macdonald 1997: 71), indicates the absence of clear theoretical justification for the Knossos-dominance model. While the 'Versailles effect' (competitive elite emulation) was coined to apply to Cretan influence in the wider Aegean (Wiener 1984: 17; 1990), it has as much relevance as a process on Crete itself (Wiener 1987: 266; Warren 2002: 204). Aspiring individuals seek to acquire or copy status-enhancing artefacts, material styles and behavioural traits developed in the more competitive context of socially differentiated urban centres. This indicates elite level communication, and illustrates processes of cultural perception and valuation in active identity construction, but how might we actually establish if, or in which cases, such adoptions represent political domination?

A second set of interpretations uses ceramic stylistic uniformity in contrast with regionalism as an indication of the degree of island-wide political unification. The equation of ceramic stylistic similarity with political affiliation is dealt with in more detail below. Here, it is the contrast in relative similarity which is taken to suggest differences in regional political integration. The focus on defining local

styles is relatively recent in Minoan ceramic studies, and is highly constrained by recent excavations which have retained and systematically studied significant quantities of material, so the emerging evidence principally concerns a limited number of LMIB assemblages (e.g. van der Moortel 2002; Floyd 1998; Barnard *et al.* 2003; Platon 2002; MacGillivray 2007; Hatzaki 2007; Knappett and Cunningham 2006; Brogan and Hallager 2011). Not surprisingly, the more systematically and intensively one looks, the greater the distinctions and local characteristics which can be identified. The criteria used to define local styles at each site are very mixed, and differ, not allowing systematic comparisons or assessments of degrees of difference among assemblages. Equally problematic, there are no standards against which to calibrate the significance of the differences detected. Interpretively, local styles may represent different production traditions, scales and modes of production, distribution and marketing systems, as well as influence through different types of interactions with other communities. Without having criteria for identifying and distinguishing these different processes, we cannot interpret degrees of regionalism in specifically political terms.

The third approach, using ceramic styles to define political territories, essentially derives from the previous, but has been developed more explicitly with Protopalatial ceramics, and is so directly involved with the question being addressed in this paper, that it requires more detailed exploration.

Distributions defined by artefact style, predominantly pottery because of its abundance, are used world-wide to define archaeological 'cultures', to establish our basic time-space frameworks for organising information about the past. How such distributions should be defined, and what they actually represent in human behavioural and social terms, have been fiercely debated for the past 60 years (e.g. Clarke 1968; Whallon and Brown 1982; Dunnell 1971; 1986; Hodder and Orton 1976; Hodder 1978; Adams and Adams 1991; Lyman *et al.* 1997). Approaches to analysing and interpreting such distributions have become increasingly diverse and self-critical in recent decades, with debates about the meaning of artefact style (e.g. Wobst 1977; Conkey and Hastorf 1989; Hegemon 1992), material culture variation and transmission (e.g. Hodder 1978; 1981; Lemonnier 1993; Dobres and Hoffman 1994; Stark 1998; Stark *et al.* 2008; Gosselain 2000; Neiman 1995; Hurt

and Rakita 2001), and the creation and representation, through material culture, of individual and group identities (e.g. Shennan 1994; Stark 1998; Emberling 1997; Jones 1997; Robb 1999; De Atley and Findlow 1984; Green and Perlman 1985; Lightfoot and Martinez 1995; Diaz-Andreu *et al.* 2005). These fundamental and on-going debates about the identification, meaning and significance of material culture variability have received almost no recognition in Minoan archaeology.

Providing evidence for these debates, a wide range of ethnographic and ethnoarchaeological research has established that some characteristics of material culture may mark cultural boundaries whereas others do not, representing economic distribution patterns, technological traditions or learning patterns, among other processes, and others simply represent random variation (e.g. Hodder 1978; 1981; Miller 1985; Stark 1998; Stark *et al.* 2008; Jones 1997; Emberling 1999; Gosselain 2000). Distinguishing among generating processes in ethnographic contexts relies on detailed and systematic analyses, and usually requires other contextual information, observable in the ethnographic present but not necessarily determinable archaeologically.

In Cretan prehistory, without explicit consideration of the assumptions involved, some distributions of artefacts are regularly interpreted, not as defining vague archaeological 'cultures', but far more specifically as mapping political entities (e.g. Cadogan 2011). The justification for this seems to be that the spatial units so defined, correspond in location and scale to the political entities we are expecting to find, but this argument is obviously circular. We need to establish why any specific material distributions should be considered to represent political affiliation.

Stylistic distribution studies build from a passive information flow model, in which it is assumed that stylistic similarities between artefacts produced in different communities will decline with the distance between them. The rationale is that producers and consumers in communities which are closer together are likely to interact more regularly with each other, and will be more accepting of (and so, willing to acquire or copy) stylistic variants they are familiar with and accept as appropriate, through regular exposure. So we should normally expect a fall-off in stylistic similarity in material culture with distance (Plog 1980). Deviations from this

suggest that something a bit more interesting is going on, for example, factors inhibiting or enhancing interaction between members of the communities, or that specific meanings are attached to the stylistic characteristics which lead to them being differentially accepted or rejected as imports, imitated closely, adapted, or ignored.

A significant analytical problem emerges if, like our vocabulary model, we choose two or more base points and assess the similarity of finds from other points against them. This will invariably define 'territories' of influence around the base points, since the stylistic characteristics at any other point will be more similar to one of the original base points than another. Because of the way we have structured the investigation, we will create 'territories' centred on our initial base points, even if these are completely arbitrary and there is, in fact, continuous variation across the area.

A systematic and neutral approach would need to give equal weight to the assemblages at all points, to try to define spatial clusters among them, which is the approach ideally used for the definition of archaeological cultures across a region: any groupings in the data emerge through analysis, rather than being imposed from the start. In contrast, Cretan studies have worked from what are presumed to be the most influential centres outwards, with the result that other communities are defined as responsive or subsidiary to those initial points of reference (e.g. 'provincial Middle Minoan pottery': Walberg 1983). Unfortunately, because of the way Cretan archaeology has developed, we rarely have either the unbiased substantial samples, nor the quantified documentation of stylistic attributes which are essential for systematic exploratory analyses.

To illustrate the problem, for Protopalatial Crete, we have three palatial sites which have been the principal focus for major investigations, and therefore provide the most abundant samples of Protopalatial pottery. We have assumed they are the major and innovating pottery-producing centres, and so use comparisons with much smaller samples from minor sites, to allocate the latter to the orbit of one assumed territorial centre or another. If style is purely passive, we should expect a regular fall-off in stylistic similarity with distance from a centre, resulting in roughly circular territories around each centre (subject to travel/transport constraints), which is approximately what has been proposed, for example in the territory

defined around Knossos (Cadogan 1994). However, since no explicit analysis has been undertaken with the assemblages, we do not know if there is actually a decline in similarity; this is simply a presence/absence distribution of some material resembling that known from the centre. Without knowing the quantities, and whether the dispersed examples are exports from the palatial centres, local copies, or some combination of both, or knowing the different contexts or modes of pottery production or exchange represented in different communities across the region, or contexts of consumption, the processes involved may be economic, social, ideological or political, but we have no basis for determining which, individually or in combination, are responsible for producing the distribution.

Beginning to address such questions was the focus of Knappett's research (1999), though this subtlety is usually ignored, and his study is simply cited as support for the 'Malia-Lasithi state' model. It was initially assumed that the stylistic similarity in pottery between Malia and Myrtos Pyrgos was the result of intensive interaction between the communities, with abundant ceramic exchange representing strong economic links (Cadogan 1995; Poursat 2010:263-64). Knappett's detailed petrographic, technological and stylistic study demonstrated that very little material was actually moving between Malia and Pyrgos, but local fine wares were extremely similar, and it was assumed that those produced at Pyrgos were closely modelled on those of the palatial centre. This was contextualised by the significant contrast with the local and non-standardised styles of the coarse and cooking wares, so the close emulation in fine table wares was identified as a specific elite strategy. This led to his suggestion that while the elites at Pyrgos were sub-ordinate members of the Malia state, the control of that state was principally ideological, rather than economic, and he proposed that the Malia-Lasithi state be considered a de-centralised or segmentary state (Knappett 1999). But with no demonstrable strong economic links, was Pyrgos actually subordinate to the Malia state, or was it independent, with the local elite simply emulating elite behaviour at the closest major centre, either to facilitate their relations with those elite, or to enhance their prestige at home, or both? We simply don't know: there is no material evidence which clearly supports the view that Pyrgos was part of the Protopalatial state centred at Malia.

Stepping back from the specific case, is it possible to recognise archaeologically a politically-determined material culture distribution? Two sets of studies are informative of the problems, but not particularly hopeful about the prospects. Late Iron Age Celtic gold coins in Britain are politically-identified, ideologically-charged artefacts, and are expected to have circulated principally within the boundaries of the political units where they were minted (Collis 1971; Cunliffe 1981; Sellwood 1984). Such politically constrained distributions could be expected to be defined by sharp edges at political boundaries (Collis 1981; Hodder 1977; Kimes *et al.* 1982). While there are regionally defined distributions, there are very considerable overlaps, so they do not produce clear boundaries (Cunliffe 2005: figs 7.9, 7.13, 7.14, 8.3, 8.10, 8.13). This makes the polities difficult to define on the basis of coinage alone, but given that there are few other bases for doing so (significantly, ceramic stylistic distributions are usually much smaller than the assumed political units: Cunliffe 2005: Figs 4.10, 7.15, 17.15, 17.16, 17.17), coinage is used this way (Kimes *et al.* 1982; Cunliffe 2005: 130-79). Even more problematically, similar boundary effects will be generated by economic competition between rival production centres (Hodder and Orton 1976: 195-7), so even if there were clear boundaries, these would not, in themselves, indicate that the material distributions defined political entities. We might expect the economic distribution patterns for different types of goods to vary to some degree (though all may be affected by common constraints on transport, the distribution of consumers, etc.), so detecting the same sharp boundary in a range of types of material culture might be suggestive of a political boundary. This would only apply if that boundary was competitive or hostile, strongly policed, and crucially, stable for a period longer than the resolution of the local archaeological periodisation. But even political boundaries significant and stable enough to be fortified and patrolled, such as the Roman Germanic *limes*, can be remarkably permeable (Hedeager 1979; Wells 1992; 1999).

One of the most relevant studies of ceramic distributions, utilising a substantial, systematically collected sample (6,410 decorated sherds from the survey of 130 sites, in 12 contiguous city-states), considered the effect of political boundaries on both exchange and ceramic styles in the south-east of the Valley of Mexico, in the period immediately before and

after Aztec unification, when political boundaries can be reconstructed through ethnohistoric sources (Hodge and Minc 1990; Hodge *et al.* 1993; Minc *et al.* 1994; Minc 2006; 2009). Two levels of political boundaries were considered, those of individual city-states and those defined by alliances among them. While some ceramic distributions were largely concentrated within regions formed by political alliances, none clearly define individual city-states, and all crossed the boundaries, with gradual fall-off in quantities with distance from source. Without previously knowing the polity or alliance boundaries, it is impossible to recognise which distributions are strongly affected by the boundaries and which are not. Following the Aztec conquest of the area, ceramics generally circulated more widely, so political relations did affect exchange patterns, but not in the spatially defined ways which would enable polities to be identified from the ceramic style distributions.

Neither cultural and political boundaries nor material culture distributions appear to conform in any straightforward sense to the assumptions necessary to support the direct interpretation of ceramic or other material culture distributions as political maps (Lightfoot and Martinez 1995; Trinkaus 1984; 1987; De Atley and Findlow 1984; Green and Perlman 1985; Emberling 1997; Jones 1997), undermining the predominant approach to the definition of polities employed in Cretan prehistory. On the other hand, spatial distributions can inform us about a wealth of processes and behaviours, from the organisation and control of exchange systems, to different types of identity construction. These processes may be affected by political structure and affiliations, but not necessarily in the direct or easily identifiable ways assumed.

V. Settlement pattern data and political structure.

For Crete, an increasing number of intensive surveys are making the island one of the most thoroughly surveyed regions of the Mediterranean, with island-wide coverage and samples from a variety of topographic contexts. However, many projects are published only in preliminary form, and the data are difficult to analyse comparatively, having been collected over several decades by projects with very different approaches to fieldwork, documentation and publication. In addition, many surveys have been very small, often in areas peripheral to the palace centres, and document only a limited segment of a local settlement system.

To date, interpretation has been largely descriptive or focused on the identification of local settlement hierarchies. The model for the latter has been Processual settlement pattern archaeology (Flannery 1998: 16-21; Parsons 1972; Wright and Johnson 1975; Cherry 1987; Balkansky 2006; Kowalewski 2008), aimed primarily at the analysis and interpretation of large regional datasets, for example in Mesopotamia and Mesoamerica (e.g. Adams 1981; Johnson 1972; Wright and Johnson 1975; Hole 1987; Sanders *et al.* 1979; Blanton *et al.* 1993; Blanton 2004). These drew interpretively on the central place models developed for modern industrial societies in Europe and North America (Johnson 1972; 1977; Hodges 1987; Butzer 1982: 219-23), though these have been demonstrated also to have relevance to understanding the regional organisation of developing economies (Smith 1974; 1976; 1980) and early modern Europe (de Vries 1990).

Because archaeological datasets are invariably only partially preserved, accessible or recorded, represent low resolution data, and exist in a variable landscape, rather than the geographers' idealised isotropic plain, it is accepted that the subtle distinctions in spatial configuration necessary to distinguish among different central place models can rarely be convincingly documented. Instead, the focus is on recognising an hierarchical relationship among sites in a region, and analysing their inter-relationships to understand the degree of integration within the system. The key characteristic for identifying a state level of political integration is usually argued to be a four-level settlement hierarchy, to differentiate such a system from the two to three levels expected for a regional chiefdom (Wright and Johnson 1975; Johnson 1977; Wright 1977; Earle and Johnson 2000), though this is only a 'rule of thumb' (Flannery 1998: 16). In the most convincing studies, the settlement data are correlated with archaeological evidence for administrative integration (Wright and Johnson 1975; Johnson 1980a; 1987; Wright 1987; 1998; Marcus 1983), or other data supporting the differential administrative role of specific communities within the postulated settlement hierarchy (e.g. Sanders *et al.* 1979: 52-60; Smith 1979; Blanton *et al.* 1982). More typically, the settlement pattern data alone are relied on, with consequent (usually unacknowledged) uncertainties.

Often ignored, but integrally linked to the subject of this paper, is the difficulty in

distinguishing territorial states from multi-polity regions, unless the primary urban centre develops exceptionally in response to its regional administrative role. This depends on factors such as how strongly centralised the system is; there is no single or unambiguous signature (Johnson 1977; 1980b; 1981; Savage 1997; Drennan and Peterson 2004). In practice, many surveys work within naturally defined regions (islands, topographic basins, restricted sections of a river valley), and assume that the study region includes most or all of one past settlement system, but not multiple systems. Other studies simply uncritically analyse a study region as if it was a coherent and integrated whole. Unfortunately, any analysis will be systematically distorted if only part, or parts of more than one system are included in the analysis.

A particular problem in the Aegean and more widely in the Mediterranean, is that requiring a four-level settlement hierarchy to identify a state, rules out most city-states. Even Athens, one of the largest and most politically complex Classical city-states, with its deme centres and dispersed hamlets and farms, had only two administrative levels, three levels overall; community sizes within the largest city-states may fit a rank-size model (Cavanagh 2009), but not the political hierarchical expectation. Most city-states were much smaller (Hansen 2006b), and surveys such as around Koressos on Keos document only two hierarchical levels, the city and rural hamlets or farms (Whitelaw 1998). Some analysts have used the absence of a four-level hierarchy to suggest that the Classical Greek city-state not be considered a state (Marcus 1998: 91). While the nature of Classical city-states is receiving critical and comparative re-assessment (e.g. Berent 2000; Hansen 2006a; Vlassopoulos 2007; Anderson 2009; Gehrke 2009), they should not be rejected as states because they do not fit one very specific spatial model; after all, when it comes to defining the nature of the state, they literally wrote the book. The archaeological models of settlement hierarchies, often applied in a mechanistic fashion, appear to have been formulated principally with reference to territorial states or very large, developed city-states; they are not adequate for recognising or analysing small city-states.

Most diachronic settlement analyses face a similar problem, trying to define the point at which a state can be recognised in a scalar continuum. Settlement data from surveys throughout the East Mediterranean and Near East

suggest that developing urban centres from 8-20ha were often surrounded by very small villages or hamlets, with the development of secondary centres as a later phenomenon, as populations expanded under relatively stable conditions (see also Falconer and Savage 1995). At what point in that process one defines the emergence of the state should depend principally on the availability of relevant evidence for the administrative structure of a state, not on what can be a fairly arbitrary exercise in defining site size modes.

The Cretan survey record is particularly problematic; different surveys engage, at best, variable segments of settlement systems, so it is not surprising there is no clear aggregate patterning; this may represent regional diversity (Driessen 2001a), or simply non-comparability of very partial datasets. From the surveys conducted to date on Crete, we have information on core areas of two states, those centred on Phaistos and Malia.

Phaistos and the west Mesara.

Taking the 40km² of the West Mesara (Watrous *et al.* 2004) and Kommos (Hope Simpson *et al.* 1995) surveys together, these represent the only published intensive survey of a segment of the core of the territory of one of the major palatial centres. The Ayiopharango (Blackman and Branigan 1977; Vasilakis 1990), South Coast (Blackman and Branigan 1975) and Odigitria (Branigan and Vasilakis 2010) surveys are assumed to provide smaller peripheral samples of the same polity (Fig. 5). Focusing on the core sample, these surveys provide useful, but far from straightforward data. Consistent with other Aegean surveys conducted in the late 1970s-80s, sherd collections were extremely limited and only aggregate site sizes for all periods of occupation are usually documented, masking period-specific changes at sites. Mitigating this, across all prehistoric periods, the only major occupations outside the palatial centre of Phaistos are at the previously known and extensively excavated sites of Haghia Triadha and Kommos. Phaistos itself is presently being surveyed (Bredaki *et al.* 2009), but patchy excavations beyond the palace suggest a Neopalatial extent on the order of 55-60ha (Watrous *et al.* 2004: 294) if occupation was continuous between all the outlying soundings, and a minimum of 32ha in the Protopalatial period, making a similar assumption (Whitelaw 2012; Militello 2012).

In analysing their data, the project directors define site hierarchies of three (EMII-III) and four levels (MMIB-LMIB), though no clear modes in site size provide any basis for this interpretation. More significantly, despite the over-estimation inevitable with all-period aggregate site size estimates, for the Prepalatial phases, only two sites outside of Phaistos might reach or exceed 1ha (most being much smaller), and for all periods, only Phaistos itself and in the Neopalatial period, Haghia Triadha, exceed 2.5ha, when the latter took over from Phaistos as the administrative centre for the region (La Rosa 2010b). The survey data provide no clear evidence for a developed regional settlement hierarchy; the divisions seem imposed on an undifferentiated distribution of very small sites, to meet the expectation of four hierarchical levels for states. However, the absence of clear second-order centres is not entirely surprising, since given the scale of Phaistos itself from MMIA, these should only develop on the order of 4-8km from the palatial centre, and it is only in the direction of Kommos that the combined intensive survey area extends this far from Phaistos. So if there was a developed settlement hierarchy in the western Mesara, intensive survey has not yet been extensive enough to detect it. On the other hand, we might anticipate that in the area surrounding Phaistos and Gortyn, each investigated fairly continuously for over a century, extensive exploration should have located the major sites, as with Kommos and Haghia Triadha.

Taking a different approach to recognise the development of an integrated settlement system, we can use site size, to the degree that it can be calculated from such low-resolution data, to estimate probable community populations, and therefore the notional cultivation areas around each site necessary to support its population. The sites outside Phaistos are so small and well-spaced that there is no overlap of such catchments, suggesting no necessary economic interaction or integration in the Prepalatial periods. The dramatic expansion of Phaistos in the Protopalatial period leads to the complete overlap of the catchment of Phaistos on those of neighbouring hamlets, and indicates the necessity for some sort of inter-site dependency relationships during the Protopalatial period, but not earlier (Whitelaw 2012). On present evidence, Phaistos would have been the centre of

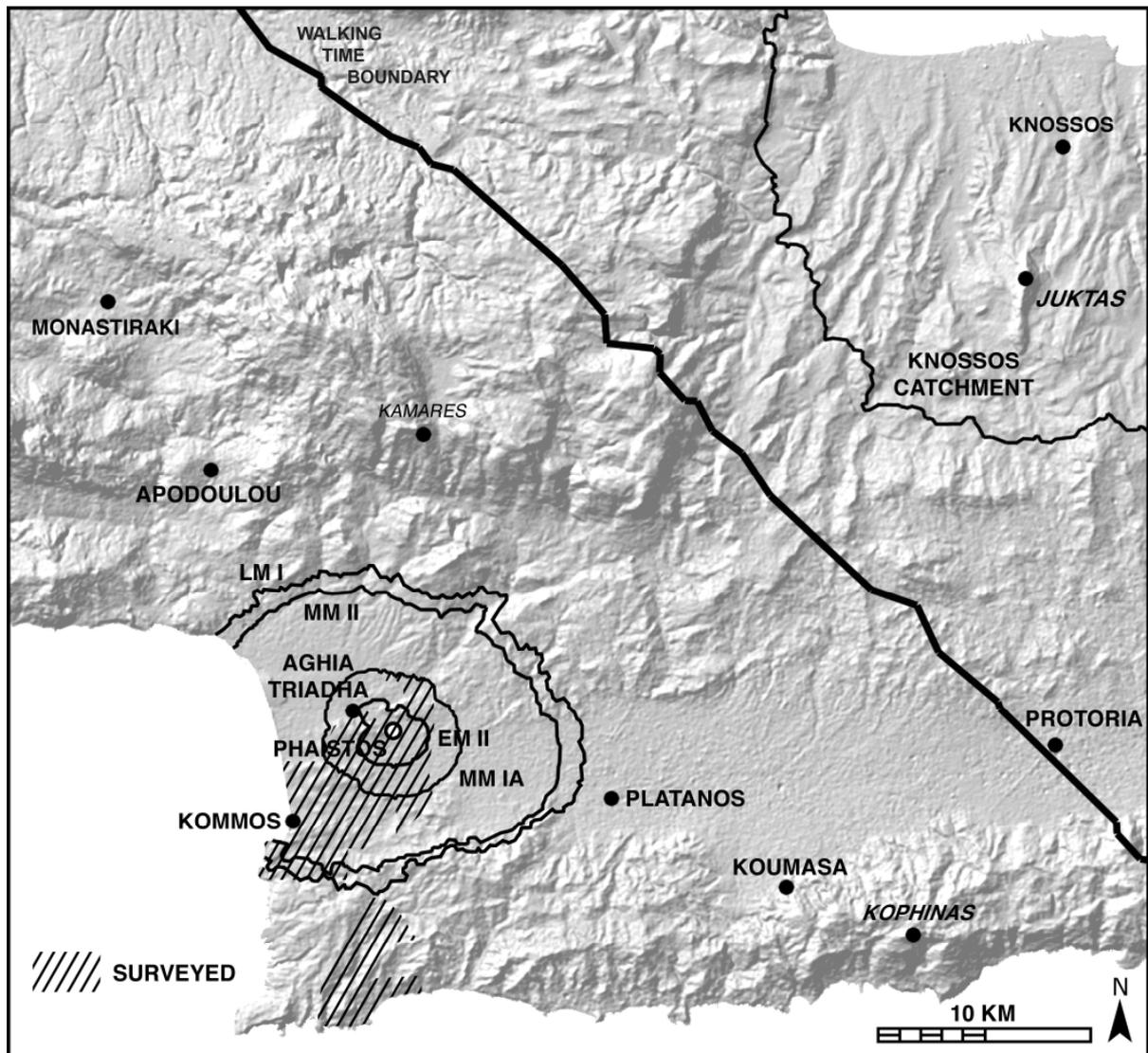


Fig. 5. Phaistos and the west Mesara: main sites and Phaistos agricultural catchments by phase.

a very simple, two or just possibly three-tier settlement system by the end of the Protopalatial period. Such simple, highly centralised, under-developed hierarchies are typical of many East Mediterranean and Near Eastern early urbanising regional systems, and city-states, rather than the well-developed, four-level hierarchically-structured systems characteristic of larger territorial states.

Watrous *et al.* (2004: 286-7, 295), challenging previous assumptions that the Mesara forms a 'natural' region (see also Relaki 2004), suggest that Phaistos may never have dominated all of the Mesara plain, let alone all of south-central Crete, based on the argument that the peak sanctuaries of Kophinas and Demati, overlooking the central and eastern Mesara, will have served separate polities. There is no necessary one-to-one relationship between polities and major sanctuaries, and in the absence of any systematic surveys east of Phaistos, this is

an interesting but completely speculative proposal. The interpretation of Monastiraki in the Amari valley as a sub-ordinate centre to Phaistos (Kanta 1999; Kanta and Tzigounaki 2000; Watrous *et al.* 2004: 287) in the Protopalatial period, is based solely on stylistic similarities in the ceramics and seals.

The known administrative documents provide minimal information relevant to polity scale. No toponyms can be recognised unambiguously in the Linear A documents from Haghia Triadha, giving no idea of its dependent territory (Bennet 1990: 198-9; Schoep 2001: 98-9; 2002: 192). While the quantities of agricultural products listed in the Linear A tablets do not require an extensive dependent territory (Palaima 1994: 318-21; Schoep 2001: 97-9; 2002: 176-92), the small number of recovered tablets is unlikely to document production from the entire territory administered by the site (see also Palaima 1994: 316-7). To date, there are

insufficient data with which to define the extent of the territories administered from Phaistos or Haghia Triadha in the Protopalatial or Neopalatial periods.

Malia and the Malia-Lasithi state.

Intensive survey was initiated at the palatial centre of Malia and expanded to include the coastal plain and neighbouring inland valleys, the only Cretan survey with both urban and hinterland data (Fig. 6: Müller 1996; 1997; 1998; 2003; Müller-Celka 2007). To date, preliminary summaries have been published, while analysis of the recovered material continues (Müller-Celka 2007; Puglisi 2007). At the palatial centre, overall sherd density has been recorded, but period-specific material is only reported on a presence/absence basis by survey unit (Müller-Celka 2007: fig. 5; pers comm.). The figure of 50-60ha for the maximum extent of the site in the Protopalatial period (Müller 1997: 52; Müller-Celka 2007: 856; Driessen 2001a: 61), includes as well as the city, the extensive cemeteries near the shore and the outlying port at Haghia Varvara (Müller-Celka 2007: fig. 5). The urban site surrounding the palace appears to cover 40ha, with up to another 17ha of low density occupation in two locations outside the fortification wall on the east. Evidence supporting a contraction of the city in the Neopalatial period (Driessen 2001a: 63), has yet to be published; all the excavated residential areas except Quartier Mu document Neopalatial as well as Protopalatial occupation throughout the core of the site. However, since the distribution of dated Protopalatial ceramics matches well the overall extent of dense surface material (Müller-Celka 2007: fig. 5), the community does not appear to have expanded in the Neopalatial period.

In addition to the coastal plain, survey extended to the inland basins of Mochos and Krasi, in the foothills of Lasithi, in all covering some 40km². The largest sites outside the city appear to be a handful of sites of limited extent, distributed across the coastal plain (Müller 1996; 1998; Puglisi 2007), with no significant subsidiary centres except possibly Sissi (ca. 3ha) reported within the surveyed territory. The valleys of Mochos and Krasi might be expected to have encouraged the development of at least one sub-ordinate centre in each, as perhaps seen in the Sissi valley.

The Malia survey and other studies in the region provide information not available for the west Mesara, which may help to define the

boundaries of the Protopalatial polity. On the southern fringe of the investigated area, well up in the foothills of Lasithi, several small fortified sites originally identified by Evans, have been re-studied and are now dated to the MM period (Müller 2003; Müller-Celka 2007: 859; Nowicki 1995; 1996; 2000). These should indicate some sort of boundary, whether to protect outlying communities of the Malia polity, protect communities outside it from aggression from Malia, or simply reflect instability or limited central control on the periphery of the polity. Whatever specific interpretation, they suggest an effective limit to palatial control on the northern slopes of Lasithi during at least some phases of the MM period.

This obviously raises serious doubts against the argument that the upland plain of Lasithi or areas further south or east were incorporated into a polity centred on Malia. Fortified or defensible sites within and around the Lasithi basin also suggest the area may not have been integrated into any polity during the Protopalatial period (Nowicki 1996). Pottery imports (Betancourt 2007), as well as ceramic dedications from the Malia lowlands at the Psychro cave (Watrous 2004), could have crossed the polity boundary, either episodically or continuously, and do not require political integration.

On the basis of the preliminary published information, the Malia survey appears to present a more comprehensive but comparable picture to the Phaistos region, of a highly centralised settlement system in both the Protopalatial and Neopalatial periods, with a two or just possibly three-level settlement hierarchy. The evidence suggesting a southern polity limit, during at least some part of the MM period, falls approximately where the boundary of the catchment necessary to support the estimated population of the centre should fall (Fig. 6), suggesting that Malia in the Protopalatial period was a small city-state, rather than a territorial state.

VI. Knossos: from site to territory.

To date, there has been no intensive survey in the wider region around Knossos. On the other hand, over a century of investigations at the palatial centre (Hood and Smyth 1981), supplemented by preliminary observations from an intensive survey of the city (Bredaki *et al.* 2010; Whitelaw *et al.* in press), provide our most detailed understanding of the development of a Cretan palatial centre. The changing occupation area of the site through time can be used to estimate the

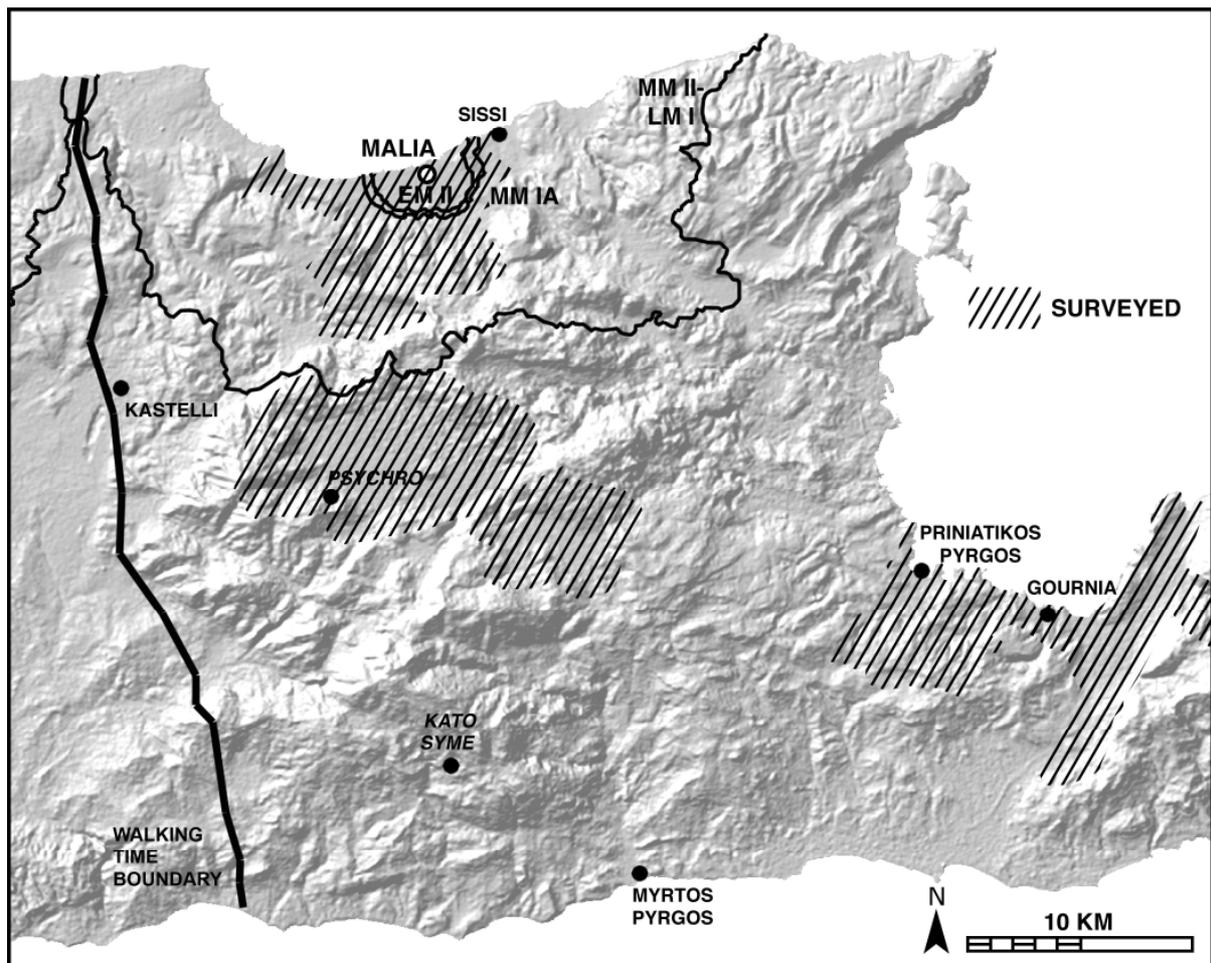


Fig. 6. Malia and east-central Crete: main sites and Malia agricultural catchments by phase.

agricultural catchment necessary to support the centre's resident population.

While this exercise does not define the actual extent of the polity centred on Knossos, it does indicate the approximate scale of the minimum region which must have been controlled by Knossos economically and politically, simply to guarantee subsistence support for its population in each phase (note 1). The importance of this subsistence-based perspective is that it addresses one of the major uncertainties expressed in alternative explorations: whether the territories defined (by whatever means) were actually dominated economically or politically from the centre (e.g. Knappett 1999; 2007; Knappett and Schoep 2000; Poursat 2008: 195; Warren 2004; Niemeier 2004: 393-4; Müller-Celka 2007).

By the end of the late Prepalatial period (MMIA), occupation at Knossos extended over a minimum of 20 and more likely 40ha (Whitelaw 2012). Its support catchment will have extended south nearly to Archanes (Fig. 7), and I have previously suggested that this may explain the

cessation of competitive new construction of burial monuments in the Phourni cemetery after MMIA, as the developing centre at Archanes was subsumed under Knossian control (Whitelaw 2004: 244-5).

A second test point is provided by the foundation of the palace (Rethemiotakis 2002), and re-establishment or very significant expansion of the community (Evely 2008: 104; Whitelaw and Morgan 2009: 94-7; Watrous pers comm.) at Galatas in the Pediada, some 16km south-east of Knossos. The sparse Protopalatial sites in the region are noted as usually fortified or in defensible locations (Panagiotakis 2003; 2004; Whitley *et al.* 2007: 107; Evely 2008: 105), suggesting that the area was outside any integrated palatial territory at that time. Established in MMIIIA, the palace went through several transformations before abandonment in LMIA (Rethemiotakis 2002). Three alternative scenarios may be considered:

1. the foundation of the palace represents the imposition of Knossian political control in the region, and its abandonment, some change in the

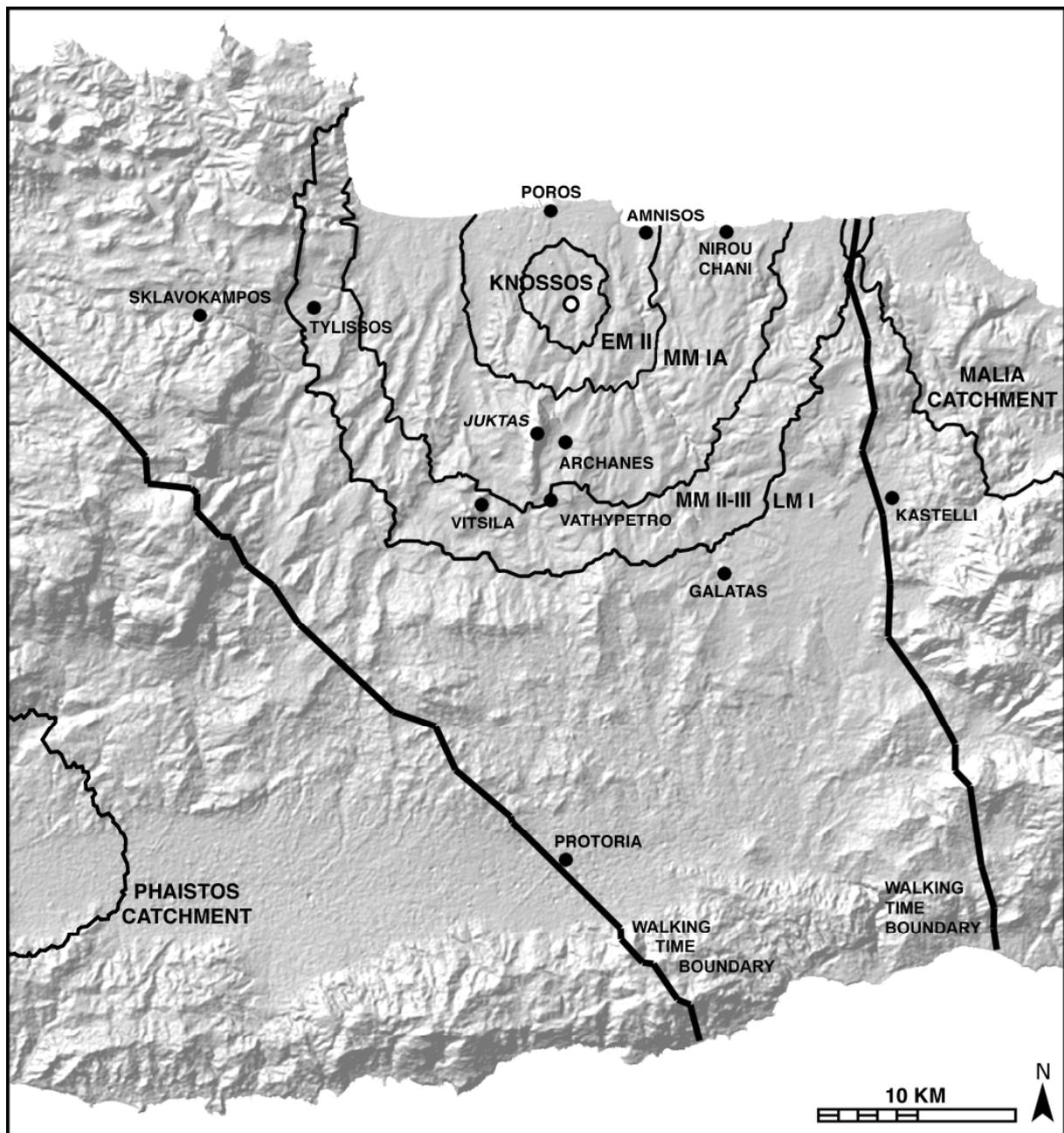


Fig. 7. Knossos and central Crete: main sites and Knossos agricultural catchments by phase.

exercise of that control (Rethemiotakis 2002);

2. the foundation of the palace represents the emergence of a local elite, and its abandonment either a local collapse, or the suppression of local independence through Knossian expansion (Watrous *et al.* 2004: 287);

3. the foundation of the palace represents the establishment of an independent polity by a cadet or dispossessed line of the Knossian (or Malliote) elite, following the model of Mycenaean peripheral polity formation suggested by Wright (1984).

Held to support the first interpretation, is a shift from stylistically local ceramics, to styles which closely follow Knossian models

(Rethemiotakis 2002; Rethemiotakis and Christakis 2004). The nature and comprehensiveness of this stylistic shift has yet to be documented in detail (e.g. some pithoi continue to be produced in the local tradition: Christakis 2006: 125), and the stylistic argument will be subject to all the ambiguities outlined above. In this case, the argument based on ceramics is considered to be strengthened by the contemporary introduction of the palace layout, ashlar masonry (with masons' marks), and frescoes. All of these are elements of Minoan palatial elite culture, so need not document a specifically Knossian origin, and they need not represent an imposition; they could have been adopted by an emerging local elite, asserting their

power and seeking legitimation through emulating palatial fashions at pre-existing centres.

An additional perspective is contributed by preliminary reports on the intensive survey of the immediate hinterland of Galatas, which appears to document the intensive colonisation of a previously under-populated landscape, contemporary with the establishment of the palace (Whitley *et al.* 2006: 107; Whitley *et al.* 2007: 107). This need not rule out the second or third options, but the preliminary evidence seems consistent with a rapid and organised intrusion, and the established Knossian power provides the nearest and most likely source.

Implicating Knossian political expansion in the foundation of the palace at Galatas in MMIIIA, provides a second test point for the city-state model, since the expanding population of Knossos would push its minimum support catchment well into the Galatas region by the end of MMIII, and as far as the site itself in LMI (Fig. 8).

Significant changes in the local power structures at Archanes and Galatas correspond broadly to the periods at which the minimum expansion of the Knossian city-state would have impinged on each community's local settlement system. Poros and Amnisos are close enough to have been absorbed within the expanding orbit of Knossos before the end of the later Prepalatial period; the evidence for off-island connections at Poros makes most sense if it was already

integrally linked with the significant consuming population at Knossos in EMII (Wilson *et al.* 2004; 2008; Dimopoulou-Rethemiotaki *et al.* 2007). Tyliossos and Vitsila will have been integrated into Knossos' political territory within the Neopalatial period, if not earlier. These, with Archanes and Amnisos, are substantial communities which can be suggested as subordinate secondary centres within a Neopalatial four-level settlement hierarchy (Whitelaw 2001: 27-9). This would probably involve three levels of administrative hierarchy (e.g. Knossos-Archanes-Vathypetro and Knossos-Tyliossos-Sklavokambos), documented through Linear A tablets and sealings. Such an hierarchy cannot, so far, be recognised for Protopalatial city-states, either on the basis of the settlement or preserved administrative evidence.

For Malia, the modelled catchment for the Protopalatial city-state (Fig. 6) extends into the foothills of Lasithi to the general area of the fortified sites, consistent with the interpretation that these marked the southern boundary of the Malia polity. These provide a test point for the reconstruction of Malia as a small city-state (Poursat 2008; 2010), rather than territorial state.

VII. Knossos: from city-state to territorial state?

The catchment-based, minimalist definition of territories developed here only applies to city-states, though we cannot yet document any necessary departure from this bottom-up model for any central Cretan palace-centred polity, at

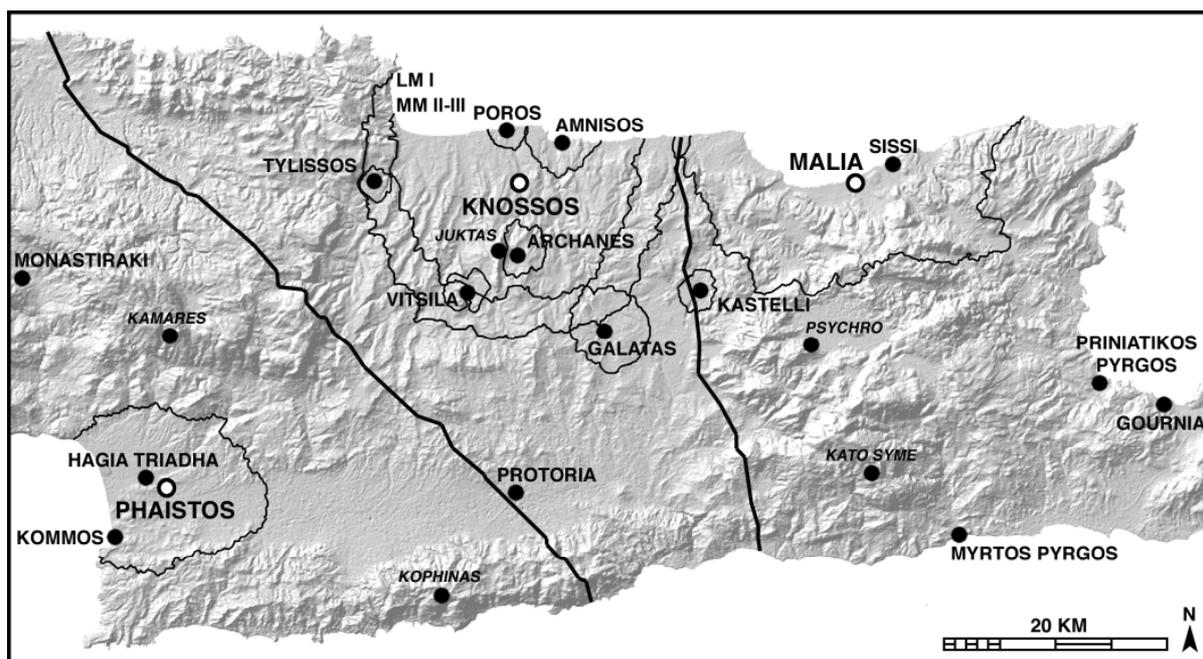


Fig. 8. Central Crete and the potential expansion of Knossos: principal sites, Neopalatial catchments and walking time boundaries.

least into the early Neopalatial period. This is as far as this model can take us, and arguments for the development of larger territorial states, based at Knossos or any other palatial centre, will have to be established on other, far more ambiguous grounds.

The recent and on-going re-assessments of the construction histories at all palatial sites in the Neopalatial period present a challengingly unsynchronised picture. Whether all or some of these reflect independent and locally contingent histories, or should be choreographed into a drama of Knossian expansion or conquest (e.g. MMIIIA: Galatas; MMIIIB: Phaistos; LMIA: Malia, and LMIB: Lasithi, Zakros), remains unclear.

If Knossos expanded into a territorial state, this will arguably have post-dated its proposed expansion into the under-populated and unintegrated area around Galatas. Intriguingly, preliminary reports on the Galatas survey suggest that settlements in the region south of the palace retained the nucleated defensible character typical of the Protopalatial period, through the Neopalatial period (Evely 2008: 105), perhaps suggesting that this region remained outside or near the periphery of the expanded polity.

If Galatas was a Knossian imposition in MMIIIA, why was it no longer important to maintain a palatial control centre in the area after LMIA? Did the community at Galatas and its local settlement system also decline, or was administration of the region maintained but re-organised? Did Knossos pull out of the region, or did it relocate its administrative sub-centre in the Pediada elsewhere, perhaps further east to Kastelli (Warren 2004: 163; though the known substantial building is said to decline in parallel with the palace at Galatas: Rethemiotakis 2002: 65; Rethemiotakis and Christakis 2011:226), possibly reflecting further eastward extension of Knossian control.

Looking east, the evidence for Neopalatial contraction at the urban centre at Malia has yet to be presented, but for the exploration here, a static situation is assumed, so the support catchment estimated for the Protopalatial period is maintained for the Neopalatial period; there is no evidence to suggest expansion into a territorial state in the Neopalatial period (Fig. 6). With the expansion of Knossos, its hinterland is likely to have bumped up against that of Malia during the Neopalatial period, at least along the north coastal strip (Fig. 8). This convergence may

have set the scene for a new type of predatory expansion, involving not just encroachment on, but incorporation of the entire neighbouring city-state at Malia into an expanding Knossian polity.

Does the early LMIA rebuilding of the palace at Malia on a layout resembling that at Knossos, represent its reconstruction as a new second-order centre under Knossian control (Poursat 2008; 2010), or increasing convergence through direct competition with the neighbouring power, and what does the destruction and abandonment of the palace at the end of LMIA or early in LMIB represent in terms of regional political structure (for arguments for a later LMIB destruction, see particularly van de Moortel 2011:542-45)?

To the south-east, the situation in Lasithi is even less clear. Fortified or defensible sites seem characteristic of the Prepalatial and Protopalatial periods, with the development of sites in non-defensible locations around the plain particularly in the Neopalatial period (Nowicki 1996; Watrous 1982). But whether these communities were ever integrated, or linked politically to a lowland palatial centre, remains unknown. The influx of Knossian ceramic dedications at the Psychro cave in LMIB (Watrous 2004) is intriguing, but need not represent Knossian political dominance.

Looking south, does the shift of administration from Phaistos to Haghia Triadha after MMIIIA represent a re-structuring of local power, or (along with the non-reconstruction of the ceremonial palace) a decisive move to cut links with the previous independent elites at the imposition of Knossian dominance (La Rosa 2010a: 590; 2010b: 499)? Does the rebuilding of the palace at Phaistos in LMIB represent some degree of local resurgence in the face of post-Theran eruption Knossian weakness (La Rosa 2010a: 591), or a confident re-inscription of Knossian control (Warren 2004: 163)?

The limited expansion suggested here for Malia, and the gradual expansion of Protopalatial Knossos, raise the prospect that Phaistos, before its eclipse in MMIIIA, may never have expanded to dominate the entire Mesara, and other, as yet undocumented polities may have existed in the Protopalatial and Neopalatial periods in the central and/or eastern Mesara. There may also have been areas, even within central Crete, which were never incorporated into state-level polities based at one of the three main palatial centres.

The suggestion of a southern boundary for Malia in the northern slopes of Lasithi in the

MM period, seriously questions whether Malia ever extended its control (as opposed to influence: Müller-Celka 2007; Knappett 2007; Poursat 2008; 2010) as far as the Lasithi plain or beyond to Myrtos Pyrgos. This should also open up a reconsideration of developments around the Gulf of Mirabello, for which the unparalleled settlement data from the combined Vrokastro, Gournia and Kavousi surveys, as well as the extensive recent excavation data from the centres at Gournia, Mochlos, Pseira and Priniatikos Pyrgos, provide a unique resource for studying the development of a region.

In the far east, Petras provides a strong argument for independent local development (Tsipopoulou 1997; 1999; 2002; Tsipopoulou and Papacostopoulou 1997). The history of the palace at Zakros, and any substantial but non-canonical antecedent structure, is under revision (Platon 1999; 2002; 2004; 2010). The interpretation that it served as an eastern port for Knossos (Bennet 1990: 196, n.20; Warren 2004: 164; Platon 2004; Wiener 2007: 234-5) seems to rest on the expectation of Knossian dominance, the assumption that it could not have been locally self-sufficient, and Knossian influence in some ceramics, all deserving documentation and critical appraisal.

To the west, the patterns of recent interaction (Fig. 3), as well as the evidence for Hellenistic conquests and alliances (Fig. 1), question whether central Cretan polities should be expected to have had any significant political impact in west or west-central Crete. The integration documented by the Knossian Linear B archive is clearly an exception, perhaps accounting for its short duration and instability. Even this control may have been more restricted and strategic than is usually assumed (Driessen 2001b), fitting better a network (Smith 2005) rather than territorial state model.

VIII. Recognising polities: problems and prospects.

The questions outlined above all deserve exploration, but none of the speculative suggestions warrant the certainty with which particular political interpretations are regularly espoused in the literature. The latter have almost all been framed with an expectation of Knossian dominance. It is refreshing when the political status of a site or local region is considered in its own terms (e.g. Andreadaki-Vlasaki 2002; 2010; Tsipopoulou 1997; 2002; Shaw 2006; Cunningham and Driessen 2004), and then in the context of a range of wider regional possibilities.

Many of the assumptions which structure present approaches to interpretation go back to the origins of Minoan archaeology, and are so fundamentally ingrained that they are difficult to recognise, let alone unpack and examine critically. Underlying nearly all conceptualisations of Minoan political landscapes has been the naturalisation of a pattern of palatial centres in central Crete, originally constructed on extremely limited information. This has discouraged investigations which might test the assumed understanding, and tended to focus our attention on spatial scales and landscape units which are not necessarily appropriate for the entities we are trying to recognise. A longer-term historical perspective makes it clear that Cretan geography is far less deterministic of political structures than has been assumed by prehistorians. Looking at the relatively small territory required to support a major palatial centre like Protopalatial Phaistos, we can realistically expect there to have been more, whether like Petras, developing locally, or Galatas, perhaps representing an intrusive colonisation of relatively unpopulated territory. There are also numerous agriculturally suitable areas, not hitherto considered, which could have supported independent polities (not necessarily all states) of various scales in the Protopalatial or Neopalatial periods. While the island has been relatively well investigated when compared with most Mediterranean landscapes, it is easy to forget how little of Crete has been systematically or intensively investigated archaeologically.

If we cannot rely on geographical 'givens', we need to use period-specific archaeological evidence to define and track changes in contingent and dynamic political formations. A first step has to be to accept how difficult it is to recognise the territories of individual states archaeologically. A fundamental problem arises because states are dynamic: they expand and contract through conquest and alliance, often combining individual small-scale city-states or incorporating non-state territories beyond their borders, into larger, less stable, regional territorial states. These processes will often take place on time-scales shorter than can be monitored using our material culture chronologies, and constant changes will blur any boundaries we might hope to detect in material distributions.

Material culture analyses have tremendous potential for informing us about interactions between the residents of different communities, and their motivations for doing so,

but interpreting these directly in terms of politics is rarely attempted elsewhere in world archaeology, with good reason. We are considerably more experienced at interpreting individual processes, such as exchange; comparisons of multiple patterns may then be suggestive of the political contexts within which different types of exchanges took place, pointing towards the actors, their potential motivations, and constraints. If we wish to use material culture distributions for such analyses, we need to consider a wide range of material culture, and document large and reliable samples systematically using standardised criteria, to allow detailed comparisons and robust spatial analyses.

In a similar way, settlement data need to be approached more subtly, as there are no diagnostic patterns that will allow us to define the limits of states on the ground with confidence. Rather, we can compare site types and their distributions (e.g. site sizes, spacing, clustering, relative population nucleation), as these pattern against landscape characteristics (e.g. resources, agricultural and other productive potential, defensible locations, routes), and track changes in relationships and configurations through time. These patterns can then be explored interpretively, in terms of what they may indicate about the nature and organisation of relations between communities, and the locations and configurations of sites may suggest the limits of integrated settlement systems, or the restructuring of local systems when communities become incorporated into (or drop out of) larger regional systems. Such studies have begun (e.g. Haggis 2005: 59-81; Hayden 2004: 35-137; Nowicki 2000; Cunningham and Driessen 2004), though interpretations and larger-scale pattern recognition are inhibited by the small scale of individual surveys and the limited and non-comparable recording and presentation of data by different projects.

The catchment-based approach to the definition of polities explored here attempts several things. It tries to define what sort of data can be used most effectively to address very specific questions, in this case, to define the agricultural hinterlands of city-state polities. It also recognises that, logical as the approach may seem, it cannot simply be asserted, but needs to be tested against archaeologically recoverable data. The patterns generated can also help support specific interpretations of other evidence, so that while the material culture arguments for the palace at Galatas as a Knossian foundation

are not conclusive, that the hinterland necessary to support the expanding population of Knossos is likely to have imposed on the western Pediada at about the same time as these characteristics appear in the area, provides a different line of support for that political interpretation of the material culture changes.

Comparatively, the catchment approach also raises interesting questions about the differential constraints on expansion faced by each of the central Cretan polities. In Figure 9, settlement size and catchment estimates are mapped, by phase, for the three palatial centres at the same scale, facilitating comparisons. Phaistos, at the western end of the Mesara plain, will have had direct access to abundant prime agricultural land, and its necessary catchment will only have reached the foothills north and south by the end of the Protopalatial period. Further expansion will have been easiest and most productive east, down the plain, but only if there were no competing polities in the central or eastern Mesara. Any attenuated expansion of the polity will have required significant second-order centres, perhaps incorporating previously independent local centres.

In contrast, the hinterland of Protopalatial Malia would have required expansion into the small inland valleys, and by the time of the maximum documented extent of the city, in MMII, would have been strongly circumscribed by relatively unproductive uplands. Intriguingly, its estimated MMII catchment borders hit against the hills separating it from the Pediada plain, the Lasithi basin, and the Mirabello coastal lowlands. To incorporate these more distant areas would probably have required the development of a more decentralised form of administration, probably also resulting in weaker control.

Between these two extremes, expansion from Knossos was through fairly dissected but largely productive terrain, all fairly comparable both in terms of agricultural productivity and transport constraints. A pattern of control developed for the immediate territory might be extended, with no natural impediments or boundaries. Despite no intensive regional survey within its territory, Knossos is the only region of Crete for which we know of significant likely second-order centres, at Archanes, Tylissos, Poros, Amnisos and potentially Vitsila. The expansion of Knossos to approximately double the size of the other central Cretan palatial centres, suggests that it did indeed develop a

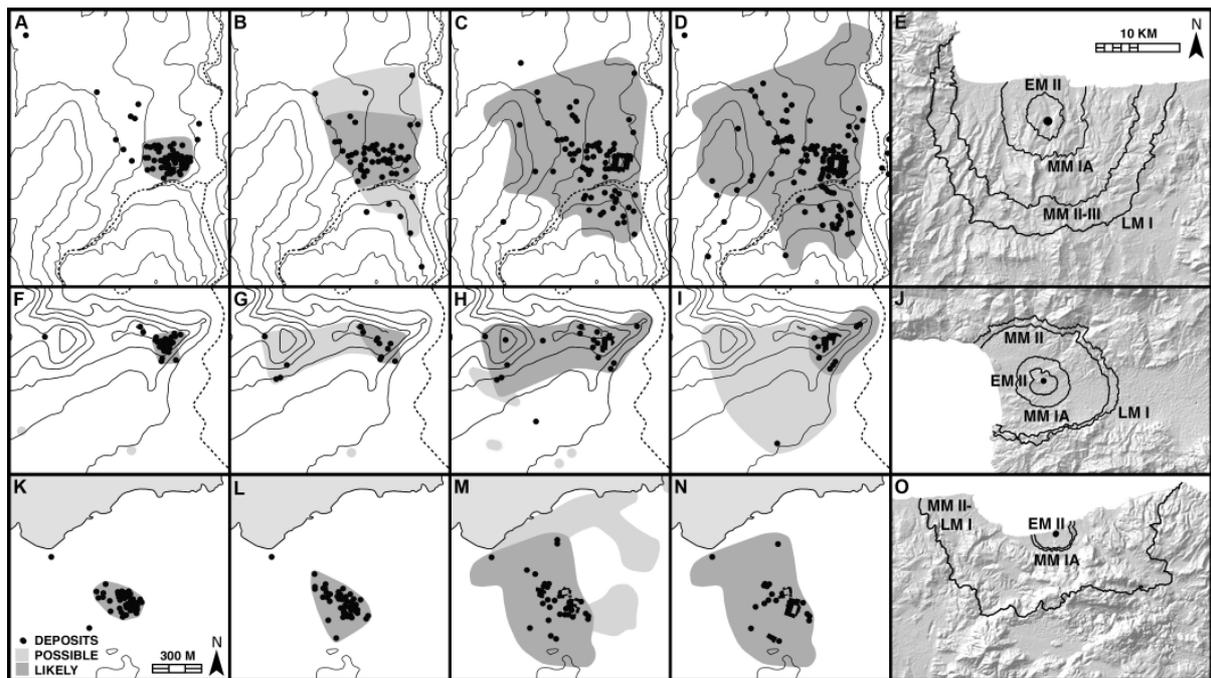


Fig. 9. The principal palatial sites and their development through time: Knossos: A. EMII; B. EMIII-MMIA; C. MMIB-III; D. LMI; E. catchments; Phaistos: F. EMII; G. EMIII-MMIA; H. MMIB-II; I. MMIII-LMI; J. catchments; Malia: K. EMII; L. EMIII-MMIA; M. MMIB-II; N. MMIII-LMI; O. catchments.

significant regional administrative role, to a degree that the other central Cretan palatial centres never did. While I have argued elsewhere for multiple pathways to complexity among Cretan Prepalatial communities (Whitelaw 2004), these need to be pursued beyond the common elements of small-scale state origins (Whitelaw 2012), to document the divergent individual histories of each polity which we are increasingly confronted by, through the on-going re-assessments at each palatial centre.

The approach developed here works from the known to the unknown, exploring regional structures from the bottom up. But this is most relevant to the scale of city-state polities. To move beyond this and confirm whether there were any territorial states in Crete before that documented by the Knossos Linear B tablets, and develop an understanding of their nature, requires that we figure out how to work more effectively with a wider range of material data, with more explicit recognition and critical assessment of the assumptions we are making, and engagement with the full range of interpretive possibilities.

We will also need to work out how to use material distributions to monitor different types of inter-community and inter-individual interactions, which themselves may be subject to political influence, organisation or control. To do this, we need to identify appropriate, theoretically-justified approaches to interpreting

the material record, and to develop methodologically-sound, empirically-supported interpretations. What is clear from the evidence of new centres and re-assessments at those long known, is that political developments on the island are far more locally varied, fluid and dynamic than our traditional approaches allowed us to recognise or interpret.

IX. Notes.

1. For calculating catchments in Figures 5-9, only land of 10° slope or less is included, and distance away from the site is assessed in terms of walking time, so the catchments include all low slope land within an equivalent walking time from the site, sufficient to support the estimated population in each phase, allowing 0.5ha to support each individual. This allowance is fairly conservative, thereby defining minimum catchments. The mapped catchments also incorporate the areas necessary to support the populations estimated for subsidiary sites within the catchment, calculated from the regional population density estimated from the MM and LM rural sites in the West Mesara and Kommos surveys (100 persons/km²). For Neopalatial Knossos, the estimated catchments for the major sites at Tylissos, Archanes, Poros and Amnisos are incorporated, as well as a purely notional figure for the known but unstudied centre at Vitsila. For calculations, Prepalatial and Protopalatial site areas and reconstructed populations follow Whitelaw 2012, with the area

for Protopalatial Phaistos estimated at 40ha, given the patchy distribution of excavations across the site and the suggestions of wider occupation from the on-going survey, and for Malia 50ha, incorporating also the evidence from the survey. For the Neopalatial period, Phaistos is estimated at 55ha (Watrous *et al.* 2004: 294), and Malia kept stable at 50ha.

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XI. References.

- Adams, R.E. 1991 *Prehistoric Mesoamerica* (2nd ed.). Norman: University of Oklahoma Press.
- Adams, R.E. and R. Jones 1981 Spatial patterns and regional growth among Classic Maya cities. *American Antiquity* 46: 301-22.
- Adams, R.M. 1981 *Heartland of Cities: Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates*. London: University of Chicago Press.
- Adams, W. and E. Adams 1991 *Archaeological Typology and Practical Reality: a Dialectical Approach to Artifact Classification and Sorting*. Cambridge: Cambridge University Press.
- Anderson, G. 2009 The personality of the Greek state. *Journal of Hellenic Studies* 129:1-22.
- Andreadaki-Vlasaki, M. 2002 Are we approaching the Minoan palace of Khania? In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 157-66. Liege: Université de Liège., 157-66.
- Andreadaki-Vlasaki, M. 2010 Khania (Kydonia). In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)* : 518-28. Oxford: Oxford University Press.
- Arvanitakis, J. 2007 Evidence for ceramic regionalism in early Final Palatial Crete: new perspectives. In P. Betancourt, M. Nelson and H. Williams (eds.). *Krinoi kai Limenes: Studies in Honor of Joseph and Maria Shaw* (Prehistory Monographs 22): 243-49. Philadelphia: INSTAP Academic Press.
- Balkansky, A. 2006 Surveys and Mesoamerican archaeology: the emerging macroregional paradigm. *Journal of Archaeological Research* 14:53-95.
- Barnard, K., T. Brogan and J. Soles 2003 Conclusion: the decoration, character and relative chronology of the Neopalatial pottery. In K. Barnard and T. Brogan (eds.). *Mochlos IB: Period III. Neopalatial Settlement on the Coast: The Artisans' Quarter and the Farmhouse at Chalinomouri. The Neopalatial Pottery* (Prehistory Monographs 8): 99-111. Philadelphia, INSTAP Academic Press.
- Bennet, J. 1985 The structure of the Linear B administration at Knossos. *American Journal of Archaeology* 89: 231-49.
- Bennet, J. 1990 Knossos in context: comparative perspectives on the Linear B administration of LM II-III Crete. *American Journal of Archaeology* 94: 193-212.
- Berent, M. 2000 Anthropology and the Classics: war, violence, and the stateless polis. *Classical Quarterly* 50: 257-89.
- Betancourt, P. 2004a Knossian expansion in Late Minoan IB: the evidence of the Spirals and Arcading Group. In G. Cadogan, E. Hatzaki and A. Vasilakis (eds.). *Knossos: Palace, City, State* (British School at Athens Studies 12): 295-98. London: The British School at Athens.
- Betancourt, P. 2004b Pseira and Knossos: the transformation of an East Cretan seaport. In L. Preston Day, M. Mook and J. Muhly (eds.). *Crete Beyond the Palaces: Proceedings of the Crete 2000 Conference* (Prehistory Monographs 10): 21-8. Philadelphia: INSTAP Academic Press.
- Betancourt, P. 2007 Lasithi and the Malia-Lasithi state. In P. Betancourt, M. Nelson and H. Williams (eds.). *Krinoi kai Limenes: Studies in Honor of Joseph and Maria Shaw* (Prehistory Monographs 22): 209-19. Philadelphia: INSTAP Academic Press.
- Betts, J. 1967 New Light on Minoan bureaucracy. A re-examination of some Cretan sealings. *Kadmos* 6: 15-40.
- Bevan, A. 2010 Political geography and palatial Crete. *Journal of Mediterranean Archaeology* 23: 27-54.
- Bevan, A. and A. Wilson 2013. Models of settlement hierarchy based on partial evidence. *Journal of Archaeological Science* 40: 2415-27.

- Bintliff, J. 1999 Settlement and territory. In G. Barker (ed.). *The Companion Encyclopedia of Archaeology, Vol. 1*: 505-45. London: Routledge.
- Bintliff, J. 2002 Rethinking early Mediterranean urbanism. In R. Aslan, S. Blum, G. Kastl, F. Schweizer and D. Thumm (eds.). *Mauerschau: Festschrift für Manfred Korfmann Vol. 1*: 153-71. Remshalden-Grumbach: Verlag Bernhard Albert Greiner.
- Blackman, D. and K. Branigan 1975 An archaeological survey of the south coast of Crete, between the Ayiofarango and Chrisostomos. *Annual of the British School at Athens* 70: 17-36.
- Blackman, D. and K. Branigan 1977 An archaeological survey of the lower catchment of the Ayiofarango valley. *Annual of the British School at Athens* 72: 13-84.
- Blanton, R. 2004 A comparative perspective on settlement pattern and population change in Mesoamerican and Mediterranean civilizations. In S. Alcock and J. Cherry (eds.). *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean World*: 206-40. Oxford: Oxbow Books.
- Blanton, R., S. Kowalewski, G. Feinman and J. Appel 1982 *Monte Alban's Hinterland. Part I: The Prehispanic Settlement Patterns of the Central and Southern Parts of the Valley of Oaxaca, Mexico* (Museum of Anthropology Memoir 15). Ann Arbor: University of Michigan.
- Blanton, R., S. Kowalewski, G. Feinman and L. Finsten 1993 *Ancient Mesoamerica: a Comparison of Change in Three Regions 2nd ed.* Cambridge: Cambridge University Press.
- Branigan, K. and A. Vasilakis 2010 Survey of the environs around the tholos cemetery. In A. Vasilakis and K. Branigan (eds.). *Moni Odigitria: A Prepalatial Cemetery and Its Environs in the Asterousia, Southern Crete* (Prehistory Monographs 30): 3-46. Philadelphia: INSTAP Academic Press.
- Bredaki, M., F. Longo, M. Benzi, S. Foresta, A. Rossi, V. Achilli, V. Amato, D. Bragagnolo, M. Fabris, V. Lenuzza, A. Menin, E. Santaniello, M. Spiridakis and G. Targa 2009 Progetto Festòs. Ricognizioni archeologiche di superficie: le campagne 2007-2009. *Annuario della scuola Italiana Archeologica di Atene* 87: 935-78.
- Bredaki, M., T. Whitelaw and A. Vasilakis 2010 Πρόγραμμα Επιφανειακής Έρευνας Περιοχής Κνωσού. Προκαταρκτική έκθεση για τη εργασία των ετών 2005-2007. In, M. Andrianakis and I. Tzachili (eds.). *Archaiologiko Ergo Kritiis 1*: 294-301. Rethymnon: Philosophical School, University of Crete.
- Brogan, T. and E. Hallager (eds.). 2011 *LM IB Pottery: Relative Chronology and Regional Differences* (Monographs of the Danish Institute at Athens 11). Athens: Danish Institute at Athens.
- Brumfiel, E. 2005 Opting in and opting out: Tula, Cholula, and Xaltotán. In R. Blanton (ed.). *Settlement, Subsistence and Social Complexity: Essays Honoring the Legacy of Jeffrey R. Parsons*: 63-88. Los Angeles: Cotsen Institute of Archaeology.
- Butzer, K. 1982 *Archaeology as Human Ecology: Method and Theory for a Contextual Approach*. Cambridge: Cambridge University Press.
- Cadogan, G. 1994 An Old Palace period Knossos state? In D. Evely, H. Hughes-Brock and N. Momigliano (eds.). *Knossos: A Labyrinth of History. Papers Presented in Honour of Sinclair Hood*: 57-69. Oxford: Oxbow Books.
- Cadogan, G. 1995 Mallia and Lasithi: a palace-state. In N. Papadogiannakis (ed.). *Pepragmena tou Z' Diethnous Kritologikou Synedriou, Vol. A1: Tmima Archaiologiko*: 97-104. Rethymno: Istoriki kai Laographiki Etaireia.
- Cadogan, G. 2011 Behind the façade: what social and political realities are behind the cultural regionalities of Middle Minoan Crete? In M. Anreadaki-Blazaki and E. Papadopoulou (eds.). *Pepragmena. I' Diethnous Kritologikou Synedriou (Khania, 1-8 Oktovriou 2006), Vol A1: 127-39*. Khania: Philologikos Syllogos 'O Chrysostomos'.
- Cavanagh, W. 2009 Settlement structure in Laconia and Attica at the end of the Archaic period: the fractal dimension. *American Journal of Archaeology* 113: 405-21.
- Chaniotis, A. 1996 Die Verträge zwischen kretischen Poleis in der hellenistischen Zeit. Stuttgart: Franz Steiner.
- Cherry, J. 1986 Politics and palaces: some problems in Minoan state formation. In C. Renfrew and J. Cherry (eds.). *Peer Polity Interaction and Socio-political Change*: 19-45. Cambridge: Cambridge University Press.
- Cherry, J. 1987 Power in space: archaeological and geographical studies of the state. In J.M. Wagstaff (ed.). *Landscape and Culture. Geographical and Archaeological Perspectives*: 146-72. Oxford: Basil Blackwell.
- Christakis, K. 2006 Traditions and trends in the production and consumption of storage containers in Protopalatial and Neopalatial Crete. In M. Wiener, J. Warner, J. Polonsky and E. Hayes (eds.). *Pottery and Society: The Impact of Recent Studies in Minoan Pottery*: 119-37. Boston: Archaeological Institute of America.
- Clarke, D. 1968 *Analytical Archaeology*. London: Methuen.
- Collis, J. 1971 Functional and theoretical interpretations of British coinage. *World Archaeology* 3: 71-84.
- Collis, J. 1981 A typology of coin distributions. *World Archaeology* 13: 122-8.
- Conkey, M. and C. Hastorf (eds.) 1989 *The Uses of Style in Archaeology*. Cambridge: Cambridge University Press.
- Cunliffe, B. 1981 Money and society in pre-Roman Britain. In B. Cunliffe (ed.). *Coinage and Society in Britain and Gaul: Some Current Problems*. (CBA Research Report 38): 29-39. London: Council for British Archaeology.
- Cunliffe, B. 2005 *Iron Age Communities in Britain: an Account of England, Scotland and Wales from*

- the Seventh Century BC Until the Roman Conquest*. 4th ed. London: Routledge.
- Cunningham, T., and J. Driessen 2004 Site by site: combining survey and excavation data to chart patterns of socio-political change in Bronze Age Crete. In S. Alcock and J. Cherry (eds.). *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean World*: 101-13. Oxford: Oxbow Books.
- de Vries, J. 1990 Problems in the measurement, description and analysis of historical urbanization. In A. van der Woude, A. Hayami and J. de Vries (eds.). *Urbanization in History. A Process of Dynamic Interactions*: 43-60. Oxford, Clarendon Press.
- DeAtley, S. and F. Findlow (eds.). 1984 *Exploring the Limits: Frontiers and Boundaries in Prehistory* (British Archaeological Reports, International Series 223). Oxford: British Archaeological Reports.
- Detorakis, T. 1994 *History of Crete*. Herakleion: Typokreta.
- Diaz-Andreu, M., S. Lucy, S. Babic and D. Edwards 2005 *The Archaeology of Identity: Approaches to Gender, Age, Status, Ethnicity and Religion*. London: Routledge.
- Dimopoulou-Rethemiotaki, N., D. Wilson and P. Day 2007 The earlier Prepalatial settlement of Poros-Katsambas: craft production and exchange at the harbour town of Knossos. In P. Day and R. Doonan (eds.). *Metallurgy in the Early Bronze Age Aegean* (Sheffield Studies in Aegean Archaeology 7): 84-97. Oxford: Oxbow Books.
- Dobres, M.-A. and C. Hoffman 1994 Social agency and the dynamics of prehistoric technology. *Journal of Archaeological Method and Theory* 1: 211-58.
- Drennan, R. and C. Peterson 2004 Comparing archaeological settlement systems with rank-size graphs: a measure of shape and statistical confidence. *Journal of Archaeological Science* 31: 533-49.
- Driessen, J. 1982 The Minoan Hall in domestic architecture on Crete: to be in vogue in Late Minoan IA? *Acta Archaeologica Lovaniensia* 21: 27-92.
- Driessen, J. 1989-90 The proliferation of Minoan palatial architectural style: (I) Crete. *Acta Archaeologica Lovaniensia* 28-29: 3-23.
- Driessen, J. 2000 *The Scribes of the Room of the Chariot Tablets at Knossos: An Interdisciplinary Approach to the Study of a Linear B Deposit* (Minos Supplement 15). Salamanca: Ediciones Universidad de Salamanca.
- Driessen, J. 2001a History and hierarchy. preliminary observations on the settlement pattern in Minoan Crete. In K. Branigan (ed.). *Urbanism in the Aegean Bronze Age* (Sheffield Studies in Aegean Archaeology): 51-71. London: Sheffield Academic Press.
- Driessen, J. 2001b Centre and periphery: some observations on the administration of the kingdom of Knossos. In S. Voutsaki and J. Killen (eds.). *Economy and Politics in the Mycenaean Palace States* (Cambridge Philological Society Supplementary Volume 27): 96-112. Cambridge: Cambridge Philological Society.
- Driessen, J. 2010 Malia. In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)*: 556-70. Oxford: Oxford University Press.
- Driessen, J. and C. Macdonald 1997 *The Troubled Island: Minoan Crete Before and After the Santorini Eruption* (Aegaeum 17). Liège: Université de Liège.
- Dunnell, R. 1971 *Systematics in Prehistory*. London: Free Press.
- Dunnell, R. 1986 Methodological issues in Americanist artifact classification. In M. Schiffer (ed.). *Advances in Archaeological Method and Theory* 9: 149-207. New York: Academic Press.
- Earle, T. and A. Johnson 2000 *The Evolution of Human Societies: From Foraging Group to Agrarian State, 2nd ed.* Stanford: Stanford University Press.
- Emberling, G. 1997 Ethnicity in complex societies: archaeological perspectives. *Journal of Archaeological Research* 5: 295-344.
- Emberling, G. 1999 The value of tradition: the development of social identities in early Mesopotamian states. In J. Robb (ed.). *Material Symbols: Culture and Economy in Prehistory* (Occasional Paper of the Center for Archaeological Investigations, Southern Illinois University at Carbondale 26): 277-301. Carbondale: Southern Illinois University at Carbondale.
- Evely, D. 2008 Crete. In C. Morgan (ed.). *Archaeology in Greece 2007-2008*. *Archaeological Reports* 54: 94-112.
- Falconer, S. 1987 *Heartland of Villages: Reconsidering Early Urbanism in the Southern Levant*. P.h.D. Dissertation, University of Arizona. Ann Arbor: University Microfilms International.
- Falconer, S., and S. Savage. 1995 Heartlands and hinterlands: alternative trajectories of early urbanization in Mesopotamia and the southern Levant. *American Antiquity* 60: 37-58.
- Faraklas, N., E. Katahi, A. Kossuva, N. Ksipharas, E. Panaghiotopoulos, G. Tasoulas, N. Tsatsaki and M. Xatzipanaghioti 1998 Οι επικράτειες των αρχαίων πόλεων της Κρήτης. Rethymnon: University of Crete.
- Feinman, G. 1994 Social boundaries and political change: a comparative perspective from ancient Mesoamerica. In G. Stein and M. Rothman (eds.). *Chieftoms and Early States in the Near East. The Organizational Dynamics of Complexity* (Monographs in World Archaeology 18): 225-36. Madison: Prehistory Press.
- Feinman, G. 1998 Scale and social organization: perspectives on the archaic state. In G. Feinman and J. Marcus (eds.). *Archaic States*: 95-134. Santa Fe: School of American Research Press.

- Flannery, K. 1998 The ground plans of archaic states. In G. Feinman and J. Marcus (eds.). *Archaic States*: 15-58. Santa Fe: School of American Research Press.
- Floyd, C. 1998 Pottery from the Plateia Building and East Cretan regionalism. In C. Floyd (ed.). *Pseira III: The Plateia Building*. (University Museum Monograph 102): 177-92. Philadelphia: University of Pennsylvania.
- Gehrke, H.-J. 2009 States. In K. Raaflaub and H. van Wees (eds.). *A Companion to Archaic Greece*: 395-410. London: Wiley-Blackwell.
- Goren, Y. and D. Panagiotopoulos 2010 The 'Lords of the Rings': an analytical approach to the riddle of the 'Knossian replica rings'. *Bulletin of the Institute of Classical Studies* 52: 257-58.
- Gosselain, O. 2000 Materializing identities: an African perspective. *Journal of Archaeological Method and Theory* 7: 187-217.
- Green, S. and S. Perlman (eds.) 1985 *The Archaeology of Frontiers and Boundaries*. New York: Academic Press.
- Griffith, R. and C. Thomas (eds.) 1981 *The City-state in Five Cultures*. Oxford: ABC-Clio.
- Grube, N. 2000. The city-states of the Maya. In M. H. Hansen (ed.) *A comparative study of thirty city-state cultures. An investigation conducted by the Copenhagen Polis Centre*: 547-65. Copenhagen: Reitzels Forlag.
- Haggis, D. 2005 *Kavousi. The Results of the Excavations at Kavousi in Eastern Crete I. The Archaeological Survey of the Kavousi Region* (Prehistory Monographs 16). Philadelphia: INSTAP Academic Press.
- Hallager, E. 1996 *The Minoan Roundel and Other Sealed Documents in the Neopalatial Linear A Administration*. (Aegaeum 14). Liège: Université de Liège.
- Hansen, M. (ed.) 2000a *A Comparative Study of Thirty City-state Cultures: An Investigation Conducted by the Copenhagen Polis Centre* (Historisk-filosofiske skrifter, Det Kongelige Danske videnskabernes selskab 21). Copenhagen: Royal Danish Academy of Sciences and Letters.
- Hansen, M. 2006a *Polis: An Introduction to the Ancient Greek City-state*. Oxford: Oxford University Press.
- Hansen, M. 2006b *The Shotgun Method. The Demography of the Ancient Greek City-state Culture*. London: University of Missouri Press.
- Harrison, G. 1993 *The Romans and Crete*. Amsterdam: A. M. Hakkert.
- Hatzaki, E. 2007 Neopalatial (MM IIIB-LM IB): KS 178, Gypsades Well (Upper Deposit), and SEX North House Groups. In N. Momigliano (ed.). *Knossos Pottery Handbook: Neolithic and Bronze Age (Minoan)* (British School at Athens Studies 14): 151-96. London: The British School at Athens.
- Hayden, B. 2004 *Reports on the Vrokastro Area, Eastern Crete, Vol. 2. The Settlement History of the Vrokastro Area and Related Studies* (University Museum Monograph 119). Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.
- Hedeager, L. 1979 A quantitative analysis of Roman imports in Europe north of the Limes (0-400 AD), and the question of Roman-Germanic exchange. In K. Kristiansen and C. Paludan-Müller (eds.). *New Directions in Scandinavian Archaeology* (Studies in Scandinavian Prehistory and Early History 1): 191-216. Copenhagen: National Museum of Denmark.
- Hegemon, M. 1992 Archaeological research on style. *Annual Review of Anthropology* 21: 517-36.
- Hodder, I. 1977 How are we to study the distributions of Iron Age material? In J. Collis (ed.) *The Iron Age in Britain: a Review*: 8-16. Sheffield: Department of Prehistory and Archaeology, University of Sheffield.
- Hodder, I. (ed.) 1978 *The Spatial Organisation of Culture*. London: Duckworth.
- Hodder, I. 1981 *Symbols in Action: Ethnoarchaeological Studies of Material Culture*. Cambridge: Cambridge University Press.
- Hodder, I. and C. Orton 1976 *Spatial Analysis in Archaeology*. Cambridge: Cambridge University Press.
- Hodge, M. and L. Minc 1990 The spatial patterning of Aztec ceramics: implications for Prehispanic exchange systems in the Valley of Mexico. *Journal of Field Archaeology* 17: 415-37.
- Hodge, M., H. Neff, M. Blackman and L. Minc 1993 Black-on-orange ceramic production in the Aztec empire's heartland. *Latin American Antiquity* 4: 130-57.
- Hodges, R. 1987 Spatial models, anthropology and archaeology. In J.M. Wagstaff (ed.). *Landscape and Culture. Geographical and Archaeological Perspectives*: 118-33. Oxford, Basil Blackwell.
- Hole, F. (ed.) 1987 *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*. Washington, D.C.: Smithsonian Institution Press.
- Hood, M.S.F. and D. Smyth 1981 *Archaeological Survey of the Knossos Area*, 2nd ed. (British School at Athens Supplementary Volume 14). London: British School at Athens.
- Hope Simpson, R., P. Betancourt, P. Callaghan, D. Harlan, J. Hayes, J. Shaw, M. Shaw, and L. V. Watrous 1995 The archaeological survey of the Kommos area. In J. Shaw and M. Shaw (eds.). *Kommos I. Part I: The Kommos Region, Ecology, and Minoan Industries*: 325-402. Princeton: Princeton University Press.
- Hurt, T. and G. Rakita (ed.) 2001 *Style and Function. Conceptual Issues in Evolutionary Archaeology*. London: Bergin and Garrey.
- Johnson, G. 1972 A test of the utility of central place theory in archaeology. In P. Ucko, R. Tringham and G. Dimbleby (eds.). *Man, Settlement and Urbanism*: 769-85. London: Duckworth.
- Johnson, G. 1977 Aspects of regional analysis in archaeology. *Annual Review of Anthropology* 6: 479-508.

- Johnson, G. 1980a Spatial organization of early Uruk settlement systems. In M.-T. Barrelet (ed.). *L'Archeologie de l'Iraq du Debut se L'epoque Neolithique a 333 avant Notre Ere: Perspectives et Limites de L'interpretation Anthropologique des Documents*: 233-63. Paris: Centre National de la Recherche Scientifique.
- Johnson, G. 1980b Rank-size convexity and system integration: a view from archaeology. *Economic Geography* 56: 234-47.
- Johnson, G. 1981 Monitoring complex system integration and boundary phenomena with settlement size data. In S. van der Leeuw (ed.). *Archaeological Approaches to the Study of Complexity*: 144-88. Amsterdam: University of Amsterdam.
- Johnson, G. 1987 The changing organization of Uruk administration on the Susiana plain. In F. Hole (ed.). *The Archaeology of Western Iran. Settlement and Society from Prehistory to the Islamic Conquest*: 107-39. Washington DC: Smithsonian Institution.
- Jones, S. 1997 *The Archaeology of Ethnicity: Constructing Identities in the Past and Present*. London: Routledge.
- Kanta, A. 1999 Monastiraki and Phaistos: elements of Protopalatial history. In P. Betancourt, V. Karageorghis, R. Laffineur, and W.-D. Niemeier (eds.). *Meletemata: Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year. Vol. II*. (Aegaeum 20): 387-93. Liège: Université de Liège.
- Kanta, A. and A. Tzigounaki 2000 The Protopalatial multiple sealing system. New evidence from Monastiraki. In M. Perna (ed.). *Administrative Documents in the Aegean and Their Near Eastern Counterparts*: 193-205. Torino: Centro Internazionale di Ricerche Archeologiche Antropologiche e Storiche.
- Karnava, A. 2008 Written and stamped records in the Late Bronze Age Cyclades: the sea journeys of an administration. In N. Brodie, J. Doole, G. Gavalas and C. Renfrew (eds.). *Horizon. Opiζov: A Colloquium on the Prehistory of the Cyclades* (McDonald Institute Monographs): 377-86. Cambridge: McDonald Institute for Archaeological Research.
- Kimes, T., C. Haselgrove and I. Hodder 1982 A method for the identification of the location of regional cultural boundaries. *Journal of Anthropological Archaeology* 1:113-31.
- Knappett, C. 1999 Assessing a polity in Protopalatial Crete: the Malia-Lasithi state. *American Journal of Archaeology* 103: 615-39.
- Knappett, C. 2007 Malia et ses relations régionales à l'époque du Minoen Moyen: les échanges céramiques à travers trois siècles (2000-1700 av. J.-C.). *Bulletin de Correspondence Hellénique* 131: 861-64.
- Knappett, C. 2011 Time, place and practice in the East Mesara: the case of Skinias. A response to Stella Mandalaki. In T. Brogan and E. Hallager (eds.). *LM IB Pottery: Relative Chronology and Regional Differences* (Monographs of the Danish Institute at Athens 11): 393-96. Athens: Danish Institute at Athens.
- Knappett, C. and I. Schoep 2000 Continuity and change in Minoan palatial power. *Antiquity* 74: 365-71.
- Knappett, C., and T. Cunningham 2003 Three Neopalatial deposits from Palaikastro, east Crete. *Annual of the British School at Athens*: 107-87.
- Kontosopoulos, N. 2006 *Glossikos Atlas tis Kritis*. Herakleion: University of Crete Press.
- Kowalewski, S. 2008 Regional settlement pattern studies. *Journal of Archaeological Research* 16: 225-85.
- Krzyszowska, O. 2005 *Aegean Seals. An Introduction* (BICS Supplement 85). London, Institute of Classical Studies.
- La Rosa, V. 2002 Pour une révision préliminaire du second palais de Phaistos. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 71-97. Liège: Université de Liège.
- La Rosa, V. 2010a Phaistos. In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)*: 582-95. Oxford: Oxford University Press.
- La Rosa, V. 2010b Ayia Triada. In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)*: 495-508. Oxford: Oxford University Press.
- Lemonnier, P. 1993 *Technological Choices: Transformation in Material Cultures Since the Neolithic*. London: Routledge.
- Lightfoot, K. and A. Martinez 1995 Frontiers and boundaries in archaeological perspective. *Annual Review of Anthropology* 24: 471-92.
- Lucy, S. 2005 Ethnic and cultural identities. In M. Diaz-Andreu, M., S. Lucy, S. Babic and D. Edwards. *The Archaeology of Identity: Approaches to Gender, Age, Status, Ethnicity and Religion*. London: Routledge: 86-109.
- Lyman, R.L., M. O'Brien and R. Dunnell 1997 *The Rise and Fall of Culture History*. London: Plenum Press.
- Macdonald, C. 2002 The Neopalatial palaces of Knossos. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 35-54. Liège: Université de Liège.
- Macdonald, C. 2010 Knossos. In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)*: 529-42. Oxford: Oxford University Press.
- Macdonald, C. 2012 Palatial Knossos: the early years. In I. Schoep, P. Tomkins and J. Driessen (eds.). *Back to the Beginning: Reassessing Social and Political Complexity on Crete During the Early and Middle Bronze Age*: 81-113. Oxford: Oxbow Books.
- MacGillivray, J.A. 2007 The Late Minoan pottery. In J.A. MacGillivray, L.H. Sackett and J. Driessen (eds.). *Palaikastro: Two Late Minoan Wells*

- (British School at Athens Supplementary Volume 43): 145-59. London: British School at Athens.
- Marcus, J. 1983 Lowland Maya archaeology at the crossroads. *American Antiquity* 48: 454-88.
- Marcus, J. 1998 The peaks and valleys of ancient states: an extension of the dynamic model. In G. Feinman and J. Marcus (eds.). *Archaic States*: 59-94. Santa Fe: School of American Research Press.
- Mathews, P. 1985 Maya early Classic monuments and inscriptions. In G. Willey and P. Mathews (eds.). *A Consideration of the Early Classic Period in the Maya Lowlands* (Institute for Mesoamerican Studies 10): 5-54. Albany: State University of New York.
- Mathews, P. 1991 Classic Maya emblem glyphs. In T.P. Culbert (ed.). *Classic Maya Political History: Hieroglyphic and Archaeological Evidence* 19-29. Cambridge: Cambridge University Press.
- Militello, P. 2012 Emerging authority: a functional analysis of the MM II settlement of Phaistos. In I. Schoep, P. Tomkins and J. Driessen (eds.). *Back to the Beginning: Reassessing Social and Political Complexity on Crete During the Early and Middle Bronze Age*: 236-72. Oxford: Oxbow Books.
- Miller, D. 1985 *Artefacts as Categories: a Study of Ceramic Variability in Central India*. Cambridge: Cambridge University Press.
- Minc, L. 2006 Monitoring regional market systems in prehistory: models, methods and metrics. *Journal of Anthropological Archaeology* 25:82-116.
- Minc, L. 2009 Style and substance: evidence for regionalism within the Aztec market system. *Latin American Antiquity* 20:343-74.
- Minc, L., M. Hodge and M.J. Blackman 1994 Stylistic and spatial variability in Early Aztec ceramics. In M. Hodge and M. Smith (eds.). *Economies and Politics in the Aztec Realm* (Studies on Culture and Society 6): 133-73. Albany: University of Albany.
- Müller, S. 1996 Malia: Prospection archéologique de la plaine de Malia. *Bulletin de Correspondence Hellénique* 120:921-8.
- Müller, S. 1997 Malia et la Crète de l'âge du bronze: L'organisation d'un territoire minoen. *Dossiers d'Archéologie* 222: 52-53.
- Müller, S. 1998 Malia: Prospection archéologique de la plaine de Malia. *Bulletin de Correspondence Hellénique* 114: 548-52.
- Müller, S. 2003 Malia: Prospection archéologique de la plaine de Malia. *Bulletin de Correspondence Hellénique* 127: 456-69.
- Müller-Celka, S. 2007 Terroir et territoire à Malia à l'époque protopalatiale. *Bulletin de Correspondence Hellénique* 131: 855-60
- Neiman, F. 1995 Stylistic variation in evolutionary perspective: inferences from decorative diversity and interassemblage distance in Illinois Woodland ceramic assemblages. *American Antiquity* 60: 7-36.
- Nichols, L. and T. Charlton (eds.) 1997 *The Archaeology of City-states: Cross-cultural Approaches*. Washington, D.C: Smithsonian Institution Press.
- Niemeier, W.-D. 2004 When Minos ruled the waves: Knossian power overseas. In G. Cadogan, E. Hatzaki A. Vasilakis (eds.). *Knossos: Palace, City, State*. (British School at Athens Studies 12): 393-98. London: The British School at Athens.
- Nowicki, K. 1995 Report on investigations in Greece. X. Studies in 1993 and 1994. *Archeologia* 46: 63-70.
- Nowicki, K. 1996 Lasithi (Crete): one hundred years of archaeological research. *Aegean Archaeology* 3: 27-47.
- Nowicki, K. 2000 *Defensible Sites in Crete c. 1200 - 800 B.C. (LM IIIB/IIIC through Early Geometric)* (Aegaeum 21). Liège: Université de Liège.
- Palaima, T. 1994 Seal-Users and script-users/nodes and tablets at LMIB Hagia Triada. In P. Ferioli, E. Fiandra, G. Fissore and M. Frangipane (eds.). *Archives Before Writing*: 307-30. Rome: Centro Internazionale di Ricerche Archeologiche Antropologiche e Storiche.
- Panagiotakis, N. 2003 L'évolution archéologique de la Pédiada (Crète centrale): premier bilan. *Bulletin de Correspondence Hellénique* 127: 327-430.
- Panagiotakis, N. 2004 Contacts between Knossos and the Pediada region in central Crete. In G. Cadogan, E. Hatzaki A. Vasilakis (eds.). *Knossos: Palace, City, State*. (British School at Athens Studies 12): 177-86. London: The British School at Athens.
- Parsons, J. 1972 Archaeological settlement patterns. *Annual Review of Anthropology* 1:127-50.
- Pelon, O. 2005 Les deux destructions du palais de Malia. In I. Bradfer-Burdet, B. Detournay and R. Laffineur (eds.). *Kris Technitis. L'Artisan Crétois: Recueil d'articles en l'honneur de Jean-Claude Poursat, publié à l'occasion des 40 ans de la découverte du Quartier Mu* (Aegaeum 26): 185-97. Liège: Université de Liège.
- Perlman, P. 2004 Crete. In M. Hansen and T. Nielsen (ed.). *An Inventory of Archaic and Classical Poleis*: 1144-95. Oxford: Oxford University Press.
- Platon, L. 1999 New evidence for the occupation at Zakros before the LM I Palace. P. Betancourt, V. Karageorghis, R. Laffineur and W.-D. Niemeier (eds.). *Meletemata: Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year. Vol. III* (Aegaeum 20): 671-81. Liège: Université de Liège.
- Platon, L. 2002 The political and cultural influence of the Zakros palace on nearby sites and in a wider context. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 145-56. Liège: Université de Liège.
- Platon, L. 2004 To Ysterominoiko I anaktoro tis Zakrou: mia 'Knossos' exo apo tin Knoso. In G. Cadogan, E. Hatzaki A. Vasilakis (eds.). *Knossos: Palace, City, State*. (British School at Athens Studies 12): 381-92. London: The British School at Athens.
- Platon, L. 2010 Kato Zakros. In E. Cline (ed.). *The Oxford Handbook of the Bronze Age Aegean (ca. 3000-1000 BC)*: 509-17. Oxford: Oxford University Press.

- Plog, S. 1980 *Stylistic Variation in Prehistoric Ceramics: Design Analysis in the American Southwest*. Cambridge: Cambridge University Press.
- Popham, M. 1980 Cretan sites occupied between c. 1450 and 1400 B.C. *Annual of the British School at Athens* 75: 163-67.
- Poursat, J.-C. 2007 Un 'Petit Palais' au Quartier Mu? Organisation de l'espace et répartition fonctionnelle. *Bulletin de Correspondence Hellénique* 131: 831-33.
- Poursat, J.-C. 2008 Minoan palaces and polities: a view from Malia. *Bulletin of the Institute of Classical Studies* 51: 195-96.
- Poursat, J.-C. 2010 Malia: palace, state, city. In O. Krzyszkowska (ed.). *Cretan Offerings. Studies in Honour of Peter Warren*. (British School at Athens Studies 18): 259-67. London: British School at Athens.
- Preston, L. 2004 A mortuary perspective on political changes in Late Minoan II-IIIIB Crete. *American Journal of Archaeology* 108: 321-48.
- Price, B. 1977 Shifts in production and organization: a cluster-interaction model. *Current Anthropology* 18: 209-33.
- Puglisi, D. 2007 Le territoire de Malia à l'époque néopalatiale: premières données de la prospection. *Bulletin de Correspondence Hellénique* 131: 865-9.
- Rehak, P. 1997 The role of religious painting in the function of the Minoan villa: the case of Ayia Triadha. In R. Hägg (ed.). *The Function of the 'Minoan Villa'* (Swedish Institute in Athens, Series in 4° 46): 163-75. Stockholm: Paul Åström.
- Rehak, P. and J. Younger 2001 Neopalatial, Final Palatial, and Postpalatial Crete. In T. Cullen (ed.). *Aegean Prehistory: A Review (AJA Supplement 1)*: 383-465. Boston: Archaeological Institute of America.
- Relaki, M. 2004 Constructing a region: the contested landscapes of Prepalatial Mesara. In J. Barrett and P. Halstead (eds.). *The Emergence of Civilisation Revisited* (Sheffield Studies in Aegean Archaeology 5): 170-88. Oxford: Oxbow Books.
- Renfrew, C. 1972 *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium B.C.* London: Methuen.
- Renfrew, C. 1975 Trade as action at a distance. Questions of integration and communication. In J. Sabloff and C. Lamberg-Karlovsky (eds.). *Ancient Civilizations and Trade*: 3-59. Albuquerque: University of New Mexico Press.
- Renfrew, C. 1986 Introduction: peer polity interaction and socio-political change. In C. Renfrew and J. Cherry (eds.). *Peer Polity Interaction and Socio-Political Change*: 1-18. Cambridge: Cambridge University Press.
- Rethemiotakis, G. 2002 Evidence on social and economic changes at Galatas and Pediada in the New Palace period. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 55-69. Liège: Université de Liège.
- Rethemiotakis, G., and K. Christakis 2004 Cultural interaction between Knossos and Pediada: the evidence from the Middle Minoan IB pottery. In G. Cadogan, E. Hatzaki A. Vasilakis (eds.). *Knossos: Palace, City, State*. (British School at Athens Studies 12): 169-75. London: The British School at Athens.
- Rethemiotakis, G., and K. Christakis 2011 LM I pottery groups from the palace and the town of Galatas, Pediada. In T. Brogan and E. Hallager (eds.). *LM IB Pottery: Relative Chronology and Regional Differences* (Monographs of the Danish Institute at Athens 11): 205-27. Athens: Danish Institute at Athens.
- Robb, J. (ed.) 1999 *Material symbols: culture and economy in prehistory*. (Occasional paper of the Center for Archaeological Investigations, Southern Illinois University at Carbondale 26). Carbondale: Southern Illinois University at Carbondale.
- Sanders, I. 1982 *Roman Crete: An Archaeological Survey and Gazetteer of Late Hellenistic, Roman and Early Byzantine Crete*. Warminster: Aris and Phillips.
- Sanders, W., J. Parsons and R. Santley 1979 *The Basin of Mexico: the Ecological Processes in the Evolution of a Civilization*. New York: Academic Press.
- Savage, S. 1997 Assessing departures from log-normality in the rank-size rule. *Journal of Archaeological Science* 24: 233-44.
- Schele, L. and P. Mathews 1991 Royal visits and other intersite relationships among the Classic Maya. In T.P. Culbert (ed.). *Classic Maya Political History: Hieroglyphic and Archaeological Evidence*: 226-52. Cambridge: Cambridge University Press.
- Schoep, I. 1999 Tablets and territories? Reconstructing Late Minoan IB political geography through undeciphered documents. *American Journal of Archaeology* 103: 201-21.
- Schoep, I. 2001 Managing the hinterland: the rural concerns of urban administration. In K. Branigan (ed.). *Urbanism in the Aegean Bronze Age* (Sheffield Studies in Aegean Archaeology): 87-102. London: Sheffield Academic Press.
- Schoep, I. 2002 *The Administration of Neopalatial Crete. A Critical Assessment of the Linear A Tablets and their Role in the Administrative Process* (MINOS Supplement 17). Salamanca: Ediciones Universidad de Salamanca.
- Sellwood, L. 1984 Tribal boundaries viewed from the perspective of numismatic evidence. In B. Cunliffe and D. Miles (eds.). *Aspects of the Iron Age in Central Southern Britain*: 191-204. Oxford, Oxford University Committee for Archaeology.
- Sharer, R. 1994 *The Ancient Maya. 5th ed.* Stanford: Stanford University Press.
- Shaw, J. 2006 Kommos in the Mesara landscape. In J. Shaw and M. Shaw (ed.) *Kommos. Vol V. The Monumental Minoan Buildings at Kommos*: 863-78. Princeton: Princeton University Press.
- Shennan, S. (ed.) 1994 *Archaeological Approaches to Cultural Identity*. London: Routledge.

- Smith, C. 1974 Economics of marketing systems. Models from economic geography. *Annual Review of Anthropology* 3: 167-201.
- Smith, C. 1976 Regional economic systems: linking geographical models and socio-economic problems. In C. Smith (ed.). *Regional Analysis vol. 1*: 3-63. London: Academic Press.
- Smith, C. 1990 Types of city-size distributions. A comparative analysis. In A. van der Woude, A. Hayami and J. de Vries (eds.). *Urbanization in History. A Process of Dynamic Interactions*: 20-42. Oxford, Clarendon Press.
- Smith, M. 1979 The Aztec marketing system and settlement patterns in the Valley of Mexico: a central place analysis. *American Antiquity* 44: 110-25.
- Smith, M. 2005 Networks, territories, and the cartography of ancient states. *Annals of the Association of American Geographers* 95: 832-49.
- Stark, M. (ed.) 1998 *The Archaeology of Social Boundaries*. Washington D.C.: Smithsonian Institution Press.
- Stark, M., B. Bowser and L. Horne (eds.) 2008 *Cultural Transmission and Material Culture: Breaking Down Boundaries*. Tucson: University of Arizona Press.
- Steponaitis, V. 1981 Settlement hierarchies and political complexity in nonmarket societies: the Formative period of the Valley of Mexico. *American Anthropologist* 83: 320-63.
- Trigger, B. 2003 *Understanding early civilizations: a comparative study*. Cambridge: Cambridge University Press.
- Trinkaus, K. (ed.) 1987. *Polities and Partitions: Human Boundaries and the Growth of Complex Societies*. Tempe: Arizona State University.
- Tsipopoulou, M. 1997 Palace-centered polities in eastern Crete: Neopalatial Petras and Its neighbors. In W. Aufrecht, N. Mirau and S. Gauley (eds.). *Urbanism in Antiquity: From Mesopotamia to Crete* (Journal for the Study of the Old Testament Supplement Series 244): 263-77. Sheffield: Sheffield Academic Press.
- Tsipopoulou, M. 1999 From local centre to palace: the role of fortification in the economic transformation of the Siteia Bay area, east Crete. In R. Laffineur (ed.). *POLEMOS: Le contexte guerrier en Égée à l'âge du Bronze* (Aegaeum 19): 179-89. Liège: Université de Liège.
- Tsipopoulou, M. 2002 Petras, Siteia: the palace, the town, the hinterland and the Protopalatial background. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 133-44. Liège: Université de Liège.
- Tsipopoulou, M., and A. Papacostopoulou 1997 'Villas' and villages in the hinterland of Petras, Siteia. In R. Hägg (ed.). *The Function of the 'Minoan Villa'* (Swedish Institute in Athens, Series in 4° 46): 203-14. Stockholm: Paul Åström.
- Van de Moortel, A. 2002 Pottery as a barometer of economic change: from the Protopalatial to the Neopalatial society in central Crete. In Y. Hamilakis (ed.). *Labyrinth Revisited. Rethinking 'Minoan' Archaeology*: 189-211. Oxford: Oxbow Books.
- Van de Moortel, A. 2011 Late IB ceramic phases at Palaikastro and Malia: a response to Sean Hemingway, J. Alexander MacGillivray and L. Hugh Sackett. In T. Brogan and E. Hallager (eds.). *LM IB Pottery: Relative Chronology and Regional Differences* (Monographs of the Danish Institute at Athens 11): 531-45. Athens: Danish Institute at Athens.
- Vasilakis, A. 1990 Proistorikes theseis sti Moni Odigitrias - Kalous Limenes. *Kritiki Estia* 3: 11-79.
- Vlassopoulos, K. 2007 *Unthinking the Greek Polis. Ancient Greek History Beyond Eurocentrism*. Cambridge: Cambridge University Press.
- Walberg, G. 1983 *Provincial Middle Minoan Pottery*. Mainz am Rhein: Von Zabern.
- Warren, P. 1985 Minoan Palaces. *Scientific American* 253(1): 205-11.
- Warren, P. 2002 Political structure in Neopalatial Crete. In J. Driessen, I. Schoep and R. Laffineur (eds.). *Monuments of Minos. Rethinking the Minoan Palaces* (Aegaeum 23): 201-05. Liège: Université de Liège.
- Warren, P. 2004 Terra cognita? The territory and boundaries of the early Neopalatial Knossian state. In G. Cadogan, E. Hatzaki and A. Vasilakis (eds.). *Knossos: Palace, City, State* (British School at Athens Studies 12): 159-68. London, The British School at Athens.
- Watrous, L. V. 1982 *Lasithi: a History of Settlement on a Highland Plain in Crete* (Hesperia Supplement 18). Princeton: American School of Classical Studies at Athens.
- Watrous, L. V. 2004 New pottery from the Psychro Cave and its implications for Minoan Crete. *Annual of the British School at Athens* 99: 129-47.
- Watrous, L. V., D. Hadzi-Vallianou and H. Blitzer 2004 *The Plain of Phaistos: Cycles of Social Complexity in the Mesara Region of Crete* (Monumenta Archaeologica 23). Los Angeles: The Cotsen Institute of Archaeology.
- Weingarten, J. 1986 The sealing structures of Minoan Crete: MM II Phaistos to the destruction of the palace of Knossos. Part I: the evidence until the LMIB destructions. *Oxford Journal of Archaeology* 5: 279-98.
- Weingarten, J. 1991 Late Bronze Age trade within Crete: the evidence of seals and sealings. In N. Gale (ed.). *Bronze Age Trade in the Mediterranean* (Studies in Mediterranean Archaeology 90). Jonsered: Paul Astrom: 303-24.
- Weingarten, J. 2010 Corridors of power: a social network analysis of the Minoan 'replica rings'. In W. Miller (ed.). *Die Bedeutung der Minoischen und Mykenischen Glyptik* (CMS Beiheft 8): 395-412. Mainz am Rhein: von Zabern.
- Wells, P. 1992 Tradition, identity and change beyond the Roman frontier. In E. Schortman and P. Urban (eds.). *Resources, Power and Interregional Interaction*: 175-88. London: Plenum.

- Wells, P. 1999 Production within and beyond imperial boundaries: goods, exchange and power in Roman Europe. In N. Kardulias (ed.) *World System Theory in Practice: Leadership, Production and Exchange*: 85-101. Lanham: Rowman and Littlefield.
- Whallon, R. and J. Brown (eds.) 1982 *Essays on Archeological Typology* (Kampsville Seminar in Archeology). Evanston: Center for American Archeology.
- Whitelaw, T. 1998 Colonisation and competition in the polis of Koressos: the development of settlement in North-West Keos from the Archaic to the Late Roman periods. In L. Mendoni and A. Mazarakis Ainian (eds.). *Kea-Kythnos: History and Archeology. Proceedings of an International Symposium Kea-Kythnos. 22-25 June 1994.* (Meletimata 27): 227-57. Paris: Diffusion de Bocard.
- Whitelaw, T. 2001 From sites to communities: defining the human dimensions of Minoan urbanism. In K. Branigan (ed.). *Urbanism in the Aegean Bronze Age* (Sheffield Studies in Aegean Archaeology). London: Sheffield Academic Press: 15-37.
- Whitelaw, T. 2004 Alternative pathways to complexity in the southern Aegean. In J. Barrett and P. Halstead (eds.). *The Emergence of Civilisation Revisited* (Sheffield Studies in Aegean Archaeology 5): 232-56. Oxford: Oxbow Books.
- Whitelaw, T. 2012 The urbanisation of prehistoric Crete: settlement perspectives on Minoan state formation. In I. Schoep, P. Tomkins and J. Driessen (eds.). *Back to the Beginning: Reassessing Social and Political Complexity on Crete during the Early and Middle Bronze Age*: 114-76. Oxford: Oxbow Books.
- Whitelaw, T. and C. Morgan 2009 Crete. In C. Morgan (ed.) *Archaeology in Greece 2008-2009. Archaeological Reports* 55: 79-100.
- Whitelaw, T., A. Vasilakis and M. Bredaki in press. Prehistoric Knossos: tracing its long-term history through its surface record. *Proceedings of the 11th Cretological Congress*. Rethymnon: Association of Historical and Folklore Studies.
- Whitley, J., S. Germanidou, D. Urem-Kotsou, A. Dimoula, I. Nikolakopoulou, A. Karnava and E. Hatzaki 2006 *Archaeology in Greece 2005-2006. Archaeological Reports* 52: 1-112.
- Whitley, J., S. Germanidou, D. Urem-Kotsou, A. Dimoula, I. Nikolakopoulou, A. Karnava and D. Evely 2007 *Archaeology in Greece 2006-2007. Archaeological Reports* 53: 1-121.
- Wiener, M. 1984 Crete and the Cyclades in LMI: the tale of the conical cups. In R. Hagg and N. Marinatos (eds.). *The Minoan Thalassocracy Myth and Reality* (Swedish Institute in Athens, Series in 4° 32): 17-25. Stockholm: Swedish Institute in Athens.
- Wiener, M. 1987 Trade and rule in palatial Crete. In R. Hägg and N. Marinatos (eds.). *The Function of the Minoan Palaces* (Swedish Institute in Athens, Series in 4°, 35): 261-7. Stockholm: Swedish Institute in Athens.
- Wiener, M. 1990 The isles of Crete? The Minoan thalassocracy revisited. In D. Hardy, C. Doumas, J. Sakellarakis and P. Warren (eds.). *Thera and the Aegean World III. Vol. 1: Archaeology*: 128-61. The Thera Foundation: London.
- Wiener, M. 2007 Neopalatial Knossos: rule and role. In P. Betancourt, M. Nelson and H. Williams (eds.). *Krinoi kai Limenes: Studies in Honor of Joseph and Maria Shaw* (Prehistory Monographs 22): 231-42. Philadelphia: INSTAP Academic Press.
- Wilkinson, T. 1994 The structure and dynamics of dry-farming states in Upper Mesopotamia. *Current Anthropology* 35: 483-520.
- Wilson, D., P. Day and N. Dimopoulou-Rethemiotaki 2008 The gateway port of Poros-Katsambas: trade and exchange between north-central Crete and the Cyclades in EB I-II. In N. Brodie, J. Doole, G. Gavalas and C. Renfrew (eds.). *Horizon. Opiçov: A colloquium on the prehistory of the Cyclades* (McDonald Institute Monographs): 261-70. Cambridge: McDonald Institute for Archaeological Research.
- Wilson, D., P. Day, and N. Dimopoulou-Rethemiotaki 2004 The pottery from Early Minoan I-IIB Knossos and its relations with the harbour site of Poros-Katsambas. In G. Cadogan, E. Hatzaki and A. Vasilakis (eds.). *Knossos: Palace, City, State* (British School at Athens Studies 12): 67-74. London: The British School at Athens.
- Wobst, H. M. 1977 Stylistic behavior and information exchange. In C. Cleland (ed.). *For the Director: Essays in Honor of James B. Griffin* (Anthropological Papers 61): 317-41. Ann Arbor: Museum of Anthropology, University of Michigan.
- Wright, H. 1977 Recent research on the origin of the state. *Annual Review of Anthropology* 6: 379-97.
- Wright, H. 1987 The Susiana hinterlands during the era of primary state formation. In F. Hole (ed.) *The Archaeology of Western Iran. Settlement and Society from Prehistory to the Islamic Conquest*: 141-55. Washington DC: Smithsonian Institution.
- Wright, H. 1998 Uruk states in southwestern Iran. In J. Marcus and G. Feinman (ed.) *Archaic States*. Santa Fe: School of American Research: 173-97.
- Wright, H. 2000 Modeling tributary economies and hierarchical polities. In G. Feinman and L. Manzanilla (eds.). *Cultural Evolution. Contemporary Viewpoints*. London: Plenum: 197-213.
- Wright, H. 2005 The polycentricity of the archaic civilizations. In V. Scarborough (ed.). *A Catalyst for Ideas. Anthropological Archaeology and the Legacy of Douglas Schwartz*: 149-67. Santa Fe: School of American Research Press.
- Wright, H. and G. Johnson 1975 Population, exchange, and early state formation in southwestern Iran. *American Anthropologist* 77: 267-89.

- Wright, J. 1984 Umpiring the Mycenaean empire. In P. Betancourt (ed.) *The Scope and Extent of the Mycenaean Empire* (Temple University Aegean Symposium 9): 58-70. Philadelphia: Temple University.
- Yoffee, N. 1991 Maya elite interaction: through a glass, sideways. In T.P. Culbert (ed.) *Classic Maya Political History: Hieroglyphic and Archaeological Evidence*: 285-310. Cambridge: Cambridge University Press.
- Younger, J. and P. Rehak 2008a The material culture of Neopalatial Crete. In C. Shelmerdine (ed.). *The Cambridge Companion to the Aegean Bronze Age*: 140-64. Cambridge: Cambridge University Press.
- Younger, J. and P. Rehak. 2008b Minoan Culture: Religion, Burial Customs, and Administration. In C. Shelmerdine (ed.). *The Cambridge Companion to the Aegean Bronze Age*: 165-85. Cambridge: Cambridge University Press.