Urbanism
in the
Aegean Bronze Age

State-formation and the emergence of civilisation have been two of the major arenas of debate in Aegean prehistory for the last twenty five years. The process of urbanisation has therefore been at the forefront of scholarly debate. Bronze Age towns, however, have largely been ignored, particularly at a generalised level. Research has usually focused on their architecture, and particularly their elite or public architecture, rather than their general nature and character, and many studies have been restricted to a single town or even a single building.

This volume redresses the balance and draws attention and thought not only to urban settlements as a whole but to their social and economic roles, their demographic significance and ultimately to their character and personality.

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Cover photo:
The Minoan town at Gournia
(photograph: Keith Branigan)

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4

History and Hierarchy. Preliminary Observations on the Settlement Pattern of Minoan Crete*

Jan Driessen

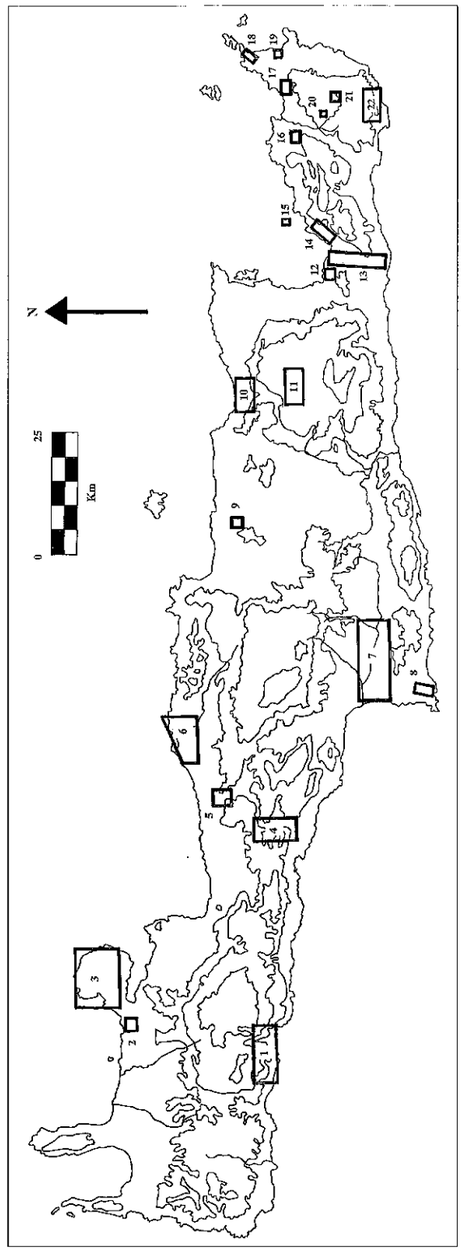
Introduction

In this paper, I explore regional dynamics in settlement trajectories on Protopalatial and Neopalatial Crete. This is an exploratory attempt to make use of the mass of archaeological data, collected during this century, with the intent of reconstructing the political geography and the settlement hierarchy of the island in the Minoan period. Reconstructing the political geography of Crete on the basis of survey data is an exercise which has to remain largely hypothetical partly because the inferences from as yet unpublished or largely unpublished survey data may be far off the truth, and partly because these surveys only relate to a tiny fraction of the island which has been intensively studied (Figure 4.1).

Indeed, a rough and exaggerated count suggests that, of the 8,305 km² taken up by the island (Bonnefant 1972: 17), less than

Table 4.1 Surveys on Crete (partly based on Moody, Nixon, Price and Rackham 1998: 88; *indicates provisional data; Knossos and Palaikastro are the only two as yet surveyed settlements; totals do not include Kythera)[13].

Area	Extent in km²	FN/EM I	Prepalatial	Protopalatial	LM I	LM IIIA2-B
Akrotiri[5]	171	12	36	98	107	48
A. Vasilios*	38	(15)	(0)	(6)	(11)	(4)
Ayiofarango	c. 20	3/5	3/5	<3	1?	1?
Gavdos	c. 45	DATA	NOT YET	PUBLISHED		
Gournia[6]*	24	(c. 3+)	(c. 7)	(c. 16)	(c. 13)	(c. 5)
Itanos*[7]	c. 30	(?)	(1+)	(?)	(c. 20)	(?)
Kavousi	c. 50	2	9	53	30	7
Knossos	c. 10					
Kommos	25	9	9	32	29	6
Lasithi[8]	c. 85	14	5	36	13	14
Malia*	c. 40	(1)	(5+)	(75+)	(9)	(9)
Palaikastro	0.36					
Praisos*[9]	9	(4)	(0)	(6+)	(4)	(9+)
Petras/Photia	4	2/3	2/3	2/3	6	3
Pseira[10]	1.75	DATA	NOT YET	PUBLISHED		
Sphakia	470	DATA	NOT YET	PUBLISHED		
Vrokastro[11]*	50	(3)	(24)	(24)	(46)	(35)
W. Mesara[12]*	22	(9)	(c. 17)	(>25)	(<20)	(?12)
Ziros	2	8	0	6	6	1
Kythera	13	(?)	(7)	(0)	(4)	(0)
Crete: 8,305 km²	**> 1097 km²**	**88**	**121**	**383**	**315**	**154**



1. Sphakia
2. Nerkourou
3. Akrotiri
4. Ay. Vasilios
5. Eleftherna
6. Landbegehungen
7. W. Mesara/Kommos
8. Ayiofarango
9. Knossos
10. Malia
11. Lasithi
12. Vrokastro
13. Gournia
14. Kavousi
15. Pseira
16. Achladia
17. Petras/Ay. Photia
18. Itanos
19. Palaikastro
20. Praisos
21. Ziros/Katclionas
22. S.E. Crete

Figure 4.1 The location of archaeological surveys in Crete.

1,100 km² has been or is being surveyed, i.e. c. 12.5% and, as far as more or less published surveys are concerned, we only know the settlement history of an area of about 437 km² that is, after all, about 5% of its surface. If we take into account that 61% of the island is between 0 and 400 m asl (with 26.6% between 400 and 800 m asl, 12.3% over 800 m asl) we observe that, relatively speaking, the Sitia area has more land below 800 m asl than the other three modern provinces. Most of the surveys indeed relate to land below 800 m (i.e. 87% of the island) and it is indeed doubtful that, apart from some highland plateaux, occupation was anything more than sparse in the mountains, which results in a somewhat more positive picture[1]. The Sphakia survey has, however, found traces of settlement at an altitude of +1000 m² in the White Mountains, which may imply that, in certain periods, the highland formed an effective, integrated part of some of the lowland polities. In our modern study area of Palaikastro this is certainly still the case and the people of the plain use the highland plateau of Magasa (situated at +550m) for a multitude of purposes[3].

Aside from the fact that the picture presented here (Figure 4.2) is based on an unrepresentative sample, there are other problems with the data. Degree of area coverage, site determination, chronological attribution, changes within a chronological phase and site extent (as well as their reciprocal influences) and a number of other features could not always be defined properly in the various reports[4]. Most importantly, there are still some 'black holes': EM III, MM III and LM II. Although sites attributed to EM III and MM III are mostly included in Figure 4.2, there can be no doubt that something was happening on the island in these respective 'Intermediate Phases' that still eludes us (see e.g. Watrous 1994; Haggis 1999). The resulting site curve, however, could look entirely different than the general impression provided by Figure 4.2, with serious drops during the 'black holes', followed immediately afterwards by a considerable upsurge.

There is another drawback, however, since most of the older surveys have concentrated on areas that seem peripheral to the development in the palatial centres. This is now being remedied with the Western Mesara and Malia surveys. The great unknown is the Knossos area: although the 'survey' by Hood (1958), and the updated Hood and Smyth (1981) version, can give us an idea about the general trend of the settlement proper, we desperately need information on the wider Knossos area before construction destroys all the evidence.

Given all these limitations, it is obvious that speculations on modes of regional integration will need to be properly scrutinized. Whatever their deficiencies, however, surveys remain the best way of obtaining a general idea about relative demographic changes, site trajectories and diachronic relationships between cities and countryside.

This is not the place to repeat the pros and cons of the unitary or peer polity model on Neopalatial Crete or, if you wish, the existence at one or more periods of a single integrated political system as opposed to a multitude of regional units (Cherry 1986; Driessen and Macdonald 1998; Schoep 1999). The present administrative organisation of the island is largely based on that of the Venetians who themselves took over the episcopal division of Late Roman times (Van Spitael 1981: 9; Bennet 1990: 205, fig. 4). It has to be admitted that the geography as well as the elongated shape of the island begs for such a division and, as Bennet (1990: 207) has noted, it is indeed singularly difficult to administer the island from a single capital except if this lies outside the island, such as Rome, Venice, Constantinople, Istanbul or Athens. Our contemporary (i.e. Bronze Age)

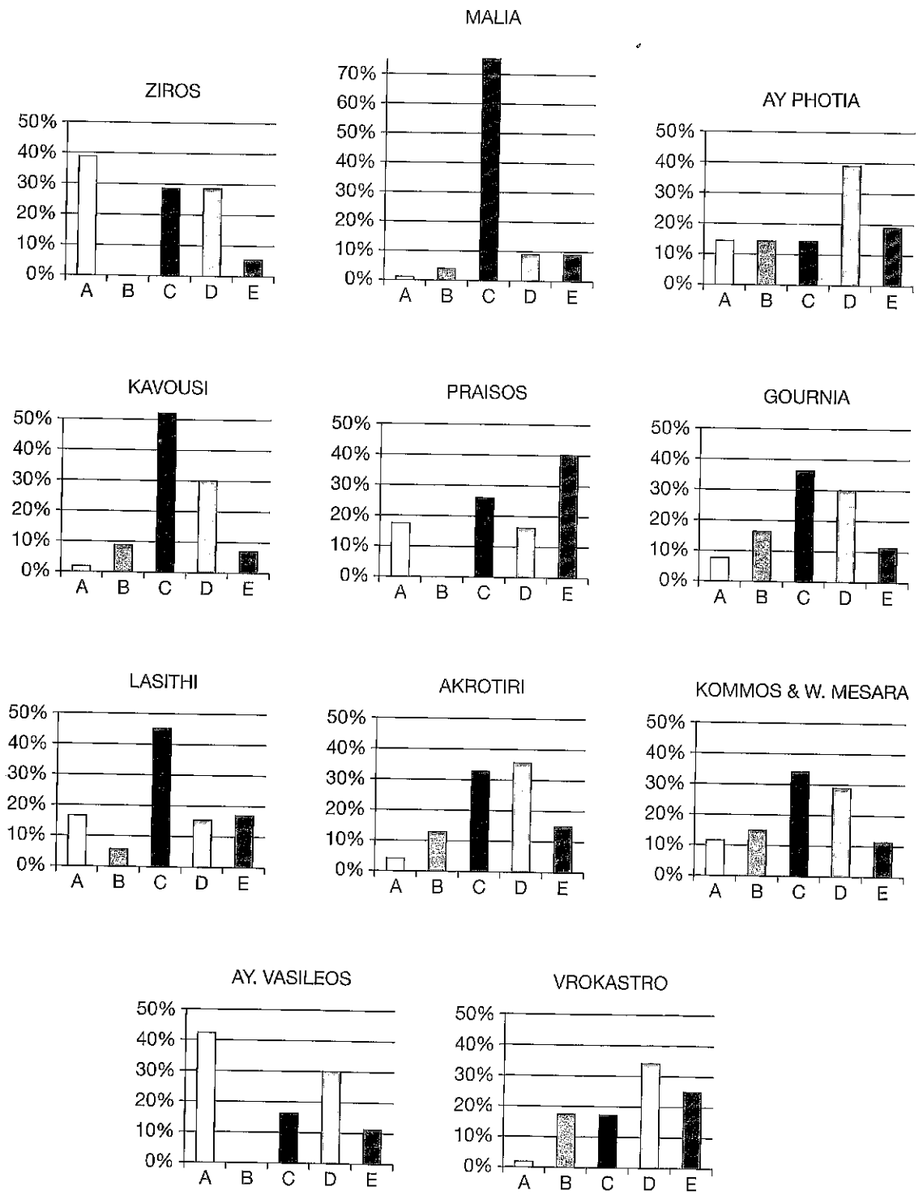


Figure 4.2 Crete: Settlement patterns from survey data. Column A = Neo/EMI. B = Prepalatial. C = Protopalatial. D = Neopalatial. E = Postpalatial.

written sources are not of much help either. Near Eastern archives mention the geographical circumscription of the people *Keftiu* or *Kaptara*, for example, which can be compared with words such as *Alashiya* or *Akhiyawa*. Only twice, the ruler of the *Keftiu* is explicitly mentioned and I have suggested that this may reflect a short period of political unification in LM II-IIIA1 (Driessen in press). I leave aside our Cretan documentary evidence since this has recently been assessed by Ilse Schoep (1999) who believes there is no conclusive evidence for an overall administrative apparatus, at least during LM IB, corroborating some of the ideas expressed in Driessen and Macdonald (1998). We are left with the rest of our material evidence and to see whether or not it reflects signs of integration. In the past, architecture seems to have provided the best indication (Driessen 1989) and indeed ashlar buildings obviously play a role in the reconstruction of the political landscape not only because of the elite message expressed by this feature of conspicuous consumption but also because they often repeat specific features of plan, design, construction and decoration (Driessen 1999: 122). Crete is fortunate in conserving a large sample of ashlar buildings that may be identified as public because of scale, plan, location and other features. Many of these are court-centred and we are used to dub them "palaces" although I prefer the term 'court-centred buildings'. These display a functional and stylistic consistency both in smaller and larger settlements. This could be an argument in favour of a single integrated system since other, so-called "archaic states" (Marcus and Feinman 1998: 4–5) show similarities between the paramount and subordinate centres, because the lower order centres would repeat, at a less grandiose scale, the functions exerted by the capital. Such a scenario would perhaps work for Crete but the many gaps in our evidence do not allow a clear-cut reconstruction. Zakros, for instance, has a larger court-centred building than Petras but both share other functions such as storage and administration. Does size matter and was Zakros a higher order centre than Petras? If so, what about Palaikastro, which has as yet not revealed such a central building but which in terms of the quality of urbanization surpasses both Zakros and Petras (Cunningham, this volume)? It is obvious that only new excavations and surveys can and will help to adjust this impression.

It may therefore be better to make a *tabula rasa* of all established ideas on Minoan state systems, largely a legacy of Sir Arthur Evans, and conduct a new exercise by looking at settlement distributions, their number and extent and this for a specific reason. The definition of the state, as correctly stressed by Flannery (1998: 15), should remain a task for anthropologists and political scientists but we can at least attempt to define its archaeological correlates (cf. Cherry 1986; 1987). One of the essential characteristics of a state, whether you call it pristine, early, archaic or whatever, is a variety of *levels* via which goods are mobilized towards the centre and thus a *spatial hierarchy* of settlement. 'Chiefdoms' are assumed to have two or a maximum of three levels, states at least four: cities, towns, large villages and small villages. Although somewhat artificial, it provides a handy tool for a first explanatory attempt. The more levels we can detect, the more developed and complex the hierarchy seems to have been. These are settlement hierarchies, however, and not administrative hierarchies which are much more difficult to detect archaeologically on the terrain than community sizes. There is a *caveat*, however. Certain archaeological data, as we have tried to suggest in the *Troubled Island* (Driessen and Macdonald 1998), can reflect sudden changes in political organization. Settlements and

architecture are much more static and will only be affected if the changes are really influencing social and political organization. Moreover, we should not expect a linear development. It should be proven and not assumed that a polity, once it achieves statehood, will remain static. The possibility should be left open that a polity can demote to a lower level of political development or be incorporated into a larger frame. I in fact suspect that some of the features that will be highlighted in this paper are a result of demotion, breakdown, incorporation, reintegration or upgrading of specific areas.

This said, it might be instructive to review some of the surveyed areas on Crete briefly. First, I illustrate how settlement *history* differs amongst the various regions and next I examine the presence of settlement *hierarchy* in the various sub-zones. To run ahead of my argument, I want to stress *spatial and temporal diversity of development* on the island, and I would like to think that the best way to explain this diversity is as a result of a varying impact of extra-regional stimuli. I have dubbed my paragraphs divergent trajectories and regional dynamics. I have not included a handful of surveys in this preliminary assessment because the nature of the publication or the original set-up of the survey does not allow an easy recovery of data. Absent are thus the surveys of the Sphakia area and the islands of Gavdos[15] and Pseira[16], as are the unpublished surveys of Nerokourou (French 1990: 80), the Pediadha and some others[17], the *Landbegehungen* in the Rethymnon area (Schiering 1982) and in the southeast of the island[18]. Apart from the data collected by Captain T.W. Spratt, A. Taramelli and F. Halbherr, I have also left aside the information collected during the explorations of Hood and co. in the sixties (Hood 1965; 1967; Hood & Warren 1966; Hood, Warren & Cadogan 1964), the individual site identifications by a score of Greek (esp. S. Marinatos, N. Platon, C. Davaras)[19] and foreign archaeologists (A.J. Evans [1896], J.D.S. Pendlebury [1939; Pendlebury *et al.* 1934], T. Wroncka [1959], P. Faure [e.g. 1956; 1958; 1960; 1962] and K. Nowicki [e.g. 1991; 1992]) or those collected by the Minoan Roads Project (Tzedakis *et al* 1989; 1990) and others. All sites located during these various explorations should, however, be included in any proper analysis and it is hoped that, when the Gazetteer of Bronze Age Sites on Crete finally sees the daylight, it will provide us with a better tool to proceed.

Divergent Trajectories

Renfrew (1972: 233, fig. 14.2), in the *Emergence of Civilisation*, argued for a continuous upward curve for Minoan settlement numbers from the Early Minoan up to the end of the Late Minoan IB period[20]. A preliminary count of the site numbers on Crete (total of 1061) given in Table 4.1, however, results in 88 Final Neolithic/Early Minoan I sites, 121 Prepalatial (+37.5%), 383 Protopalatial (+216%), 315 Neopalatial (-17.75%) and 154 Postpalatial sites (-51.11%), meaning that the curve already went down after the Protopalatial period[21].

This, of course, is just a general trend, a closer look at the different sub-zones results in a more even-handed picture. I briefly summarise the number of settlement sites known and their chronological attribution.

In the **Lasithi** plain, Watrous (1982) identified 15 FN/EM I sites. Only five, especially slightly larger, hilltop sites at the edge of the plain remain occupied during EM II-III but this number increases to about 40 during the Protopalatial period. This number plunges to about 15 in LM I and stays more or less the same in the next period, LM IIIA2-B, after a possible hiatus during LM II-IIIA1. The drop

in site numbers in the Neopalatial period is attributed to emigration to prosperous coastal centres (Watrous 1982: 15). The material from the Psychro Cave includes some LM II, which suggests that visitors arriving on the plateau must have been able to stay somewhere (Watrous 1996: 41, 52–53). During LM I-III, the main centre may have been at Plati. The identity in settlement numbers before and after the Middle Bronze Age is interesting, suggesting that this is the norm and that the Middle Minoan boom results from an external stimulus.

This inland area contrasts with coastal **Vrokastro** where Hayden, Moody and Rackham (1992) have surveyed an area of c. 50 km², which includes 13 ecological zones with site density largest in the coastal area and the river valleys up to the LM I period (Hayden, Moody and Rackham 1992, 317–318). They located only three FN/EM I sites but the number of sites increases to 24 during the Prepalatial period, a number which remains more or less the same afterwards during the Protopalatial period. Here the settlement boom occurs in the Neopalatial period when the number almost doubles to 46. After LM I, the settlement number drops a bit to 35 but still remains high.

Further along the coast, in the **Kavousi** area surveyed by D. Haggis (1996), the picture seems again somewhat different: in an area of about 50 km², Haggis located nine FN or EM sites with a drastic increase to about 60 during the Protopalatial period. In Neopalatial times, the overall site number drops slightly to c. 50 but afterwards the area is almost abandoned with only six sites showing some signs of reoccupation. 'Equally striking is the marked increase in settlement size and numbers in the subsequent LM IIIC and Protogeometric periods' (Haggis 1992: 408).

Three areas, three different settlement histories. It gets worse though.

The **Malia** survey, directed by Sylvie Müller, has found evidence for at least one Neolithic site and a handful of EM sites. The increase in the number of sites during the Protopalatial period to about 80 is staggering especially considering the subsequent drop in number during the Neopalatial (9+?) and Postpalatial periods. The survey covered 40 km² and in toto 87 sites were located (Müller 1996: 1236; 1998: 548, 552).

The surveys by Hope Simpson of the **Kommos** area (Shaw & Shaw 1995; Hope Simpson 1995) and by Watrous and Vallianou (1994) for the **Western Mesara**[22] fortunately seem to suggest a parallel settlement history. The Kommos survey covered an area of c. 17.5 km² and no other 'large' (i.e. more than 10.000 m²) settlement was found apart from Minoan Kommos and Roman Matala (Hope Simpson 1995: 326). The Western Mesara survey intensively covered 22 km² around Phaistos, a tiny fraction of the Mesara plain, which, with its 362 km², comprises two thirds of the best arable soil of the island. Both areas together contain about 18 FN/EM I sites and this number increases to about 30 in the Prepalatial period. The settlement number is highest during the Protopalatial period (at least 25 for the Western Mesara, 32 for the Kommos area). In the Neopalatial Period there is a small drop in both areas and a serious plunge during LM III with only half a dozen of sites remaining occupied in the Kommos area and slightly more in the Western Mesara.

Another recent survey, that of the **Ayios Vasilios** Valley by Moody, Peatfield and Markoulaki (1996: 95), succeeded in locating 88 Bronze Age sherd scatters (Tomlinson 1995: 64). There are about 15 FN/EM I sites. Surprisingly the area seems to have been basically abandoned afterwards up to the

Protopalatial Period when half a dozen sites were established, a number that doubled again in the Neopalatial Period.

Yet another, slightly different, picture resulted from the **Ayiofarango** survey by Blackman and Branigan (1977: 68–69): several FN/EM I sites with more in EM II – EM III but a decline during the Protopalatial Period and afterwards and the same was true on the coast nearby up to Kaloi Limenes (Blackman and Branigan 1975: 34–35). Moody's **Akrotiri** survey covered about 100 km² and identified about 245 sites. It also illustrates a continuous upward site curve with about 18 FN, 56 EM, 147 MM and 150 Neopalatial sites (Moody 1987; 1990; Moody, Rackham and Rapp 1996). Only afterwards a serious drop occurs to 76 sites in the LM III period.

A preliminary report of the **Gournia** survey mentions how an area of 24 km² was surveyed and 154 prehistoric sites were identified. Preliminary numbers give seven Prepalatial, 16 Protopalatial and 13 Neopalatial sites (Watrous 1992: 607–608; 1999; pers. comm.)[23], and, in recent paper, Betancourt (1999: Plate VIII.b) discusses material from three Final Neolithic/Early Minoan I sites.

The recently published **Ziros** survey found evidence for eight Final Neolithic sites after which the area was abandoned (Branigan 1996; 1998; 1999). It was again settled during the Protopalatial and Neopalatial periods with half a dozen sites after which it was again largely abandoned (one site remaining). The nearby **Praisos** area was also settled in the FN/EM I period (four sites) and also abandoned afterwards during the Prepalatial period (Whitley, Prent and Thorne 1999: 233, 257; Whitley 1998). The Protopalatial period is better represented than the Neopalatial period but especially during the Postpalatial phase, the area knew a boom in occupation sites.

The survey at **Petras** and **Ayia Photia** yielded two or three FN/EM I sites and a similar number afterwards during the Pre- and Protopalatial periods (Tsipopoulou 1990). Only during the Neopalatial period did the number slightly increase to half a dozen after which it was halved again. Finally, the **Itanos** survey in the north-eastern tip of the island, directed by A. Schnapp-Gourbeillon (A. Schnapp [pers. comm.]; Greco *et al* 1996; 1997; Kalpaxis *et al* 1995), has hitherto covered an area of c. 30 km²: they have found one Prepalatial site and about 20 Neopalatial ones but as yet there is very little evidence for a Protopalatial occupation of the area, an impression that reinforces our ideas about the Palaikastro countryside which seems only to have been used for extensive settlement from the Neopalatial period onwards (Driessen and MacGillivray 1989). We may conclude by referring to the results of the recently published 1998 season of the Kythera survey under direction of C. Broodbank (1999: 200–209) that covered an area of c. 13 km²: 7 Prepalatial and 4 Neopalatial sites were located but no Protopalatial and Postpalatial sites[24].

Of course, these numbers as such are not very meaningful since they can only be properly understood if the size of the settlements is also taken into account and processes of nucleation or dispersal. Some general comments are possible though. For a start, it is obvious that the main 'colonization' phase of the island is the **Final Neolithic** period when occupation begins in all sub-zones of the island, both in coastal and highland areas. This is the first floruit for the entire island (cf. Strasser 1992; Branigan 1999: 64)[25]. We may wonder whether this move inland is a result of population pressure or of factional competition in one or more of the larger Neolithic centres.

In any case, something must have happened in the course of the **Prepalatial** period

to set off the divergent trajectories that can be observed, from now onwards, in the various sub-zones of the island. Four, rather remote, inland areas (A. Vasilios, Lasithi, Ziros, Praisos) and perhaps even the Ayiofarango witness a serious drop in settlement numbers. This is, apart from in the Ayiofarango, not a result of nucleation, at least not within the same sub-zone itself. It may, however, be a result of the attraction which nearby coastal agricultural areas presented, especially those where palaces would be constructed in MM IB. In fact, it suggests already that larger centres were operational at this early stage, something confirmed by the existence of monumental buildings at various EM sites (Knossos, Malia, Palaikastro, etc.)[26].

During the **Protopalatial** period, the island again illustrates a combination of stagnation, boom and regression. Earlier abandoned or semi-abandoned inland areas are mostly recolonized, suggesting a serious pressure on agricultural land in the coastal zones. This is corroborated by the increase in settlement numbers in those coastal areas where palaces are established such as Phaistos, Malia, perhaps Khania and possibly Gournia. Other areas, and especially in the far east of the island (but also Kythera in the far west), do not follow this development and instead show a drop or stagnation in site numbers. When we first commented upon this feature, particularly where Protopalatial sites around Palaikastro were concerned (Driessen and MacGillivray 1989: 102), some authors (e.g. Dickinson 1994: 69 Haggis 1996: 393, n. 64) protested by calling attention to developments elsewhere on the island. I like to believe that our view is now substantiated by some of the other surveys in the area and that a divergent trajectory did indeed exist. Since Petras, Palaikastro and Zakros were flourishing settlements in the Protopalatial Period, it may well be that some kind of nucleation process took place in these regions and a similar process may have occurred on the island of Kythera (cf. Broodbank 1999: 212). The south-east of Crete, including the Praisos, Palaikastro, Ziros and Zakros areas, are very much characterized by the presence of a large number of small but almost cyclopean structures, situated at regular intervals along road-terraces that connect the different Protopalatial settlements (Tzedakis *et al* 1989: 60, fig. 20 and fig. 22; 1990). Moreover, the number of Protopalatial peak sanctuaries is much higher in the far east than anywhere else on the island: 11 against 12 elsewhere on the island (Nowicki 1991: fig. 7). How to explain this coincidence of anomalies is another matter but I will further on suggest that these features combined may explain the special nature of the far east of the island.

For the **Neopalatial** period, again the picture differs: a drop in settlement numbers occurs in Lasithi and the regions around Gournia, Kavousi and Malia as well as in the Western Mesara. Elsewhere, however, on Akrotiri, in the Vrokastro area, the Ay. Vasilios valley and in the east of the island, around Petras, Palaikastro and Itanos, the number of sites seems to rise slightly or considerably. We assume that this difference results from local environmental or geopolitical conditions and that another region positively gained some of the loss of one region, especially since the drop is obvious in areas in which court-centred buildings are situated. The great unknown here, yet again, is the Knossos area. The picture is very blurred after the LM IB destructions when many areas seem at least temporarily abandoned or sparsely inhabited. The reoccupation or recolonization after LM II is especially obvious in some inland areas as Lasithi and Praisos but some of the traditional agricultural coastal areas continue to be relatively densely occupied as shown at Malia, Vrokastro,

Akrotiri and Gournia. Other areas, however, are again basically abandoned such as Kavousi, the Ayiofarango and the Ziros area. Since some of these areas were also those that suffered mainly during the Early Minoan period, I assume that similar processes were at work.

Regional Dynamics

It may be instructive at this point to have a look at site hierarchy and this is where it gets tricky. The existence and the size of 'public' structures at some sites evidently manifest the presence of some kind of 'power' at these settlements (Driessen 1999). The size of these structures requires both a considerable population and a social cohesion and their mere existence implies an energy input and hence the presence of administrative personnel. Since many sites do reveal such buildings, it can reasonably be assumed that there were different levels of importance, i.e. a hierarchy of sites. Since we lack a sufficient number of excavated settlements within a single region[27], we are left with settlement sizes to detect different levels in spatial organization at a given time. In her Akrotiri account, Moody (1987) has suggested a four-tiered hierarchy but, following Near Eastern examples, I thought it useful to add a category of sites that are larger than 25 hectares. If we assume a density coefficient of 250 people per hectare (Hasan 1978; Postgate 1994; Whitelaw this volume), we have the five categories seen in Table 4.2.

The drawback here is that only very few of the published surveyed areas provide information on settlement extent and the exercise conducted here will need to be redone once all the information is published. Until then it is impossible to present proper rank-size distributions for the island or to examine how the number of sites varies in each hierarchical level with each chronological period in each region (cf. Cherry 1987). What follows are therefore simply some preliminary observations.

For the **Final Neolithic** period, our data are sparse but it appears that small, nucleated villages and isolated farms of Level 5 coexisted throughout the island aside from Knossos where, according to a recent study (Manning 1999: 471), a Level 3 settlement or town of 5 ha may already have existed in the Late Neolithic period. In view of the extent of the site during the Early Minoan period, this seems somewhat exaggerated but it is not impossible that the sheer size of Final Neolithic Knossos forced the migration of groups to other, not yet settled areas of the island, explaining the first wave of colonization alluded to above.

During the **Prepalatial** period, some regions witness the growth of larger, Level 4 settlements: Malia itself already had an extent of about 2.58 ha and recently another

Table 4.2 Hypothetical Site Hierarchy.

Level	Settlement Type	Size	Households	People
Level 1	Capital Town	25 ha or more	> 285	c. 6250 or more
Level 2	Large Town	7 to 24.9 ha	80 to 284	1750 or more
Level 3	Town	3.5 to 5 ha	40 to 50	875 or more
Level 4	Village	2.4 to 3.49 ha	28 to 38	600 or more.
Level 5a	Small village	1 to 2.3 ha		250 or more.
Level 5b	Hamlet	0.28 to 0.99 ha		70 or more
Level 5c	Single house/farm	< 0.2 ha		< 50

large site was identified a few kilometres east, near the Arkovouno hill (S. Müller in Blackman 1997: 109). Knossos is said to cover 4.84 ha (Whitelaw 1983: 339), Phaistos about 1.5 ha (Watrous *et al* 1993: 224) and Watrous' team has identified a series of small sites (campsites, hamlets) as well as 'the largest EM I-II settlement in the Isthmus of Hierapetra' at Halepa at the east end of the Pacheia Ammos bay which covers 2 ha (Tomlinson 1996: 45; *BCH* 120 (1996): 1234–1235; L.V. Watrous pers. comm.). Blackman and Branigan (1977: 69) discovered a 3.25 ha site in the Ayiofarango, 'possibly the largest Early Minoan settlement yet known'. In some areas, we seem to have a two- or three-tiered hierarchy which people tend to equate with 'chiefdoms', ranked societies in which chiefly families played a considerable role. I think it is very likely that at least Knossos and Malia, but most likely other places too, may already have developed further at this point but this needs more archaeological corroboration. Malia at least already seems to have some kind of central building and the same is probably true for Knossos and Palaikastro (MacGillivray and Driessen 1990: 399; Schoep 1999a).

This, still limited, hierarchy heralds what happens next in these areas since both the site number and site extent show a massive increase in the **Protopalatial** period. Indeed, the data make it clear that some regions such as that of the Akrotiri with the site of Khania (7.64 ha) and the Western Mesara with the site of Phaistos (15 ha) (Watrous *et al* 1993: 225) achieved a four-tiered hierarchy starting with Level 2 sites. The Malia and Knossos areas, on the other hand, may already have known a five-tiered hierarchy since both evidence Level 1 settlements of more than 25 ha since 45 ha for Knossos and 60 ha for Malia have been claimed (Whitelaw 1983: 339; Hood and Smyth 1981; Müller 1997: 52)[28]. In the case of Malia, it can be argued that the site grew through the incorporation of a population that was initially established elsewhere on the plain (Arkovouno ?) or in the hinterland. Malia, at present, seems to have been the largest Protopalatial polity of the island, which is amply illustrated by the score of public buildings at the site (e.g. Poursat 1987). As shown by Sylvie Müller (1996; 1997), the secondary settlements of this period are located in three, almost concentric circles around the city. The success of Knossos is more difficult to explain, again because of the lack of surveys in its hinterland. In contrast to these areas, some other regions such as Lasithi, Kavousi, Vrokastro and East Crete have failed to provide evidence for a developed hierarchy in this particular period. Other zones, as mentioned, were largely abandoned during this phase. This seems to suggest that these areas remained outside of the territories administered by the First Palaces and hence outside the mainstream development (Cadogan 1990; 1995; Haggis 1996: 424; Knappett 1999; Knappett and Schoep 2000). A fourth trajectory seems illustrated by the far east of the island (Figure 4.3): there is evidence for at least three Level 2 (if not Level 1) sites during the Protopalatial period, Petras, Zakros and Palaikastro, but as yet little evidence for the presence of sites that stood on a lower hierarchical step apart from a very large number of Level 5c sites (Branigan 1972; Driessen and MacGillivray 1989; Tsipopoulou 1995; 1996; Tsipopoulou and Papacostopoulou 1997). Road stations and peak sanctuaries form the latter, at the lowest level. Nucleation appears to have been the rule here, and, although I use the concept hesitantly and anachronistically, the east Cretan towns may have been some kind of city-states 'avant la lettre'. If correct, city and countryside may have been entirely integrated, perhaps in an *achoritic*

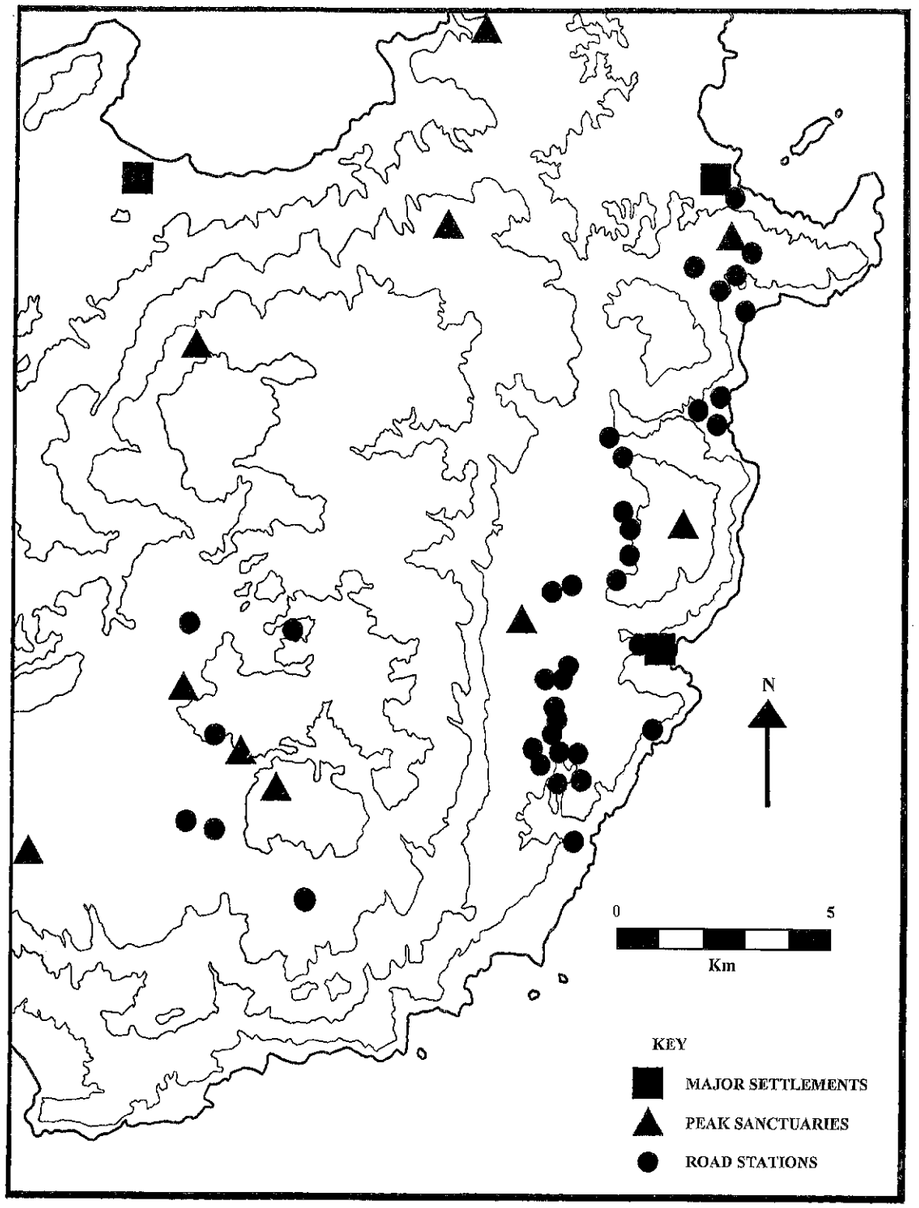


Figure 4.3 East-Crete: main settlements

system, where farmers lived in town and not on farms. Such societies seem to have been very much kinship based[29]. This achoritic system should then be considered against the background of the mentioned 'watchtowers' and the presence of a high number of peak-sanctuaries. There is obviously a great cultural uniformity at play here in the Protopalatial period and I wonder whether the peak sanctuaries formed discrete but obvious boundaries between the different components of some kind of confederacy, linked via a road system.

The Gournia area, on the other hand, may also have had a three or four-tiered hierarchy during the Protopalatial period and its main settlement is now thought to have had an extent of about 21 ha[30]. There is as yet no proof that it attracted settlers from the rest of the Mirabello area where the site numbers increase or stay the same and no hierarchy develops. Gournia indeed may well have been a mini-state.

For the **Neopalatial** period, there is an islandwide establishment of small Level 5 sites, usually identified as farmsteads or, when there is obvious architectural elaboration, as 'villas' (Hägg 1997). At the same time, I have the impression that some settlements grow in size whereas some intermediate sites disappear. In other words, the five-or four-tiered hierarchy broke down into a three-tiered one. When such a process happens elsewhere in the ancient world, it usually suggests *incorporation* into a larger framework. Could this be happening on Crete? Some of the regions show an obvious, overall reduction in settlement numbers and a reduction in the extent of the main settlement during LM I. These same areas see an increase in higher order centres (e.g. the Phaistos-Ayia Triadha-Kommos triangle [Shaw and Shaw 1985]). This is especially clear for the Malia and Phaistos areas, for example. All hypotheses, however, depend on the position of Knossos and it would be interesting to know precisely what is happening in its hinterland during this phase and what its relations were with the major settlements at Tylissos, Archanes, Amnisos and Galatas. The *Knossos Survey* (Hood and Smyth 1981: 10; Warren 1994: 209) suggests an intensively settled area of 75 ha during the Neopalatial period[31], which, if we accept a density coefficient of 250 people per hectare, represents an increase for the city from the Protopalatial to the Neopalatial period from 11,250 to about 18,750 people. The decline of the Malia and Phaistos polities – both with smaller palaces and surrounding settlements than in the Protopalatial period – with an accompanying loss of integration in their respective hinterlands may then suggest that Knossos, which boomed in this period, had effectively taken the lead and that those sites that were situated nearby had been demoted into some kind of provinces, to all intents and purposes under control of Knossos. If so, the Malia and Phaistos court-centred buildings would really represent smaller, subordinate versions of the capital's 'paramount palace'[32]. If this hypothesis is acceptable, it follows that, at least during LM IA, Knossos was in charge over the entire central Cretan area. It thus acted as a real 'central place'[33], with a well-integrated hierarchy in which the Level 2 towns (Phaistos, Malia, Ayia Triadha, Kommos, Tylissos, Archanes[34], Galatas[35], Plati[36] etc.) would in turn be encircled by Level 3 satellite settlements at regular and shorter distances, in this case Vathypetro, Khannia-Mitropolis, Pitsidia, Milatos etc. Myrtos-Pyrgos would, still following this reconstruction, represent some kind of boundary station for the Knossos state in LM IA, explaining its architectural elaboration with obvious Knossian features as I have discussed on another occasion (Driessen 1989: 21).

Elsewhere, especially in the far east and west of the island, we can observe that the Neopalatial settlements not only outgrow their Protopalatial predecessors but these regions also illustrate an increase of site numbers and a more developed hierarchy. In fact, they seem to reflect a situation similar to that of the main polities during the Protopalatial period and those in the far east may only now have crossed the early state threshold, illustrating some kind of secondary state formation. Some areas, such as those around Gournia, Kavousi and Vrokastro and in the Lasithi, show a reduction in the number of Neopalatial settlements but a more developed site hierarchy and obvious signs for nucleation in one or two larger settlements. It is at this point, for instance, that several Protopalatial settlements along the north coast of Mirabello were abandoned and we may assume that the Gournia polity integrated several areas[37], perhaps as a reaction against pressure from the west (the Knossos state). Plati too may well have taken control over the Lasithi plain. As far as this evidence is concerned, I do not think it is sufficient to suggest incorporation by Knossos.

During the **LM IIIA** period, there are initially rather few larger settlements left on the island and isolated farms and hamlets are also rare. The absence of a complex local hierarchy may then suggest that Knossos was indeed, for some time, in overall control of the island, with a more developed supra-regional hierarchy. The progressive establishment of more settlements on different levels illustrates, however, that within the LM IIIA-B period, the political situation also changed, opening the possibility that this Knossos state disintegrated in different political units (cf. Bennet 1985; 1987; 1990).

Preliminary Conclusions

Site numbers and sizes do not suffice to reconstruct a persuasive political geography and ideally, this preliminary outline of settlement history and hierarchy should be substantiated with other archaeological data, especially those related to the presence of high status artefacts, elaborate architecture and documentary information. Moreover, it must be verified with the settlement history of some major sites such as Knossos, Malia and Palaikastro. Further, we should try to establish whether areas with nucleated settlement patterns show traces of increased urbanization and from what moment onwards 'central places' with their hierarchical site arrangement but without signs of urbanization form a feature of the Cretan landscape. What we first need, however, are proper intensive surveys of the Knossos, Palaikastro and Zakros hinterlands to try out the validity of the hypotheses presented here.

What is clear, however, from this first analysis, is that different trajectories were being followed on the island and this from a very early moment onwards. The evidence further seems to suggest that already during the Early Bronze Age regional powers existed in some areas of the island and that these attracted people from outlying areas. The resulting demographic stress in the core settlement may subsequently have led to the incorporation of outlying areas, if only to ensure the supply of agricultural produce to the centre. Territorial claims may have led to conflict at the end of the MM II period. Elsewhere on the island, both some sort of 'city-states' and more conservative kin-based systems may have been the rule for quite a long time. Afterwards, during MM III and LM IA, it appears that some of the different, large, comparatively well integrated polities that existed during the Middle Bronze Age in central Crete were incorporated into a larger political framework and a territorial state headed by Knossos. Elsewhere on the island we may only now witness the development of pristine states.

A final note of warning, however. The regional dynamics and different trajectories that can be observed make me wonder whether, where Minoan Crete is concerned, we are not trapped into established theoretical models and definitions of political and territorial organisation. The scarcity of fortification systems, an absence of an overt royal iconography and the difficulty of tying in the Cretan situation to territorial organizations known from the Bronze Age Mediterranean, leaves me frustrated. Taken together, it may imply that Crete, because of its insularity, had developed a different type of territorial organization, perhaps largely ritually motivated, which reduced intra-insular tension.

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*To Paul Faure, great explorer of Crete and great-grandfather of Danae.

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Notes

1. D. Haggis (pers. comm.) reminded me that the area between 400 and 800 m is still largely unknown but may eventually prove to be an important ecozone as shown by a highland site such as Zominthos on the way to the Idaean Cave and the defensible and pastoral sites identified e.g. by Faure 1962 and Nowicki 1991; 1992.
2. One site in the Madhares area was even found at +1810–1840 m (L. Nixon in French 1993: 81); D. Haggis (pers. comm.) located a 2+ ha Protopalatial site at +600 in the Triphti mountains whereas the Malia survey found a protopalatial site at +801 m between Malia and Mochos ('peut-être les traces d'un bivouac de bergers', Müller 1991: 749).
3. I admit having 'fudged' some of the numerical data where not obtainable: if a 'dozen' sites were mentioned, I have taken this to represent '12'; when the site number is then said to be 'halved' I assume this to mean '6'. Likewise, when a 'couple' of sites are mentioned, this is interpreted as '2'. All numbers are, of course, provisional and conditional. At the Knossos conference held in Heraklion in November 2000, Nikos and Marina Panagiotakis presented the first result of a survey carried out in the Pediada, covering about 800 km² in which about 125 Protopalatial and 230 Neopalatial sites were discovered. I thank Mr. Panagiotakis for his permission to mention this work. Once published, the results will add greatly to our understanding of the hinterland of Knossos.
4. For other problems, methodologies etc. of Cretan surveys, see Soetens and Gkiasta (in press).
5. Moody 1987: chapter 6; I have used her numbers for occupation and sacred sites.
6. L.V. Watrous (pers. comm.).
7. Data based on personal communication with A. Schnapp and preliminary reports (Greco *et al.* 1996; 1997; Kalpaxis et alii 1995).
8. Numbers of occupation sites based on the maps published in Watrous 1982.
9. Precise number not clear from the publication (Whitley, Prent and Thorne 1999).
10. P.P. Betancourt (pers. comm.).
11. Numbers based on maps published in Hayden, Moody and Rackham 1992; since the three chronological groups given are EM-MM II, MM III-LMI and LM I/III-EIA, I have counted the number of Pre-and Protopalatial sites twice.
12. Watrous *et al.* 1993, 225–228 mention 'a handful of sites', 'this number doubles', etc. so the given numbers only reflect a general trend.
13. Incidentally, this gives a site density of about 1 site per 13.5 km² in the Final Neolithic period, 1 per 9.61 km²

during the Prepalatial period, 1 per 3.35 km² in the Protopalatial period, 1 per 4 km² in the Neopalatial period and 1 per 7.77 km² in the Postpalatial period.

14. Moody, Nixon, Price and Rackham 1989: 88. The Sphakia survey attempted to cover c. 470 km² but it is not entirely clear whether the entire region was explored intensively. After the 1987 and 1989 seasons, 15 km² had been explored and 34 prehistoric sites identified. Nixon (in French 1993, 81) reports that all in all 218 sites were discovered but no chronological attributions have as yet been presented that can be used for statistical analyses; see also Nixon 1996; Nixon, Moody, Price, Rackham and Niniou-Kindeli 1990; J. Moody and L. Nixon in French 1990: 81–82.

15. Although very few Minoan sites seem to have been identified, there is good evidence for Middle Minoan occupation (Kopaka 1996: 70)

16. There is an abstract on the survey and some ideas on landuse but no mention is made of the chronological attribution of the sites (Betancourt and Hope Simpson 1992; Hope Simpson and Betancourt 1990). For the Chrysokamino survey, see *BCH* 120: 3 (1996), 1324. P.P. Betancourt (pers. comm.) mentions the discovery of 300 sites on the island of Pseira (1.75 km²): 'the island is first settled in the Final Neolithic. Its main period of use is LM I'. The Chrysokamino survey was included in the Kavousi survey (see below) but was even more intensive and managed to locate 40 sites (1 km²).

17. The area around Achladia seems to have been examined in detail (Tsipopoulou 1995) and a survey in the Nerokourou area is mentioned in French 1990: 80; apparently surveys have also taken place in the areas around Thronos/Sybrita (Rochetti 1994), Monastiraki and Eleftherna.

18. See especially Schlager 1987, 1991 and 1997 and Blackman 1997: 117–118. Recent reports mention the discovery of 44 Minoan and later sites in the communities of Ziros and Agia Triada but no information on their size or chronological attribution is as yet available.

19. See the annual reports in *Archäologischer Anzeiger* before World War II and those in *Praktika tis Archeologikis Heterias* and *Archeologikon Deltion* afterwards.

20. A similar stand is taken for the Vrokastro area by Hayden, Moody and Rackham 1992: 335: 'Activity gradually increased throughout the Bronze Age to culminate in the LM I period; during LM III, the absolute numbers of sites decreased and the nucleation of settlement began'.

21. Compare with Renfrew 1972: 232, Table 14.III where a total of 379 sites is considered (42 Neolithic, 111 Prepalatial, 190 Protopalatial and 284 Neopalatial).

22. For a long time, the eastern Mesara has remained *terra incognita*. This seems now gradually changing with new and exciting discoveries by the *ephoreia* as mentioned by P.M. Warren at the Knossos 2000 conference in Heraklion.

23. See also the reports in *BCH* 117 (1993): 886; 118 (1994): 815; 119 (1995): 1020; 120 (1996): 1324–1325 and *AR 39 for 1992–93*: 73, *AR 40 for 1993–94*: 81; *AR 41 for 1994–95*: 65 and *AR 42 for 1995–96*: 45.

24. C. Broodbank (pers. comm.) reported that during the 2000 campaign this picture was somewhat rectified with the discovery of two or three Protopalatial sites, one of which very large, and many more Neopalatial sites.

25. See also Warren 1984 for internal and external colonization for reasons of demographic pressure in later Minoan periods.

26. For other processes at work during the Prepalatial period, see especially Dabney 1989, Dabney and Wright 1990 and Haggis (in press).

27. The Knossos region, for instance, comprises a high number of high-class sites including Archanes, Vathypetro, Tylissos, Amnisos etc, but without surface exploration it is extremely difficult to attribute a hierarchy to this collection. It is hoped that the Pediada survey will rectify this situation.

28. O. Pelon, J.-C. Poursat and R. Treuil in *Aerial Atlas*, 176, assume the Malia settlement to have covered 80 ha but this seems to have been an educated guess before Müller's survey took place.

29. Compare with Crumley 1995: 29, who distinguishes between *synchoritic* settlements (where the population of the centre is supported by the surplus produced by a rural population), *achoritic* settlements (like the Greek poleis) and *epichoritic* settlements where the centres are all but deserted except for a few specialists but the outlying area supports a sizeable rural population.

30. According to Watrous 1992: 608, Gournia measured 700 × 300 m at its prime although Watrous 1999: 906, talks only about 4 ha. and 400 to 1200 inhabitants. The *Aerial Atlas*, 104, gives 2.5 ha excavated area (with the palace measuring c. 50 × 37 m, the court 40 × 15 m). L.V. Watrous (pers. comm.) mentions that many protopalatial sites were found, a few of which are village sized.

31. We may wonder to what degree the size of the central building reflects the size of the settlement: Knossos palace measures 13,000 m², Malia c. 9,350 m², Phaistos c. 6,000 m², Zakros about 3,000 m² and Kommos c. 4,500 m²) (cf. Shaw and Shaw 1993: 186, n. 151). Other authors give different sizes e.g. Knossos palace and surroundings 4 ha (Cadogan in *Aerial Atlas*, 129), Malia palace 8.900 m² (*Aerial Atlas*, 176), Zakros palace c. 8000 m² (*Aerial Atlas*,: 298). Sakellarakis and Sakellarakis 1998: 77 assume a palace at Archanes of 14,000 m² but this seems slightly exaggerated; see especially Wiener 1990 for settlement sizes.

32. And this may then also apply to Galatas. Compare with Warren 1985: 79, who reconstructed a Knossos polity with a territory of c. 1000 ha.; moreover, since he calculates a population of 17,000, the site needs a considerable catchment area.

33. 'This is a term for an administrative hierarchy so well integrated that Tier 2 towns encircle the Tier 1 city at very regular distances; in turn, Tier 3 settlements encircle Tier 2 settlements at regular (and shorter) distances' (Flannery 1998: 18).

34. Sakellarakis and Sakellarakis (1998: 139) argue for a very large settlement with another one at Vitsila, measuring 18 km² – surely this should be 18 ha.

35. Approximate size: 7 ha (cf. *BCH* 120 (1996): 1332).

36. Watrous (1982: 15) suggests a settlement on two hills of c. 2 ha.

37. Watrous (1999: 908) believes that the abandonment in the Gournia area only happened at the time of the Santorini eruption. Hayden, Moody and Rackham (1992: 335) assume that the Vrokastro area formed part of the Gournia polity during the entire Minoan Palace period. Unfortunately, the site numbers given for the Vrokastro area are difficult to use because of the chronological attribution in two groups (MM III/LM I and LM I/III).

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