Between the Mountains and the Sea: Landscapes of Settlement, Subsistence and Funerary Practice in Later Bronze Age and Iron Age Crete

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Declaration

I, Dominic Pollard, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis presents a study of Late Bronze Age (LBA) and Early Iron Age (EIA) Crete – from the Late Minoan II to early Archaic periods – and specifically the settlement systems, agricultural regimes, and mortuary practices which characterised the transition from the palace-centred, 'Minoan' society, through a period of political and economic fragmentation, to the emergence of the small, numerous city-states of the Greek era. Research on these periods has traditionally been divided amongst quite distinct scholarly traditions. This thesis seeks to transcend these disciplinary boundaries by focussing on types of evidence well represented across the entire timeframe, and by employing methods so far underutilised in their study. Firstly, with a database of known habitation sites, along with digitised intensive surveys of several subregions, this thesis presents an analysis of the environmental correlates and spatial relationships of human settlement, and the networks of visibility, movement and interaction which, it is suggested, underpinned the long-term evolution of Crete's LBA and EIA communities. Secondly, drawing on these same datasets, and ethno- and bio-archaeological studies of ancient agriculture, developments in the demography and subsistence practices of LBA and EIA Crete are examined. Thirdly, with a database of published and reported tombs from the periods under investigation, this thesis undertakes a spatial and quantitative analysis of mortuary practices and assemblages across the island. Finally, these analyses are integrated into an historical synthesis, based on diverse strands of evidence, including law codes, historical sources, and settlement and cult assemblages. This thesis argues that a focus on changes in the networks of movement and interaction which developed at multiple scales interconnecting communities of the LBA and EIA – at all times rooted in the affordances of the Cretan landscape – offers a fruitful, dynamic means of bridging the traditionally perceived disjuncture between the final palaces and the later city-states.

Impact Statement

The contributions of this thesis can be grouped into three main areas: disciplinary approaches, methods of analysis, and data collection and sharing. Firstly, this thesis offers an account of the Late Bronze Age (LBA) and Early Iron Age (EIA) of Crete which transcends traditional disciplinary boundaries, and so contributes towards current efforts to reconcile the formerly disparate traditions of prehistoric and classical archaeology in the Aegean. By bringing a broad historical timeframe within the purview of a single study, it demonstrates the value of applying a consistent theoretical framework to the archaeological evidence of periods traditionally studied and published separately. In doing so, this thesis contributes to our understanding of a significant and complex period of Mediterranean history, and may inform and provide comparisons for other research focussing on similar regional and historical contexts.

This thesis also makes several methodological contributions to the study of the LBA and EIA Aegean. Spatial and quantitative analyses of archaeological sites and assemblages remain relatively rare for these periods, and this study demonstrates their utility for understanding settlement patterning, subsistence regimes, and funerary practice over multiple scales. These themes have been investigated previously, but in analysing the spatial and environmental correlates of settlement, modelling agricultural catchments and estimating demographic trends, simulating communication routes across the landscape, and quantifying changes in mortuary assemblages through time, this thesis introduces new means of defining and developing our understanding of the synchronic and diachronic variations in these aspects of social practice. These and similar methods may be taken up in future studies, both within the field of Aegean prehistoric and historic archaeology, and more widely. The focus of these analyses on the diversity of human responses to the Mediterranean landscape, may also have relevance for research seeking long-term perspectives on this region, for the Mediterranean remains characterised by great variability in ways of life, increasingly subject to significant environmental challenges, to which responses still include local and regional interaction, and mobility at various scales.

Finally, this thesis involved the production of substantial datasets to facilitate the analyses undertaken. Two databases – one concerning settlements, and the other cemeteries, tombs, and

burial assemblages – were created, and will be made available online, providing access for those within and outside the field to a wide range of data concerning LBA-EIA Crete. These data could support a range of future analyses, as well as providing comparanda for those working in other regions or related disciplines.

The research undertaken for this thesis has led to the publication of two articles, in the peer-reviewed *Journal of Anthropological Archaeology*, and in the proceedings of the Cambridge University Annual Student Archaeology conference. In line with the commitment to data-sharing, the full dataset and code for first of these articles was made freely available at publication. Findings of the research have also been shared in six conference and workshop presentations, including as an invited speaker, and future publications are planned, based on the wide range of data and analyses developed for the thesis.

Acknowledgments

There are a great many people without whose help, guidance, support, insight, or encouragement, this thesis would be but a pale reflection of its present form. My thanks must go, first and foremost, to my supervisors, Todd Whitelaw and Corinna Riva. Both have served as invaluable guides, mentors and constructive critics for my work, and I am greatly indebted to them for the care and dedication with which they have supported my research, my writing, and the next steps I have looked to take in academia. Prof. Whitelaw also introduced me to the LBA-EIA-Classical ceramics of Knossos, which has greatly aided my understanding of the published Knossian material.

At the IoA, I have benefitted hugely from conversations with, and advice from, Borja Legarra Herrero, Andy Bevan, Kevin MacDonald and Corisande Fenwick. I owe a debt to Christine Spencer for sharing data with me, Anna Bloxam for introducing me to aoristic analysis, and Giacomo Fontana for helping me out with Python and getting my code to work. Thanks also to Panos, Victoria, Anna, Hannah, Ivana, Lousia, Barney, Laurence, Giacomo and the other denizens of G7B, for making time spent in the office endlessly enjoyable, if not always endlessly productive.

I have had many fruitful conversations and correspondences, that have informed my thinking on LBA, EIA and Archaic Crete, as well as the wider ancient Mediterranean, with Grace Erny, Jesse Obert, Rafael Laoutari, Sarah Murray, Carl Knappett, James Whitley, Antonis Kotsonas, Brice Erickson, Paula Perlman, Giovanni Marginesu, Natalia Vogeikoff-Brogan, David Lewis, Florence-Gaignerot Driessen, Vassilis Petrakis, Michael Loy, and Cyprian Broodbank. I thank Kostis Christakis and the BSA team for their help and support during my various stints at Knossos, and Catharine Judson for sharing her site database with me. Thanks also to Peter Mitchell, for having remained a mentor, advocate and source of wisdom long after he ceased being my tutor.

I am immensely grateful to the support of my friends, especially during recent months when I have not always been the most enjoyable company. Percy, Molly, Laurence, Anna, Sam, Tilly, Joe, Sophia, Will, Mike, Paddy, Alec – I owe you all a drink, and a big thank you. My family has been a constant, grounding presence throughout, and I can't imagine feeling more supported. Thank you all. Finally, I want to thank Em, who is my rock, and the standard I try (and fail) to hold myself to in all things. I couldn't have done this without you.

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Abbreviations

The following works are referred to in abbreviated forms within in-text citations:

FGrH	JACOBY, F. 1923-58. *Die Fragmente Der Griechischen Historiker*. Berlin and Leiden: Brill.
IC I	GUARDUCCI, MARGHERITA. 1935. *Inscriptiones Creticae I: Tituli Cretae Mediae Praeter Gortynios*. Rome: La Libreria dello stato.
IC IV	GUARDUCCI, M.. 1950. *Inscriptiones Creticae IV: Titulae Gortynii*. Rome: La Libreria dello stato.

The referencing of Archaic Cretan legal inscriptions follows the nomenclature of Gagarin and Perlman (2016, x-xi), with the relevant codes highlighted in bold, e.g. **G72** for the Great Code of Gortyn, or **Dr1** for the earliest inscription from Dreros.

The following chronological abbreviations are used throughout:

BA	Bronze Age	PG	Protogeometric
IA	Iron Age	G	Geometric
EM	Early Minoan	PA	Protoarchaic
MM	Middle Minoan	A	Archaic
LM	Late Minoan	CL	Classical
SM	Subminoan	HL	Hellenistic

The letters E, M, and L are used to refer to Early, Middle and Late phases, as in EIA (Early Iron Age), MPG (Middle Protogeometric), or LBA (Late Bronze Age).

Chapter 1

Introduction

This thesis presents a study of the Late Bronze Age (LBA) and Early Iron Age (EIA) of Crete, here defined as the period of the final Bronze Age (BA) palaces, through to that of the early Archaic *poleis* or city-states, and specifically between c.1460 and c.575 BCE. This timeframe encompasses a significant series of developments in the spatial distribution, material culture, and social practices of communities across Crete, and is bracketed by two ostensibly very different forms of political organisation. The Linear B tablets recovered from Knossos suggest that the final palace exerted administrative control over some two-thirds of the island, with its bureaucratic operations orientated towards the stimulation of certain kinds of economic activity, the mobilisation of resources to supply palatial officials, craftspeople and dependants, and the provisioning of large-scale feasts and religious ceremonies (Killen 1985; 2008; Halstead 1993; 2007; Bendall 2007; Nakassis et al. 2011). The palace was an institution with significant power and reach, but which also delegated many aspects of taxation, storage and production to secondary centres and individuals across its large territory (Bennet 1985; 2017). By contrast, the 49 historically attested Archaic-Classical city-states that have been archaeologically identified cannot have had territories typically exceeding 170km^2 (Whitley 2020, 164–65; see Perlman 2004a), nor populations regularly above the low thousands, especially in the Archaic period. The legal inscriptions which have been recovered from 10 of these polities document a very different set of concerns to the Linear B tablets, including restrictions on the holding of political office, regulations around property, adoption and inheritance, penalties for misdemeanours, and terms of employment for individuals providing services for the state (Gagarin and Perlman 2016; Lewis 2021).

Much of the dissimilarity between the organisation of the final palace and the later *poleis* may be traceable to the major political disruptions at the close of the BA in the Eastern Mediterranean (Dickinson 2010; Cline 2014; Knapp and Manning 2016; Middleton 2020), which on Crete

involved the collapse of literate administration – first at Knossos and later at a possible second palatial centre at Khania – and a significant reorientation of settlement towards inland, elevated, and defensible locations (Nowicki 2000), perhaps also accompanied by the arrival of new population elements (e.g. Kanta and Kontopodi 2011; D'Agata et al. 2012; Hitchcock and Maeir 2019). The communities which developed in subsequent centuries, even where argued to demonstrate a strong degree of resilience and cooperation in the face of these changes (Wallace 2010), apparently retained few political or social structures from the preceding palatial era.

On the other hand, various forms of behavioural, iconographic, and cultural continuity have been observed or proposed across the centuries separating the final palaces from the later *poleis*. These include a continuously developing ceramic tradition (e.g. Coldstream 2001; Tsipopoulou 2005b; Hatzaki 2007), recurrent symbols and locations of religious worship (Prent 2005; 2009), enduring knowledge of certain crafts and technologies (Eder and Lemos 2020, 136–37; Matthäus and Vonhoff 2020; Nosch 2020), and a range of fundamental subsistence practices (Foxhall 1995; Palmer 2001; Zurbach 2017). In defiance of earlier scholarly traditions, wherein the BA and historical periods were studied largely independently (Renfrew 1980) – and the intervening EIA poorly integrated into either tradition (Morris 1997; Kotsonas 2016) – it is increasingly recognised that the formation of the Archaic *poleis* cannot be fully appreciated without an understanding of the way that identities, beliefs, technologies and principles of social organisation were shaped by the structures of LBA palatial governance, their subsequent collapse, and the evolution of the enduring communities of EIA Greece (Zurbach 2016; Nakassis 2020; Eder and Lemos 2020).

The present thesis positions itself with this trend of rapprochement between the scholarly traditions of archaeological research on LBA, EIA and Archaic Greece (Kotsonas 2020, 84–90). The goal of this thesis is to outline an approach to the archaeological record of the period that permits a continuous and dynamic characterisation of historical change, and integrates traditionally distinct research agendas, scholarly debates, and methodologies. There are three primary motivations for the present study. The first is that, though recent publications on the Cretan EIA have considered the transition from the final LBA (Nowicki 2000; Wallace 2010; Lefèvre-Novaro 2014; Gaignerot-Driessen 2016a), studies incorporating both the Final Palatial and early *polis* periods in a comparative frame remain rare. Recent monographs (Zurbach 2017) and edited

volumes (Lemos and Kotsonas 2020), have asserted the value of such cross-disciplinary approaches for understanding the LBA-EIA Greek world, as well as the vital role of archaeology in illuminating the early historical period (see papers in Haggis and Antonaccio 2015). The present study aims to bring such perspectives to bear in a specifically Cretan context.

Secondly, despite their distinct traditions, archaeological research on the LBA and EIA has produced datasets with reasonable continuity and comparability, yet these remain largely unintegrated. This thesis aims to address this by specifically collating datasets spanning the full chronological range from Late Minoan (LM) II-Archaic (A) Crete, and analysing them collectively through a coherent theoretical and methodological framework. These datasets comprise, on the one hand, a database of known habitation sites, along with digitised intensive surveys of several subregions, and on the other a database of published and reported tombs and their assemblages. These, in turn, are marshalled to address three key themes, namely settlement patterning, subsistence and demography, and mortuary practice. These data and themes were chosen for both theoretical and practical reasons. Several catalogues covering settlements and tombs are available for the periods under investigation (see Chapter 2), as are a number of published surveys. But these themes have also formed foci of discussion for both LBA and EIA Crete[1], though the relevant data have seldom been considered comparatively across both periods.

Thirdly, this thesis seeks to provide a fresh perspective on the social developments of the LBA and EIA by employing modes of analysis so far under-utilised in research on the period. In particular, inspiration is drawn from studies utilising spatial and quantitative datasets to trace long-term developments in human settlement, organisation and practice (e.g. Bevan and Conolly 2013; Murray 2017; Spencer and Bevan 2018; Whitelaw 2018). Murray (2017), for instance, has demonstrated the potential for quantitative data of broad spatial and chronological scope, to illuminate long-term changes in the Aegean economy from the Final Palatial to Geometric periods.

[1] On settlement patterning and (implications for social organisation), see e.g. Haggis (1993), Bennet (1995), Nowicki (2000), Borgna (2003b), Sjögren (2003), Wallace (2010), and Whitelaw (2017). On subsistence, agricultural economy and demography, see e.g. Halstead (1993; 2007), Foxhall (1995), Nowicki (1999), Palmer (2001), Wallace (2001a), Chaniotis (1999), Zurbach (2017), and Whitelaw (2019). On burial, see e.g. Löwe (1996), Preston (2000; 2004), Smith (2002), Alberti (2004), Eaby (2007), Kotsonas (2008), Evangelou (2009), Papadopoulou (2014), Murphy (2011; 2020), Antoniadis (2017).

A specific aim of this thesis is to integrate such approaches with more traditional archaeological narratives, something provided by an historical synthesis, which draws on a wide range of archaeological and historical evidence to complement the preceding analyses of settlement, subsistence, and mortuary practice.

Binding these analyses together is a theoretical perspective informed by recent work emphasising the historical significance of the underlying geography and ecology of the Mediterranean region, and the importance of connectivity and interaction between human communities, as ways of managing the pressures and uncertainties of this challenging environment, and achieving economic, political and social goals (Horden and Purcell 2000; Knapp and van Dommelen 2010; 2014; Broodbank 2013). Such approaches have sought to transcend disciplinary and chronological boundaries, by drawing attention to more constant – or at least more continuously developing – forms of social practice operating at various scales. This thesis argues ultimately that a focus on changes in the systems of settlement, movement and interaction which developed at multiple scales interconnecting communities of the LBA and EIA – at all times rooted in the affordances of the Cretan landscape – offers a fruitful, dynamic means of analytically bridging the traditionally perceived disjuncture between the final palaces and the later city-states.

Outline of Thesis

The remainder of this introductory chapter begins with an outline of the chronological framework for the present study, and the problems and uncertainties of terminology and phasing that affect this period on Crete. Then follows an overview of archaeological research on the Cretan LBA and EIA, and a review of the theoretical foundations of this thesis. Finally, a historical outline of the period under investigation is presented, framed by a series of important debates or questions, which serve to both contextualise the analyses of subsequent chapters, and further define the theoretical perspective of the thesis.

As noted above, the aim of this study is to utilise large datasets spanning the LM II-A periods to investigate settlement patterning, subsistence regimes and demography, and trends in mortuary practice. Chapter 2 presents the datasets and methods employed in the analysis of these three

themes, outlining the construction of the relevant databases, the potential and limitations of the data, and the forms of analysis employed.

Chapter 3 offers an introduction to the physical and environmental setting of Crete, and particularly those features of the landscape relevant to the themes of subsequent chapters, including the economic potential of different ecozones, and the relationship between the physical landscape and forms of human movement and connectivity.

Chapter 4 presents an analysis of settlement dynamics in the LBA and EIA, based on a spatial database comprising known habitation sites from the LM II-A periods, as well as four intensive surveys from two regions, which include information on site size by period. These data are used to examine the changing environmental and topographic correlates of settlement through the LBA, EIA, and Archaic period, as well as the spatial relationships which evolved between communities. Chapter 5 offers a chronologically structured account of settlement patterning on the island, informed by the analyses in Chapter 4.

In Chapter 6, the same intensive survey data are employed in an investigation of subsistence practices and demographic trends across the LBA and EIA, for which they form the basis of population estimates and modelled agricultural catchments. This chapter also draws on archaeobotanical and zooarchaeological evidence to examine the changing nature and scale of the productive economy, and how these developments might be tied to the trends in settlement patterning discussed in Chapters 4-5.

The second main database constructed for this thesis includes published and reported tomb deposits from the LM II-A periods, which in Chapter 7 is used for a quantitative study of changes in burial practice which align with or tie into the trends identified in the discussions of settlement patterning, and subsistence and demography.

In Chapter 8, the conclusions from the analyses in Chapters 4-7 are integrated into a historical synthesis, where additional lines of evidence including settlement and cult assemblages, legal codes, and ancient historical sources are marshalled to present an overarching account of social change across the LBA-EIA which is rooted in the changing networks of interaction which developed during the period on both local and regional scales. Finally, Chapter 9 presents some summary

conclusions, and outlines potential future lines of enquiry.

Chronology

The chronological framework of the present thesis draws on a number of different sources, while recognising that many points of uncertainty remain regarding the absolute and relative chronologies of the island, and its various subregions. The absolute dates provided in Table 1.1. broadly follow the adjustments made by Manning (2010) and Whitelaw (*forthcoming*) to the LBA chronology proposed by Warren and Hankey (1989). Despite long-standing debates over the relative merits of archaeological-historical and scientific dating methods for the BA – especially regarding the Theran eruption (see Pearson et al. 2020) – the latter have been an important component in establishing working chronologies of the era (Manning 2010, 18–24). Scientific methods have had less impact for the EIA, where absolute chronologies generally retain their reliance on traditional ceramic cross-dating, and on Mainland pottery sequences, against which regional traditions like those of Crete were established (Brock 1957; Coldstream 2001; 2008), though the situation has begun to change recently, with new radiocarbon dates presenting challenges to these traditional frameworks (Toffolo et al. 2013; Wardle et al. 2014; Gimatzidis and Weninger 2020; see Facorellis 2017). For the purposes of this thesis, Coldstream (2001) is largely adhered to as the basis of the Cretan EIA chronology, as in other recent publications on the period (Lefèvre-Novaro 2014; Gaignerot-Driessen 2016a).

There are difficulties surrounding the identification and dating of every ceramic phase outlined in Table 1.1, and a full discussion of each is beyond the scope of this thesis. Problems relating to the identification of archaeological sites (especially in survey) are considered in Chapter 2, and other specific issues at various points throughout the thesis. Here only a few of the more major concerns around chronology and regional variation in ceramic styles are considered.

Age	Period	Ceramic Phase		Years BCE
Bronze Age	Neopalatial	Middle Minoan (MM) III	MM III	1750-1670
		Late Minoan (LM) I	LM IA	1670-1550
			LM IB	1550-1460
	Final Palatial	LM II	LM II	1460-1410
		LM IIIA	LM IIIA1	1410-1350
			LM IIIA2	1350-1310
		LM IIIB	LM IIIB	1310-1190
	Post-Palatial	LM IIIC	LM IIIC	1190-1070/970
			(Subminoan (SM))	(1070-970)
Iron Age	Early Iron Age/ Dark Age	Protogeometric (PG)	Early Protogeometric (EPG)	970-920
			Middle Protogeometric (MPG)	920-875
			Late Protogeometric (LPG)	875-840
			Protogeometric B (PGB)	840-810
		Geometric (G)	Early Geometric (EG)	810-790
			Middle Geometric (MG)	790-745
			Late Geometric (LG)	745-710
		Protoarchaic (PA) (Orientalising (O))	Early Protoarchaic (EPA)	710-670
			Late Protoarchaic (EPA)	670-600
	Classical Greece	Archaic (A)	A	600-480
		Classical (CL)	CL	480-323

Table 1.1 Chronological chart for the LBA, EIA and Archaic-Classical periods. Along with the ceramic phases and their associated calendrical dates, the chart outlines the broader terminological and disciplinary frameworks of the relevant periods. Abbreviations of periods used throughout are also provided.

Late Minoan II is a patchily represented fine ware style, most visible in the centre of the island. It seems likely that, especially in East Crete, local LM IB styles may have continued in use (or continued to develop) contemporary to the emergence of LM II at Knossos (see papers in Brogan and Hallager 2011). Though short-lived, the low visibility of this phase – at what may have been a critical political juncture for the island – hampers our understanding of social developments at the time, and at present we are limited to making informed propositions about what these might have involved. There may be some internal phasing, and regional variation in the use of this style (Arvanitakis 2007), but the broad chronological confines of the phase appear unlikely to change greatly. Problems of regional variation are potentially more acute for the LM IIIB phase, for which

stratified subphases have been identified at some sites (Hatzaki 2007; Hallager 2017), but not others (Langohr 2017c, 16–17), and generally the period has resisted attempts at subdivision in a manner applicable to most of the island. However, attempts at phasing, albeit relatively, evidence from across the island offer the potential to trace certain chronological developments across the period, as will be explored in subsequent chapters (see papers in Langohr 2017a). In adopting a roughly one-century long LM IIIB phase, this thesis follows Langohr (2017c).

Despite much continuity in ceramic technology and styles between LM IIIB and IIIC (Kanta 1997b), these periods are characterised by changing repertoires, especially in open vessels (Warren 2005; 2007; Hatzaki 2007); however, distinguishing LM IIIB *late* from LM IIIC *early* assemblages remains problematic (Hallager and Hallager 1997, 327–36; Langohr 2017c, 26). Similarly, early and late LM IIIC phases have been identified at some sites (D'Agata 2003; Hallager 2003; Mook 2004), though not yet at Knossos, where only characteristically *early* IIIC assemblages are known (Hatzaki 2007).

These difficulties tie into discussions of Subminoan (SM) pottery, which has been suggested to reflect merely a style – rather than a genuine chronological phase – contemporary with later LM IIIC and largely produced for deposition in tombs (Mook 1993, 170; Hayden 2004a, 160), though this possibility has been disputed on the basis of stratified sequences at Thronos Kefala (D´Agata 2007; cf. Kanta 2005, 123). The absence of SM pottery stratified directly above early LM IIIC levels at Knossos leads Hallager (2010) to argue that at this site the phase is chronologically equivalent to late LM IIIC in most other areas. The term SM has been provisionally adopted by Tsipopoulou (2005, 346; see Table 1.2) for East Crete, however, who nonetheless recognises that it still requires more precise stylistic and chronological definition[2]. In line with the approach of Gaignerot-Driessen (2016a, 17), the term is generally avoided in this thesis, as it does not appear to correspond with any particularly clear change in settlement patterning or practice, unlike the transition to PG in the 10th century, from which time a large number of settlements founded in LM IIIC were abandoned. Throughout the thesis, therefore, LM IIIC is generally treated as covering the period between c.1190 and 970 BCE. Subminoan is used in discussion of mortuary

[2] It is worth noting that much of the material considered by Tsipopoulou (2005) comes from burial contexts.

contexts, however, where the style is better represented, and the terminology more commonly employed, especially at Knossos.

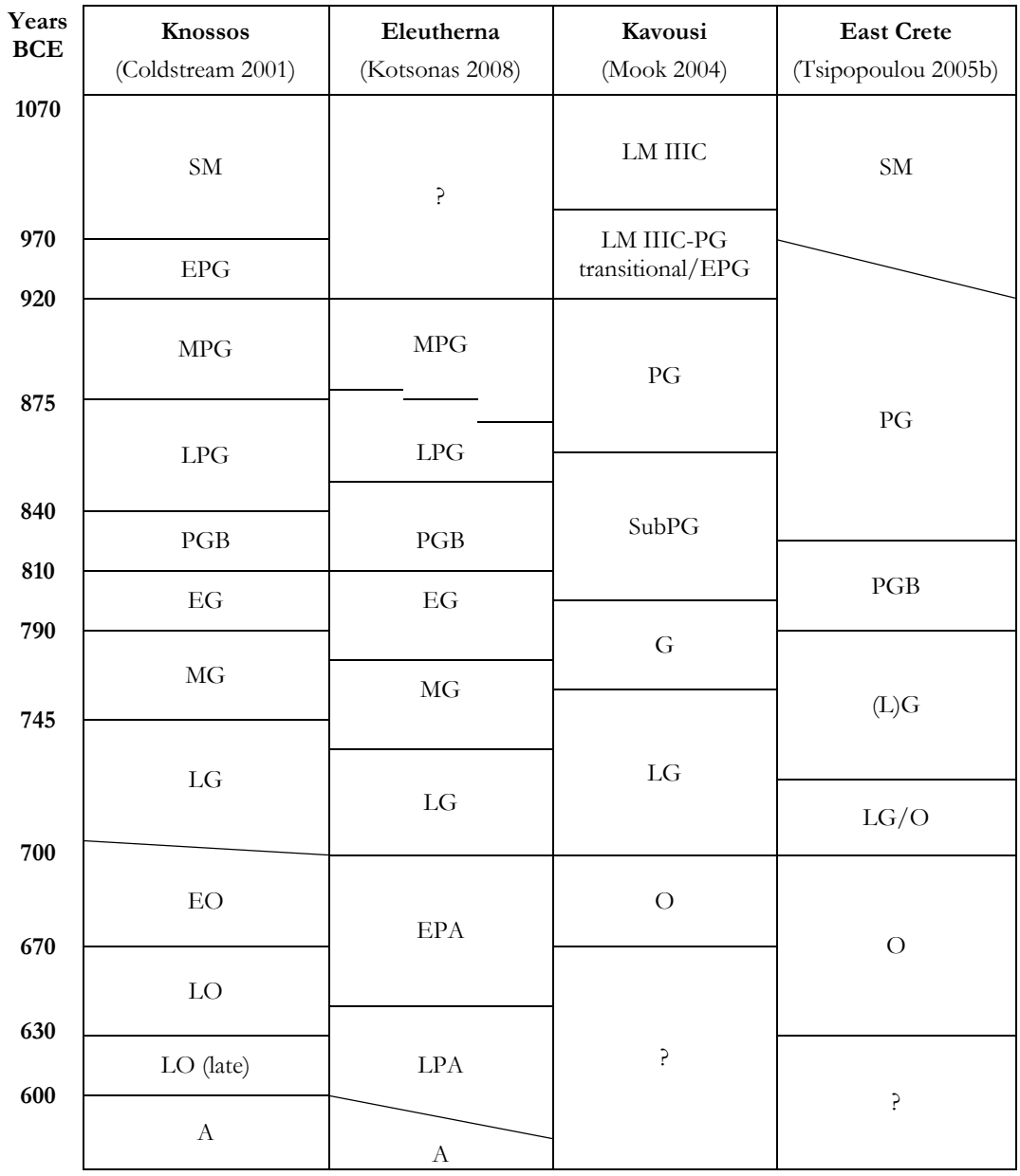

Table 1.2 Regional ceramic chronologies for the Cretan EIA.

Issues of regionalism are a point of concern for the chronology of the EIA. The main EIA sequence on Crete has its roots in Brock's (1957) study of the pottery from the Fortetsa cemetery at Knossos, with his absolute chronology based on limited Attic imports. This sequence was only slightly adjusted by Coldstream (1996, 409–12; 2001, 22), and is still often employed as the basis for chronology even in other parts of the island (e.g. Lefèvre-Novaro 2014; Gaignerot-Driessen 2016a). However, it seems unlikely that the Knossian scheme serves as a reliable guide for closely

dating developments across Crete, especially in the east, where distinct ceramic sequences have been identified (see Table 1.2). Mook (2004) has offered a chronology for the site of Kavousi Kastro, based on stratified occupation layers extending from LM IIIC down to the Protoarchaic (PA), while Tsipopoulou (2005b) has constructed a slightly different sequence based on ceramic material from across East Crete, particularly from burial contexts[3]. As can be seen in Table 1.2 there are periods of greater or lesser alignment between these proposed regional traditions, with the east of the island broadly lagging behind the centre in the development of Protogeometric (PG) and Geometric (G) styles, though the start of the Protoarchaic/Orientalising period is generally dated everywhere to the turn of the 7th century. In general, these misalignments are small enough that they do not present major problems for the broad regional and chronological focus of this thesis, as close chronological alignments between events in different regions are seldom central to the arguments presented. In line with work emphasising the long-term, oscillating relationships between Crete and the Eastern Mediterranean (Morris 1992; Whitley 2013; Kotsonas 2017), the use of the term Orientalising as a period label for the 7th century is avoided here, with Protoarchaic employed instead, as advocated by Kotsonas (2008, 37–38; 2013, 238). Connections between Crete and the Eastern Mediterranean are certainly apparent in the material culture of the island in the 7th century, but this is also true of the BA (e.g. Immerwahr 1985; Watrous 1991; Cline 1999; Martino 2012; Zeman-Wiśniewska 2020), and much of the EIA (Morris 1992; Hoffman 1997; Matthäus 1998; 2000a; Jones 2000; Kotsonas 2012; Karageorghis et al. 2014; Whitley 2018b), such that its use as a period label for only the 7th century feels inappropriate. The term orientalising may still have a utility, when considered as a process involving conscious, selective and varied engagement between EIA communities of the Aegean (and the Central and West Mediterranean) and the peoples, ideas, and artistic repertoires of the East Mediterranean (Brisart 2011; Gunter 2013; see papers in Riva and Vella 2006), though the great deal of ideological baggage it carries remains a concern (see Purcell 2006).

Finally, regarding the start of the Archaic period, a date of 600 BCE is employed here, in line with

[3] Note that Kotsonas (2008) disputes Tsipopoulou's high dating for the onset of LG in East Crete. He argues this is based on an outdated high date for the emergence of the style in Central Crete, and should be adjusted down to cover most of the second half of the 8th century. This would align more closely with the timing of the phase at Knossos and Eleutherna.

Erickson (2010), Sjögren (2003) and Kotsonas (2008). The alternative date is typically 630 BCE (e.g. Gaignerot-Driessen 2013a; Gagarin and Perlman 2016), which aligns with the last use of the cemeteries of Knossos (Brock 1957; Coldstream and Catling 1996), but does not clearly mark a transition to a new ceramic phase in other contexts.

As a matter of convenience, in this thesis the term Late Bronze Age (LBA) is used to refer to the period between LM II and LM IIIB, and Early Iron Age (EIA) for the period between LM IIIC and PA, with the Archaic period named as such. As can be seen in Table 1.1, this does not strictly align with the chronological span of these two ages, as the LBA also includes LM I, and the EIA is generally considered to begin sometime during LM IIIC (or at the transition to SM). However, as Haggis (2012a, 155) notes, 'LM IIIC is closely related ceramically to the Bronze Age, but historically to the Early Iron Age–Archaic tradition', given its alignment with the major reorientation of settlement to upland locations around 1200 BCE. An alternative approach could be to discuss pre-1200 BCE and post-1200 BCE periods, or else LM II-IIIB and LM IIIC-PA, but it is hoped here that the convenience of the terms LBA and EIA, along with this clarification, makes up for the slight technical misalignment of the terms as employed here. The point is to emphasise, above all, the two contrasting orientations in the patterning of settlement which align closely enough with the LBA-EIA transition as to justify the conflation for the purposes of clarity and convenience.

Research on LBA-EIA Crete

Though it was certainly the case for much of the 20th century, it is perhaps no longer accurate to say that archaeological research on the EIA of Greece lags significantly behind that of the BA. Mounting scholarly interest in the EIA has been noted for decades (Morris 1997; Snodgrass 1998), with several recent reviews tracing the developments in excavation, publication, and theoretical perspectives that have seen the period become a major focus of ongoing archaeological work in the Aegean region (Kotsonas 2016; 2020; Murray 2018; see also Papadopoulos 2014). Several important publications of the mid-20th century, by Desborough (1972), Coldstream (1977) and especially Snodgrass (1971), are seen as foundational to the emergence of dedicated anglophone scholarship on the EIA, something further reflected in the publications of a second generation of

scholars under the supervision of Snodgrass in the 1980s and 1990s (Morris 1987; Morgan 1990; Whitley 1991). Excavations like those at the cemeteries of Lekfandi (Popham et al. 1990; 1993) and Knossos (Coldstream and Catling 1996b) were important in challenging assumptions about the cultural isolation of the EIA, given the evidence they provided for the maintenance of long-distance networks of exchange and interaction at the dawn of the period[4]. Meanwhile, critiques of the terminology and disciplinary history of EIA research – which since at least the 1960s was typically termed the 'Dark Ages' – drew attention to the disjuncture between classical and prehistoric archaeology (Papadopoulos 1993), and the limitations this imposed on understanding continuities across both periods, such as interactions between the Aegean and the Eastern Mediterranean (e.g. Morris 1989; 1992).

Today, the term 'Dark Ages' has fallen largely out of favour in the scholarly literature (Murray 2018; cf. Muhly 2011), and interest in the period continues to grow, something reflected not only in important publications on the EIA itself (Lemos 2002; Langdon 2008; Mazarakis Ainian 2011), but also those which treat it in a comparative frame with the preceding LBA (Deger-Jalkotzy and Lemos 2006; Dickinson 2006; Knodell 2021; Lemos and Kotsonas 2020; for the wider Mediterranean: Knapp and van Dommelen 2014).

The growth of scholarly interest in the EIA is visible on Crete as well. Sites of EIA date, in line with developments in the wider Aegean, formed the focus of several major research projects in the 1980s and 1990s, especially the surveys and renewed study of previously excavated sites at Kavousi (Haggis 2005a; Day et al. 1986) and Vrokastro (Hayden 1983; 2005), but also at Thronos Kefala (Prokopiou 1991; D'Agata 1999a). More recently, new researches and excavations have been conducted at EIA sites including Anavlokhos (Zographaki et al. 2013; Gaignerot-Driessen et al. 2020), Azoria (Haggis et al. 2004; Haggis et al. 2011a; Haggis et al. 2011b), Prinias (Palermo et al. 2008; 2012), Axos (Tegou 2013; 2014), Dreros (Farnoux et al. 2012), Karfi (Wallace 2020b) and Lyktos[5]. Important publications concerning the final BA-EIA have appeared in recent years,

[4] Though note that Murray (2018b, 27–28) suggests that publication of the remarkable finds from Lefkandi, often pointed to as a turning point in the scholarly appreciation of the EIA, did not correlate with a rapid abandonment of the term 'Dark Age', which was only widely superseded in in the 1990s to early 2000s as the preferred term for the period.

[5] New excavations have begun at the site under the directorship of Angelos Chaniotis (Princeton University) and Antonis Kotsonas (New York University), and in collaboration with Vasso Sythiakaki (Herakleion Ephorate of Antiquities).

offering both island-wide (Nowicki 2000; Wallace 2010) and regional perspectives (Lefèvre-Novaro 2014; Gaignerot-Driessen 2016a) on social developments across the LBA-EIA transition. The continuing scholarly interest in dismantling long-standing disciplinary divides in the study of the LBA and EIA has been demonstrated most recently in the edited volume by Lemos and Kotsonas (2020; and papers therein on Crete: Haggis 2020; Hatzaki and Kotsonas 2020; Lefèvre-Novaro 2020), the chronological purview of which extends from the time of the final palaces through the emergence of the Archaic *poleis*.

Related developments can be observed in the study of Archaic Crete. This period was for a long time bedevilled by low archaeological visibility (Prent 1997; Coldstream et al. 1999; Erickson 2014), and limited overlap between archaeological and ancient historical approaches, particularly regarding the epigraphic record which, in contrast to most other kinds of material culture, has long been a highly visible feature of 7th-5th century Crete (cf. Perlman 1992; 2004). Reassessments of the ceramic sequence (Erickson 2002; 2010a) and newly published material (Erickson 2010b) have challenged earlier views of the period, and interest in the Cretan Archaic continues to grow (e.g. Niemeier et al. 2013; Pilz and Seelentag 2014), including important publications integrating archaeological and ancient historical perspectives (Seelentag 2015; Gagarin and Perlman 2016).

The present study is therefore not aimed at addressing a dearth of archaeological interest, as such – though there do remain issues with limited excavation for much of the EIA and Archaic period. Rather, it situates itself within a general trend towards more holistic analyses of the LBA, EIA, and Archaic period, whilst recognising that studies fulling embracing this timeframe – especially incorporating both the Final Palatial and early *polis* periods – remain a minority. Through the use of comparable datasets, the application of consistent methods, and the shaping of a common set of questions and theoretical perspectives through which to interpret the available evidence, this thesis seeks to demonstrate both the viability and value of treating the LBA and EIA in a single long-term, comparative frame.

Theoretical Foundations

The theoretical and methodological approach of this thesis is grounded in three recent strands

within archaeological and historical literature on the ancient Mediterranean, namely: the significance of the interaction between human groups and the environment; the importance of mobility and connectivity between populations over various scales; and the value of deep-time perspectives and large datasets to inform our understanding of the long-term development of social systems. Together, these provide a framework for analysing, in a continuous and dynamic manner, the changes in settlement patterning, subsistence practices, and mortuary behaviours of LBA-EIA Crete, as well as the evolution of economic, political and social structures across the period.

Historical Ecology

The rootedness of human life in the physical and temporal landscape of the Mediterranean lies at the heart of Braudel's (1972 [1949]) seminal publication on the region during the reign of Phillip II, but the rejuvenation of such a perspective within archaeological and historical discourse is largely attributable to Horden and Purcell's (2000) *The Corrupting Sea*[6]. This work advocated, among many other things, a perspective on Mediterranean history centred on the region's fragmented and unpredictable micro-ecologies, in the context of which, they argued, connectivity between human communities is necessitated as a means of mitigating and navigating the associated agricultural uncertainty. The authors' focus on fundamental, scalable processes like agricultural diversification, storage and redistribution, or else the oscillating aggregation or dispersal of populations, and the continuously shifting networks of movement and interaction which interweave different microregions, all served to underpin a critique of traditional, typological and period-based approaches to social, political and economic change. Dispensing with terminology like 'Dark Ages', 'urbanism', and even 'subsistence', they advocated pursuing a fluid and volatile model of Mediterranean history to overcome traditional disciplinary, chronological, and classificatory boundaries. This abandonment of traditional categories of historical and archaeological analysis has been challenged (Shaw 2001, 427; Algazi 2005, 230; Morris and Manning 2005, 19–22), as has the assertion of the Mediterranean's coherence as a unit of study (Morris 2003; Herzfeld 2005),

[6] They in turn cite the work of Rostovtzeff (1957), Pirenne (1939) and Gotein (1967) alongside Braudel as key influences over their approach to the subject.

though the galvanising effect of *The Corrupting Sea* on Mediterranean archaeological research is hard to deny (Knapp and Blake 2005; Broodbank 2013, 15–25).

The enduring value of Horden and Purcell's approach, with regard to the present thesis, is in the application of a multi-scalar perspective on the interactions between communities and their physical, ecological, and social landscapes. The emphasising of subsistence practices as a foundational form of human activity, and the way that the affordances and limitations of the local environment are navigated to sustain a living in an unpredictable environment, still holds value as an approach to human settlement, demography, and socio-political organisation in antiquity. This perspective dovetails closely with ethnoarchaeological and ethnographic work of the past 40 years which has greatly informed our understanding of ancient subsistence practices (Halstead 1987; 1992; 2014; Garnsey 1988; Halstead and O'Shea 1989; Gallant 1991; Sarpaki 1992; Horden and Purcell 2000), and together allows us to make reasonable assumptions about the kinds of productive activity which may have supported populations in the timeframe under investigation, nuanced by the additional evidence available in each period.

As Legarra Herrero (2016, 27–28) has noted, there has been a certain shift in focus away from these micro-regional, agricultural systems as an arena for the dynamic evolution of socio-political systems in the ancient Mediterranean, with a growing emphasis on (particularly elite) forms of mobility and connectivity between regions (e.g. Galaty et al. 2014). While this may be the case, their analytical utility is reasserted here, for two main reasons. Firstly, there have been, as of yet, no studies of settlement patterning and subsistence practices which encompass the full chronological span from the final palaces of the BA to the Archaic *poleis* on Crete[7], and the multi-scalar, landscape-centred approach outlined here provides a useful holistic framework for discussing these periods which have traditionally been the subject of distinct scholarly traditions. Secondly, by integrating such a perspective with a focus on mobility and connectivity, it is possible to avoid an undue emphasis on the stressors and uncertainties of habitation and production in a Mediterranean context, and reframe such discussions towards the different strategies and choices

[7] With the exception of Zurbach (2017), though this represents a broader discussion of the Greek world, and is at heart a historical, rather than an archaeological, study.

adopted by actors and communities in different chronological and geographic contexts.

Mobility and Connectivity

The second main theoretical foundation for the present study is the varied and growing debate on mobility and connectivity in Mediterranean history. Interest in these topics has developed from World Systems-based approaches to the ancient Mediterranean economy (Sherratt and Sherratt 1993; Sherratt 1998), and from Horden and Purcell's (2000) emphasis on intra- and inter-regional connectivity, as well as from contemporary concerns with issues like globalisation, migration and social networks (Morris 2003; Rowlands 2010; Sherratt 2003; 2018; Hodos 2014; van Dommelen 2017; Knappett 2018). The attraction of such approaches is that they offer the potential to overcome more static, bounded models of cultural groups, regions or political entities, and examine dynamic processes of economic interaction (Knapp et al. 2022), technological transfer (Brysbaert 2008), and the formation of identities through cross-cultural encounters (Hodos 2006; Tronchetti and van Dommelen 2005). Such approaches are not without their limitations, and it has been noted that the specific meanings of certain analytical terms – such as hybridity and entanglement – are in danger of being diluted through over-use (Yasur-Landau 2017, 142–43).

Despite these reservations, there are two main areas within the literature on mobility and connectivity that form a particularly complementary set of theoretical approaches for the present thesis. The first is represented by scholarship on Mediterranean islands, which has moved beyond the bioarchaeological perspectives of the later 20th century to emphasise the historically contingent nature of insularity as both a physical and cultural phenomenon (Rainbird 1999; Broodbank 2000; Knapp 2008; Cherry and Leppard 2014), something which has fed into accounts like those of Horden and Purcell (2000). Crete's connections to the wider Aegean and Mediterranean have oscillated throughout history, and one focus of this thesis is the changing relationships of Cretan communities to the sea and societies beyond it, as well as forms of regionalism and connection within the island itself.

The second strand of scholarship on mobility and connectivity which informs the present thesis is that relating to the modelling of networks of interaction, both in abstract terms, and in relation to specific landscapes and patterns of mobility. Network analysis has become a popular tool in

recent decades for investigating systems of interaction between actors – be they individuals, groups, or polities – and for exploratory reconstructions of how such systems may change with time, and through different conditions (Brughmans 2013; Knappett 2013a; papers in 2013b). Network analysis embraces a very wide variety of both theoretical and methodological approaches, though all are ultimately oriented towards understanding connections and interactions between entities. This variety and flexibility means they can be employed to model a range of historically salient processes, such as maritime connections (Knappett et al. 2011; Greene 2018), ethnogenesis (Malkin 2003; 2011; Collar 2014), and the regular interactions of spatially proximate settlements or groups (Broodbank 2000; Knodell 2021). A related set of approaches, though not strictly falling under the banner of network analysis, looks to model how systems of settlement – and ultimately forms of settlement and political hierarchy – may have developed through interactions between communities within specific landscapes. That is, the costs of terrestrial and maritime navigation between settlements are treated as active variables within the evolution of settlement networks, with likely routes between settlements modelled utilising GIS. Such approaches have been employed most notably for BA Crete by Bevan (2010; Bevan and Wilson 2013), to examine how political centres and territories may have crystallised out of intra- and interregional networks of movement, communication, and information transfer.

This thesis does not involve the creation of complex networks, or mathematical models of settlement evolution, but it does draw on many of the insights and perspectives offered by these approaches for conceptualising and visualising mobility and interaction in the context of Crete's physical topography and environment. Some simple network models are employed to visualise the spatial arrangement of settlements, and plausible areas of regular interaction between communities, while GIS is used to simulate walking routes through the landscape, and so explore associations between settlements and corridors of movement and communication. At the same time, the concept of connectivity between communities is also employed in a heuristic manner, more akin to the works of Horden and Purcell (2000) and Broodbank (2013), where the kinds of interaction between groups are illustrated and discussed without formal modelling of such interactions. For much of the LBA and EIA on Crete, such formal approaches would be difficult to apply given the variable and limited datasets available. Thus, in the present thesis, these concepts are used in an

illustrative and exploratory way, rather than to model specific forms of mobility and interaction.

The Big Picture

The final strand of recent archaeological work in the Mediterranean that feeds into the theoretical approach of this thesis is the renewed interest in research with a broad chronological and geographical scope, and the tracing of historical patterns and trends across multiple scales. This approach is represented most clearly in the monographs by Horden and Purcell (2000), Abulafia (2011) and Broodbank (2013), but also finds expression in edited volumes which span the Mediterranean region (Blake and Knapp 2005; Knapp and van Dommelen 2010), and transcend traditional disciplinary or chronological divides (Knapp and van Dommelen 2014; Lemos and Kotsonas 2020). As argued by Broodbank (2013, 25) such approaches offer 'a promising chance to write simultaneously both big and small, to locate the multiplicity of local trajectories within a wider framework that allows peculiarities and shared features alike to emerge, and thereby to avoid both the dual temptations of a steamrolling master narrative and the mere heaping up of a magpie's bricolage of local truths.' The present thesis, which encompasses the entire island of Crete over a period of some 900 years, is certainly limited in focus compared to such wide-reaching accounts of Mediterranean history. But the geographic scale and timeframe still offer much scope for the juxtaposing of island-wide, regional, and site-specific evidence to illustrate the variability and variety which exists within the broader historical trajectories traced in subsequent chapters.

One development related to the growing popularity of deep-time and multi-regional approaches to Aegean and Mediterranean archaeology is a recognition of the value that large datasets hold for identifying patterns in what might otherwise be disparate reports and publications. This is evidenced not only by the growth of network analyses outlined above – which rely to a greater or lesser extent on spatial and quantitative databases of archaeological sites, artefacts, inscriptions and material culture traits – but also investment in cataloguing and digitising archaeological datasets (Mazarakis Ainian 2017; papers in Mazarakis Ainian et al. 2017), and the use of such datasets to analyse historical, and even historiographical, trends. Murray, for instance, has examined the collection and representativeness of EIA archaeological data, relative to the preceding LBA (2015; 2018), as well as presenting an analysis of the final BA and EIA economy of Mainland Greece and

Crete based on databases of archaeological sites, metal artefacts, and imports covering the Late Bronze IIIB-Geometric periods (2017). The value of such approaches is that they can facilitate the identification of larger or longer-term trends that might be difficult to discern without collating the data in such a manner, while these broader trends can always be nuanced through consideration of local developments, identified through more traditional modes of archaeological inference. Such is the aim with the multi-scalar, long-term and landscape-focussed approach of the present thesis.

Historical Outline and Key Debates

This introduction concludes with an overview of the main historical developments of the LM II-A periods, as a way of framing the subsequent analyses of settlement, subsistence, and burial across that timeframe. This overview is structured around a number of key debates within the archaeological and ancient historical literature on each period, to both illustrate the areas of contention or uncertainty that characterise each period, and to outline the perspectives adopted in this thesis with regard to such debates. Several of these serve as particular foci in coming chapters, for which the analyses presented aim to offer new perspectives, or clarify points of disagreement.

The Final Palatial Era (LM II-IIIA1)

During the Neopalatial period (MM III-LM I), Crete was home to a number of palaces and palace-style buildings, which acted as primary or secondary political, economic and ritual centres within independent polities of varying sizes, though the largest was undoubtedly Knossos (Rehak and Younger 1998, 100–49; Hallager 2010, 151–53; cf. Schoep 2010). Indeed, during the period, Knossos may have extended its administrative control over a significant proportion of at least central Crete, if not much of the island (Younger and Rehak 2008, 151; Warren 2004; 2012; Wiener 2007; cf. Whitelaw 2018). Though it has been argued the period was one of instability and conflict, particularly in the aftermath of the Theran eruption (Driessen and Macdonald 1997), this destabilisation evidently reached a head at the end of LM IB, when destruction horizons have been identified at sites across Crete[8], some of which appear targeted specifically at buildings of

[8] These include Mokhlos, Gournia, Pseira, Pyrgos, Makriyialos, Petras, Palaikastro, and Zakros in east Crete; Phaistos, Agia Triada, Zominthos, Tylissos, Sklavokambos, Arkhanes Tourkogeitonia, Amnissos, Malia and Nirou Khani in the central region; and

administrative or ritual significance (Cunningham 2007; Wiener 2015, 137). At Knossos, destructions also affected the town (Warren 1980-1, 75–92; Hood 2011), and perhaps the palace (Mountjoy 2003; see Whitelaw *forthcoming*), but by LM II-IIIA1 it is clear that a literate administration had continued or been reinstated, with major rebuilding undertaken (McEnroe 2014) and the earliest documents written in Linear B script employed in the Room of the Chariot Tablets (Driessen 2000).

The LM IB-II transition has been interpreted as a period of population decline, given the limited distribution of LM II pottery (Popham 1980b; Watrous and Blitzer 1997, 511), and reduced site counts in regional surveys for the LM II-III periods, relative to the preceding Neopalatial phase (Buell and Turner 2017; Watrous and Chatzi-Vallianou 2004, 298). However, arguments against this reconstruction include the likelihood that the final palace at Knossos drew on pre-existing networks and structures of administration (Bennet 1985, 242–45; 2017, 17), the probable continuation of local LM I ceramic traditions into the period of Knossian LM II (e.g. at Palaikastro: MacGillivray 1997, 278–79), and the implausible rates of population growth implied by the rapid resurgence in known burial and settlement sites between LM II and IIIA (Bennet 1986; Preston 2000; see Whitelaw *forthcoming*). It is possible that any real decline in population was therefore less dramatic than has previously been assumed. Nonetheless, settlement evidence is more plentiful in the LM IIIA1 period, during which time Knossos was at the head of a large polity, extending over much of the centre and west of Crete, with the palace's documented activities including taxation, the loaning out of land and oxen, oversight of textile and perfumed oil production, provisioning of ceremonial feasts and religious rites, as well as the mobilisation of agricultural and natural resources for the production of a range of products which probably circulated on Crete and abroad (Killen 1985; 2008; Halstead 1993; 2007; Bendall 2007; Nakassis et al. 2011). A secondary centre seemingly existed at Khania, which may have had a degree of local administrative autonomy (Petrakis 2014). The eastern third of the island likely fell beyond the auspices of Knossian control (Killen 1977; Bennet 2011), though tombs and architecture at Gournia and Mokhlos have been suggested to reflect offshoots or emulations of palatial power (Soles 2008, 200–3; Younger 2016).

Nerokourou and Khania in the west (Hallager 2010, 151–53).

A central debate regarding the Final Palatial period concerns the presence of Mainland groups at Knossos, and more widely on the island, following the destructions of LM IB. The development of Linear B from Linear A to accommodate the recording of a Greek dialect (Ventris and Chadwick 1956), the appearance of new burial practices (Kilian-Dirlmeier 1985) and forms of material culture (Popham 1969), and changes in architectural styles (Hayden 1981, 97–121) and the execution of certain crafts, such as frescoes (McEnroe 2010, 123–24), are among the features argued to reflect the influence or presence of Mainland groups. Debates around the relative degree of local or external impetus for these changes have typically been couched in terms of 'Minoan' and 'Mycenaean' identities, regardless of whether these are considered to represent actual population elements on the ground (Driessen and Macdonald 1984; Wiener 2015; Alberti 2018), or else cultural traditions or reference points which could be asserted through particular practices and forms of material culture (D'Agata 1999b; 2015, 95–96; Girella 2020, 266).

There are several difficulties with both these approaches to the discussion of changing material culture and practice in LM II-IIIA, not least because they essentialise what were, on both the Mainland and Crete, cultural traditions with much regional variation, but more dangerously because they risk eliding material cultural traits with ethnic identities whilst deploying terms with an increasingly problematised disciplinary history (Papadopoulos 2005; Hamilakis and Momigliano 2006; Whitley 2006; Legarra Herrero 2009). Furthermore, the actual significance of the terms from an emic perspective – how the people in question conceptualised themselves and those around them – is seldom clear, nor are the social mechanisms involved in, for instance, a building exhibiting both 'Minoan' and 'Mycenaean' traits. This is made increasingly problematic by the fact that 'Mycenaean' presence or influence continues to be attributed to features of material culture on Crete through to the LM IIIC period (Nowicki 2000; Tsipopoulou 2005a; 2011a; Warren 2005; Basakos 2016), further obscuring what the processes of inter-cultural interaction are meant to represent in human terms during the 15th-12th centuries BCE.

Ongoing, if variable, population movement and interaction between Crete and the Mainland throughout this period is certainly plausible – and would align with recent scholarship on the importance of regular, small-scale mobility in a Mediterranean context (e.g. Knapp et al. 2022) – but the Minoan:Mycenaean binary presupposes the terms through which these encounters were

experienced[9]. More fruitful, from the perspective of this thesis, has been work emphasising the socially contingent processes of identity formation and expression which occurred in the context of the consolidation of political power at Knossos in LM II-IIIA1 (Preston 1999; 2004; Driessen and Langohr 2007; Galanakis et al. 2017), and the way that a distinct, Knossian palatial tradition may have, in turn, become a reference point for social practices and identity formation in other parts of Crete (Boyd 2016; Smith 2020). In this thesis, therefore, the labels 'Minoan' and 'Mycenaean' are avoided and when what might be specifically 'Cretan' or 'Mainland' material or behavioural forms are considered, these terms are used instead.

The End and Aftermath of the Palatial Era (LM IIIA2-IIIB)

Sometime early in LM IIIA2, the palace at Knossos suffered a major destruction. Following this, it either went permanently out of use as an administrative centre, or else continued to function as such until another, truly final, destruction early in LM IIIB (for foundational statements of each position, see Palmer and Boardman 1963). This uncertainty is significant, as it has implications for how we should interpret contemporary evidence from elsewhere, which may date to the later stages or else the aftermath of Knossian rule. Popham (1970; 1997) advocated an LM IIIA2 date[10], which he derived from burnt pottery found among charcoal and building material in cists below the West Magazines and Long Corridor of the palace. However, these pits were sealed over by a final floor surface, above which were also found Linear B documents, suggesting administration of some form survived this destruction and continued into LM IIIB (Hallager 1977; Niemeier 1982). The debate rests on whether the contexts above the sealed cists still fall within LM IIIA2, or are later. Popham (1994, 90) holds that the marginality of occupation at LM IIIB Knossos is irreconcilable with a functioning bureaucracy, though the close resemblance of handwriting styles on tablets from Knossos and LM IIIB contexts from Khania may suggest near-contemporary bureaucracies still functioning at both centres in this latter period (Olivier 1993; 1996; Palaima 1993).

[9] The risks of asserting population presence or absence solely on the basis of material culture appear increasingly fraught given the contributions aDNA is likely make to our understanding of these periods (see recently Clemente et al. 2021). Such evidence has the potential to greatly inform – and perhaps reshape – our understanding of mobility and population interaction, though of course it cannot resolve in any simple way questions around how ethnic identities were perceived or negotiated in the past.

[10] Specifically, an early stage of LM IIIA2, during which LM IIIA1 pottery was still in use.

Early contributors to both sides of this debate presupposed the so-called 'unity of the archives' (Palmer 1963, 110), that is, that all the Linear B tablets were contemporaneous, and preserved in a single destruction. This consensus began to be undermined by Driessen (1990b; 1997), who proposed that the Room of the Chariot Tablets (RCT) archive predated the other known document caches, having been in use perhaps as early as LM II. He further identified, based on Olivier's (1967) *Les scribes de Cnossos*, a typology of scribal hands, which he labelled 'conservative', 'centrist' and 'progressive' (Driessen 2000). A more detailed chronological scheme has been proposed by Skelton and Firth (2016a; 2016b; 2016c), based on a phylogenetic analysis of the handwriting styles identified by Driessen and refined by the authors. They conclude that the RCT tablets do indeed date to LM II-LM IIIA1, and that the remaining tablets can be divided into distinct LM IIIA2 and LM IIIB1 deposits. In the present thesis, the broad conclusions of Skelton and Firth's study are provisionally accepted, with the Final Palatial administration at Knossos assumed to have lasted until at least a late phase of LM IIIA2, if not early in LM IIIB. Furthermore, though issues of partial preservation and recovery of the tablets complicate attempts to trace changes in palatial governance via Skelton and Firth's three tablet groups (Whitelaw *forthcoming*), the possibility that the palace's operations developed through time should be seriously considered, and may serve to temper readings of the LM IIIA2 period that presume a sudden cessation of palatial control, rather than a gradual decline or disintegration.

More widely on Crete, the LM IIIA2 and early IIIB periods are represented by increasing numbers of known settlements and burials (see Chapter 4), evidence of continued administration at Khania (Hallager and Vlazaki 1997), along with a lively export market in inscribed stirrup jars (and their valuable contents, presumed to be mostly perfumed oils; see Day et al. 2016), and the likely consolidation of small polities around former secondary centres, such as Ayia Triada in the Mesara (La Rosa 1997; Cucuzza 2003; Privitera 2014). That is, the collapse of Knossos does not seem to have had a catastrophic impact on the economic life of the island as a whole, though it was accompanied by growing regionalism and political fragmentation. However, during the mid-late LM IIIB period, imports started to decline (Rutter 2017), the literate bureaucracy of Khania disappeared (Hallager 1997, 181–82), and regional centres like Ayia Triada were abandoned (D'Agata 2017), along with many other coastal settlements (Nowicki 2011a; Langohr 2020).

Defensible Settlement and Questions of Incoming Population (LM IIIC)

The decline and abandonment of many lower-lying and coastal sites is most marked around the transition from LM IIIB to IIIC, when a large number of new settlements were founded further inland, generally at higher elevations, and in areas of naturally defensible topography. According to Nowicki (2000, 235–37; 2001), this shift occurred in three stages, with several fortified sites founded in the latter part of LM IIIB, a swathe of particularly remote and inaccessible refuges established at the very start of LM IIIC, and a reorientation towards less extreme, but still defensible, topography some two-three generations later, in the mid-12th century. However, the process was regionally varied, and settlement in the central third of the island – perhaps linked to its gentler topography – was less characterised by high inaccessibility. Some sites remained in use throughout this time, particularly the erstwhile centres of Knossos, Phaistos, and Khania, but also the smaller settlements of Tylissos, Kastelli Pediada, and Perama ta Grivila (Kotsonas 2011d). A few coastal settlements are known from LM IIIC, including Khamalevri in the centre-west (Andreadaki-Vlazaki and Papadopoulou 2005), Palaikastro Kastri in the far east (Sackett et al. 1965), and Ilias to Nisi on the Bay of Mirabello (Hayden 2001). However, by the end of the period, all but the last of these had been abandoned, with very few sites representing plausible foci of continuing maritime activity. Religious activities in this period appear mostly focussed within settlements, where numerous small shrines have been identified (Prent 2005, 126–54; Gaignerot-Driessen 2016b), while burials were generally little differentiated from one another (Eaby 2007, 338–69), and evidence for imported items or other external connections is slight (Jones 2000, 177).

The defensible settlement phenomenon has been a central focus of research on the LM IIIC period on Crete, arguably at the expense of other observable trends, such as the persistence of lowland or coastal occupation in some areas (Kotsonas 2011; 2021, 60). Several defensible sites were excavated at an early stage of archaeological work on the island (Boyd 1901; Hall 1914; Pendlebury et al. 1938), and the great number of such settlements identified since (Nowicki 2000; 2011) – not to mention the striking contrast they present with preceding modes of habitation – has seen them retain a pre-eminent place in archaeological discussions of the 12th and 11th centuries. Perhaps the greatest source of contention is what prompted the often-dramatic relocations evidenced by these settlements. Nowicki (e.g. 2001; 2011a; 2011b; 2011c) has been the most vocal proponent of a

'coastal threat' interpretation, arguing that the relocations were made in response to the fear of raiding or enslavement, during the turbulent fallout of the LBA collapse in the Eastern Mediterranean. However, alternative perspectives have been proposed, which argue for a reorientation in the productive economy (Borgna 2003b), the formation of cooperative communities spread across clusters of related settlements (Haggis 1993; 2001), and a proactive balancing of concerns around defence, agricultural production, and connections to the wider landscape (Wallace 2010; Gaignerot-Driessen 2016a). This thesis investigates these issues further by considering the topographic and spatial contexts of LM IIIC sites in both a regional and broader chronological context, as well as the kinds of interaction which might have operated between nearby communities.

As with the LM II-IIIA1 periods, the presence of foreign populations has been debated in the context of the relocations of LM IIIC. Nowicki (2001) has argued that the seaborne threats that afflicted communities on Crete in LM IIIC can be linked to the so-called 'Sea Peoples', a still highly contentious term applied to a hypothetical confederation of seafaring mercenaries, marauders, or displaced populations claimed to be behind many of the destructions of the wider LBA collapse phenomenon in the Eastern Mediterranean (Vermeule 1960; Sandars 1978; Dothan 1982; Dothan and Dothan 1992; Stager 1995; cf. Silberman 1998; Cline and O'Connor 2003). The published literature on the Sea Peoples is vast (see e.g. Dothan et al. 1998; Oren 2000; Killebrew 2005; Yasur-Landau 2010; Killebrew and Lehmann 2013; Fischer and Bürge 2017), and largely beyond the scope of the present thesis. However, in as far as these debates are relevant to the settlement changes on Crete around 1200 BCE, this thesis aligns with those perspectives advanced in recent decades which avoid the essentialising, ethnic interpretations of such groups, and emphasise the increasingly decentralised, mobile and perhaps volatile nature of maritime and economic activity at the close of the LBA (Artzy 1997; Sherratt 1998; 2003; 2013; Broodbank 2013, 445-72; Bauer 2014; Middleton 2018; 2020; Hitchcock and Maeir 2019).

Similar considerations apply to the question of when Doric-speaking groups arrived on Crete (see Hall 2002, 73–89). Doric appears to have been the main – though by no means only (Gagarin and Perlman 2016, 47) – dialect spoken on Crete by the time of the Archaic law codes, and so it has in the past been suggested as one of the regions into which putative 'Dorians' moved at the end of

the LBA (Mainland Greece: Schweitzer 1971, 10; Snodgrass 1971, 311–12; Desborough 1972, 22–23; Crete: Willetts 1965, 16–36; 1977, 143–215; Watrous 2004, 310–15). Large-scale migrations are no longer widely favoured as an explanation for the palatial destructions on the Mainland (Middleton 2020; Dickinson 2020), but as with the Sea People phenomenon, the likelihood of increased small-scale mobility in this period may be of relevance to Crete, where the presence of diverse population elements has been proposed in LM IIIC (Tsipopoulou 2005a; Kanta and Kontopodi 2011; D'Agata et al. 2012; Iacono 2013), and in later periods when epigraphic evidence attests to the names of tribes and months with both Doric and non-Doric etymologies (Perlman 2014, 192–204). The extreme difficulty of linking forms of material culture to historically perceived ethnic or cultural groups once again urges caution in identifying specific moments of population arrival on Crete, though a general recognition of their plausibility – within a framework of widespread, small-scale mobility – seems appropriate for this period.

Relocation, Nucleation and Other Trends in Settlement (PG-G)

The PG period witnessed further changes in the distribution of settlement. Though precise dating is difficult, it appears over half of all sites founded in LM IIIC went out of use by the end of the 10th century, and possibly by the end of its first half. There is evidence of growth, meanwhile, at those settlements which continued to be occupied. Wallace (2010, 233-53) has dubbed these developments a 'nucleation phenomenon', arguing that the site abandonments reflect coordinated consolidations of population within those settlements best suited to agricultural production and expansion within their local area. There was regional variation in this process, however, and the movements in some places do not follow a simple model of defensible sites being abandoned in favour of more accessible ones[11]. In general terms, it does seem that population was increasing across the island, with nascent centres often being hill-top or acropolis towns, occupying commanding positions over agricultural land and corridors of communication through the landscape (Gaignerot-Driessen 2016a, 71–79). Despite general agreement on these broad trends, debate has persisted around whether they reflect the consolidation of genuine polities,

[11] At Kavousi, for instance, the more accessible settlement of Vronda was abandoned sometime in LM IIIC, while the more defensible Kastro remained inhabited for several more centuries (Glowacki 2002, 38).

characterised by precocious institutionalisation (Wallace 2006; 2010), or simply larger, better connected and more stable population centres, which nonetheless still lacked the complex political structures of the later *poleis* (Gaignerot-Driessen 2016a; 2017, 515). This thesis aims to contribute to this debate by examining the demographic processes implicated in the growth of population centres in the PG-G periods, as well as the broader economic contexts in which they emerged.

More broadly, the PG-G periods are characterised by expansion not only in terms of population, but also established cemeteries, rural and suburban sanctuaries, and overseas connections, with imported material of both Aegean and East Mediterranean origin occurring in settlement, cemetery and sanctuary contexts (Judson 2018). It has been suggested that, during this period, connections to the wider Mediterranean and encounters with the architecture, tombs and material culture of the preceding BA may have prompted developments in artistic styles, novel forms of mortuary deposition, and the targeted reuse of abandoned settlements for burial or communal acts of drinking and dining (Day 1995; Coldstream 1998; Prent 2003; 2009; Lefèvre-Novaro 2004; Whitley 2013). These in turn may reflect evolving forms of social hierarchy or kinship expression at the growing centres of population on the island, though the actual nature of political organisation at most remains somewhat obscure.

The Development of the Cretan Poleis (LG-A)

The late 8th and 7th centuries are generally taken to herald the emergence of the *polis* as a political entity on Crete (Kotsonas 2002; Gaignerot-Driessen 2017), based on evidence for the major reworking of settlement layouts (Rizza 2011; Haggis 2014a); the construction of larger houses and buildings with possible public and religious functions (Prent 2007; Haggis et al. 2011b; Lamaze 2019); the continued proliferation of suburban sanctuaries and shrines, with evidence for possible rituals of initiation (Prent 2005; Erickson 2009); the first real signs of industrial production, often located at the outskirts of settlements (Rizza et al. 1992; Kotsonas 2021); and, around 650 BCE, the earliest known legal inscription from the Greek world, from the site of Dreros (**Dr1**), which includes restrictions on terms of political office (Perlman 2004b). However, this impression is complicated by a series of developments in the early Archaic period (c.630-550 BCE), which include the abandonment of a number of long-inhabited settlements, changes and declines in

dedications at major sanctuaries, cessation of archaeologically visible burial at most sites, and an island-wide convergence on ceramic repertoires with limited decoration (Kotsonas 2002; Erickson 2010; Seelentag 2015, 36–56; Gagarin and Perlman 2016, 22–29). This last phenomenon may be particularly important, as for a long time Archaic habitation proved difficult to identify at sites across the island, something labelled the 'Archaic Gap' at Knossos (Coldstream et al. 1999), and theorised to correspond to a period of warfare, economic decline, or isolation from Mediterranean trade (Morris 1992, 170-71; Prent 1997; Kotsonas 2002; Erickson 2014). Ongoing refinement of ceramic chronologies suggests, however, that much of this perceived gap may be illusory – or at least highly regionally variable – and a product of both the conservative ceramic styles of the period, and the inappropriate assumption that Knossos could serve as a type-site for the island's 6th century ceramic sequence (Erickson 2010, 45–67; 2014, 78–79). More recently, attempts have been made to reconcile the complex archaeological trends with models of the consolidation, competition and continued development of urban and political centres on the island during the period (Wallace 2013; Haggis 2014b)[12].

Important debates continue around how to characterise the political communities of the Archaic (and Classical) Cretan *poleis*. Perlman (1992) argued in an influential paper that the epigraphic and archaeological evidence for these small states was irreconcilable with the homogeneity presented by Aristotle's (*Politics,* 1269a29–1272b23) description of Crete's political constitutions. Elements of this argument have been challenged – though largely from an ancient historical, rather than an archaeological perspective (Link 2002; 2008; Seelentag 2015, 93-117) – and it does seem that certain political features may have been common to many Cretan *poleis*, such as their small citizen bodies, strong hierarchies, forms of state-controlled communal dining, and the holding of slaves (Chaniotis 2005; Lewis 2021). However, in common with the rest of the Greek world, there remain unresolved questions on the nature of Archaic statehood and citizenship among the Cretan *poleis*,

[12] Seelentag (2015, 55-56), for instance, makes the important observation that much of the diminishment in archaeological visibility in the 6th century corresponds to a decline in what, in other parts of Greece, remain visible expressions of aristocratic practice, such as elaborately decorated pottery employed in sympotic contexts, or rich dedications in sanctuaries. Some of the difficulties with interpreting this period, therefore, relate to how much our archaeological understanding tends to derive from what might be broadly termed 'elite' material culture – larger, more permanent buildings in the centre of settlements, diagnostic fine ware ceramics, elaborate burials and ritual deposits, and administrative documents – for which the Archaic period has produced limited evidence, particularly relative to the centuries which preceded it.

given the small scale of their populations and territories, especially when viewed comparatively with other ancient states (Whitley 2020; 2022). Recent scholarship on the Greek *polis* has emphasised the importance of participation and performance in the negotiation of social status (Duplouy 2006a) and citizen identity (Blok 2014; 2018), and the applicability of such models to Crete has been considered (Whitley 2014; 2018). This thesis engages with these debates particularly through the lens of demography and settlement structure, as well as changes in burial practice at the onset of the Archaic period.

A final consideration for the Archaic period is the question of regional or cultural identities on Crete. One well-known case concerns the so-called Eteocretans, a term which first appears in Homer's *Odyssey* (19.175-72), where Crete is described as a land of ninety cities and many languages, with groups including Achaeans, Kydonians, Dorians, Pelasgians and Eteocretans, that is, native or true Cretans[13]. Several inscriptions written in Greek script – but not a Greek dialect – have been found at Dreros (Van Effenterre 1946) and Praisos (Comparetti 1888; Conway 1901-2; 1904), and by convention have become known as Eteocretan (Duhoux 1982; 2007), though the language they preserve and its relation to the Eteocretans of Homer remain unclear. It has previously been proposed that the Eteocretan inscriptions preserve a language descended from that recorded in Linear A in the BA (e.g. Gordon 1975). Though such attributions remain speculative, evidence for distinctive material culture, architectural styles, and forms of ritual practice in East Crete have been the subject of much archaeological discussion, covering both the LBA and EIA (Whitley 1998; Langohr 2006). These have ranged from Coldstream's identification of an Eteocretan Geometric ceramic tradition (Coldstream 1968, 257–61) to the proposed identification of nascent Eteocretan identities at the close of the BA, under mixed 'Minoan' and 'Mycenaean' influence (Tsipopoulou 2005a).

Whitley (1998; *pers. comm.*), whose work has focussed on the supposed Eteocretan heartland of Praisos, has emphasised the political aspect of Eteocretan identity in the Archaic period, especially as manifested in the known inscriptions, and stresses that aside from these, and a distinctive terracotta tradition, there is little about Praisos that differentiates it from the other small polities

[13] Other references to the Eteocretans, especially in relation to the city of Praisos, are found in Herodotus (7.170-1) and Strabo's *Geography* (10.4.6-12).

of the period. In such a context, the mobilisation of certain ethno-cultural identities may have been a strategy of self-representation and differentiation, but we should be cautious in extrapolating from this an enduring 'Minoan' legacy in the east of the island. As such, and in keeping with the approach adopted vis-à-vis the use of 'Minoan' and 'Mycenaean', specific discussion of Eteocretan identities is generally avoided in this thesis, though regional variability and distinctive local trajectories are certainly highlighted.

Cretan Exceptionalism

A final recurrent theme in studies of both the LBA and EIA on Crete relates to what has been referred to as Cretan 'exceptionalism' (Whitley 2004; 2009), a term which embraces both Crete's idiosyncratic and archaising representation in ancient sources, but also the distinctive historical developments which identified through archaeological research on the island. In the first case, ancient texts[14] generally converge on a view of Classical-Hellenistic Crete as highly traditional, with a precocious legal tradition, strict communal institutions like the *andreion* – a form of men's dining hall or mess – and constant warfare between *poleis*, though with highly stable internal organisation and little engagement in conflicts affecting other parts of Greece, except as mercenaries (see e.g. Willetts 1955; 1982). Though elements of this picture have been interrogated and revised (see especially Chapter 8), the Cretan Archaic period does exhibit a number of distinctive features, especially the changes in cult practice and material culture outlined above, and its early written legal codes.

The second kind of Cretan exceptionalism regards the island's singular historical development, as evidenced by archaeology, across the final BA and EIA. Lemos (2002, 1) excluded Crete from her study of Protogeometric Greece, claiming 'its character … is different from most of the rest of the Aegean'. Such differences include the early date of the destruction of Knossos, relative to the palaces of the Mainland; the concerted movement to elevated and defensible settlement locations

[14] The main sources being Plato's *Laws* and *Minos*, Aristotle's *Politics* (especially Books 2 and 7), Strabo's *Geography* (especially 10.4), scattered mentions in Herodotus (e.g. 3.44-59, 4.150-57, 7.169-71), and fragmentary descriptions from Ephorus' *History* (quoted at length in Strabo's *Geography*; see especially *FGrHist* 70 F149) and from Dosiadas (Athenaeus' *Deipnosophists*; see *FGrHist* 458 F2). The only potentially 'emic' view of Cretan society – in ancient historical, as opposed to epigraphic, sources – is the so-called song of Hybrias, preserved in Athenaeus (*Deipnosophists*, 15.695f–696b).

in LM IIIC (Nowicki 2000); early evidence for reconnections with the wider Mediterranean (Catling 1995), especially including the material culture of its eastern regions (Morris 1992; Stampolidis and Kotsonas 2006; Whitley 2013); continuity of cult practice at a number of BA sanctuaries (Prent 2005; cf. Whitley 2009b); and precocious examples of both formal temples and inscribed legal texts (Whitley 2009a, 273–74; Gagarin and Perlman 2016). The implications of this exceptionalism are still in need of further research, particularly regarding contemporary developments in the wider Aegean world; the Cretan *poleis*, though exhibiting many distinctive features, were still part of the widespread emergence of small, highly participatory state societies in 8th-6th century Greece. This thesis does not present a comparison with other regions of Greece – largely for limitations of space – but it is aimed at further illuminating aspects of the social, political and economic trajectories of the island through the LBA, EIA, and Archaic period, which should in turn contribute to discussions of Cretan 'exceptionalism' in an Aegean context. Every region of Greece underwent distinct historical developments in the LBA-EIA, and the rich characterisation of that regional diversity can contribute to future systematic comparison and theorisation.

Chapter 2

Data and Methods

Introduction

The analyses presented in this thesis are based upon two main datasets, the first relating to settlements, and the second to tombs and mortuary assemblages of the LM II-A periods. The analyses of settlement patterning, subsistence and demography make use of the former, while the examination of burial practices utilises the latter. In this chapter, the creation of these datasets will be outlined, along with a discussion of their potential and limitations, and the methods which were chosen to analyse them in the present thesis.

Analysis of Settlement

Settlement Databases

The investigation of settlement patterning across the LBA and EIA on Crete is based, first and foremost, on a site database comprising previously published, catalogued, or reported habitation sites from the LM II-A periods. The vast majority of these sites were identified through published catalogues and monographs (Kanta 1980; Bennet 1986; Judson 2018; Nowicki 2000; Sjögren 2003; Wallace 2010; Gaignerot-Driessen 2016a), and through survey publications and reports (Watrous 1982; Moody 1987; Watrous et al. 2004; Haggis 2005; Hayden 2005; Duplouy 2006; Watrous et al. 2012; 2017). Coordinates were taken for each settlement, as was a record of each ceramic period for which occupation had been noted. This evidence was subject to a twofold categorisation of 'definite' and 'possible' habitation, to reflect the uncertainty surrounding occupation at some sites in some periods. Given the uneven chronological resolution between sites, based on their histories of investigation and excavation, only broad ceramic phases were employed, though given the wide

chronological scope of the present thesis, this was considered sufficient for the investigation of diachronic change in settlement patterning. Coordinate data for sites of the LM II-IIIB and PG-G periods were generously shared by Christine Spencer and Catharine Judson respectively, but each of these points was independently checked and adjusted where necessary. The complete catalogue numbers 437 settlement sites (see Table 2.1).

	LM II	LM IIIA	LM IIIB	LM IIIC	LM III	PG	G	PA	A
Definite	21	61	84	117	39	97	107	102	130
Possible	9	24	48	58	50	62	29	30	33

Table 2.1 Counts of sites for each ceramic period in the island-wide spatial database. Definite and possible habitation are differentiated.

In addition to this island-wide database, the site catalogues of five archaeological surveys were also digitised, covering the regions of Galatas (Watrous et al. 2017), the western Mesara (Watrous et al. 2004)[15], and Vrokastro (Hayden 2005), Gournia (Watrous et al. 2012) and Kavousi (Haggis 2005a). The Vrokastro, Gournia and Kavousi surveys covered a largely contiguous area on the Isthmus of Ierapetra and, given their similar approaches to site identification and size estimation (Hayden 2004, Appendix 1: 3–5; Haggis 2005a, 26–38; Watrous 2012, 6–8)[16], they were incorporated into a single dataset. As with the island-wide database, coordinates were established for each site, but in this case a separate entry was created for each period of occupation at a site, with its size in that period recorded, as per the information provided in the survey publications. In the case of the Western Mesara Survey, site sizes were not consistently recorded, and so this region was ultimately not included in the comparative discussion in Chapter 4, though some tentative use of these survey data is made in Chapter 6 regarding agricultural production. The chronological phases into which sites were grouped essentially followed that presented in each survey publication, though in the case of the Mirabello region, only the Gournia survey distinguished between a PG and G phase, which were thus incorporated into a single phase in the database. In the Mirabello region, the resultant phases were MM III-LM I, LM IIIA-B, LM IIIC, PG-G, and PA-A. In the Galatas area,

[15] Incorporating sites from the Kommos survey (Shaw and Shaw 1995).

[16] A similar collation of these surveys was employed by Spencer and Bevan (2018, 72–76), who point to the similar methods of sampling along cross-transects for defining site size, and the comparable distributions of site size produced by each survey.

they were MM III-LM I, LM IIIA-B, LM IIIC, PG-PA[17], and A.

The value of these intensive surveys compared to the island-wide database is their inclusion of estimated site sizes, which can form the basis of more nuanced discussions of changing settlement patterning through time (in that population distributions can be inferred through settlement size). Thus, in contrast to the island-wide database, where only single points were used to represent site location, for the digitised survey datasets a number of points proportional to site size was sampled from within a circle equal to the recorded area of each site. This approach not only more accurately reflects the likely distribution of population across sites of different sizes, but also captures some of the topographic variability present even within single sites, as values corresponding to the topographic and environmental variables outlined below were assigned to all points.

Representativeness and Comparability

These different spatial databases – that covering the whole island and those based on regional surveys – are complementary in that they offer different chronological and spatial resolutions. The survey data should provide a more representative sample within their respective regions and, in the case of the Galatas and Mirabello areas, permit comparison between settlement patterns identified through comparable methodologies. However, the ceramic phases on which both datasets are based all present problems of definition, visibility, and regional variability that might be seen to impact the representativeness of the data[18]. To consider each phase in turn, LM II remains an elusive style, still only documented at a relatively small number of sites and often absent or unrecognised in surveys (Hayden 2005, 6–8; Haggis 2005b, 80; 2005c, 55; Buell and Turner 2017, 75; Watrous and Chatzi-Vallianou 2004, 298). The style is defined by a limited range of fine wares, and probably spread from Knossos, meaning its distribution may only give a partial image of genuine settlement patterning at the time, with sites lacking such styles potentially overlooked.

There are problems of ceramic visibility for the LM IIIA-B periods as well, given the continued

[17] Though some of the PG-PA sites in the Galatas survey have material definitely datable to a particular subphase (PG, G, PA), many do not, and as such are treated collectively. Though problematic from the perspective of identifying shorter term trends in settlement patterning, the high degree of continuity into the subsequent A period suggests the locations inhabited in PG-PA periods reflect patterns which persisted into the subsequent phase (Turner 2017, 85–88).

[18] See Chapter 1 for discussion of ceramic styles as they relate to relative and absolute chronologies of the different periods.

reliance on a small range of fine wares to identify them in survey (Watrous et al. 2004; Haggis 2005c, 80; Hayden 2004a, 132–33; Buell and Turner 2017, 75)[19]. There does, however, appear to be a high degree of continuity between these two periods in both survey and excavated settlement contexts (see Chapter 4), and it appears unlikely that a large number of settlements belonging to one phase or the other (but not both) have been overlooked in intensive or extensive researches. Similarly, many sites of LM IIIA-B date also had LM I occupation and in general it appears that similar landscapes or topographic settings were inhabited in these periods (Popham 1980; Bennet 1985, 244; see Chapter 4). If sites of LM IIIA-B were consistently being overlooked, they would probably have to be in locations other than those settled in LM I[20], but the impression from intensive survey is that such sites were in a minority.

Issues of representativeness also affect our understanding of LM IIIC settlement patterns. Most surveys record a drop in settlement numbers in this period (Watrous 2004, 207–311; Buell and Turner 2017, 80–82)[21]. However, the number of known settlements of the LM IIIC period in the island-wide database rises by over 30 compared to LM IIIB. Such a pattern is certainly at odds with that seen in many areas of the Greek Mainland at the time (Murray 2017, 210–46), though it has been noted that Crete's early loss of centralised administration with the fall of Knossos may have resulted in a different process of 'collapse' on the island, perhaps characterised by greater population stability (Wallace 2010). However, the large number of known LM IIIC settlements is also a product of the extensive reconnaissance of Nowicki (1987b; 1990; 1992b; 1994; 1995; 2000; 2011), at locations likely to have been home to such sites. Though this has evidently highlighted an important phenomenon, the degree to which it is representative of settlement across the island is unclear, given that similar researches have not been conducted in other locales (Gkiasta 2008, 80–84, 204, 214). Two points, however, suggest the cautious acceptance of our current knowledge of LM IIIC settlement as not wholly unrepresentative. Firstly, surveys in different regions have

[19] These survey publications note particular difficulties with identifying LM IIIA1 pottery, with vessels more generally assignable to LM IIIA2-B tending to be recovered in greater numbers.

[20] In a related manner, the presence of unrecognised settlements of LM IIIA-B date in the area of later LM IIIC sites appears unlikely, given Nowicki's (2000) extensive reconnaissance of such locations, and his recording of phases of occupation outside the LM IIIC-PG range which forms the focus of his publication on final BA-EIA defensible settlements.

[21] The Mirabello region is a notable exception; see Chapter 4.

identified patterns consistent with that represented by the sites identified by Nowicki. In the Mesara, Lasithi and Mirabello areas, settlement aggregated in LM IIIC to more defensible areas, while in the Galatas area, where such locales were few, settlement greatly declined (see Chapter 4). Secondly, Moody's (2012, 259–63) assessment of the relative representativeness of survey work in different 'production zones' on Crete concluded that, compared to coastal and lowland areas up to 400masl (where the majority of LM IIIA-B settlements are located), mid-slopes of 400-800m are under-represented in intensive survey work. Almost half of the LM IIIC and PG sites in the island-wide database are located above 400m, and so such sites are likely to have gone underreported in survey work, relative to those at lower elevations. The identification of such sites by Nowicki could, in that case, be seen as something of a corrective to a general over-representation of lower-lying settlements.

For the PG-PA periods, there are problems arising from these phases largely having been defined on fine wares from tomb contexts (Erickson 2017, 227–29). Given such wares are more rarely documented in surveys (e.g. Haggis 2005e, 57), and contemporary coarse wares are less well dated, PG-PA sites have often proven difficult to date closely based on surface remains (Turner 2017). An issue which may have impeded the identification of some PG sites, and which has certainly affected our understanding of the character of PG settlements, is the obscuring effect of later G-A occupation at those sites which continued in use throughout the EIA. For instance, at Azoria, stratified sequences of PG to earlier G date have proven elusive, compared to the clearer architectural remains of LG-A (Haggis and Mook 2015, 18), and similar difficulties have been encountered at Prinias, though evidence for continued occupation from LM IIIC-G has slowly mounted (Babbi 2015, 89 n.21, with references).

For the Archaic period, there have been long-standing difficulties with identification, based on limited refinement of the relevant ceramic chronologies. Excavations at Azoria, and work on Archaic material from across the island (Erickson 2010a), have started resolving some of these issues, but the lack of good evidence for occupation at many settlements specifically in the mid-late 6th century remains an issue (Erickson 2014). Furthermore, a range of stamped coarse ware jars, usually dated to the 7th-early 6th centuries and found in survey work in both the Galatas and Mirabello areas, may actually have been produced or used down into the 5th century, introducing

uncertainty about the chronology of some PA-A sites identified in survey contexts (Erickson 2017, 228). Many of the sites in the island-wide database employed in this thesis derive from Sjögren's (2003) catalogue of 8th-6th century sites, though as Erickson (2014, 69-71) has pointed out, many of those with 'Archaic' occupation in this catalogue do exhibit a caesura or diminishment in archaeological visibility sometime in the 6th century. This observation is important, but the chronological scope of the present thesis only extends to the early 6th century, and as such is not strictly concerned with the continuity or discontinuity of settlement in subsequent decades – though this remains a significant issue in need of further study and theorisation.

In summary, there are certainly problems of archaeological visibility affecting our knowledge of settlement in each period under investigation. It is difficult to weigh the representativeness of each period against others, though there do not appear to be any issues of identification which may so dramatically affect our perception of any given period that it should be excluded from comparative discussion (with the possible exception of the few known LM II sites). It is hoped that the comparison of regional and island-wide patterns provides a means of navigating the issues of representativeness presented by the current datasets, and that the conclusions reached are balanced against the reliability of the evidence in a way that avoids gross mischaracterisations of the patterns under investigation.

Additional Settlement Data

To set the evidence from LM II-A within a broader chronological context, data were obtained on settlement locations in the Neopalatial period (MM III-LM I) from the Mycenaean Atlas Project[22], and in the Classical, Hellenistic and Roman periods from the Pleiades gazetteer[23]. Furthermore, locational data for the settlements recorded in the 1881 census of Crete were obtained by cross-referencing the dataset of modern-day settlements from Open Street Map[24] with the census publication (Spanakis 1991), removing newer settlements, and manually identifying and adding coordinates for those no longer inhabited. This last dataset was included because of its much richer

[22] Available at helladic.info.

[23] Available at pleiades.stoa.org.

[24] See openstreetmap.org. The relevant datasets are available for download from geofabrik.de.

documentation, in contrast to antiquity, and because, though historically recent, it still reflects a largely pre-industrial phase on the island for which similar environmental concerns may have impacted on the choice of settlement locations.

An important caveat regarding these additional settlement data is that the representativeness or comprehensiveness of the site lists obtained for the Neopalatial and CL-Roman periods cannot be guaranteed, though both sources represent the work of many scholars seeking to compile thorough records of ancient archaeological sites, with particularly high representation in Crete and the Aegean. Future analyses could certainly look at verifying and expanding on these datasets, but they are considered sufficient for the broad comparisons presented in Chapter 4.

Topographic and Environmental Data

In addition to the settlement data outlined above, underlying map data were collected and generated in several GIS programmes, to use as the basis of the analyses presented in Chapter 4, which consider the topographic and environmental characteristics of settlement. Digital elevation models (DEMs) were downloaded from NASA's Earth Explorer service[25], utilising ASTER DEM data at approximately 27m resolution (Fig. 2.1). From this, several derivative surfaces were computed, aimed at capturing features of topography with implications for agriculture, accessibility, and defensibility (for summary, see Table 2.2).

Firstly, maps representing relative elevation were created. Here, the elevation value of each pixel is compared to the mean elevation of all pixels in a given radius, producing either a positive (the pixel is above the local average) or negative (the pixel is below the local average) value. This procedure was performed over both 500m (Fig. 2.2) and 2.5km scales (Fig. 2.3), to capture both immediate situation and wider topographic setting. A site on a small hill on a plain, like Phaistos for instance, would thus be characterised by higher relative elevation on both scales, while one like Knossos, on a small hill in a valley, may have positive elevation on the 500m scale, but negative relative elevation within a 2.5km radius. Sites on the low flanks of hills at the edges of plains – a common phenomenon in areas like the Mesara and the Lasithi Plateau – would in turn be likely to

[25] Available at earthexplorer.usgs.gov.

produce negative values over both scales.

Variable	Measured in	Significance
Elevation (Fig. 2.1)	Meters above sea level (masl)	Elevation closely linked to types of environment found on island, with coastal plains at lower elevations and mountains and upland plateaux at higher ones
Distance from coast (Fig. 2.7)	Meters (m)	As with elevation, related to types of environment, but also orientation of settlement with regard to coastal and/or maritime activity
Relative elevation (500m radius) (Fig. 2.2)	Meters (m)	Reflects localised topography – positive values could reflect hilltop or raised location, negative values a valley or depression
Relative elevation (2.5km radius) (Fig. 2.3)	Meters (m)	Reflects wider local topography – positive values could reflect mountainous location, negative values a large valley or gorge, or flanks of hills
Quantity of flat land (500m radius) (Fig. 2.4)	Count of cells in raster map below 13° slope	Reflects localised topography with implications for subsistence in immediate vicinity of settlement
Quantity of flat land (2.5km radius) (Fig. 2.5)	Count of cells in raster map below 13° slope	Reflects wider local topography with implications for subsistence in hinterland of settlement
Topographic wetness (Fig. 2.6)	Arbitrary units	Estimate of the accumulation of water in landscape, with implications for subsistence based on the exploitation of well-watered terrain

Table 2.2 Environmental and topographic variables created as raster maps, from which values were attributed to site points in the spatial databases.

A second set of maps was produced by first deriving a slope surface from the DEM. Then, two different surfaces reflecting the local topography were generated by reclassifying the slope raster so that pixels lower than 13° were valued 1, and those above valued 0. Then, for each pixel, the value of all pixels in a 500m or 2.5km radius were summed, producing maps which represent the quantity of 'flat' land in both an immediate and broader vicinity (Figs 2.4-5). These quantities of flat land have implications for both agricultural potential, in that flatter land is typically favoured

for cultivation (see discussion below regarding agricultural catchments), and accessibility or defensibility, as less flat terrain typically characterises more inaccessible or defensible locations.

Values from each of these maps were attributed to the points representing settlements in each of the spatial databases outlined above, and the randomly sampled points generated for the digitised survey datasets within the areas of known sites. The statistical distribution of these values for the site points of each ceramic period forms the basis of the discussion of settlement patterning in Chapter 4. There, the distributions of these values in different periods are compared by means of box and whisker plots, where the boxes represent the interquartile range (or IQR – the range between the 25th and 75th percentiles), and the whiskers (lines) represent the range of values within 1.5 times the IQR above and below. Outliers are displayed as points. The differences between some of these distributions are tested for statistical significance, to examine whether they are more likely to reflect random variation or genuinely distinct distributions, that might inform us about the changing priorities of settlement through time. The test employed is the Mann Whitney U test, which assesses the likelihood that two samples were drawn from different populations, in relation to a single dependent variable. The test is non-parametric, which means it does not assume the data are normally distributed[26], and can be used for even relatively small sample sizes. It thus serves as an appropriate tool for assessing the significance of differences in the topographic and environmental variables outlined above between sites of different periods. Changes in settlement patterning have been an important theme in discussions of the LBA and EIA on Crete (Nowicki 2000; Wallace 2010; Gaignerot-Driessen 2016a), and the use of this statistical approach is aimed at testing and quantifying the nature, scale and significance of these changes through time.

Analysing Movement and Connectivity

Questions of mobility and interaction are also an important component of the present thesis, and so beyond the discussion of topographic and environmental contexts of settlement, Chapters 4-7 examine various kinds of spatial relationship between settlements and the possible corridors of movement which may have served to connect them in antiquity.

[26] This is true for many of the topographic variables considered here, with those including elevation and coastal distance typically skewing towards lower values.

A first concern in these discussions is intervisibility. The analysis of visibility through the use of GIS tools is long-established in archaeology (Wheatley 1995; Llobera 2001; Soetens et al. 2002; 2003), as are the many theoretical and practical questions concerning the degree to which we can extrapolate from simulated viewsheds back to human experience of the visual landscape in antiquity (see Conolly and Lake 2006, 225–33)[27]. Here the use of line-of-sight modelling is largely employed to examine the intervisibility of settlements, or else settlements and their associated cemeteries, and the discussions are intended to be illustrative more than predictive or deterministic. To produce these lines of sight, the Visibility Analysis plugin for QGIS was employed (Čučković 2016), along with generous parameters of 2m start and end point heights. To achieve a more realistic result, these lines of sight were simulated from the random points sampled within the areas of survey sites, rather than from single points representing those sites.

For investigating movement and possible routes through the landscape, two different approaches were employed. The first is the programme UNICOR (Landguth et al. 2012), a corridor network simulator originally developed in an ecological context to study species movements, but which follows many of the same conventions of least-cost path simulations in the fields of archaeology (on Crete, see e.g. Siart et al. 2008b; Déderix 2017). The value of this programme is that it computes, based on a supplied set of starting points and a cost-surface, a complete network of least-cost paths between all points. The routes are calculated based on Dijkstra's (1959) algorithm, which minimises costs across the whole route, while the cumulative output of all paths is smoothed using a Gaussian kernel density function, such that locations where many paths intersect or follow identical or closely adjacent routes emerge as areas of higher intensity movement. The cost surface employed was a slope map reclassified following Tobler's (1993) hiking function, to reflect the incurred cost of crossing pixels of different slope values (Fig. 2.8)[28]. This programme was used in

[27] Some of these, such as the effect of past vegetation on visibility, are likely to be of lesser concern on Crete, which was probably not heavily wooded in the period under investigation, and in most of the areas of human settlement being considered, long-term agricultural use is likely to have further reduced major areas of potentially obstructive woodland (see Chapter 3).

[28] The fact that only a single cost surface was used to compute these paths does mean that, in contrast to other studies involving the calculation of cumulative least-cost paths (Bevan and Conolly 2013), the simulated routes reflect isotropic costs. That is, they do not take account of the different costs of directional travel between points A-B and between points B-A. Anisotropic routes do take account of these differences, but are more computationally expensive to calculate, and so, as in other studies aimed at calculating route networks, the simpler, if ultimately less theoretically robust, approach of using isotropic costs was adopted (see

simulating routes across the Mirabello and Galatas survey areas, starting from 100 points randomly distributed outside the survey areas (Figs. 2.9-10). This was done such that the resulting routes would not be affected by the locations of known sites, but the relationships of those sites to the resulting routes could be explored.

The second approach to modelling human movement made use of the r.walk module in GRASS GIS. The relative accuracy of this module for calculating walking times in the Cretan landscape has been demonstrated by Bevan (2011; 2013), based on comparisons with the journeys recorded by Pendlebury (1939)[29]. This module also makes use of Dijkstra's algorithm, but is based on Naismith's rule for walking times (presented in Langmuir 1984), and when supplied with a starting point and cost surface, produces a raster map of incurred cost, represented in seconds of travel out from that point. A direction raster can also be produced, which indicates the least-cost direction of travel from each pixel back towards the origin point, and the use of the r.path module on this direction raster produces a least-cost path linking any supplied point(s) to the origin point[30]. This module was used in producing the maps of estimated travel times presented in Chapter 3, and the simulated routes to Knossos in Chapter 7. The r.walk module also forms the basis of the r.catchment algorithm discussed below.

Networks

As discussed in Chapter 1, networks have become a popular feature of archaeological discourse, theory and formal analysis (Brughmans 2013; Knappett 2013a; papers in 2013b; Peeples 2019; Knodell 2021, 22–23). Beyond their metaphorical usage, network approaches typically involve the drawing of connections, known as links, between various entities or actors, known as nodes. Commonly in archaeology, archaeological sites or regions serve as the nodes, with links representing anything from imported artefacts, to shared material or stylistic features, historically

e.g. Déderix 2017). The shortcomings of this approach were partially mitigated by generating the cost-surface based on the mean values for both uphill and downhill travel, as derived from Tobler's hiking function.

[29] The correlations are particularly strong up to around eight hours, beyond which point the module has a tendency to under-estimate walking times. The distances over which routes were estimated using r.walk in this thesis are all well below these limits.

[30] The paths produced here are anisotropic, as they reflect the cost of travel out from the origin point to the supplied points; the reverse journey would not necessarily be identical.

or epigraphically attested relations, or the kinds of attachments and patterns of mobility which develop between spatially proximate communities. This last kind of connection, employed in a hypothetical or probabilistic manner for examining plausible systems of movement and interaction, has been employed before in an Aegean context (Broodbank 2000; Knodell 2021), and informs the use of networks in the present thesis. Here, networks are employed in both an abstract and illustrative way, firstly in Chapter 3, to model hypothetical patterns of mobility across Crete, and in Chapter 4 to visualise changes in the spatial relationships within settlement systems through time. In creating the networks for this thesis, the QGIS v.net.models plugin was used (Ducke and Suchowska 2021). This module facilitates the creation of networks based on a wide range of starting parameters, as well as the extraction of various metrics from the produced network. The programme also permits the construction of links as least-cost paths between points, which can aid in the investigation of past networks of mobility. Further particulars on the creation of these networks can be found in the relevant chapters.

Demography and Subsistence

There are evident – though certainly complex and much debated[31] – relationships between the size of a population, the forms of subsistence it practises, and the types of settlements into which it is aggregated. In attempting to investigate these connections in a quantitative manner, it is necessary to employ certain assumptions and calculations regarding population density or size, and the amount of land necessary to feed each person.

Estimating Populations

There are a number of different approaches to the estimation of past populations, but perhaps the most common are the multiplication of estimated site size by a single coefficient of population density, and the multiplication of the estimated number of dwellings at a site by the average number of residents per house (Hassan 1981; Zorn 1994). Cross-cultural population density estimates have

[31] The literature on the relationship between population size, subsistence practices, settlement forms, and social complexity is vast. See e.g. Naroll 1956; Sahlins and Service 1960; Service 1962; Carneiro 1967; Flannery 1972; Chapman 2003; Boone 2010; Bowles et al. 2010; Flannery and Marcus 2012; Thomas and Mark 2013; Powers and Lehmann 2014; Ortman et al. 2015; Hughes et al. 2018.

been put forward in the past (e.g. Naroll 1962) but these likely underplay the true geographic and historic diversity of what are deemed desirable or acceptable levels of individual living space (Whitelaw 2001, 15–17). Indeed, even reasoning back from modern or early modern population figures to ancient populations in the same geographic region, though preferable, remains potentially fraught with error. More common for the Aegean LBA and EIA has been the approach of estimating the number of households within an extensively excavated settlement, extrapolating from this the likely population, and in such a way producing a density estimate which can be applied to other unexcavated sites.

Table 2.3 summarises the population estimates made by a range of authors covering the BA and IA in Crete and the Aegean. Despite the application of similar methodologies in most cases, a wide range of suggested density values nonetheless exists, from 12.5-400 people per hectare (henceforth p/ha). These vary in the specificity of their application, both temporally and geographically.

Perhaps most salient to the present discussion are the figures employed by Nowicki (1987, 245–46; 1990, 177–78) and Wallace (2001; 2002, 74–75), the latter being based on an adjusted version of the former, and in each case defining a general set of parameters to estimate the populations of LM IIIC-PG settlements. Nowicki's estimates are based on the excavated buildings of Karfi, which he argues amount to 25-30 individual residences. Given that, based on surface sherd scatters, the site of Karfi may have reached 3ha in size, with 0.6ha currently excavated, and assuming an average of 5-8 people per household, Nowicki thus calculates a population of 750-1200 people. Wallace follows Nowicki's method, but considers the 5-8-person average too high, settling for a figure of five people per household[32].

[32] Nowicki's estimate does indeed seem high, and assumes three generations are present in each household. Whitelaw (*forthcoming*; see Fig. 2.12) has shown that house sizes in LM IIIC were small by comparison with earlier LM I houses, and perhaps comparable with those of LM II-IIIA. If this is the case, and given the grounds for assuming averages of 4-5 people per household in BA and Classical Greece (Whitelaw 2001; Gallant 1991), it seems highly unlikely that these numbers significantly increased in LM IIIC.

Source	Smaller sites (p/ha)	Definition of smaller sites	Larger sites (p/ha)	Definition of larger sites	Household	Period	Region
Nowicki (1987a, 246)	208-400[33]	Sites with agglutinative plans	208-400	Sites with agglutinative plans	5-8	LM IIIC-PG	(East) Crete
Wallace (2002, 74–75)	208-250	N/A	208-250	N/A	5	Early Iron Age	Crete
Day (2016a, 221)	142-214	N/A	142-214	N/A	4-7 (5 avg.)	LM IIIC	Kavousi, East Crete
Hayden (1995, 135 n.154)	165	N/A	165	N/A	4-5	O-A	Meseleroi, East Crete
Haggis (2005a, 84)	150-250	N/A	150-250	N/A	5	LM IIIC	Kavousi, East Crete
Whitelaw (2019, 96)	100	Rural sites/villages	200-225	Larger urban centres	5	Late Bronze Age	Crete
Watrous et al. (2004, 24–25)	30-50	Site size <10ha	50-100	Site size >10ha	N/A	All periods	Mesara, South Crete
Price (2011, 28)	40-60	N/A	40-60	N/A	4.42	Graeco-Roman	Sfakia, West Crete
Morris and Knodell (2015, 347)	N/A	N/A	12.5-25	Larger sites (Knossos, Argos...)	N/A	Early Iron Age	Greece

Table 2.3. Estimates of population density and household size from studies covering the LBA and EIA in Crete and the Aegean. Where different densities are presented for smaller and larger sites, the definition of these are given. Estimates are ranked from the highest density estimates for small sites, to the lowest.

[33] These values correspond to the number of people per hectare of 'agglutinative architecture'.

The difficulty with these estimates is that they presume a constant density of architecture across the entire 3ha site, something thrown into doubt by recent excavations, which have identified at least one building standing largely alone at a relatively central location within the settlement (Wallace and Mylona 2012, 6–7; Wallace 2020b, 26–38; see Fig. 2.11). Furthermore, we know that Karfi expanded over the course of LM IIIC (Wallace 2020b, 56), while at any one time it seems unlikely that all standing architecture would have been inhabited, especially to the full quota of five or more people assumed by Nowicki.

We can also set these estimates in context against others proposed for the BA and EIA (see Table 2.3). Whitelaw (2001; 2004; 2019) has calculated on the basis of demarcated areas of administrative, public, and domestic architecture among excavated BA sites that an average density of 200-225p/ha may have obtained in the larger political centres of the palatial period, but that among smaller villages and hamlets a figure of 100-150 people is more likely. One method discussed by Hayden (1995) for the Meseleroi valley, involves assuming one person per $20m^2$ of roofed space (thus 500p/ha) which, on a conservative estimate, accounts for around one third of the footprint of the Meseleroi survey sites, giving 165p/ha. A much lower density for Graeco-Roman sites has been advanced by Price (2011, 25–30) on the basis of archaeological survey in the Sfakia area, calibrated against early modern census data, though he concedes this region, covering the rugged southern limits of the Lefka Ori, and their scant coastal strips, may have supported less dense populations regionally[34] than other parts of the island. The Western Mesara Survey (Watrous et al. 2004) also employed separate estimates for smaller and larger sites, based on Ottoman census data on the early modern villages of the region, with a figure of 30-50p/ha for sites under 10ha, and 50-100 for those above. Estimates from the Mainland of Greece for the EIA range even lower still (Morris and Knodell 2015).

[34] Though within settlements, and their immediate environs, densities may have been quite high, as a result of the limitations of readily habitable land.

The estimates adopted here fall towards the middle of the range represented by these studies. A figure of 100-150p/ha is assumed for all settlements of the LM IIIA-Archaic periods, accepting that this will at times no doubt exceed and at others fall short of the true value. Not enough sites of this period have been sufficiently excavated to fully test these figures, but the few that have suggest they are reasonable. Day (2016a) has calculated that Kavousi Vronda, with an estimated 20-25 domestic units, each housing on average five people, was thus inhabited by 100-150 souls in LM IIIC. The site is around 0.7ha in size, yielding a density of 142-214p/ha. By contrast, at Monastiraki Khalasmenos, 0.4ha have been excavated of what may be a 0.65ha site (Haggis and Nowicki 1993b, 308–10), yielding 7-11 structures interpreted as houses (Tsipopoulou 2018, 4–5; Rupp 2014). This would correspond to 35-55 people, or 87-138p/ha, given the excavated area of 0.4ha. The estimate of 100-150p/ha falls roughly in the middle of these two ranges. Meanwhile, applying these estimates to Karfi would produce an estimated 300-450 people, admittedly much lower than previous projections (Pendlebury et al. 1938, 65; Nowicki 1987a, 246). While on the conservative side, this figure would imply that the density of architecture seen in the 25-30 dwellings so far excavated could cover up to 2.16ha of the 3ha site, which does not seem wholly implausible. The implications of these revised estimates will be thoroughly explored in the ensuing analysis of settlement patterning, subsistence practice, and socio-political organisation.

Estimating Agricultural Catchments

Building on estimations of population size, we can calculate the likely minimum cultivated areas or catchments necessary to support the subsistence needs of a community, and use these as the basis for considering the nature, organisation, and viability of agricultural regimes across sites in different periods[35]. As with the estimation of populations, assumptions about the likely quantities of land necessary to feed each individual must be employed, from which minimum catchments can be estimated. Wallace (2001; 2002) calculated likely catchments for a number of EIA sites on

[35] Site catchment analyses have a long history in archaeology, going back to the work of Vita-Finzi and Higgs (1970). Notable publications include Hodder and Orton (1976), Flannery (1976), Findlow and Ericson (1980), and Roper (1979). The estimation of minimum catchments in the present thesis embraces the general approach of such studies, but does not go as far as attempting to identify specific resource locations within the environment, or model the relative costs of exploiting those resources. Rather, the goal is simply to illustrate the likely minimum geographic areas regularly exploited as part of agricultural production by the residents of a site.

Crete, using estimates for pre-modern yields and consumption based on the data compiled by Allbaugh (1953), and modified by ethnographic (Wagstaff and Augustson 1982) and ancient historical (Garnsey 1992) sources on the likely quantities of grain reserved for resowing. She arrived at a figure of 0.94ha per person.

An analysis of the storage practices of BA Crete by Christakis (2008), suggests a slightly different figure for the minimum necessary land to supply individual subsistence needs. Likewise drawing on Allbaugh's statistics, in combination with ethnohistorical information regarding Venetian and Ottoman Crete, Christakis (2008, 29) postulates an average Neopalatial diet consisting of '44% cereal products, 38% vegetables, wild greens, fruits, and nuts, 3% pulses, 5% olive oil, 8% wine, and 2% animal products'. Assuming a figure of 166kg of cereals consumed each year, and utilising historic data on the yields of the main crop types (see Table 2.4), these ratios amount to '4 *stremmata*[36] of cereals (estimated on the basis of barley), 0.3 *stremma* of pulses (on the basis of lentils), 0.5 *stremma* for olive oil, and 0.2 *stremma* for wine'. With an additional 1 *stremma* for fruit and vegetables, Christakis estimates a minimum of 6 *stremmata* or 0.6ha per person, a figure which aligns with estimates for the Classical Greek period (Osborne 1987, 46), and is close to that of 0.5ha per person employed by Whitelaw (2019) in recent estimates of minimum agricultural catchments in the Palatial era on Crete. The figure of 0.6ha per person is thus adopted here and, in conjunction with the estimated 100-150 people per hectare outlined above, forms the basis of the minimum agricultural catchments calculated in subsequent discussion of agricultural practice.

Crop	**Kg/*stremma***
Barley	75.89
Lentils	50.11
Olive oil	28.62
Wine	178.95

Table 2.4 Estimated yields of chief food crops for the Cretan Neopalatial period. Based on estimates by Christakis (2008, Table 7), using data from Petmezas (2003). *One stremma is equal to 1000m².*

While agricultural catchments can simply be calculated as minimum areas, and represented as circles of a given radius around a site, they can also be adjusted to reflect the kinds of landscape

[36] One *stremma* (plural *stremmata*) is equal to 1000m², or 0.1ha.

most likely to be cultivated, and the costs of travelling to and from the fields each day. As estimated by Chisholm (1968, 52–53), the effectiveness of agricultural production at a location declines somewhere on the order of 15-20% per kilometre travelled to get there, and Allbaugh's (1953, Table A82; see Fig. 2.13) data make clear that farmers in mid-20th century Crete seldom ventured more than two hours to their furthest field, with more than half never straying beyond one hour. The minimisation of walking times to and from fields can be expected to be of importance to ancient populations as well. In addition, we can assume that farmers would exhibit preferences for more level terrain, given the necessity of terracing steeper slopes to render them stable and productive (Whitelaw 2019, 97). This approach may be prudent given that the extent of terracing in the LBA and EIA is unknown (see Chapter 3). Thus the calculation of catchments for the present study was conducted in GRASS GIS, utilising the *r.catchment* module developed by Ullah (2011), which constrains the footprint, though not the area, of the resultant catchment both by travel times (through utilisation of the *r.walk* module), and the exclusion of land above a certain slope. A value of 13° was employed here, in line with evidence from intensive survey on Kythera as to the pitch at which land management systems shift decisively in favour of terracing (Bevan and Conolly 2002; see Fig. 2.14).

One final concern is that of livestock rearing, which does not contribute directly to these estimates. The chief difficulty is that limited data exist to assess the likely scale or structure of animal husbandry in any one period, making estimations of minimum populations and thus pasturage highly problematic to calculate (Hughes et al. 2018, 6–9; Halstead 1996). Whitelaw (*forthcoming*) cites estimates of 0.5-1 sheep/goat per hectare in modern Crete (Papanastasis et al. 1990), with the higher stocking densities encouraged by agricultural subsidies in the 20th century (Ispikoudis et al. 1993; Kosmas et al. 2015) suggesting rates towards the lower end of this scale may be more applicable to prehistoric contexts. The documentation of the Linear B tablets permits broad estimates of the amount of grazing land necessitated by the quantities of recorded sheep (see Chapter 6), but in non- and post-palatial contexts we have very little evidence as to the likely number of animals kept per person. As such, the potential contribution of herding, grazing, and transhumance to the landscapes of subsistence discussed in Chapter 6 is not approached through the modelling of minimum catchments, but is instead considered on a case-by-case basis, to avoid

the introduction of further potential sources of error and over-generalisation.

Mortuary Analysis

Cemeteries Database

The investigation of mortuary behaviours presented in Chapter 7 utilises a database constructed to permit spatial, quantitative, and statistical analysis of the cemeteries, tombs, and grave goods of LBA-EIA Crete. A number of catalogues covering LBA and EIA tombs have been produced in recent decades (namely Löwe 1996 and Eaby 2007; Preston 2000 provides an abbreviated catalogue; Pini 1968; Tsipopoulou 2005; Evangelou 2009; Papadopoulou 2014). Invaluable though they are, these catalogues do not form the basis of quantitative analyses, and as such do not always present the relevant data in ways conducive to such analyses. Accordingly, a new database was constructed from scratch, using the catalogues of Löwe, Eaby and Preston as a guide to the known tombs of each period, supplemented by published material where available on the contents of the tombs. Given the ever-growing corpus of LBA and EIA tombs known on Crete, more recent summaries (Galanakis 2018), reports[37] and, where possible, publications[38] were also employed to bring the catalogue more up-to-date.

The mortuary record of Knossos is particularly well published and investigated. Admittedly, many of these tombs were excavated in the early 20th century (Hogarth 1899-1900; Evans 1905; 1935, 962–1018), leading sometimes to confused interpretations of the burial contexts and their associated dates, but several have been restudied in recent years (Coldstream 2002; Preston 2005; 2007). In turn, the two largest known burial grounds of the EIA period have been fully published (Brock 1957; Coldstream and Catling 1996). These, together with the other scattered tombs of this period (Hutchinson and Boardman 1954; Coldstream 1963; Boardman 1967; Davaras 1968; Callaghan et al. 1981) constitute by a long way the largest dataset on mortuary activities anywhere

[37] Utilising, in particular, *Archaeology in Greece Online*, the joint online database of the British School at Athens and École française d'Athènes, available at: chronique.efa.gr.

[38] Important tomb and cemetery publications of the past 20 years include the sites of Mokhlos (Soles et al. 2008; Smith 2010; Soles and Davaras 2011), Kalokhorafitis (Davaras and Banou 2003), and Kounavoi/Eltynia (Rethemiotakis and Egglezou 2010), while in-depth studies of sites including Maroulas near Rethymno have also been produced (Papadopoulou 2017).

on the island for the period[39].

Unfortunately, and in contrast to Knossos, a number of extensive and significant cemeteries of the LBA and EIA periods remain unpublished, limiting the degree to which they could be integrated into this database. The more than 200 tombs of the Armenoi cemetery, south of Rethymno, are in the process of being published, but the recent first volume does not concern the tomb assemblages themselves (Tzedakis et al. 2018). However, a string of annual reports (Tzedakis 1970; 1971; 1972; 1973-4; 1976; 1978; 1980; 1994-6), and preliminary studies (Papadopoulou 2014) permit certain features of tomb construction and assemblage composition to be included in the database. In the EIA, the cemeteries of Prinias and Eleutherna likewise remain unpublished, despite a number of preliminary reports and studies (Rizza 1972; 1973; 1973-4; 1981; 2011; Stampolidis 1988; 1989-90; 1994-6; 2000-1; 1996). The former cemetery, at the location Siderospilia, appears to comprise over 500 tombs (Rizza 2019), while the number excavated at the latter, at the site of Orthi Petra, remains unknown, though many tens of tombs seem likely (Eaby 2007, 179–85). Given the only partial information on tomb numbers, dimensions, contents, or dates, these burial grounds remain absent from the present database, other than in the broadest 'Cemetery' section, including what summary information can be gleaned from preliminary reports.

Database Structure

The mortuary database is divided into four nested sections or levels. The first, 'Cemetery' level provides information on the groups of (or single) tombs found at a particular location. Note this is distinct from the site or settlement to which this cemetery might be seen to belong. For instance, the Knossos North and Fortetsa cemeteries appear as separate entries in the Cemetery section of the database, but both belong to the site of Knossos. This sheet contains geographic information on the cemetery, including coordinates where known; the ceramic periods attested there; the number of confirmed and published tombs; the presence and, where available, the counts of

[39] Recent studies of the Knossian material have likewise permitted the addition of several further criteria to the database for this site, which was the subject of the present author's master's dissertation. These include the identification of BA artefacts in EIA tomb contexts from Crowe (2016), and imitations of East Mediterranean imports from Antoniadis (2017). Imported items of the EIA were identified – in addition to original publications – from Jones (2000).

different tomb types; and the presence and counts of different mortuary rites.

The second sheet of the database covers individual tombs. Information includes location; tomb type; state of publication; periods in use; tomb dimensions; type and number of burials; and tallies of artefact materials and types, generated from the remaining two sheets of the database. These last two sheets cover ceramic vessels and other kinds of artefacts separately. The 'Ceramics' sheet includes information on the tomb from which the vessel came; shape; broader functional type; dimensions; ceramic period; and corresponding absolute date ranges. The 'Other Finds' sheet is very similar, but also includes information on artefact material.

Taken together, the database covers 333 cemeteries or burial locations; 1,790 individual tombs; 12,698 ceramic vessels; and 5,513 other artefacts. Though the state of publication – not to mention looting and tomb disturbance – raises issues about the robustness of some of these data, taken *en masse* they represent a powerful resource for examining broad, long-term trends in the composition of mortuary assemblages and practices across the island. In keeping with the approach of the present thesis, the kinds of analyses permitted by this database tend towards the broad, comparative, and synthetic, though there is also scope for the examination of smaller scale trends and patterns. The extended discussion of the 8th-7th century Knossian material – which is particularly abundant – with comparisons to contemporary developments more widely on Crete, is aimed at illustrating this joint potential. This is the first time these datasets from across the LBA and EIA have been combined and analysed from a quantitative standpoint, and so Chapter 7 also serves as a test case for such an approach, and the state of the presently available data.

Modes of Analysis

Much of the analysis presented in Chapter 7 utilises relatively straightforward quantification and visualisation of spatial and chronological patterns in cemetery and tomb use, tomb types, burial rites, and artefact categories. However, a technique known as aoristic analysis is also employed, for which some explanation should be provided. A major problem arising from assigning individual vessels to ceramic periods is the temporal uncertainty about their true date. A Knossian EPG vessel, for instance, could have been made anytime between 970 and 920 BCE, on our current estimates. Such a situation presents major challenges to both visualising and analysing ceramic

assemblages. One approach is simply to utilise mean dates (i.e. 945 BCE for our EPG vessel), but when considering large datasets, this has the effect of artificially clustering the dates of vessels from the same period on the same calendar date (see Fig. 2.15). This is particularly problematic for vessels only assignable to less specific phases, such as PG. The use of the mean date for the whole PG period (905 BCE) would make all such vessels appear to fall within the MPG sub-period (920-875 BCE), when in reality they could belong anywhere from 970-840 BCE.

Aoristic analysis aims to incorporate this implicit uncertainty into the visualisation of temporal data (Johnson 2004; Crema 2012; Crema et al. 2010), and is used multiple times in Chapter 7. In aoristic analysis, vessels are not assigned individual dates, but rather their corresponding date range is divided into equal chunks of time, and these chunks assigned values which sum to one[40]. In the present study, decades were used as the interval, meaning that an EPG vessel, datable to between 970 and 920 BCE, would receive a value of 0.2 for each of the five constituent decades. A PGB vessel, meanwhile, would register 0.33 for each decade between 840 and 810 BCE. As such, 'events with tight temporal definition contribute more to the total probability over their range than do loosely defined events' (Johnson 2004, 450). The use of this technique avoids the misleading clustering caused by the use of mean dates and so permits a more nuanced examination of diachronic changes in burial assemblages (Fig. 2.16). There are, of course, limitations to this approach (Crema et al. 2010, 1123-24), but it overcomes many of the problems posed by assigning absolute dates to artefacts, and is particularly apt for tracing long-term patterns in the deposition of different vessel types, as will be explored in Chapter 7.

Summary

This chapter has outlined the principal datasets and methodologies employed in the analyses presented in Chapters 4, 6 and 7. As will be apparent from this overview, a range of different techniques and methods are utilised, though these have been chosen as most suitable for the broad scope and multi-scalar approach of the present thesis. Specific details of variations on these

[40] These values thus function as probabilities that the vessel dates to one of the chunks of time. These probabilities sum to one across the date range assigned to the vessel, as it is assumed the vessel dates with 100% certainty to some point within this chronological range. Of course, in reality, this level of certainty is not guaranteed.

methods are provided in the relevant sections in subsequent chapters, while in the Appendices, complete lists of sites from the settlement and mortuary databases are presented, along with tables of summary information on tomb, burial, and artefact types.

Chapter 3

The Cretan Landscape

Introduction

Crete is the largest of the Greek islands and, excluding the islets of Gavdos, Khrisi, and Koufonisi, the most southerly. At 245km long and, at its widest, 50km across, Crete is more than twice the size of second-place Euboea – 8,340km^2 versus 3,670 – and boasts remarkable contrasts of climate and ecology. In its fragmented landscape, pine and deciduous woodland, steppe and grassland, maquis and garigue, even wetlands are all to be found, each host to distinctive flora and fauna, and each settled, traversed, exploited and managed in differing ways and to different degrees by the island's inhabitants (Rackham and Moody 1996). If environmental fragmentation begets connectivity, as in the model of Horden and Purcell (2000), then the scale of Crete has fostered a complexity and diversity in these relationships untenable on Greece's smaller islands.

The island's location, at the bottom of a great arc running from the Peloponnese through Kythera and Antikythera, and on to Kasos, Karpathos, and Rhodes, is in no small part responsible for the sheltered, almost bounded appearance of the Aegean Sea on a map (Fig. 3.1), captured long ago in Plato's image of the 'frogs about a pond' (*Phaedo* 109b). Crete's northern and southern coasts thus look out onto different seas – the Cretan and the Libyan, that is, the Aegean and the wider Mediterranean. This situation has found the island repeatedly integrated into sailing routes running east to west and north to south (Arnaud 2005, 56-57, 212, 217, 226; see Fig. 3.2). Though they varied in their nature and intensity, maritime connections can be traced in the LBA and EIA with the Cyclades (Kotsonas 2011b) and mainland Greece[41] on the one hand, and Egypt (Watrous 1998; Cline 1999), the Levant (Stampolidis and Kotsonas 2006), Cyprus (Karageorghis et al. 2014), Libya (Boardman and Hayes 1966; Schaus 1985), Italy (Lo Porto 1974; Hallager 1985), and Sardinia (Lo

[41] The connections here are the subject of a vast literature – various aspects will be considered in subsequent chapters.

Schiavo 2003) on the other.

The climate, physical environment and wider regional setting of Crete are the subjects of this chapter, especially those aspects most closely tied to forms of human settlement, economy, and interaction. 'Much of the beauty of Crete,' Rackham and Moody (1996, xi) suggest, 'is that it is a cultural landscape. Its present appearance is the result of millennia of interaction between human activities, human default, and the workings of Nature.' Such a view shares much with the 'historical ecology' of Horden and Purcell (2000). When they talk of microregions, they are not simply referring to disparate zones of particular morphology, soil composition, climate, and wildlife – though Crete has these in abundance. Rather, such areas are to be seen as emphatically human, in that it is only through human engagement with local ecology – most fundamentally, though by no means only, in trying to grow or procure enough food to live – that the fragmentation they see as defining the Mediterranean region becomes historically (and historiographically) meaningful. This is not an argument for simple determinism, but it does emphasise the recurrent pressures, constraints, structures[42] and opportunities which stem ultimately from humans acting within, and as part of, the environment. Crete's history is that of a long-running, dense human occupation of a spatially restricted environment, giving rise to a landscape which is the definition of an archaeological palimpsest, a single document written over again and again.

Many of the environmental features and processes considered here exist on an altogether different timescale from the historical developments examined in subsequent chapters, namely that of Braudel's (1972) *longue durée*: not static by any means, but in the main marked by rhythms and evolutions far slower than those of any human lifetime. Focussing first on the more constant or recurrent features of the Cretan climate and environment is intended to provide something of a baseline against which to orient the discussions of settlement, subsistence, burial and regional interaction which follow. For the periods and places where archaeological evidence is plentiful, forms of human activity within the landscape can be richly drawn, but even where it is limited, more enduring processes and relationships provide a footing on which to offer plausible scenarios where otherwise would be mere speculation. This chapter begins with a discussion of the Cretan

[42] Horden and Purcell (2000, 464) are cautious about the use of the term 'structure' but recognise that on some level it is an appropriate label for the types of continuities they propose.

climate, and our understanding of its character in the LBA and EIA. Next, the various physical and natural landscapes of Crete are introduced, before a closing discussion of how these may have shaped patterns of communication and movement in antiquity.

The Cretan Climate

The Modern Climate

Crete's climate today is typically Mediterranean, characterised by hot, dry summers, and mild, wet winters (Fig. 3.3). The lion's share of annual precipitation falls between November and March, and rain between June and August is not merely a rarity; if it does fall it has little impact, as the ground is too dry, and the temperature too hot for it to percolate down and provide moisture for the parched vegetation (Bottema 1980, 196). The island lies at the intersection of four principal weather systems, which in pairs are responsible, broadly speaking, for the island's seasonal weather patterns. The Azores High and Indo-Persian Low interact in the summer months to produce the Etesian winds, hot air currents which arrive over the island as north westerlies, and bring with them dry, hazy summer days. In winter, the North Atlantic Low meets the high-pressure belt over Southwest Asia and North Africa, producing depressions as the cool, dry air coming south from Europe mingles with the moist, warm air over the Mediterranean. These depressions move eastward over Crete, resulting in an alternating pattern of heavy rains and clear skies (Rackham and Moody 1996, 33–34).

Annual rainfall on Crete averages around 640mm, but this is by no means evenly distributed. The prevailing westerly winds, in combination with the rain shadows and excesses caused by the island's rugged topography, result in precipitation levels which tail off towards the east of the island, yet in any one area the uplands receive more rain than the plains below (Naoum and Tsanis 2003). Additionally, rainfall declines broadly south to north, whilst increasing further inland (Rackham and Moody 1996, 34–35), though with significant inter-annual variability (Vrochidou and Tsanis 2012). Similar differentials are seen in temperature, which again varies less longitudinally than it does altitudinally. Only a degree or two separate the average temperatures in Khania and Heraklion, but the mountain town of Anogia to the southwest of Heraklion regularly records

temperatures 6-8°C cooler than those in the capital (Moody 1987, 40–41). Through the combination of strong winds, minimal summer rainfall, and high temperatures, Crete is a very evaporative landscape. Drought resistant flora occur across the island, and wildfires are not uncommon[43]. Such climatic complexity and microregional variability are characteristic of Mediterranean landscapes, but are particularly pronounced on Crete, especially in combination with the island's highly divided topography.

The broad contours of this climatic regime have been in place for millennia, but episodes of social change and instability in the past have many times been linked to fluctuations and longer-term shifts in the balance of rainfall, temperature and seasonality, as well as interannual variability. It is worth considering, therefore, the evidence for climate – and climate change – in the LBA and EIA, and its implications for the historical developments explored in this thesis.

Reconstructing the Ancient Climate

A wide array of proxies is available for the study and reconstruction of ancient climates: pollen cores; isotopes from seawater frozen in polar ice; fossilised remains of climate sensitive flora and fauna; the preserved layers and rings of speleothems and ancient trees, and many others (Gornitz 2009). These can be marshalled to reconstruct, even if only in broad terms, past temperatures, precipitation levels, and seasonality (Moody 2014, 23). Caution must be employed in interpreting these proxies, which are often either very narrow or else very broad in their geographical scope. Only by assembling different proxies across multiple scales and regions can we hope to build up a picture sufficiently robust and nuanced to begin tying aspects of past climate to human developments on the ground.

On Crete, pollen cores have served as the main climatological proxy. The number of published cores continues to grow, with samples having been taken across the entire east-west span of the

[43] Despite this general picture, Crete's dramatic topography creates many local curiosities of precipitation, humidity and evaporation. The Asterousia Mountains, for instance, stand in a double rain shadow, but on their slopes can be found woods of moisture-demanding vegetation. Rackham and Moody (1996, 36) speculate that these could be something akin to the Caribbean cloud forests, with the precipitous crags and gullies leading down into the sea intercepting damp air and fog from which the plants derive their water. The Lefka Ori, on the other hand, receive several metres of snow each year, but as it disappears in May, the meltwater runs straight down into the porous limestone, leaving this upland area a barren desert in summer.

island (Fig. 3.4; Bottema 1980; Moody 1987; Hall and Atherden 1999; Bottema and Sarpaki 2003; Lespez et al. 2003; Pavlopoulos et al. 2007; Ghosn et al. 2010; Jouffroy-Bapicot et al. 2016; Cañellas-Boltà et al. 2018; Ghilardi et al. 2018; Jouffroy-Bapicot et al. 2021). Unfortunately, only a few of these have yielded evidence pertinent to the climate of the 15th-6th centuries BCE, either because they (or their published results) cover different timeframes (Jouffroy-Bapicot et al. 2016; Cañellas-Boltà et al. 2018), or else because the pollen sequences recovered were discontinuous or insufficient for that period (Lespez et al. 2003; Pavlopoulos et al. 2007; Theodorakopoulou et al. 2009). Recent cores made at Malia await full publication (Lespez et al. 2016). Those samples which remain offer some broad insights into the climatic conditions in the BA and IA that can in turn be weighed against wider regional palaeoclimatic indicators.

The Bronze Age Climate

In the broadest sense, something approaching the modern climate of Crete was in place throughout much of the Bronze Age. During the Last Glacial Period, until around 12,000 BCE, conditions were likely around 6-8°C cooler than today, and probably more arid. But by at least 8000 BCE, hornbeam, hazel and lime/linden all appear in the Cretan pollen record, trees which today are rare or completely absent from the island, suggesting a moister, warmer climate, while the broader pollen profile implies a landscape fragmented into tracts of woodland and steppe (Allen and Katsikis 1990, 14; Moody 1987, 157). From the Late Neolithic, and certainly by the EBA, several pollen cores record changes in flora suggestive of human agricultural activity, including a rise in burning, a decline in woodland species, and the increased presence of olive (Cañellas-Boltà et al. 2018; Jouffroy-Bapicot et al. 2021). The Middle-early Late Bronze Age appears to have been a period of relative climatic stability in the Mediterranean (Finné et al. 2019, 856–57). Warm-water foraminifera, a type of marine protist which serve as a proxy for more clement conditions, are abundant in the LC21 seabed core, taken off the northeast coast of Crete, in levels dating to between 2800 and c.1650 BCE[44] (Moody 2009b, 243–44).

Short-term anomalies and longer-term climatic impacts have been attributed to the Theran eruption of the 17th or 16th century BCE (Baillie and Munro 1988; Burgess 1989; Hammer et al.

[44] There is uncertainty here as to the later date, due to a gap in the data, possibly linked to the Santorini eruption.

2003)[45], yet many of these have proven flawed or difficult to verify (Eastwood et al. 2002; Pearce et al. 2004; Zanchetta et al. 2011). Despite an interruption in the LC21 foraminifera sequence around the time of the eruption, their much reduced abundance at c.3400 cal. BP may indicate the onset of cooler conditions, especially summers (Rohling et al. 2002, Fig. 1d). Recent multi-proxy studies do suggest that the period following c.1600 BCE may have been characterised by more variable climatic conditions (Finné et al. 2019; Avnaim-Katav et al. 2019), though a connection to the Theran eruption *per se* remains to be demonstrated.

Climate and Collapse

For no period in Cretan – perhaps Mediterranean – prehistory is the nature and impact of climate change more hotly contested than for the close of the Bronze Age. Carpenter (1966) was the first to propose an environmental explanation for the social disintegration witnessed at this time, an idea which found some early endorsement (Bryson et al. 1974; Weiss 1982). He argued that intense droughts – resulting from a period of global glaciation around 1200 BCE detected in Greenland ice cores – had resulted in food shortages and famine which precipitated the overthrow of the ruling elites in Greece and elsewhere by a starved populace.

Global patterns jostle with more locally observed trends, and the proliferation of studies on this topic have resulted in as much confusion as clarity, with ongoing debate among advocates of climate-induced collapse (Kaniewski et al. 2013; Kaniewski and Van Campo 2017), dissenters (Dickinson 2006, 46; Knapp and Manning 2016), and more cautious sceptics (Rohling et al. 2009; Finné et al. 2017). A recent survey of the literature (Finné et al. 2011) examined more than 200 papers, based on 80 climatological records, and concluded that several points of contention remain thoroughly unresolved. In part these problems relate to data and methodologies. Wiggles in the calibration curve for radiocarbon leave a great deal of uncertainty surrounding dates in the region

[45] This is not the place to discuss the – still highly contentious – dating of the Santorini eruption. Suffice it to say, longstanding divisions between those favouring radiocarbon (RC) dates, and chronologies derived from cross-referencing of Aegean material in Egyptian contexts, have been partly, though not fully, reconciled by recent refinements of the RC chronology based on RC dating of annual growth rings (Pearson et al. 2018, 2020) and the release of the updated RC calibration curve, IntCal20 (Manning et al. 2020). A date in the mid-17th century is no longer tenable, but then neither is one around 1500 BCE. It seems rather the date will lie somewhere between 1617 and 1600 BCE, or 1570 and 1562 (*ibid.*, Fig. 6, Supplementary Information, 24-26).

of 1200 BCE, limiting our ability to accurately date archaeological and climatological samples pertaining to the period, and thus to tie the one to the other (Kaniewski et al. 2010, Fig. 210; Manning 2007). Furthermore, we currently lack the spatial resolution to trace regional patterns across the Aegean and East Mediterranean. Most pollen analyses have been conducted in the Levant and Cyprus (Kaniewski et al. 2013; Langgut et al. 2013), rendering contentious the claims of some that similar conditions can be expected in Mainland Greece (Kaniewski et al. 2015).

Quite aside from the difficulty of identifying closely dated and potentially significant changes or oscillations in climate, there remain major problems of chronological phasing and historical interpretation with regards to the so-called Bronze Age collapse. If a single major climatic event is to be tied to this phenomenon, that would imply a degree of synchronisation in the destruction horizons for which, at present, we lack clear evidence. But while a more gradual and regionally variable suite of climatic changes might have caused multiple upheavals spread over a broader chronological range, we still need clear models of how this may have intersected with other social stressors, and what the local and regional manifestations of this process might have entailed (Knapp and Manning 2016, 100). Higher resolution data have not necessarily painted a clearer picture of climatic impacts. A recent analysis of a speleothem from a cave near Pylos found evidence of a short (c.20-year) dry spell, 20-80 years before the assumed date of the destruction of the so-called Palace of Nestor[46], and another more extended arid period afterwards in LH IIIC. If the proposed chronology is correct, the destruction itself would seem to have fallen within a time of wetter conditions, complicating, at least locally, claims of a direct link between drought-induced food insecurity and civil unrest (Finné et al. 2017, 9–11).

These issues are unlikely to be imminently resolved, and lie beyond the scope of this thesis. What seems agreed by most is that the period between c.3400 and 2800 BP (that is, roughly 1450 and 850 BCE) was one of increasing aridity (Finné et al. 2011) and variability (Rohling et al. 2009; Finné et al. 2019; Avnaim-Katav et al. 2019) in the Mediterranean, though with much regional and temporal variation (Kaniewski et al. 2013, 6; Langgut et al. 2015, 228; Moody 2014, 28). Cooling and aridification are suggested by the declining warm-species foraminifera in the LC21 core, which

[46] Which the authors base on the dates given in Shelmerdine (2001), Deger-Jalkotzy (2008) and Davis (2010).

has been aligned with global climate proxies suggesting a period of rapid climate change between 3500 and 2500 BP (Mayewski et al. 2004, fig. 5; Rohling et al. 2002, 591)[47]. However, most indicators point to these conditions becoming more severe in the centuries *after* 1200 BCE (Drake 2012, 1864–65; Kaniewski et al. 2013, 6; Rohling et al. 2009, 5), when the destructions at the end of the Bronze Age largely occurred in the decades either side of 1200. None of this makes climatic stress impossible – or even implausible – as a factor in the destabilisations of the period, though it by no means amounts to a smoking gun.

Caution is especially necessary in the case of Crete, for the destruction of Knossos may have preceded the fall of the Mainland palaces by decades, if not more than a century[48], while the circumstances under which bureaucratic administration ceased at Khania remain unclear[49]. Lime/linden disappeared for good from pollen cores sometime in LM III, suggesting the passing of a threshold for this species which may represent a local manifestation of the wider regional trend to aridification (Bottema and Sarpaki 2003, Figs. 4–5; Moody 2014, 28). In cores from what has been identified as a former shallow lake to the east of Phaistos, an increase in brackish-water diatoms in the couple of centuries before 1200 BCE may likewise reflect a more evaporative climate (Ghilardi et al. 2018). For the same period (c.3500-3000 BP), coarse-grained aggradation in the Anapodaris Gorge, south of the Mesara, suggests an increase in erosive rainfall or flooding, something not inconsistent with a generally cooler and drier climate when flash floods may be more likely and destructive (Macklin et al. 2010). The excavators at Karfi have strongly disputed suggestions of a deteriorating climate around 1200 BCE, however (Wallace and Mylona 2012, 76). Charcoal recovered from the site suggests to them that stands of deciduous or evergreen oak were to be found nearby, while the whole BA range of agricultural plants and animals are attested. As one of the most elevated sites of the whole period, this array of flora and fauna is notable, but it also raises questions about how representative the locale climate and ecology would be of the wider

[47] A proposed mechanism for this observed cooling is an intensification of the Siberian High, leading to more frequent and intense northerly winds over the Aegean, and a 2-3°C drop in sea surface temperatures (Rohling et al. 2009, fig. 4).

[48] Depending on the date one favours for its final destruction (see Chapter 1).

[49] Furthermore, Crete still lacks many climatological proxy samples relevant to this period. In the multi-proxy analysis of Finné et al. (2019), 44 proxy datasets were considered from six regions – South Iberia and the Maghreb, North Iberia, Italy, the Balkans/Greece, Turkey, and the Levant – though none came from Crete.

island. At present there is insufficient evidence, beyond a possible increase in aridity and variability, that climatic changes were a contributing factor to the political disintegration of the final BA, especially on Crete, though this does not mean such a possibility is inconceivable.

The Early Iron Age Climate

The climate of the early first millennium BCE has received far less attention and is only poorly understood. A climate cooler than today seems probable, particularly in the winter months, though a gradual warming relative to the final BA is implied by the recovery of warm-species foraminifera in the LC21 core (Rohling et al. 2002, Fig. 1d). Precipitation levels, meanwhile, may have declined sporadically from the 10th-5th centuries (Moody 2005, 471). The Phaistos lakebed cores suggests this body of water may have become swampland by the end of the 12th century, and dried up completely before 500 BCE (Ghilardi et al. 2018), while sediments from the Anapodaris Gorge record a period of incision during the EIA, which may reflect warmer, drier conditions (Macklin et al. 2010). The 1st millennium witnessed the growth of populations and the emergence of Crete's city-states, and at present there is little evidence that contemporary climatic conditions greatly impeded or accelerated these developments. In this period, as in the final BA, we are still best served by seeking social explanations for the political and economic trajectories we can observe, whilst remaining open to the possible contributary role of climatic changes.

The Cretan Landscape

One of the central concerns of this thesis is the nature, scale and diachronic variability of interactions between human communities and their local environments, as well as with other groups in both micro- and macro-regional contexts. The following is an attempt to map out some of the most salient features of the Cretan landscape as regards this approach, and to introduce some expectations against which subsequent chapters will weigh evidence of settlement patterning, agricultural practice, and mortuary behaviours.

A Rocky Start

The great bow-shaped curve traced by the Ionian and outer Aegean islands, from Lefkada,

Kefalonia and Zakynthos, down through Kythera, Crete and out to Rhodes, follows the line of what is known as the Hellenic Arc. This is part of a tectonic region formed by the interface of the African and Aegean Sea plates, where the former is slowly subducted beneath the latter. The collision of these plates has given rise to features along a series of concentric arcs, underpinning much of the terrestrial and marine topography of the region (Figs 3.5-6.; Higgins 2009; Higgins and Higgins 1996, 19–25; Le Pichon and Angelier 1981; Rackham and Grove 2001, 40). Seismic and volcanic activity has been perennial, and a powerful reminder of the ways in which the *long durée* of geological time can still intersect dramatically with the *histoire événementielle* of single human lifetimes. The mighty eruption of Thera, now Santorini, in the late 17th-early 16th century BCE is but one example, often cited as a major destabilising force in the breakdown of Neopalatial society on Crete (Driessen and Macdonald 1997; Driessen 2001b; Knappett et al. 2011)[50].

This tectonically active region has undergone major episodes of uplift and subsidence over millions of years, with the land that is now Crete rising from and sinking below the sea several times since the Cretaceous period. Only in the terminal Pliocene and early Pleistocene, around two million years ago, did dramatic tectonic compression and faulting cause the uplifting of Crete which resulted in more or less its present geography[51]. Though developments since the Last Glacial Maximum have been on a much smaller scale, it is clear that localised uplift and subsidence, along with changing sea-levels, have continued to alter the island's coastline (Stiros 2010; Pavlopoulos et al. 2011; Tiberti et al. 2014; Simaiakis et al. 2017), sometimes in ways relevant to the study of the LBA-EIA[52]. A gradual rise in sea level across the Aegean has been reconstructed over the past 6000 years, largely due to peripheral rebound of land formerly covered by glaciers (Lambeck 1995),

[50] Earthquake clusters, meanwhile, have been linked by some to the later Bronze Age collapse, particularly the destruction of the Mainland palaces (Cline 2014), though others have raised a sceptical eyebrow (Bintliff 2020, 4; Knapp and Manning 2016). A recent edited volume has highlighted the need for more subtle narratives on the interplay of seismicity and society on BA Crete (Jusseret and Sintubin 2017).

[51] On these developments, see Meulenkamp 1971; Drooger and Meulenkamp 1973; Fassoulas 1998; 2001; Adediran et al. 2004; van Hinsbergen and Meulenkamp 2006.

[52] Mokhlos, for instance, was connected to the mainland by a narrow isthmus in the LM IB period, and probably in LM III, though this was later submerged (Soles 2003, 1; Soles et al. 2017). It has also been suggested that the submergence of an islet (now a reef) off the shore of Kommos during the EIA may have contributed to the eventual abandonment of the site in favour of Matala as a harbour (Mourtzas and Kolaiti 2020). This islet would have provided shelter, and a temporary anchorage before boats were brought ashore, advantages lost when sea-level rises covered it.

but alluviation and tectonic activity make the determination of the ancient coastline for the whole island in any one period a complicated task (Bintliff 2020, 5; Moody 1987, 22–26; see Mourtzas et al. 2016). But barring some localised shifts and fluctuations in the coastline, it seems the silhouette of the island, as it were, has been largely stable since at least the Bronze Age.

Between the Mountains and the Sea

Crete's tectonic history has created an island exhibiting major contrasts in topography and underlying geology, the most fundamental opposition being that of the uplands and the lowlands (Fig. 3.7). This dichotomy results from the horst and graben structure of the island's bedrock, that is, the land in parts thrust up and in others subsided through tectonic action (Fig. 3.8; Higgins and Higgins 1996, 23, 97). The gently sloping lowland and coastal plains of Crete are interrupted by more rugged, vertiginous mountain ranges (Fig. 3.9). These latter comprise a heterogenous series of stacked tectonic nappes, bodies of older rock thrust up through faults in younger overlying sediments (Adediran et al. 2004; Higgins and Higgins 1996). There are 15 ranges in total, but three dwarf the rest: the Lefka Ori in the west, Ida or Psiloritis in the centre-west, and Lasithi or Dikti in the centre-east. Tracts of Plattenkalk or platy limestone form the cores of these ranges, while sediments of the Tripolitza series (crystallised limestone and dolomite) occur in all but the Lefka Ori, where instead the Tripali unit (carbonates of particularly crystalline and dolomitic limestone) separates the eastern half of the massif from the extensive phyllite-quartzite deposits in the west (see Figs 3.7; 3.10; Bergmeier 2002, 208–9). Beyond the major massifs, smaller nappes of limestone protrude through lower-lying bedrock, like the lone peak of Juktas, or the southern side of the Asterousia mountains (Rackham and Moody 1996, 29).

The lowlands and the plains are, in geological terms at least, the clear counterpart to the mountains. They are the grabens, the lands which have subsided along the island's many fault lines, as demonstrated by their much younger sediments of Neogene and Quaternary date (Fig. 3.11; Hall et al. 1984, 500–1; ten Veen and Postma 1999). Neogene marls provide an excellent substrate for vine and olive cultivation when worked, and at least since the Bronze Age have supported the greatest densities of human habitation (see Figs 3.12-14; Bintliff 1977, 73, 99; Rackham and Moody 1996, 30). Somewhere between a third and a half of the island has been estimated to be cultivatable

land, of which the lowland plains represent by far the largest continuous tracts (Bintliff 2020, 14–15)[53]. The lowlands are the realm of fields, vineyards and olive groves, which creep up the foothills of the surrounding mountains, eventually limited by steeper slopes, thinner soils and declining temperatures (Fig. 3.15). These impediments have been at least partly remedied by terracing, which breaks up the soil and allows it to accumulate in more level deposits against the bracing walls which lace the hills in zigzags or concentric rows (Moody and Grove 1990; Rackham and Moody 1996, 140–41). There is now clear evidence of terracing being employed during the BA (Hope Simpson et al. 2005; Vokotopoulos 2011; 2014), but it is worth noting that those identified around Palaikastro largely made use of gentler slopes (roughly 7-15°; Orengo and Knappett 2018, 499), and it is not yet clear whether the island's more precipitous terrain was regularly terraced during the BA or EIA.

Looking at Figs 3.8-11 and 3.15, the spatial correspondences between the tectonic structure, topography, geology, and agricultural exploitation of the landscape are clear. This does not mean, however, that the uplands are not also deeply implicated in the history of human life on the island. We cannot cleave to Braudel's (1972, 12) conviction that 'mountains are as a rule a world apart from civilisations, which are an urban and lowland achievement', however perennial such views may be, on Crete as elsewhere in the Mediterranean[54]. The upland landscapes of Crete provide evidence for an array of habitational, economic and religious activities in prehistory, and the degree of integration between montane and lowland economies, the relations both cooperative and hostile, and the movements of people, products, and prestige goods up and down are vital elements in the cultural history of any period (Chaniotis 1999).

[53] Some local exceptions, or at least complications, to this general picture can be found. The plain around Kavousi is today densely farmed, particularly for olives, but this present abundance belies the fact that only with the installation of hydraulic infrastructure in the 1960s was the plain rendered desirable for oleiculture. Before this time it seems its colluvial, *terra rossa* soils were liable to drying out in summer, with survey suggesting that ancient settlement in the area aggregated more commonly on the low flanks of the hills, only extending into the plain in times of agricultural extensification (Haggis 2005; Betancourt 2006; cf. Morris 2002). We would do well not to assume *a priori* that settling the coastal plains was always a priority from a productive or social standpoint throughout Crete's history.

[54] Pendlebury (1939) related stories of those with a price on their heads fleeing to the Lefka Ori, certain that few if any would pursue them. Earlier still, Spratt (1865, 53) and Pashley (1837, xxii) wrote in admiring, if slightly histrionic, terms of the Sfakiotes who resided in and around the White Mountains, fomenting resistance to Ottoman rule, but also terrorising and raiding the lowlands when the mood took them.

The significance of the uplands rests in no small part on their flora and fauna. The majority of Crete's floral habitats can be grouped into four types: steppe, garrigue, maquis, and woodland[55]. Garrigue, steppe and maquis are all characteristic of Mediterranean climates, and in broad terms comprise herbaceous grass and scrubland, with varying degrees of tree and shrub growth (Moody 1987, 41–42; Rackham 1990, 38). The predominance of each type is principally dictated by availability of moisture, and thus by local rainfall, water retention in the soil, and ease of root penetration. Where these are favourable, as on the phyllite-quartzite bedrock of the far west, large tracts of near-continuous maquis can be found, while on the drier Siteia peninsula, steppe is far more prevalent, with some phrygana but little maquis (Fig. 3.16; Rackham and Moody 1996, 112–15). Woodland is not particularly abundant on Crete, and declines from west to east, in line with precipitation differentials caused by the prevailing north-westerly winds (Fig. 3.17)[56]. Evergreen outstrips deciduous woodland across the island, due to its hardier, more drought- and browse-resistant forms (Rackham and Moody 1996, 63–65), and can occur up to quite high elevations, c.800-1000masl (Bottema 1980, 197)[57].

The chief economic significance of these environments is as sources of timber and firewood, and

[55] Other habitats exist of course – wetlands and high mountains for instance – but these are rarer, or lacking in abundant flora (Turland et al. 1993).

[56] It was long thought that Crete, in antiquity, was far more wooded than today. Pendlebury (Pendlebury 1939, 6) went as far as to claim that 'there is a strong probability that in Minoan days at least the whole island West of Ida was a great virgin forest'. The presumption was that, from the Neolithic onward, human overexploitation led to the retreat of these forests to their present, patchy distribution (Zaharis 1977). A line from Strabo's Geography is often relied on to support this idea, as is the largely untested assumption that the BA Cretans would have needed to cut down large tracts of forest to build ships, as necessary to support the putative Minoan 'thalassocracy' (Papanastasis et al. 1990, 42–43). However, this reconstruction has since been challenged by Rackham, Moody and others, based particularly on pollen cores which demonstrate, at least from the Neolithic period, if not earlier, that Crete has always been a patchwork landscape, with forests interspaced with maquis, steppe and phrygana. Woodlands may have been slightly more widespread in the BA and EIA than today, but complex processes such as changes in aridity, temperature and seasonality, not just human activity, will have affected the relative abundance and spatial distribution of these environments over the millennia. In any case, present – and often justified – anxieties about the fragility of Mediterranean landscapes today should not tempt us into drawing Paradise Lost narratives about the historical Cretan landscape (Moody 1987, 123; Rackham and Moody 1996, 9–10, 127).

[57] The high mountains are not home to a great diversity of plant species, compared to those of the Greek mainland, yet a remarkably high proportion of their species are endemic to the island, and even to each particular mountain range (Strid 1995, 100–104; Legakis and Kypriotakis 1994; cf. Greuter 1995, 6). This apparent paradox may be explained by Crete's separation from the continent before the major uplift of its present mountain ranges, leading to a dearth of true highland species, and a gradual colonisation of the mountains by the most tolerant or adaptable lowland flora, resulting in many cases in unique species (Trigas et al. 2013).

browse and fodder for sheep and goats. The movement of herds into the hills for summer grazing is an ancient feature of the Cretan economy, with its significance to the LBA palatial wool industry recently reaffirmed by isotopic evidence (Isaakidou et al. 2019). A wide array of herbs are also found in the pastures and scrublands of the Cretan hills, with many used in the production of perfumed oils in the Final Palatial (Shelmerdine 2008), and Post-Palatial periods (Koh and Birney 2017). All these herbs attract bees and produce flavourful honey, which we know from the Linear B tablets to have had alimentary, medicinal and votive uses (Rutherford 2013, 258; see D'Agata and De Angelis 2014).

Distributed throughout the mountains and plains are a range of smaller topographic and geological features, each with complex histories of human activity. Much of Crete is karstic, a term which denotes the unique structures which emerge through the dissolution of particularly carbonate bedrock, like limestone, dolomite and gypsum, resulting in a landscape that is pockmarked and riddled with underground caverns, sinkholes, and aquifers (Rackham and Moody 1996, 24–25). One outcome of this porous landscape is the rapid percolation of rainwater, such that Crete lacks many perennial rivers, despite a significant groundwater supply (Knithakis 1990, 66–67). Today there are only six which flow year-round, yet even these can be reduced to mere streams in the dry season, and while in antiquity others may have existed, few have probably ever been navigable to any great distance inland (Pendlebury 1939, 7; Whitelaw 2019, 91). By contrast, Crete abounds in springs, which rely on aquifers, underground zones of highly water-bearing rock formed through the dissolution of soluble minerals by percolating groundwater. Mesozoic limestones and Pleistocene gravel terraces deposits provide excellent conditions for aquifers to develop, particularly where those sediments come into contact with less permeable layers, such as Neogene marls and alluvial clay deposits (Knithakis 1990, 67; Moody 1987, 15–16).

Locating ancient springs – once they have dried up – is very difficult, but it is likely that most ancient settlements will have been founded close to at least one. Knowledge of how to locate these will have been vital. Trevor-Battye (1913, 282–83) reported in the early 20th century that local wisdom stated 'often they are shaded by a large plane-tree, or higher up in the mountain by a walnut, higher still by a maple.' Such mnemonics may have served in ancient times too. Wells could also be dug and aquifers augmented or fabricated, as with the cisterns identified at Afrati (Gagarin

and Perlman 2016, 181), Dreros (Perlman 2004b, 191–92), Axos (Tegou 2014, 33), and Lato (Sjögren 2003, 26)[58]. At Eleutherna, these were fed by an aqueduct leading from a nearby spring (Perlman 2004c, 98), and sections of aqueduct remain at Knossos, Khersonisos, Gortyn and Sougia (Rackham and Moody 1996, 44). However, for many of the smaller, more rural communities throughout the period of our enquiry, frequent trips to the local spring would have been necessary, to bring home water for cooking, washing, and drinking.

Other features of Crete's karstic landscape include the island's many caves, valleys, and plains or basins set within the limestone hills. Over 25 mountain plains of varying size and elevation are scattered across Crete, the grandest of all being the Lasithi Plateau (Fig. 3.18). A great oval, 2830ha in size, it stands at 850masl, and is bounded by the even higher peaks of the Dikti massif. Without any valleys leading out from it, snowmelt and rainfall accumulates in the basin, the many rivulets converging into a single stream, which escapes instead through a great cave at its northwest edge (Rackham et al. 2010, 275). Today, as when Spratt (1865, 101) visited, the villages of Lasithi cluster around the edges of the plateau itself, and survey work shows that such a pattern has been the norm since antiquity. This is probably due to the abundance of springs at the plateau's margins and to the ease of access it affords to both arable land and upland pasturage (Watrous 1974; 1982).

Crete is one of the most cave-rich areas in all Greece, with more than 5200 listed by the Greek Speleological Society (Kłys-Melas 2011, 53–55). Many have developed through the dissolution of carbonate rock along underground water channels, or through the opening out of cracks and clefts in the rock (Bate 1913, 240–41), but in both cases are often convoluted and rich in speleothems and calcite drapery (Rackham and Moody 1996, 25). Throughout history, caves on Crete have been lived and hidden in, used by shepherds as huts and corrals, and frequented as sanctuaries and sites of ritual activity, though the archaeology of these varied uses has been poorly and unevenly explored (Kłys-Melas 2011). Faure (1960a; 1962; 1963; 1964; 1969a) undertook extensive exploration of caves across the island, but his methods of recording, characterising, and dating human presence have left much of his work difficult to verify and build upon. The Idaean Andron and Psychro Cave are exceptions, the extent of archaeological work on each reflecting their

[58] Two much earlier cisterns are also known from the site of Myrtos-Pyrgos, dating to the MM period (Cadogan 2007).

significance as cult centres in ancient times (Kunze 1931; Boardman 1961; Sakellarakis 1988; Watrous 1996; Rutkowski and Nowicki 1996; Sakellarakis and Sapouna-Sakellaraki 2013). Human settlement in gorges is likewise not unknown, particularly in the LBA and EIA. Several small sites have been identified in the Gorge of the Dead near Zakros, the longest-lived being Ellinika (Hogarth 19001), while the well-known refuge of Monastiraki Katalimata clings to the cliff by the outlet of the Kha gorge (Nowicki 2008). More recently, occupation has been identified in the Aposelemis gorge in the Pediada, dating to LM IIIB, and offering an early case for the apparently defensive or inaccessible tendencies of settlement in the subsequent LM IIIC period, of which Katalimata and Ellinika are themselves examples (Kanta and Kontopodi 2017).

A final feature of note, from a settlement perspective, is the coastline of Crete. Barring the localised changes in sea level noted above, many of the patterns visible in the settling of Crete's shores in recent history probably obtained in prehistory too. Anchorages are more numerous along the north coast, not only because it is more indented, but the water is shallower, and the land tends to roll more gently down to the sea, conditions favourable to the growth of large, harbour towns (see Figs 3.19-20)[59]. The southern coast is far more perilous. The sea lies deeper there, and though this allows closer approach by larger vessels, submerged rocks are everywhere a source of potential ruin (Trevor-Battye 1913, 81). Steep slopes descend in many parts right down to the water (Fig. 3.21), with proper harbours, bays or inlets few in number, and the accompanying settlements limited in size by the unforgiving and constricted terrain. We should expect things in the past to have looked slightly different, however, because the shallow-hulled ships of the period would have as readily been run aground on beaches as anchored in port, a fact that dramatically increases the number of potential landfalls. Probable ship-sheds have been identified at Poros (Vasilakis 2010a) and Kommos (Shaw et al. 2006, 850–53), the location of the latter especially, on a long, sweeping beach by the Mesara Gulf, favouring such a reading of the coming and going of vessels.

The affordances of the Cretan landscape, as regards the distribution of human settlement, and the economic potential of various productive environments, may be tied to some notable recurrences in the orientation of territorial or political units on the island. Moody (1990, 52), for instance, has

[59] Today Ierapetra is the only major settlement on the south coast, while on the north are found Khania, Rethymno, Knossos, Malia, Agios Nikolaos and Siteia.

pointed out that of the 20 former provinces of Crete (Fig. 3.22)[60], almost all contained between one and three major Minoan sites, Hellenistic city states, and Late Roman bishoprics respectively, as well as one Venetian *castellate* castle. Bennet (1990) has also highlighted a link between these districts and the territories of the ancient Greek city-states, if not in exact location or size, then in their frequent incorporation of coastal plains, foothills and uplands, allowing the exploitation of a full range of ecozones. More broadly, he identifies an oscillation between over-arching – often externally derived – state governance of the island, which has typically involved administrative divisions following the natural boundaries of the island's chief mountain ranges, and smaller units of the kind represented by the modern districts or classical city-states prevailing in times of disintegration or autonomy[61]. Without presenting an overly deterministic view of the relationship between Crete's human inhabitants and the physical landscape[62], these correspondences do appear reflective of some of the more fundamental constraints and opportunities afforded by the island's geology, ecology, and climate. In subsequent chapters, consideration will be paid to how changes in the apparent relationships between communities and these features of the landscape might serve as an explanatory tool in consideration of social organisation and change.

Landscapes of Movement and Connectivity

The final part of this chapter explores some of the ways in which forms of communication and movement across the landscape of Crete may have been shaped by its physical features, and the possible implications for considering social interaction in the LBA-EIA. Such issues have been considered in the past, from a range of different perspectives. Ancient roadways have been identified in excavation and survey contexts (Evans 1928, 60–92; Sofia Voutsaki et al. 1989; Tzedakis et al. 1990; Chappell et al. 2018; Beckmann 2019), or else modelled utilising historical sources (Pazarli et al. 2007), or GIS software (Siart et al. 2008a; Déderix 2017). From a more

[60] These districts have since been replaced, through two major administrative reforms known as the Kapodistrias and Kallikratis Plans respectively, with slightly smaller municipalities, or *dimoi*, of which there are now 24.

[61] More recent work simulating the evolution of settlement systems on BA Crete through spatial interaction models has also tentatively suggested that the exogenous imposition of political power may be the most likely explanation for the emergence of a single overarching centre (Bevan and Wilson 2013, 2423).

[62] On the perils of projecting a uniformitarian view of the rural economy in the Mediterranean back into prehistory, see Halstead (1987).

experiential perspective, Wallace (2010, 145) has suggested that communities in LM IIIC came to conceive of, and navigate their way to, settlements like Monastiraki or Vrokastro in part through the 'shorthand' of their remarkable topography. Earlier, Pendlebury (1939, 1) observed that the distinctive landforms of the island create a natural cartography, acting as waypoints and mnemonics for the island's safe harbours and anchorages.

The present thesis aims to occupy a space intermediate between these different approaches. It is not so much concerned with precisely mapping or predicting the 'actual' ancient paths and routeways of the LBA or EIA, but it does make use of GIS methods to offer plausible approximations for important corridors of movement, and seeks to relate these to experiential aspects of the dwelt landscape, as well as mechanisms of interaction and communication. In this vein, the work of Bevan (2010; 2011; 2013) has proven particularly influential, offering models and frameworks through which to approach questions of past mobility and regional interaction.

It seems likely that that the major axes of communication across the island have always been shaped by its physical topography. Figure 3.23 is a slope map of Crete adjusted to reflect Tobler's hiking function (see Chapter 2), and shows how the mountains break up the island into areas of more and less navigable terrain. The Lefka Ori descend more gently on their northern flanks, down to the northern coastal plains, while the southwest coast is particularly precipitous. Mount Ida rises in the centre of the island, with valleys to its north and south circumnavigating its steep slopes. Only in the island's centre do substantial lowlands connect the northern and southern coasts, though the Asterousia mountains mean the only place in the south where the plains meet the sea is around Kommos. Like Ida, the Lasithi Massif is more readily skirted than crossed, while the Isthmus of Ierapetra offers another rare point of communication between the north and south coasts, at the island's narrowest point[63], as does the valley of Praisos to the east. The Thrifti Mountains which rise between these valleys can be passed to the north or south, or through the pass which rises behind Kavousi. In general terms, the north coast has probably always been the natural thoroughfare for transit along the island's length, with north-south corridors typically branching off this main axis, through valleys and breaks between the major massifs. Such a pattern

[63] During the Roman period, Haggis (1996) suggests that the isthmus may have served as a transhipment corridor, for precisely this reason.

is visible in Allbaugh's (1953) map of the 1948 road network (Fig. 3.24) and persists today (Fig. 3.25). The routes described by Pendlebury (1939) broadly follow the same patterns (Fig. 3.26), but he was explicitly attempting to trace ancient walking routes, leading him to traverse more rugged areas, particularly in the far west, that even today are poorly served by roads. Nonetheless, the close correspondences that Allbaugh's roads and Pendlebury's walking routes exhibit with the Tobler-adjusted slope map of Crete suggests the importance of the physical terrain in shaping patterns of movement, especially before modern infrastructure and mechanised transport.

Understanding how and by what routes the different regions of Crete were connected has implications for thinking about forms of social organisation and political integration. Figure 3.27 shows the settlement of Knossos, from which walking times to the rest of the island have been calculated[64], and bracketed into four-hour intervals. A 12-hour radius reaches the far sides of the Psiloritis and Lasithi massifs, and extends further along the lowland corridors towards the coasts near Phaistos and to the east of Rethymno. It would take well over a full day's walking (not accounting for rest-stops) to reach Khania or Palaikastro. This is only considering terrestrial movement, however; allowing for maritime transit at a conservative rate of twice walking speed (see Bevan 2011), the picture changes dramatically, with much of the north coast from Palaikastro to almost as far as Khania brought within a half-day's sail (Fig. 3.28). Subtracting the first map from the second, we can visualise the amount of time saved by factoring in travel by boat (Fig. 3.29). These patterns might prompt consideration of the methods by which the Knossian polity was integrated and administered in LM II-III[65], but also more broadly how the presence or absence of regular seafaring may have affected networks of movement and communication in prehistory.

We can explore this more holistically by modelling movement between multiple settlements across the island. Figure 3.30 shows the locations of 47 known A-CL city-states, which have been

[64] Using the r.walk module in GRASS GIS, with the elevation map of the island discussed in Chapter 2, and default parameters.

[65] In the Mesara, for instance, maritime transport may have offered little benefit, as far as the circulation of goods or administrators was concerned, meaning perhaps that there may have been a greater physical presence of palatial officials in the area, as travel by land between centres would have been necessary. The area of Khania, meanwhile, would have been much more readily accessed via boat, and were voyages between Knossos and Khania the norm, we could hypothesise that this may have limited the extent to which Knossian officials travelled in, and directly oversaw, the management of the agricultural landscape in the Khania region.

connected by least-cost paths calculated between every pairwise combination of settlements[66]. Adding together the costs of the 46 outgoing paths for each *polis*, we get a metric known as 'closeness centrality', which can be thought of as reflecting how 'connected' that site is to every other, with lower total costs representing higher 'connectedness'[67]. These total costs are represented in Fig. 3.31, where the size of circle reflects how closely 'connected' each site is to all the others combined. The settlements in the centre of the island, perhaps unsurprisingly, emerge as more 'connected' than those at the island's east and west peripheries. Allowing once again for sea travel, using the same speed as above, the resulting network and map of 'connectedness' (Figs 3.32-33) are quite different, with the disparities between the centre and fringes of the island apparently much reduced. In Fig. 3.34, the representations of terrestrial 'connectedness' are overlain on those incorporating sea-travel, while in the Fig. 3.35, the circles represent the proportional gain in 'connectedness' that sea-travel affords each settlement. These figures suggest that those communities at the east and west ends of the island stand to gain most – be it in terms of economy, information flow, social interaction, political power etc. – from regular maritime activity around the island.

It was noted above how the locations of Crete's major harbours has been influenced by both topography and bathymetry along the coast, with the southern shoreline being less accommodating than the northern. To this we can add the evidence from these simple models of terrestrial and maritime movement. They suggest that, particularly in the case of settlements in the far southwest of the island, at the foot of the Lefka Ori, the absence of regular seafaring would have left them particularly isolated from developments across the rest of Crete, and given their limited agricultural potential, such communities may not have been viable at all in times of limited maritime commerce. It is striking, then, that almost no settlements are known from this part of Crete anytime from LM II until at least the Archaic period (Figs 3.36-37). Only in CL-HL times (Figs 3.38-39), and especially during the Roman periods (Fig. 3.40), when the scale and regularity of

[66] This network was calculated using the v.net.models module for GRASS and QGIS (Ducke and Suchowska 2021). The cost surface used to calculate the least-cost paths is that based on Tobler's hiking function.

[67] On closeness centrality, see Newman (2010, 180–85). Specifically it is the reciprocal of (as in, one divided by) the total cost of all the least-cost paths.

maritime trade is likely to have peaked, did significant numbers of coastal settlements flourish here.

To sum up, these illustrative models suggest some possible interpretive frameworks through which to consider the nature and impact of interregional connectivity on the island across the LBA and EIA. Firstly, the lowland and coastal areas of Crete are those where terrestrial movement was most expedient and as such may have formed important axes of communication and integration for larger political entities, be they unified states, alliances, or confederacies. Maritime travel, meanwhile, was a significant mechanism by which communities on Crete were connected not only to distant lands, but to each other. Declines in seafaring might be hypothesised to coincide with diminishing contact between more distant regions on Crete, given the higher costs involved in terrestrial travel across the island's length. However, such impacts are likely to have been unevenly felt as, for example, in the central region, maritime interaction was probably of more limited consequence to networks of movement and communication between the north and south coasts. The far west and east of the island, however, may have experienced reduced interaction with other areas, and the viability of certain communities may even have been affected, especially where seafaring formed an important part of the economy or offset limited terrestrial resources.

Tensions between terrestrial and maritime forms of connectivity – the former related to political integration of productive landscapes, and the latter to the economic opportunities of overseas trade – have been highlighted before in a Cretan context, in work modelling the evolution of settlement networks under different parameters for travel costs and information flow between sites (Bevan and Wilson 2013). These models suggest – as those outlined above do on a simpler level – that the changing balance between these sources of information, power and connectivity may be reflected in shifting settlement distributions and hierarchies, as well as patterns of regional interaction. Such dynamic relationships will be considered at length in coming chapters.

Conclusion

This summary can only provide a snapshot of the diversity and complexity of ancient Crete's climate and ecology, but the relationships between the Cretan environment and the forms of settlement, economic activity, and regional interaction that characterised the LBA-EIA will form

an important through-line in subsequent chapters. Cretan communities have, from the beginning, sought out fertile soil, reliable pasturage, and the best routes through the mountains. They have had to deal with the vagaries of the climate, and the changing face of the seasons. Beyond the bounds of fields and villages, they have foraged and hunted, cut timber for firewood and building material, coaxed honeybees into hives, and ventured to sea to fish, collect shells, trade, travel and go to war. A diverse, fragmented but deeply inter-connected landscape is the setting for human societies of equal diversity, fragmentation, and connectivity. Such a view provides not only a common lens through which to consider periods traditionally separated by time and scholarly tradition, but also an appreciation of the diverse strategies by which past societies have adapted to the constraints and opportunities of the Cretan landscape.

Chapter 4

Settlement Dynamics

Introduction

The physical nature and setting of human habitation in the LBA-EIA has been the source of much debate, particularly regarding two episodes of major settlement reorientation. The first of these is the transition from LM IIIB-C, when many sites in lowland or coastal areas were abandoned, and a large number of new ones were founded in more inland, elevated, and defensible locations (e.g. Nowicki 2000; Watrous 2001; Kanta 2001; Haggis 2001; Borgna 2003). The second is what Wallace (2010, 233–53) has termed the 'nucleation phenomenon' of the PG-G periods, when around half of all settlements founded in LM IIIC were abandoned, and populations aggregated in larger, more accessible sites, typically relocating only a short distance or to settlements that had already formed part of a cluster of interrelated communities. Gaignerot-Driessen (2016a) has investigated the regional manifestations of this process around the Bay of Mirabello, characterising the emerging centres of the period as *habitats polarisés* ('polarised habitation sites'), whose locations were advantageous for defence, subsistence, communication and accessing natural resources.

One interpretation of these developments would be that, in the face of political fragmentation and growing insecurity in the coastal lowlands, communities fled to the hills in LM IIIC, returning to such environments as populations, economies and the scale of political integration regrew in subsequent centuries. In a broad sense, such a view has much to recommend it; however, in the present chapter and the next, I argue that certain elements of this narrative should be nuanced in light of the changing environmental and topographical characteristics of settlement across this period. These chapters aim to contextualise these two episodes of settlement change within the longer-term developments of human habitation between the 15th and 6th centuries BCE. The present chapter presents a study of settlement dynamics, of the environmental affordances and social processes most fundamental to settlement systems as they evolved across the LBA and EIA.

The discussion begins at the broadest level, comparing the environmental and topographic characteristics of sites from across the LM II-A periods to those of preceding and succeeding eras. Important general trends are identified which bear on the relocations of LM IIIB-C and the nucleations of PG-G. Following this, two case studies of well-surveyed regions are presented, to examine some of the micro-regional diversity existing within the broader developments outlined in the first part. The next chapter presents a chronological account of settlement change through the LBA and EIA, highlighting both the overarching trends and regional nuances identified in the present chapter.

Environmental and Spatial Contexts of Settlement

Continuity and Change

The geographic distribution of human settlement – and of populations across those settlements – is seldom static for long periods of time, and certainly underwent pronounced shifts during the LBA, EIA and Archaic periods (see Figs 4.1-8). The two processes which underpin these shifts are the abandonment of old settlements and the founding of new ones. The degree of abandonment or continuity between periods is therefore an important component in considering how greatly and rapidly the characteristics of settlement changed across the timeframe in question. Figure 4.9 shows the counts of known sites in each period from LM II-A, while in Fig. 4.10, these counts are divided by the length of the respective periods, producing a measure of known sites per decade[68]. In Fig. 4.9 the number of known sites increases through LM II-IIIC, declines in PG, oscillates between G and PA, and then rises again in A. In Fig. 4.10, the chief difference is that the counts for the LM IIIC and PG periods are much reduced, representing a drop from LM IIIB. The trajectory in Fig 4.10 especially is in keeping with the broad strokes of our understanding of the social developments across this timeframe, with the recovery post-LM IB, fragmentation and relocation by the LM IIIB-C transition, and the gradual redevelopment of more densely occupied

[68] These two ways of visualising the data are complementary, in that the former may over-represent the number of known sites within particularly long periods (like LM IIIC, which spans approximately 200 years), while the latter may downplay discrepancies between the use of different sites within single periods (a site like Karfi, for example, was occupied for essentially the entire LM IIIC period, while Monastiraki Khalasmenos may only have been inhabited for a single generation).

landscapes alongside the emergence of the first city-states.

We can examine turnover in settlement through the proportion of sites abandoned or continuing between periods. Fig 4.11. shows the proportions of known sites in each period which were abandoned, and those which continued into the next period, as well as the more uncertain cases. The LM II-IIIA periods are characterised by high degrees of continuity and limited abandonment, while in contrast somewhere between 38% and 56% of settlements occupied in LM IIIB were abandoned. The picture for LM IIIC is less clear, as some 40% may have continued into PG – though many of these were subsequently abandoned, as part of the nucleations of the 11th-9th centuries. Considered as part of longer-term trends, each successive period from LM IIIC appears to have witnessed increasing settlement continuity, though never quite matching the high levels of LM II-IIIA.

Another way to examine turnover in settlement is the balance between those sites inherited from previous periods and those newly founded. As shown in Fig. 4.12., this produces slightly different patterns. The growth in the number of known sites between LM II and LM IIIB means that the high degree of site continuity observed for LM II and LM IIIA is not matched by the proportion of sites in LM IIIA and LM IIIB that were inherited. For LM IIIC, however, the high proportion of newly founded sites is consistent with the widespread abandonments of LM IIIB. The many possible abandonments of LM IIIC reappear here as the large number of possibly inherited sites in PG, but from this period onward there was a higher proportion of inherited sites, and more limited new foundations. Taken together, the two episodes of settlement relocation highlighted earlier are reflected in these tallies of site abandonments and continuities, with the transitions between LM IIIB and IIIC, and between LM IIIC and PG characterised by increased site turnover, bracketed by periods of greater continuity in settlement. However, while the relocations of LM IIIB-C appear largely confined to the decades either side of 1200 BCE, the 'nucleation phenomenon' described by Wallace (2010) was a more gradual process, involving continuing, though more limited, changes in settlement into the G period, if not later.

Taking the Long View

A way to interrogate these observed patterns is to examine the topographic and environmental

characteristics of settlements from the LM II-A periods, to see if there if there are correspondences between periods of high settlement turnover and shifts in the nature and distribution of these characteristics. Figures 4.13-19 are boxplots showing the statistical distributions of values for certain topographic and environmental variables, characterising known settlements of the Neopalatial-Roman periods and the 19th century CE. As described in Chapter 2, the chosen variables are intended to reflect important aspects of the physical, environmental and economic affordances of the landscape. To begin with elevation (Fig. 4.13), though the low number of known sites for LM II urges caution, the values for LM IIIA-B are similar to those of the Neopalatial period, while all feature a number of outlying sites at higher elevations, which correspond to settlement of the Lasithi Plateau. This plain is flat and reasonably fertile despite its montane setting, and thus occupation of it in the MM III-LM IIIB periods may not be such an outlier in terms of its local agricultural affordances, despite its elevated situation. The period from LM IIIC-A is in turn characterised by an orientation towards higher locations. A shift back towards lower elevations is in evidence from the Classical period, but it should be noted that between LM IIIC and A, the median elevation of settlement remained fairly stable, though with an increasing spread (as represented by the interquartile range, or IQR) around that average in the G-A periods. Notwithstanding the caveats noted for the 19th century settlements (see Chapter 2), the distribution for this period tends towards higher elevations than for any ancient period outside the LM IIIC-A range[69].

Similar patterns are seen in the case of distances from the coast (Fig. 4.14). The MM III-LM IIIB periods are characterised by similar medians and IQRs, with the LM IIIC and PG periods exhibiting a major shift inland. Indeed, the median distance from the coast for PG is more than double that for LM IIIA-B. That the greatest distances from the coast are seen in PG is notable, given that the LM IIIB-C transition is typically presented as the period of major coastal abandonment (Nowicki 2000). For at least some of LM IIIC, however, there persisted a number of coastal settlements which were abandoned during the course of the 12th-11th centuries. These

[69] One possibility is that this reflects more extensive terracing of steeper upland areas that was common in ancient periods. If so, it would perhaps suggest that the tendency of archaeological surveys not to cover such landscapes will have had only limited impacts on the identification of ancient settlements.

distributions raise questions, therefore, about whether the shift towards inland locations was merely a response to an intense but limited phase of coastal insecurity. The subsequent five periods, through to the Hellenistic, appear to trace a steady drift back towards the sea, but it is worth noting that, by the A period, the distribution is more akin to LM IIIC, than LM IIIA-B. Furthermore, as noted above, elevations in the A period remained higher than in LM IIIA-B, meaning the gradual reoccupation of coastal environments was not necessarily focussed on the coastal plains. The 19th century again contrasts with the LBA and CL-Roman periods, with a distribution closer to that of the G-PA periods.

Turning to relative elevation (Figs 4.15-16), most periods outside of LM IIIC-A are characterised by settlement, on average, being level with its immediate surroundings (500m radius), and if anything slightly below the mean elevation of the wider area (2.5km radius). This may reflect a tendency towards the settling of not simply level terrain, but the fringes of plains and low flanks of hills, to capitalise on a range of ecozones, as has been noted for settlement on the Lasithi Plateau (Watrous 1974, 2–3). Again, settlements of the LM IIIC-PA periods deviate from this more general pattern, being typically elevated in their immediate setting and at or slightly above the mean elevation of the wider environs, with the Archaic period appearing to represent a shift in the distribution back towards less locally elevated terrain. However, LM IIIC-A also exhibit much wider IQRs and whiskers (1.5 times the IQR), suggesting greater diversity in these periods than in those which preceded and succeeded them. A range of local topographic settings are implied, though with an overall tendency towards local points of raised topography.

A slightly different set of patterns characterises the quantities of flat land surrounding settlements (Figs 4.17-18), for here, though the LM IIIB-C transition again marks a significant reorientation, the subsequent centuries did not entail a shift back to a distribution like that of the LBA. Indeed, settlements of the LM IIIA-B (and the more uncertain LM II) periods appear as outliers, situated amidst unusually large tracts of flatter land over both scales (500m and 2.5km radii). They even contrast with the preceding Neopalatial distribution, which they resemble for most other variables. Furthermore, though Fig. 4.17 does suggest that settlements in LM IIIC-PA were typically surrounded by less gentle terrain in their immediate surroundings, over the wider 2.5km scale (Fig. 4.18) they were not dramatically limited in their access to flat land compared to settlements in the

later CL-Roman periods, nor to those of the 19th century. A similar picture emerges in the case of topographic wetness (Fig 4.19) – a proxy for land that is well-watered – where values are particularly elevated in LM II-IIIB. The LM IIIC-PA periods are once again slightly below the medians for most other periods, with a gradual increase through to the Archaic period, suggesting a gradual movement towards the settling of better watered land.

Broadly speaking, the patterns described here correspond with the received wisdom on the LBA-EIA on Crete, with the transition from LM IIIB-IIIC involving a profound reorientation of settlement towards higher relative and absolute elevations, steeper and less well-watered topography, and greater distances from the coast. Subsequently, over several centuries, more extreme locales were abandoned, and there was a gradual reoccupation of less rugged terrain, with better access to flatter, cultivatable land. However, two important nuances to this general picture should be stressed. Firstly, never after the LM IIIB-C transition were changes in settlement patterning so rapid or stark, and even by the Archaic period, nothing directly comparable to the Final Palatial settlement pattern had re-emerged. That is, there is an apparent stability to many of the characteristics of settlement in the EIA, despite the turbulent circumstances under which they are typically considered to have emerged.

Secondly, though the LM IIIC-A periods do contrast with the settlement patterns that preceded and succeeded them, it would be wrong to regard the EIA as a deviation from a more typical or natural orientation of human habitation on the island. Certainly, by the CL-Roman periods, lowland and coastal landscapes were widely occupied, as they had been widely in the Final Palatial period (Haggis 1993, 143; Sanders 1976). But there are also important contrasts between the Final Palatial and the later CL-Roman periods, with settlements of LM IIIA-B being especially low-lying and well-watered, and surrounded by uncommonly large amounts of flat land[70]. Settlement changes during the PG-A periods did not represent a simple 'return' to Final Palatial conditions, therefore, and it seems necessary to explore how the specific orientation of settlement in each period reflects elements of the economic, political and social landscapes of the time.

[70] Though, as mentioned, issues of population distribution may urge particular caution in interpreting the 19th century data, it is worth noting how this period contrasts, in turn, with the LBA and CL-Roman distributions across several variables, particularly elevation and coastal distance, in which they are more akin to the settlements of the EIA.

Excluding Random Variation

There are broad correspondences between the degree of settlement turnover and the changes in the orientation of settlement tracked by the topographic and environment variables discussed above. In particular, the LM IIIA-B periods, which exhibit significant continuity in settlement, were very similar across all variables. The LM IIIB-C transition witnessed high turnover, and marked shifts in the topographic contexts of settlement. The subsequent periods, through the Archaic, were in turn characterised by increasing continuity of settlement, something consistent with the more limited changes seen in these periods for the environment variables considered above. However, regarding the two episodes of major settlement relocation in the LBA-EIA – the LM IIIB-C transition, and the nucleations of PG-G – we can further interrogate which aspects of settlement location were most changed, which may have implications for considering the social mechanisms behind those changes.

One approach is to test whether the changing distributions between periods, identified from the boxplots above, amount to statistically significant differences. That is, we can assess the probability that the differences observed between two periods – in, say, elevation or distance from the coast – reflect genuinely statistically distinct distributions for those variables, or else could simply result from random variation alone. As noted in Chapter 2, the test employed here is the Mann Whitney U test. Given the already noted limitations in the datasets at hand, the results should be treated with caution, but they provide at least some statistical basis by which to assess the scale or significance of the changes in settlement patterning between periods. Tables 4.1-3 present the results from these tests, which were run on three different paired sets of sites. The first round of tests was run on sites occupied in LM IIIB but abandoned by LM IIIC, against those newly founded in LM IIIC. The second round of tests was run on sites occupied in LM IIIC and/or PG but abandoned by G, against those newly founded in G. A third round of tests was run on the same sample of LM IIIC-PG sites, but against sites newly founded in G, PA or A, to investigate whether there were any longer-term contrasts between settlements founded during the period of upland, defensible settlement, and those established in subsequent centuries.

Sites occupied and abandoned in LM IIIB vs sites newly founded in LM IIIC	
Variable	**p-value**
Elevation	**<0.0001**
Relative elevation (500m radius)	**<0.0001**
Relative elevation (2.5km radius)	**0.0019**
Quantity of flat land (500m radius)	**<0.0001**
Quantity of flat land (2.5km radius)	**<0.0001**
Distance from coast	**0.0104**

Table 4.1. Results of Mann Whitney U tests for a range of topographic and environmental variables, performed for sites abandoned in LM IIIB (n=45) and newly founded in LM IIIC (n=76). P-values below 0.05 – the 95% confidence interval – are shown in bold.

Sites occupied and abandoned in LM IIIC and/or PG vs sites newly founded in G	
Variable	p-value
Elevation	**0.0117**
Relative elevation (500m radius)	**0.0110**
Relative elevation (2.5km radius)	0.3512
Quantity of flat land (500m radius)	**0.0041**
Quantity of flat land (2.5km radius)	0.0925
Distance from coast	0.6780

Table 4.2. Results of Mann Whitney U tests for a range of topographic and environmental variables, performed for sites occupied in LM IIIC and/or PG, but abandoned by G (n=83) and those newly founded in G (n=25). P-values in bold as in Table 4.1.

Sites occupied and abandoned in LM IIIC and/or PG vs sites newly founded in G-A	
Variable	p-value
Elevation	**0.0088**
Relative elevation (500m radius)	**<0.0001**
Relative elevation (2.5km radius)	0.0520
Quantity of flat land (500m radius)	**<0.0001**
Quantity of flat land (2.5km radius)	**0.0207**
Distance from coast	0.2834

Table 4.3. Results of Mann Whitney U tests for a range of topographic and environmental variables, performed for sites occupied in LM IIIC and/or PG, but abandoned by G (n=83) and those newly founded in G, PA or A (n=72). P-values in bold as in Table 4.1.

The results of these tests suggest differences between the two main phases of settlement

reorientation in the LBA-EIA. For the major abandonments and relocations at the LM IIIB-C transition, every variable produced a significant result, well below the 95% confidence interval[71], suggesting that the observed differences between these two samples of sites are unlikely to be random. Though some of these variables may correlate with one another – higher elevations may be expected, for instance, further from the coast – the statistically significant results may also imply that the topographic or environmental affordances associated with each of these variables were implicated in the decisions made during these relocations.

By contrast, the settlements founded and abandoned in LM IIIC-PG, and those established in the subsequent G-A periods, did not produce universally significant results. In both the tests run on sites of the G period, and those of the G-A periods, elevation, local (500m radius) relative elevation, and quantities of flat land produced statistically significant results, while in the case of sites founded in G-A, quantities of flat land in a 2.5km radius also did, and relative elevation on the same scale came very close. In neither case, however, were the results significant for distances from the coast. The implications of these results could be many, but one possibility is that proximate topographic characteristics – lower lying, flatter, and more accessible terrain within and immediately surrounding a site, for instance – were of primary importance during the settlement relocations in PG-G. That is, more precipitous, inaccessible or elevated sites may have been abandoned for more favourable locations nearby.

The results from the set of tests also including sites founded in PA-A may suggest, in turn, that in these subsequent periods the wider environs – particularly the amount of flatter, more readily cultivated terrain – became increasingly relevant also. But in neither case do these tests suggest that the distance of settlements from the coast proved a major factor in either their abandonment or their foundation, relative to the other periods considered. This is not to say that a shift back towards the coasts did not occur – as shown in Fig. 4.14 – but it does imply that, on a period-by-period basis, these shifts were gradual and possibly localised. Decisions to relocate are likely to have been made in the context of local topographic and environment concerns, such as accessibility to readily cultivatable land, and perhaps within increasingly established systems of land

[71] This threshold signifying that the two distributions submitted to the analysis would only be expected to arise from random sampling of the same underlying population 5% of the time, with lower values reflecting even lower probabilities.

tenure and nucleated settlement, with the resettlement of coastal locations a less obvious concern.

Summary

The foregoing examination of the environmental and topographic characteristics of settlement, and the nature of settlement turnover and change, has broadly confirmed the traditional understanding of these processes in LM II-A, but has also suggested a number of important nuances to the more general picture. Firstly, the settlement patterns of the LBA were not, as least as presently understood, directly akin to those of the CL-Roman periods, and by extension the quite distinct character of the interceding LM IIIC-Archaic periods should not be thought of as a digression from a norm re-established by the 5th century BCE. Secondly, the characteristics of the LM IIIA-B periods that set them apart from all other periods seem to be particularly marked proclivities for low-lying, well-watered, flat terrain, as well as land quite the near the coasts. Thirdly, though the transition from LM IIIB-C does indeed represent a major shift in the orientation of settlement on the island, with more elevated, rugged and inland locations occupied, subsequent centuries witnessed more gradual developments, for which local topographic context appears to have been important – with regard to access and agricultural potential – but the proximity of coastal environments less so. These observations suggest a series of questions in need of further investigation, namely, what accounts for the orientation of settlement in LM IIIA-B, the major relocations of LM IIIB-C, and the processes of settlement nucleation from PG-A, for which access to the coast appears to have been of limited significance. These questions will be considered further in subsequent chapters.

Micro-Regional Patterns in Settlement

Aggregate patterns across the island provide a broad perspective on the changing nature of human settlement; however, the limited resolution inherent in such an approach means that smaller scale variation within the broader picture can be difficult to recognise. To complement the foregoing analyses, therefore, this section presents two case-studies of regional settlement patterning, based on surveys conducted around the Bay of Mirabello in east Crete, and the Galatas area in the Pediada, in central Crete.

The Mirabello and Galatas Survey Regions

The Gulf of Mirabello is a deeply set embayment in the eastern third of Crete, which at its southern limit meets the coast of the Isthmus of Ierapetra, the island's narrowest point (Fig. 4.20-21). The Ierapetra valley connects the northern and southern coasts, running north-northeast between the limestone and phyllite-quartzite peaks of the Thrifti range to the east, and the gently mounting marly hills up to Meseleroi in the west (Haggis 2005d). The major centres of the Neopalatial era were probably the town of Gournia, with its small palatial building and dense urban plan, first excavated by Harriet Boyd in 1901 (Boyd 1908), and to its west the site at Priniatikos Pyrgos, which appears to have been a substantial settlement in MM III-LM I, though perhaps declining by the end of LM IA (Watrous and Schultz 2012; Hayden and Tsipopoulou 2012, 541). The rocky bastions of Kavousi and Vrokastro, first occupied at the LM IIIB-C transition, were likewise early discoveries in this area, excavated by Boyd (1901) and Hall (1914) respectively. The *polis* of Istron was probably located around the Ilias to Nisi peninsula, near Priniatikos Pyrgos, while the smaller, perhaps dependent *polis* of Oleros was somewhere in the Meseleroi valley to the south. Azoria is the best-known Archaic settlement in the region, but it does not appear to have become a *polis*, and was abandoned in the 5th century. As described in Chapter 2, three intensive surveys have been conducted in the area: the Gournia survey (Watrous et al. 2012), the Vrokastro survey (Hayden 2003), and the Kavousi-Thrifti survey (Haggis 2005a), from which the data were collated into a single database for the purposes of the present analysis.

The Galatas survey (Watrous et al. 2017; Figs 4.22-23) was established to investigate the settlement dynamics in the area of the MM palace, which was founded possibly as part of the territorial expansion of the Neopalatial Knossian state, but which only survived until LM IA (Rethemiotakis 2002; Buell 2014). The area is typical of the rolling landscape of the Pediada and central Crete, with its marly ridges and open valley bottoms, crossed by a network of seasonal and perennial streambeds, the largest of which is the Karteros River, which flows northwards, reaching the sea at Amnissos (Kokinou et al. 2017). The Lasithi mountains lie to the east, where the major city-state of Lyttos was located, while to the south are located the important settlement of Afrati (possibly ancient Arkades or Datala), and beyond that the eastern Mesara. Eltynia and Knossos were situated to the northwest. No major settlement or *polis* of the A-CL era is documented for

the Galatas region itself, though the sites at Astritsi and Khoumeri were the largest at the time.

Chronological Developments

As with the previous discussion of island-wide settlement patterning, the first consideration here is the number of sites represented in each period, and the nature and degree of settlement continuity and change by period. Unlike for the site database covering the whole island, estimated site sizes are provided in the publications for these survey regions, and so here it is also possible to examine changes in the total settled area and distribution of site size classes through time (as proxies for population), as well as approximate rates of population growth or decline.

Site size class	Site areas
1	<0.4ha
2	0.4-1ha
3	1-3.5ha
4	>3.5ha

Table 4.4 Site size categories used in discussion of the Mirabello and Galatas survey regions.

Figures 4.24-28 map the known survey sites for each period in the Mirabello area, while Figs 4.29-33 present the same for the Galatas region. Figures 4.34-35, present the counts of sites belonging to four size classes (see Table 4.4), which were employed in the Galatas survey publication and here have also been applied to the Mirabello sites, to facilitate comparison between the two regions. Tables 4.5-6 present summary information on the number of sites, total settled area, and rates of continuity and abandonment, for each survey region. The present analysis begins with the MM III-LM I periods, for although these lie beyond the chronological limits of the present thesis, they provide a useful point of comparison for LM IIIA-B, particularly considering the changes in political organisation implicated in the transition from the Neopalatial to Final Palatial periods.

During the Neopalatial period, both the Mirabello and Galatas regions were densely occupied. At Galatas, the eponymous palatial centre was the largest settlement of the region, dominating the ridge on which it stands, and overlooking the valley of the Karteros river to the west. No settlement so large is known from the Mirabello area, though as mentioned Gournia and Priniatikos Pyrgos were probably local centres. Sites were distributed across the entire survey region, particularly in

the valleys and coastal plains, but also extending into the uplands around Meseleroi[72]. The largest sites were located in the Valley of Ierapetra and along the coasts, with generally smaller settlements dotting the slopes and upland areas. Looking at the distribution of sites by size (Figs 4.34-35), both regions were characterised by very few settlements above 3.5ha (size rank 4), with increasing numbers of smaller sites, though in the Mirabello area there were proportionally more sites of 1-3.5ha in size (rank 1), perhaps reflecting a slightly less pronounced hierarchy of settlement than at Galatas, where the palace was the pre-eminent centre.

Period	Total sites	Sites per decade	Total area (ha)	Ha per decade	Percentage inherited	Percentage continued
MM III-LM I	158	5.45	78.91	2.72	--	23.4
LM IIIA-B	45	2.05	8.01	0.36	82.2	28.9
LM IIIC	36	1.64	36.21	1.65	36.1	58.3
PG-G	36	1.38	40.18	1.55	58.3	30.6
PA-A	41	1.78	82.78	3.60	26.8	--

Table 4.5 Summary information on sites identified in the Mirabello surveys, including known sites per period; sites per decade (based on period length); total settled area; total settled area per decade (based on period length); the percentage of sites inherited from the previous period; and the percentage of sites continuing into the subsequent period.

Period	Total sites	Sites per decade	Total area (ha)	Ha per decade	Percentage inherited	Percentage continued
MM III-LM I	107	3.69	79.08	2.73	65.4	40.2
LM IIIA-B	52	2.36	21.97	1.00	82.7	32.7
LM IIIC	19	0.86	7.19	0.33	90.5	68.4
PG-PA	24	0.64	27.52	0.74	54.2	62.5
A	19	1.58	23.33	1.94	78.9	68.4

Table 4.6 Summary information on sites identified in the Galatas survey. Columns as in Table 4.5.

Following the destructions at the end of LM I, the density of settlement dropped precipitously in both regions. Over 75% of sites in the Mirabello area were abandoned, as were 60% of those around Galatas, with the total settled area dropping by around 90% and 72% respectively. Relatively few new sites were founded, resulting in high levels of site inheritance in LM IIIA-B (82% in both regions). This meant that, despite major changes in the scale of settlement, similar areas continued to be occupied, though with particular declines in certain locales, such as the

[72] Though extensive occupation of the Meseleroi valley itself, a prominent feature of the Archaic period, is not seen in MM III-LM I, in many other respects the settlement pattern of the region would appear to reflect an in-filling of suitable agricultural land.

eastern part of the Galatas survey region, or the central Ierapetra Valley. As shown in Figs 4.34-35, the sites abandoned in MM III-LM I came from across the site size distribution in both regions, but turnover was apparently greatest amongst small sites. New sites in LM IIIA-B were also generally small, with none larger than 1ha founded in either region. There are some differences between the two regions, however, for while the number of sites, and sites per decade, remained higher than it would do in subsequent centuries in both the Galatas and Mirabello areas, in the latter, LM IIIA-B marked the nadir in terms of the total settled area, and hectares settled per decade, for any period in the LBA-EIA. Furthermore, while the site size distribution between MM III-LM I and LM IIIA-B saw a slight decline in the relative number of rank 3 sites in the Mirabello area, rank 2 and 3 sites became proportionally more common around Galatas, perhaps suggesting that the existence of the palace had suppressed the development of medium-sized settlements, which then became relatively more common following its collapse.

In LM IIIC, the settlement trajectories of these two regions diverged more starkly. In the Mirabello area, 71% of LM IIIA-B sites were abandoned, with only 36% of those occupied in LM IIIC being inherited. What is more, though the number of sites declined, the total settled area (and hectares settled per decade) increased. Sites of all sizes were abandoned during LM IIIA-B, but of the new foundations in LM IIIC, there were proportionally fewer very small sites and more of rank 2 (0.4-1ha). Many of these new settlements occupied hilltops, cliffs and natural bastions with readily defensible topography. Several clusters of such settlements appeared, around Vrokastro (Hayden 2004b), Kavousi (Day 1997; Coulson 1997), Monastiraki (Haggis and Nowicki 1993b; Nowicki 2008), and Kato Khorio. Indeed, this region has been at the centre of discussions around the 'refuge site' phenomenon on the island (Haggis 1993; Watrous 2001; Nowicki 2004; Gaignerot-Driessen 2016a). Such a pattern is not clearly in evidence in the Galatas region, however. Here, though 67% of sites were abandoned in LM IIIA-B, again across all site sizes, only two new settlements were founded in LM IIIC, with 90% being inherited, and no sites over 3.5ha recorded at all. This appears to have been the sparsest period of occupation in the region during the LBA-EIA.

The clusters which emerged in LM IIIC in the Mirabello region remained the foci of settlement into the subsequent PG-G periods; indeed, nearly 60% of LM IIIC sites continued into the PG-

G periods, accounting in turn for nearly 60% of the sites occupied in that subsequent phase. Most notably, all sites of ranks 3 and 4 continued, with only smaller sites abandoned, while the vast majority of new sites in PG-G were also small. The total settled area increased, though this amounts to a slight decline in hectares per decade, given the long span of PG-G. These developments are broadly consistent with the process of nucleation documented for the Mirabello region in this period, where populations aggregated to settlements within former clusters of associated sites (Gaignerot-Driessen 2016)[73]. In the Galatas region, many LM IIIC sites (68%) continued to be occupied into the subsequent period as well, but this amounted to a lower degree of site inheritance than in the Mirabello region (54%), as more new sites were founded. In the Galatas survey, the PG-PA periods were grouped together, with only a few sites definitely assignable to one or other sub-period, meaning that the roughly 370 years represented by this bracket must be treated with great caution, as shorter-term patterns of occupation and abandonment are no doubt being elided. Larger sites are better represented in these periods than in LM IIIC, suggesting nucleation or growth may also have been occurring in this region. Two larger settlements, at Astritsi and Khoumeri, appear to have become the largest sites in their respective locales during this time.

Finally, in the PA-A periods in the Mirabello region, the nucleation and growth of regional centres reached its height, with Kato Khorio Profitis Ilias, Azoria (Haggis 2014a) and Istron (Hayden 2004a) emerging as the population centres of the region. This period witnessed a growth in the number of known sites and the total settled area. Despite consolidation of the major population centres, there was more limited continuity between PG-G and PA-A, with only 31% of sites continuing from the earlier period, and only 26% of those occupied in the latter being inherited. An important development in this period was the settling of the Meseleroi valley, where a host of new settlements emerged along the ridgeline and down into the valley, among which may be the

[73] These patterns do represent an interesting point of comparison with Wallace's (2010) more general model of the 'nucleation phenomenon' in the PG-G periods, however. The abandonment of roughly half of all LM IIIC settlements by the G period, as documented by Wallace, would appear to reflect a phase of significant settlement turnover. Based on the survey evidence from the Mirabello area, however, LM IIIC here exhibits the highest level of site continuity (into PG-G, that is) of any period between MM III and Archaic, while PG-G has the second highest level of site inheritance, after the LM IIIA-B periods, and certainly higher than either LM IIIC or PA-A. In other words, the period of nucleation in this region actually stands out as one of relative stability, something which would appear to run counter to its typical presentation as a phase of settlement reorientation and relocation.

site of the later-attested city-state of Oleros (Hayden 1995). This inland valley had been little occupied since the BA. In the Galatas area, the sites at Astritsi and Khoumeri remained the largest, and would continue into the subsequent CL era. Here there was more continuity from the preceding era, with 63% of PG-PA continuing, making up 79% of A sites, though there was a slight decline in the number of sites and the total settled area. This ostensible decline did nonetheless correspond to an increase in the number of hectares settled per decade. No new sites of ranks 3 or 4 were established (Figs 4.34-35), giving the impression that this period was largely a consolidation of the preceding settlement pattern.

Period	Low estimate	High estimate
LM IIIA-C	0.34%	0.44%
LM IIIC-G	0.02%	0.04%
PG-A	0.15%	0.22%
LM IIIC-A	0.12%	0.17%

Table 4.7 Estimates of population growth in the Mirabello region based on site area totals from Table 4.5. The low estimate uses the start date of the earlier period to the nearest century, and the end date of the later period (so c.1200-700 BCE, or 500 years, for LM IIIC-G), while the high estimate uses the end date of both (c.1000-700 BCE, or 300 years).

Period	Low estimate	High estimate
LM IIIA-C	-0.25%	-0.33%
LM IIIC-PA	0.24%	0.40%
PG-A	-0.03%	-0.05%
LM IIIC-A	0.17%	0.24%

Table 4.8 Estimates of population growth in the Galatas region based on site area totals from Table 4.6.

The site sizes recorded for these two survey regions also allow us to make broad estimates of the rate of growth or decline in the settled area and, assuming a roughly constant density of occupation across sites, population. These are presented in Tables 4.7-8. In the Mirabello region, every period from LM IIIA-B onwards was marked by growth, with the highest rate being between LM IIIA-B and LM IIIC. Comparative analyses of population growth in historical and anthropological contexts suggest that rates above 0.1-0.2% per annum are certainly possible, especially during the settling of sparsely populated landscapes, but that sustained growth above such rates is relatively uncommon (Cowgill 1975, 510–11; Hassan 1978, 68–69). The rates calculated for the Mirabello region could certainly represent local growth in population during the PG-A periods, especially if

true rates tended toward the lower estimates presented in Table 4.7. But the rates in LM IIIC are especially high, and the possibility of some external influx of population should be considered for this period.

In the Galatas region, the LM IIIA-C periods were marked by decline in the total settled area, suggesting population fell. The growth between LM IIIC and the PA period would appear to be quite high, perhaps raising the possibility of incoming populations, but this should be weighed against the long timeframe represented by the PG-PA period in the Galatas survey, and the probability that not all sites were necessarily contemporary. However, this does appear to have been a period of population growth, while in contrast the Archaic period saw a slight decline in the settled area, and thus perhaps population, in contrast to the continued expansion in the Mirabello area. These two regions therefore evidence quite different trajectories in population growth and decline, especially for the LM IIIB-C transition, in line with the contrasting settlement evidence already considered.

Environmental and Topographic Variables

The availability of site size estimates from the survey datasets also allows us to examine the environmental and topographic characteristics of settlement in relation to the distribution of the settled area rather than simply the locations of sites represented by single points. To achieve this, random points were sampled from within the bounds of recorded survey sites, in numbers proportional to their size[74], with values for each topographic variable ascribed to each point from the relevant raster maps. The resulting datasets should provide a more accurate reflection of the distribution of population within the landscape as reflected by site size. Figures 4.36-42 are boxplots produced from these sampled point locations, for the same environmental and topographic variables discussed in the island-wide analysis. Distributions from both regions are plotted using the same y-axis, and though in some cases this produces an offset between the two datasets, it also facilitates absolute, as well as a relative comparisons between the two regions. Tables 4.9-10 present the p-values from Mann Whitney U tests, run for each variable in a pair-

[74] Specifically, one point per 0.1ha, in addition to a minimum of one point allocated to each site, so that every site location was represented at least once, some being smaller than 0.1ha.

wise manner between successive periods. Each column therefore provides an indication of whether the distribution of values for each variable in the given period diverges from that in the previous period, to a statistically significant degree.

Variable	P-values			
	LM IIIA-B (vs MM III-LM I)	**LM IIIC** (vs LM IIIA-B)	**PG-G** (vs LM IIIC)	**PA-A** (vs PG-G)
Elevation	0.0996	**<0.0001**	**0.0369**	**0.0253**
Coast distance	**0.0194**	**<0.0001**	0.0850	0.6012
Rel. elevation (500m radius)	**<0.0001**	**<0.0001**	0.1129	**<0.0001**
Rel. elevation (2.5km radius)	**0.0003**	**<0.0001**	**0.0009**	**<0.0001**
Flat land (500m radius)	0.0520	**<0.0001**	0.2970	**<0.0001**
Flat land (2.5km radius)	**<0.0001**	**0.0345**	**0.0230**	**<0.0001**
Topographic wetness	**<0.0001**	**<0.0001**	**0.0195**	**<0.0001**

Table 4.9 Results of Mann Whitney U tests run on the distributions of environmental and topographic values for sites from pairs of successive periods from the Mirabello surveys. Statistically significant results are shown in bold.

Variable	P-values			
	LM IIIA-B (vs MM III-LM I)	**LM IIIC** (vs LM IIIA-B)	**PG-G** (vs LM IIIC)	**A** (vs PG-PA)
Elevation	0.5321	0.2280	**0.0003**	0.7075
Coast distance	0.9854	**0.0028**	0.5529	0.5307
Rel. elevation (500m radius)	0.1409	0.7787	**<0.0001**	0.4723
Rel. elevation (2.5km radius)	**0.0089**	0.4961	**0.0022**	0.8282
Flat land (500m radius)	**0.0340**	0.4315	**0.0001**	0.7781
Flat land (2.5km radius)	0.2038	0.1124	**0.0334**	0.9935
Topographic wetness	0.2284	0.2940	**0.0090**	0.4427

Table 4.10 Results of Mann Whitney U tests for sites from the Galatas survey, run as in Table 4.9.

These figures and tables suggest significant contrasts between the Mirabello and Galatas regions in terms of the distribution and chronological development of settlement in the LBA and EIA. Looking first at elevation (Fig. 4.36), both regions exhibit an increase in median elevation through all periods, though as seen in Tables 4.9-10, only in the PG-PA periods is this shift statistically

significant for the Galatas region, whereas in the Mirabello area, only the transition from MM III-LM I to LM IIIA-B does *not* produce a statistically significant result. In both regions, however, the highest general orientation of settlement came after, rather than during, LM IIIC, which matches the pattern observed across the island in the first part of this chapter. In the Mirabello area, the PA-A periods represent a complex picture, where the median elevation of the settled landscape continued to rise, but the IQR expanded greatly. During this period, major settlements grew at the hilltop locations of Azoria and Kato Khorio Profitis Ilias, while the elevated Meseleroi valley was newly settled, but at the same time the harbour site of Istron expanded to become one of the largest sites in the region. The wide spread of elevation values for the A period reflects these countervalent processes.

For distance from the coast, only the LM IIIC period produced a statistically significant shift in the Galatas region, though this should be treated with caution. In absolute terms the Galatas area is very much inland, and the shift in the median between LM IIIA-B and LM IIIC of just over a kilometre seems unlikely to reflect a concerted movement away from the sea, when it was around 15km distant anyway. What this shift probably reflects is the emptying out of the northeast part of the survey region, an area that would remain little inhabited for the rest of the EIA. The reasons for this abandonment are unknown, though the role of Lyttos, founded to the east of Galatas in the LM IIIC period, has been proposed by the survey authors (Buell and Turner 2017, 81). In LM IIIC, however, it is unclear how great, and of what kind, this putative influence might have been. In the Mirabello area, the LM IIIA-B periods saw, if anything, a shift further towards the coast in comparison to MM III-LM I, reflecting the emptying out of the central Ierapetra Valley. In LM IIIC, there was a movement towards more inland locations, in line with the founding of defensible upland sites, though the IQR range for this and subsequent periods shows that coastal locations were still inhabited, if to a lesser extent. Indeed, there was more limited change in the coastal orientation of settlement following LM IIIC, with the changes in PG-G falling slightly short of the 95% confidence interval, and the subsequent changes into the P-A periods being far from significant. No significant shift was found in the Galatas area in the PG-A periods either, meaning that both regions conform to the pattern noted at the island-wide scale, where the distance of settlements from the coast appears not to have been as clear a differentiator between the sites of

different periods in the first millennium, as other topographic and environment variables.

Turning to relative elevation (Figs 4.38-39), the Galatas region witnessed a gradual rise over both scales (500m and 2.5km) for settlements of the LBA-EIA. Only in the PG-PA periods did these shifts in local relative elevation produce a statistically significant result, while over the 2.5km scale both the LM IIIA-B and PG-PA periods did so. It is in the PG-PA period that what would become the two largest settlements of the A period began to outgrow other surrounding sites, and their hilltop locations are reflected in higher values for relative elevation, which continued into the A period. By contrast, there was essentially no change in median relative elevation between LM IIIA-B and C, when as discussed earlier only two new sites were founded. Again in the Mirabello region, changes in the orientation of settlement appear to have been more major from period to period. Developments were similar over both scales in the Mirabello area, with relative elevation increasing between MM III and LM IIIA-B, and again more dramatically into LM IIIC, reaching a peak in PG-G. The PG-G period is the only one not to register a significant result for relative elevation at the local level, which may reflect the continuity of many hilltop settlements in the region from LM IIIC. Likewise it may be the ongoing abandonment of lower-lying sites (a process already in evidence LM IIIC) that accounts for the increase in relative elevation over the larger scale in PG-G. The subsequent drop in relative elevation on both scales in PA-A is the result of the growth of lowland sites like Istron, and the settling of the valley floor around Meseleroi.

Comparing the two survey regions as a whole, a major point of dissimilarity is that around Galatas, settlements of all periods, and over both scales, were typically set above their surrounding landscape. As can be seen in Figs 4.29-33, hills and particularly ridgelines were common foci of settlement in the area, perhaps serving as a convenient and more defensible location from which to overlook agricultural land and routes of communication through the landscape. The hills and mountains flanking the Isthmus of Ierapetra, and the general orientation of settlement towards the low hills and plains of the area, means that in this region, by contrast, sites were very often below the mean elevation of the surrounding landscape. It seems notable, therefore, that only in the LM IIIC and PG-G periods was settlement commonly found well above the local average elevation. The hilltop, defensive sites of LM IIIC-PG are well known in this region, and these distributions would appear to capture their particular topographic orientation. The largest settlements of the

Galatas region by the PG-A periods were also hilltop or *acropolis* sites, but these did not mark such a break with the preceding orientation of settlement.

For quantities of flat land surrounding settlements (Figs 4.40-41), statistically significant shifts were identified again in the PG-PA periods around Galatas, over both scales (500m and 2.5km), and on the smaller scale for the LM IIIA-B periods. In the Mirabello region, only the LM IIIA-B and PG-G periods did not produce significant results, and in both cases only on the smaller scale. Contrasts between the two regions are especially apparent here. The gentler terrain of the Galatas area results in far higher quantities of flat land, especially in the wider 2.5km radius, though even over the 500m scale values were typically higher here than in the Mirabello region. Also, while LM IIIC in the Mirabello region saw a significant drop over the smaller scale, around Galatas the median actually increased in this period for the same measure. In this region, once again, PG-PA appears to have been a period of more pronounced change, with a drop in quantities of flat land on the small scale, and a contraction in the spread of values over the large scale, both features which continued into the A period. In the Mirabello region, the continuity noted between LM IIIC and PG-G in other variables is seen again here, with the PA-A periods evidencing a subsequent increase in local flat terrain, and a diminished range of values over the larger scale. Thus, in the Mirabello region, steeper terrain appears to have been occupied from LM IIIC-G, in contrast to the preceding Neopalatial and Final Palatial periods, with a greater reoccupation of flatter land in the PA-A period. But, importantly, the amount of flatter terrain in a wider radius, which may better reflect nearby agricultural land, did not drop so precipitously between LM IIIA-B and LM IIIC. Though occupying locations that were proximately steep or inaccessible, in other words, communities of the LM IIIC and PG-G periods retained proximity to reasonable amounts of flatter land in the wider area.

The distributions for topographic wetness (Fig. 4.42), tie into the patterns observed in the other variables. Around Galatas, only the PG-PA periods produced a significant result in the Mann Whitney U tests, corresponding to a drop in topographic wetness from LM IIIC, again reflecting the growth of the hilltop sites that would become the population centres of the region in this and the subsequent A period. In the Mirabello area, on the other hand, every period produced statistically significant results, with the trajectory traced being one of declining topographic wetness

from MM III-LM IIIC, a nadir in the PG-G periods, and subsequent rise in the PA-A periods. The steady abandonment of low-lying, flatter terrain, and the subsequent re-occupation of such areas, account for these trends, which were reflected also in the distributions for relative elevation and the quantities of flat land.

The Social Side of Settlement Patterning

The foregoing analyses have focussed on the physical contexts of settlement, and the types of landscape characteristics and topography which were occupied in different periods. The patterns explored so far do reflect human priorities and choices, in that changing social conditions will have impacted on which kinds of enironment were sought out and exploited for their economic or defensive advantages, their accessibility or proximity to the coasts, and their articulation within the wider landscape. But another important feature of settlement systems is how communities locate themselves in relation to each other. Settlement location in all periods has been shaped by the proximity of others, and the cooperative, competitive, and sometimes violent relations which develop between communities. The changing structure of these interactions is an important dynamic in the development of settlement systems, and has the potential to shed light on forms of social interaction and integration.

Spatial Relationships

To illustrate some of the changing spatial relationships between settlements in the two survey regions through time, Figs. 4.43-62 present a series of networks constructed by connecting sites to their nearest neighbours. Two networks were produced for each period, the first comprising links between each site and its three closest neighbours, and the second weighted such that the number of links is proportional to site size, to reflect that larger population centres may have been more likely to interact over a wider area than smaller ones. The site size ranks employed above were used, with the number of links thus ranging from one to four. This second approach produces networks that are generally sparser, and more hierarchical, but potentially more reflective of the connections which form between communities of different sizes (Ducke and Suchowska 2021).

What are known as edge effects are an important concern for generating network links (e.g.

Conolly and Lake 2006, 91, 229). The finite extent of any survey will result in reduced relative archaeological visibility beyond its boundaries, meaning there are likely to be sites lying beyond the edges of the survey area which remain undiscovered. Therefore, the use of methods like the network models employed here can give an artificially self-contained impression of the local settlement system. These issues are partly addressed here by incorporating any known settlements outside of the survey regions into the networks in the relevant period with a conservative single connection, given limitations in knowledge about the sizes of such sites. Thus is it important to stress that the networks presented here are not intended to reflect closed systems of interaction. Similarly, these networks treat all sites of a given period as contemporary, which is probably not the case, something that should be borne in mind in the following discussion. Finally, an upper limit for network links was set at 2.5km, or roughly a one-hour round trip, to prevent artificially long connections being created between small or spatially isolated sites, and to draw particular attention to localised patterns in settlement distribution[75].

In both regions, the networks constructed for the MM III-LM I periods link a great many of the recorded sites into a small number of networks, one to two in the case of Galatas (Figs 4.43-44), and two in the case of the three-link network in the Mirabello area (Figs 4.45-46). In the latter case, however, the weighted network is far more fragmentary, resulting from the large number of very small sites in the Ierapetra and Kalo Khorio valleys which only form a single connection. Nonetheless, a number of larger connected chains of sites do emerge, particularly across the coast and hills in the centre-west of the survey region, where the two likely centres of Priniatikos Pyrgos and Gournia are located. The density of settlements in both regions has been noted for the Neopalatial period, and probably reflects the high degree of agricultural exploitation of these landscapes, likely under the auspices of the palace of Galatas, and the smaller regional centres of the Mirabello region. In the LM IIIA-B periods, different patterns emerge in the networks of the two regions. In the Galatas area (Figs 4.47-48), both networks still incorporate the majority or all of the known settlements into a single network, with only a small outlying cluster to the west in

[75] Straight lines are here used to represent links between sites, rather than modelled routes or least-cost paths. While the latter may produce networks that more accurately reflect patterns of human mobility between sites, they are unlikely over the short scales considered here to differ in terms of which sites they connect, and as such the less computationally expensive option of connecting sites based on Euclidean distance was employed.

the three-link model. Despite the collapse of the palace at Galatas, there are similarities in the overall shape of these networks and those in MM III-LM I, reflecting the high degree of site inheritance from that previous period. A large workshop or storage structure, built over the remains of the ruined palace in LM IIIA (Rethemiotakis and Christakis *forthcoming*), could plausibly have served as a local centre for the mobilisation of agricultural produce in the area. Though its small size compared to the earlier palace suggests the mechanisms involved would have been quite different to those in MM III-LM I, it is possible that continuity of settlement patterning in the area in LM IIIA-B reflects the renewed role of Galatas in coordinating aspects of local production.

In the Mirabello region (Figs 4.49-50), by contrast, both the three-link and weighted models exhibit three largely distinct loci of settlement in the south, northeast, and northwest of the survey area, though the last of these is far more fragmentary in the weighted model. The major decline in occupation of the central Ierapetra Valley may be largely accountable for the segmentation of these networks, and the period generally lacks any clear evidence for local political integration, despite what may be small-scale elite buildings at Gournia (Younger 2016) and Mokhlos (Smith 2005). It is interesting to note, however, that these three broad areas of settlement preface the later clusters of LM IIIC which, though orientated somewhat differently, may have been founded by the corresponding populations at the end of the 13th century.

The networks for LM IIIC in the Mirabello area (Figs 4.53-54) clearly emphasise the settlement clusters which have been argued to be a hallmark of this region in the period. Haggis (1993; 2001) has suggested they served to coordinate aspects of landuse, inheritance, marriage, and the enforcement of local justice. Several sites known from outside the survey areas in this region may have formed part of these clusters, as represented in the networks drawn here, though they may also have been linked to other sites not yet known. In the hierarchical network, these clusters are slightly more fragmented, with that in the valley of Kalo Khorio, for instance, separated from the Vrokastro cluster. The precise scales over which these communities interacted is not clearly understood, though will be considered in Chapter 6, in the context of agricultural production. In LM IIIC in the Galatas area (Figs 4.51-52), the two networks are identical, and contrast with the distinct clusters of the Mirabello area. They suggest a more evenly spaced distribution of minor settlements, focussed along the edges of the Karteros river valley, and here both networks are fully

integrated (with the exclusion of a single site to the northeast). Purely from the perspective of settlement patterning, therefore, the Galatas region contrasts with the local clustering seen in the Mirabello area. As mentioned above, the depopulation of the eastern part of the survey region is a curiosity in this period, but one possibility is that the ridges and hills along the Karteros valley proved particularly attractive locations for settlement, with defensive and connective advantages.

This valley continued to form the locus of settlement into the PG-PA periods around Galatas (Figs 4.55-56). The networks drawn for these periods, which incorporate some sites from outside the survey area, reflect the growth of the two regional centres at Astritsi and Khoumeri, around which smaller satellite sites are known. These patterns contrast with the more dispersed networks of LM IIIC, where no local centres were especially apparent, except perhaps at Arkalokhori. The close proximity of the two emerging centres in the Galatas region contrasts with the situation in the Mirabello area (Figs 4.57-58), where the well-separated clusters of the LM IIIC period continued as the main concentrations of settlement in PG-G. The site of Kato Khorio Profitis Ilias appears isolated at this time, though its position at the edge of the surveyed area may belie connections to unidentified sites to the south and west. At Vrokastro, a number of small settlements appear to have surrounded the site (and, indeed, here these are split into two distinct networks, though this is unlikely to reflect the true interactions between these nearby communities).

By the Archaic period in the Galatas area (Figs 4.59-60), the two clusters of settlement centred on Khoumeri and Astritsi are increasingly distinct, at least as represented by the networks defined here. The continuing consolidation of settlement along the Karteros valley still contrasts with the relative emptiness of the plain to the east, though a couple of small sites are known in the northeast, which the survey authors have suggested may reflect the existence of routes leading to Lyttos. The PA-A periods were characterized by greater change in the Mirabello region (Figs 4.61-62). The centres of Kato Khorio Profitis Ilias and Azoria retained their pre-eminent position – the latter particularly following the abandonment of Kavousi Kastro early in the PA period. But the west of the region was marked by reorientation towards the coast on the one hand – with the abandonment of Vrokastro and the growth of Istron – and inland towards Meseleroi on the other, where a numerous sites were founded, probably with an orientation towards agricultural exploitation of the fertile valley (Hayden 1995). A linear, chain-like network is constructed between these

settlements, which appear to represent a structured colonisation of this inland valley[76]. The connection between these countervalent developments is not yet clear, though the settlement of Meseleroi does appear to follow the abandonment of Vrokastro.

Now You See Me

Before the advent of technologies facilitating rapid movement and communication across distances, intervisibility was an important means of connection across even large distances (see e.g. Horden and Purcell 2000, 124-32). In a land of such dramatic hills and valleys as Crete, sweeping vistas are not difficult to come by. Much work has been done examining the visual landscapes of the BA, especially concerning the peak sanctuaries of the palatial era (Peatfield 2009; Soetens et al. 2002). Into the subsequent EIA, however, such connections have been little explored, except where noted during survey or prospection of particular sites. But visibility – or the avoidance of it – is an important dynamic of settlement systems, implicated in processes of communication, territoriality, defence, and navigation.

For both the Mirabello and Galatas regions, lines of sight were modelled between settlements in each period, to examine the relationship between the resulting networks of intervisibility, and the other characteristics and patterns of settlement so far analysed. As discussed in Chapter 2, these were modelled between the random points created within the bounds of settlements, to better reflect the greater visibility of larger settlements, and the range of viewpoints found within the bounds of any one settlement. In in both regions, the Neopalatial period was characterised by a dense network of intervisible sites (Figs 4.63-64). In the Mirabello region, these were particularly pronounced along the Ierapetra and Kalo Khorio valleys, and along the north coast, though sites towards Meseleroi were far less intervisible. In the gentler landscape around Galatas, the network of intervisibility is less constrained by the terrain, and is especially dense.

In LM IIIA-B, the visibility network remains quite dense, especially along the Karteros valley (Fig. 4.65), where many of the larger sites of the period are located. In the Mirabello region in LM IIIA-B (Fig. 4.66), by contrast, the modelled network of intervisibility breaks down dramatically. This

[76] Given that the limit of the Vrokastro survey area runs through the valley, it is very possible that additional sites exist to the south of those currently known.

is partly a reflection of the much-reduced number of sites and settled area in the period, though around Vrokastro, where a number of small hilltop and ridge sites are known, there remains greater intervisibility. However, it is difficult to read any broader structuring principles in the connections represented here. This situation contrasts strongly with that of the LM IIIC period (Fig. 4.68). Here, the modelled lines of sight replicate much of the patterning illustrated by the above networks – communities occupied clusters of not only proximate, but intervisible settlements – but there is also strong intervisibility between clusters. These inter- and intra-cluster visual relationships are evident upon visiting many of these sites, as shown in Figs 4.69-70, and are a striking feature of the settlements of the period in the Mirabello area.

In the Galatas region in LM IIIC (Fig. 4.67), the reduced settled area produces a fainter network of intervisibility, but it is clear that the settlements which lined the Karteros river had clear views not only of the valley itself, but their neighbours along its course. This intervisibility is much clearer in the PG-PA periods (Fig. 4.71), where, as in the Mirabello area, there are strong visual connections both within and between local clusters of sites, which also serve to illustrate the linear arrangement of settlement along the Karteros valley. In the Mirabello region (Fig. 4.72), the lines of sight modelled for the PG-G periods largely resemble those of the LM IIIC periods, reflecting the continuity of the clustered settlement pattern, though the depopulation of the Monastiraki area accounts for a reduced density of intervisibility in the central Ierapetra Valley. In the Galatas region in the A period (Fig. 4.73), the visibility network appears much as in the PG-PA periods, with sites along the Karteros valley still highly intervisible, though some visual connections can also be seen to the outlying sites to the northeast, and those outside the survey region to the west and southwest. In the Mirabello area (Fig. 4.74), the visibility networks fragment, in line with the high degree of nucleation visible in the period, with much of the settled area comprising the larger sites of Azoria, Kato Khorio Profitis Ilias, and Istron. An important exception is Meseleroi, where many of the sites in the valley and along the surrounding ridges communicated visually, as well as the lines of site extending up the Kalo Khorio valley from Istron, into what was probably its agricultural hinterland.

The Long and Winding Road

The final form of interaction to be considered here is that of movement through the landscape, and the relationship between settlement location and possible corridors of communication. Major routeways and pinch points in the landscape receive frequent mention in discussions of settlement patterning in the LBA-EIA (Wallace 2010a, 239–42, 245; Paschalidis et al. 2017, 181–82; Perna 2009a, 39; Haggis 2001, 51), and here they are examined systematically in relation to the changing settlement systems revealed by regional survey. For the present discussion, hypothetical path networks were modelled between random points distributed beyond the bounds of the survey regions, using the UNICOR programme described in Chapter 2. This approach meant that the survey sites themselves did not affect the modelled routes, so that the locations of settlements could be independently considered with regard to the resulting networks.

In the Mirabello area, the simulated route network appears strongly influenced by the relative ease of movement through the Ierapetra Valley, and along the northern coast, as well as the limited points of entry into the isthmus, especially from the east. The MM III-LM I settlement pattern (Fig. 4.75) aligns closely with the simulated route network, with the Neopalatial centres of Gournia and Priniatikos Pyrgos situated at points where several paths converge on a single coastal route. To this day, this is the main corridor of passage along the north of the isthmus. The only sites that are found at any great distance from the main modelled routes are in the hills south of Istron and Vrokastro, though none of these are large in this period. The sites that continue in LM IIIA-B also largely lie along the main axes of movement (Fig. 4.76), including Gournia again, the sites around Episkopi in the central Ierapetra Valley, and the settlements in the far northeast of the survey region at Tholos. In LM IIIC (Fig. 4.77), despite the shifts in settlement already discussed, there remain clear relationships between locales of habitation, and the major arteries of movement through the region. The Kavousi cluster is situated along a major route entering the isthmus from the east, and overlooks another which comes from the north. Vrokastro and its associated harbour on Ilias to Nisi flanked the same coastal route once dominated by Gournia and Priniatikos Pyrgos. The sites around Monastiraki and Kato Khorio do not lie directly on these routes, though they do overlook them, especially the latter, with its commanding location above the main point of access between the Ierapetra Valley to the north and the Ierapetra Plain to the south. As seen already,

these areas remained the chief loci of settlement into the PG-G periods (Fig. 4.78), with the notable exception of the sites around Monastiraki. These settlements, in the centre of the Ierapetra valley, though well placed to exploit the local agricultural landscape, would have enjoyed little control over access to the valley itself from the north or south, and it is possible the growth of the centres at Kavousi/Azoria and Kato Khorio was implicated in their abandonment. The later consolidation of Azoria, Istron and Kato Khorio Profitis Ilias as the largest settlements in the region (Fig. 4.79), therefore, represented centuries of growth and nucleation at locations directly on or overlooking the major axes of movement through the region. Given that this is the island's narrowest point, and alternate routes are limited, these locations thus appear particularly strategic. The Archaic settlements in the Meseleroi valley are once again something of a quandary, though the prospective site of Oleros itself does sit right upon the (admittedly minor) simulated route which connects this area to the north and south coasts. However, given the other curious features of renewed habitation in this area, it is also possible that the fertile valley was settled precisely because it lay at a remove from the other emerging centres of the period.

The Galatas area, once more, presents points of commonality and divergence with the Mirabello region. The gentler terrain of the area probably accounts for the more numerous, less constrained paths produced by the simulation. The more important modelled routes are those running north along the Karteros valley, and branching west and east at its northern end, as well as continuing to the northwest, with another route coming from the east and joining the Karteros valley to the south of Galatas. Knossos and Arkhanes would have been accessed by routes leading northwest out of the area, with Kastelli Pediada and later Lyttos reached by ones running east, Mount Ida some way to the west, and the Mesara to the southwest. In MM III-LM I (Fig. 4.80), as in the Mirabello area, most large sites are found on or directly overlooking the principal modelled paths – most notably the palatial centre of Galatas itself, overlooking the Karteros river – with those sites further away from main routes generally being smaller, something largely still in evidence in LM IIIA-B (Fig. 4.81), with its significant degree of settlement continuity. From LM IIIC (Fig. 4.82), and continuing through the PG-PA (Fig. 4.83) and Archaic (Fig. 4.84) periods, settlement concentrated particularly along the Karteros valley, with routes from the south overlooked by the settlements of Arkalokhori and then Khoumeri, and from the north by the later centre of Astritsi

Kefala. That this was an important corridor of movement is certainly suggested by the concentration of simulated routes along its length, and the important settlements which, especially by the G-A periods, lay to its north, south and east, for which the area of Galatas may have been something of a crossroads.

Summary

The contrasts drawn out between the sites of the Mirabello and Galatas regions suggest distinct histories of settlement over the course of the LBA, EIA and Archaic periods. In the former, most settlements of LM IIIA-B witnessed continued or renewed occupation following the upheavals of LM IB, and there is little evidence for the dense distribution of small rural sites in the lowland plains that characterised the Neopalatial period. However, the relocations occurring at the LM IIIB-C transition were more pronounced and saw the emergence of clusters of spatially proximate and intervisible settlements. These tended to occupy more elevated and uneven terrain, but they also retained access to areas of flatter land in their wider environs, as well as being frequently located above major routes and bottlenecks of movement in the landscape. The implications of the topographic and spatial relationships evidenced by such sites are both cooperative – with the regular contact of nearby communities possibly providing a range of productive, defensive, and social benefits (Haggis 1993; 2001) – but also assertive, with groups seeking to manifest forms of control or supervision over landuse and movement on the micro-regional or regional scale. This is particularly relevant to discussions of settlement patterning from LM IIIC onwards, for despite the general defensibility of many of these sites, they were often situated in conspicuous locations with clear points of connection to the wider landscape. The subsequent PG-G periods appear to represent reorientations and restructurings within the general confines of this clustered pattern, with fewer significant shifts in the topographic character of settlements, and continued growth at those centres overlooking points of access to the landscape. Finally, the PA-A periods were a time of countervalent trends, with both continued nucleation to the larger population centres, but also significant shifts including the abandonment of Vrokastro, and the settling of the Meseleroi valley.

Around Galatas, the settlement pattern in LM IIIA-B appears to have retained the general characteristics and orientation of settlement to a greater degree than in the Mirabello region.

Similar levels of site inheritance were seen in both regions at this time, but the total settled area dropped less precipitously in the Galatas area, the mapped networks for the region do not give a strong impression that disparate areas of settlement emerged, as on the Isthmus of Ierapetra. In LM IIIC, the Galatas region did not experience major relocations or an increase in the settled area as seen in the Mirabello region, but rather appears to have undergone a continued attenuation of settlement in broadly similar locations. The spatial distribution of sites did not exhibit the clustering seen in the Mirabello area in LM IIIC, but the near total abandonment of the eastern plain and the settling of ridges and hills along the Karteros valley may still reflect a conscious set of responses to the pressures of a more unstable time. It is unclear whether the inhabitants of these sites – which were in general very small – would have communicated or interacted in a manner akin to that proposed for the Mirabello region. There, the cluster model has been a powerful corrective in the discussion of defensible settlements, drawing attention to the processes of cooperation and community formation which were just as operative as those of fear and defence (Haggis 1993; Gaignerot-Driessen 2016a). But the evidence from the Galatas region argues against this model providing a uniform explanation for settlement patterning across the island. There, hilltop settlements did become the focus of local settlement systems during the EIA, but the reorientations of settlement involved in their emergence seems datable – if only broadly – to the PG-PA periods, in contrast to the early establishment and later consolidation of such centres in the Mirabello area. This indicates local variability in the timing and processes of population and settlement growth in different parts of the island, variability which is more readily discerned with the higher resolution spatial data – particularly site sizes – offered by survey.

In seeking explanations for the divergent settlement histories of these two regions, fundamental aspects of topography may have been important. The territory covered by the Mirabello surveys is one of stark contrasts, of coastal plains, inland valleys, sheer cliffs, and upland refuges, and each in turn was utilised by people in different periods, in response to wider social, political and economic developments (Figs 4.85-86). Several significant phases of relocation occurred, often towards territory which contrasted with that of previous periods. Around Galatas, the landscape is more uniform, the coast is a long way away in any direction, and there are few radical contrasts of topography and elevation (Figs. 4.87-88). The end of the BA here was not marked by major

relocation, but rather by population decline. While people may have left the area to seek out more secure locations elsewhere, it is still notable that, among those whose stayed, they largely occupied former sites of habitation. In turn, the settlement system which emerged by the PG-PA periods remained largely intact into the subsequent Archaic period, something partly true in the Mirabello area, particularly around Kavousi and Kato Khorio, but there too significant reorientations of settlement occurred around Vrokastro and the Meseleroi valley. It may be over-generalising to suggest that micro-regions characterised by more diverse topography are likely to engender more mutable, and more contrasting patterns of settlement through time, as changing priorities and demands among the population can be partly addressed through relocation, but the case of the Mirabello and Galatas areas suggests something of the sort.

The differing trajectories of these two regions offer fruitful points of comparison with the more general trends outlined at the island-wide scale, especially regarding the two major phases of settlement reorientation in LM IIIB-C and PG-G. With regard to the former, the Galatas and Mirabello regions make clear the contrasting fortunes of different regions around 1200 BCE, with the one evidencing continued decline, and the other a possible influx of population. As to the latter, both regions appear to support the impression gleaned from the island-wide data, that though the nucleations of PG-G generally involved expansion of population in areas of gentler terrain, probably with greater agricultural potential, the evidence of a shift back towards the coasts is more equivocal, raising questions about the extent to which the economic opportunities such locations afforded were implicated in the development of regional centres in the PA-A periods. These issues will be considered with reference to wider settlement evidence in the next chapter.

Chapter 5

History of Settlement

Introduction

In the previous chapter, in consideration of island-wide developments in settlement patterning, it was suggested that the LM IIIA-B periods were characterised by a strong orientation towards gentler, lower-lying, and coastal locations, that the LM IIIB-C transition marked the most significant reorientation of settlement on the island for the whole LBA-EIA, and that subsequent developments into the A period were more gradual, with the reoccupation of lower elevations and flatter areas, but not necessarily involving a concerted movement back towards the coasts. The case studies of the Mirabello and Galatas surveys drew attention to some of the kinds of local variation that existed within these broader patterns and trends. It was suggested that, though the observed changes in settlement patterning between periods were in some cases substantial, it may be misleading to think of any one configuration as being more natural or typical than another. Rather, the choices of communities in any period are likely to reflect a convergence of both external constraints and active choices regarding accessibility and defensibility, access to economic opportunities (be they subsistence-related, or pertaining to terrestrial or maritime trade), and positioning within networks of intervisibility and communication. The present chapter aims to integrate these perspectives on settlement dynamics into a chronological account spanning the LBA and EIA, with a particular focus on how the main chronological developments in settlement patterning discussed in the previous chapter might be understood from a historical perspective.

Knossos Ascendant

As noted in Chapter 1, settlement evidence in LM II remains far more scantily represented than that of LM IB, with the destructions that came at the end of that period traditionally considered to have coincided with severe depopulation across the island. Late Minoan II was initially thought

by Evans (1935, 297–358) to be a localised, Knossian style, and though characteristic LM II pottery is now attested much more widely, at Katsambas, Malia, Phaistos, Ayia Triada, Rethymnon, Khania, Khondros Kefali, Agia Pelagia (Kanta 1980, 318), Kommos (Shaw and Shaw 1997, 425), Palaikastro (MacGillivray 1997), Mokhlos (Brogan et al. 2011), Sissi (Driessen 2021, 71–14), Pseira and possibly Tylissos (Hayden 1984, 37), securely identified settlement contexts of the period remain relatively few in number

Given that LM II – as a ceramic style – does appear to emanate from Knossos, it has been suggested that its spread may track the extension of Knossian political control in the aftermath of the LM IB destructions (Popham 1994; Rehak and Younger 1998, 148–49). Noting the continued, large-scale investment in reconstruction and elaboration of the palace at Knossos in LM II-IIIA, Whitelaw (*forthcoming*) argues the accompanying resource, subsistence and labour demands are inconsistent with a gradual model of expanding territorial control[77]. Such mobilisation would rather suggest the quite rapid reassertion of Knossian dominance over the centre and west of the island, particularly with regard to mineral extraction, agricultural surplus mobilisation, and construction labour – that is, if such dominance was ever truly lost across the LM IB-II transition. It has been noted that the Final Palatial administration at Knossos likely drew on existing networks and structures of governance inherited from the Neopalatial period (Bennet 1985, 244–45; Driessen 2000, 224–28)[78], all but necessitating the persistence of communities in and around former secondary and tertiary centres. Most sites which have yielded LM II pottery had indeed been centres of LM IB occupation, if not administration (Popham 1980b; Bennet 1985, 244)[79]. Thus it makes very good sense that sites like Khania, Ayia Triada/Phaistos, and Malia have yielded LM II pottery, based on evidence for their earlier palatial infrastructure and later integration within the final Knossian state.

[77] Driessen (2000), in his analysis of the Room of the Chariot Tablets at Knossos, suggested that the LM II-IIIA1 early state at Knossos was more limited in scope and extent, based on comparisons with toponyms found in later tablet deposits at the palace which were absent in the RCT (see McArthur 1993). There may be issues of sampling bias here (see Whitelaw *forthcoming*), given the associations between these missing toponyms and shepherding, which is not an activity documented in the RCT.

[78] Notwithstanding significant changes in the sphere of language, script and documentation (Bennet 2008; Palaima 1987), architecture (McEnroe 2014), and economy (Driessen 2001a), many of which may have been employed as intentional adaptations and manipulations of erstwhile palatial practices (Driessen and Langohr 2007).

[79] And note, Popham's (1980, 165) exceptions of Mokhlos and Pseira have now yielded solid evidence of (re)occupation.

One issue is that, given the continuation of essentially sub-LM IA pottery – dubbed the 'Standard Tradition' by Betancourt (1985, 137–40) – at many non-palatial sites, and our inability to date post-LM IB occupation by anything other than the presence of LM II or later fine ware styles, settlements which were not abandoned pre-LM II, but which continued to produce 'Standard Tradition'-style pottery may be going unrecognised (Whitelaw *forthcoming*). Evidence from Palaikastro (MacGillivray 1997; Hemingway et al. 2011; Cunningham 2012) and Mokhlos (Barnard et al. 2003, 107–9; Barnard and Brogan 2011) points towards local LM IB traditions extending into early Knossian LM II, with the towns' accompanying destructions thus potentially later than those of central Crete[80]. Taken together, this suggests much of the apparent depopulation post-LM IB may be more illusory than real[81], and that the major destruction horizons of LM IB reflect no single event, but rather a period of instability varying regionally in its timing and severity (see Rutter 2011, 340–41; papers in Brogan and Hallager 2011).

Those settlements yielding LM II styles might thus be understood as centres brought rapidly within the administrative and/or cultural ambit of the new or reformed Knossian administration (Driessen 2021), with more generalised sub-LM IA traditions continuing at other sites where occupation – or reoccupation – has generally only been inferred from LM IIIA1 onwards[82]. Such a view would assume far greater continuity in habitation from LM IB, and a relatively swift consolidation of power in the central and western parts of the island by a renewed Knossian administration, probably following a period of civil conflict, elite factionalism, local uprisings, or retaliative destructions at the island's secondary political centres.

[80] Meanwhile, MacGillivray (1997, 278–29) identifies a so-called 'Burnished Blot and Trickle' style to distinguish it from the better-known LM IIIA2/B 'Blot and Trickle' ware, as likely contemporaneous with LM II in central Crete, and so providing evidence of occupation at Gournia, Episkopi, and Ierapetra at this time.

[81] Not to mention the dubious rates of population growth such a bounce-back would imply. Whitelaw (*forthcoming*) estimates a figure of around 2% as necessary to account for the growth suggested by settlement (based on Bennet 1986) and mortuary (Preston 2000) site tallies from LM II-IIIA1, well above typical average rates derived from archaeological survey and historical demography.

[82] In some cases, a genuine discontinuity in occupation does seem probable, however. At Mokhlos, deposits of metal artefacts and raw materials were left in houses at the end of LM IB, and not recovered by those that reoccupied the site from LM II-IIIA1, suggesting they were not the original inhabitants returning. The establishment of a new cemetery and lack of correspondence between house plans of the two periods also argue in favour of discontinuity (Brogan et al. 2002; Barnard et al. 2003)

A Lowland State

This view of the emerging political landscape in the Final Palatial period accords with the argument forwarded in the previous chapter, that settlement in LM IIIA was largely oriented around the same kinds of environment as in the Neopalatial period, namely the gentler topographies of the island's lowland and coastal plains, or else its rolling hills and upland plateaux[83]. If the appearance of LM II pottery at former Neopalatial centres does indeed manifest Knossian interest in maintaining or exploiting former networks of palatial power, then the persistence of lowland settlement probably speaks to the relative success of this venture[84]. From the view of the Knossian administration, the agricultural potential of these landscapes was no doubt central to their continued exploitation into LM III, but they also represented the most navigable and readily integrated of the island's productive environments (see Fig. 5.6)[85]. A close correspondence can be observed in the distribution of LM IIIA settlements and the major routeways of the pre-industrial road network as recorded by Allbaugh (1953, Fig. 20; Whitelaw *forthcoming*, Fig. 9), while as modelled in Chapter 3, the central Cretan lowlands and northern coasts would, from a Knossian standpoint, represent the most accessible areas through a combination of terrestrial and maritime transit (Fig. 5.7). The consolidation of Knossian power in LM II-IIIA plausibly proceeded via similar routes, cleaving to the plains, valleys and coastal waters highlighted in previous chapters as the island's perennial thoroughfares. Assuming military force was marshalled in the establishment and maintenance of the Knossian state, not to mention the long-distance transportation of organic and inorganic resources, the efficiencies of an integrated lowland network are clear (Bennet 1985, 236–37; Driessen 2001a, 110–11)[86].

[83] Aggregation of settlement towards such locales has been noted in several regions at the transition from the Protopalatial to the Neopalatial periods, particularly away from more mountainous terrain (Müller Celka et al. 2014; Haggis 2005b, 75–79). This may correlate with changes in the focus or strategies of agricultural production, and engagement with maritime opportunities via coastal settlements and ports, though regional variation in such processes seems likely (Spencer and Bevan 2018, 83–84).

[84] Small quantities of LM I-II pottery have been noted at a couple of sites occupied more visibly in LM IIIC (Nowicki 2011a, 48), but nothing on the scale of those later relocations appears likely following the LM IB destructions.

[85] For the relevance of similar topographic and environmental factors in the development of political centres in the Neopalatial periods, see Bevan and Wilson (2013).

[86] The large number of chariots, as recorded in the Linear B tablets, constructed at Knossos and possibly distributed to Khania and Phaistos has long been something of an enigma, given these vehicles' very limited utility in the rugged, mountainous terrain of

This is not to claim that the settlement networks of the preceding era had gone wholly undisturbed, nor should we expect them to, given the instability accompanying the re-establishment of Knossian dominance, and the different character of Final Palatial governance. As discussed, LM IIIA (and B) occupation was far more limited around Galatas (Buell and Turner 2017) and the Mirabello region (Haggis 2005c; Hayden 2004b; Watrous et al. 2012) than in the Neopalatial period, and survey in the Mesara tells a similar story (Watrous et al. 2004)[87]. More particularly, we can discern a breakdown in the density of settlement networks, especially with regard to the constellations of smaller settlements commonly arrayed around centres of the Neopalatial era. Around Galatas, such small sites declined dramatically, through what the survey authors assume to have been a process of nucleation, leaving the remaining village-sized sites more isolated than before. This, they suggest, reflects contrasts, at present only dimly understood, between the local impacts of palatial administration under the LM I and LM II-III palaces (Buell and Turner 2017, 76, 80).

At the same time, among many of the former Neopalatial centres occupied or reoccupied in LM II-IIIA, habitation appears to have been more sporadic, limited or dispersed. The handful of LM III dwellings erected on Mokhlos overlie the former settlement haphazardly, in one case utilising, though in others disregarding former house-plans (Soles and Brogan 2008, 5–9). Similarly, at Malia (Farnoux 1997), Palaikastro (Cunningham 2012), Gournia (Watrous et al. 2015), Galatas (Rethemiotakis and Christakis *forthcoming*), Zakros (Zoitopoulos 2012) and others, only certain sectors or buildings were utilised, altered, or repurposed for continuing habitation. Though at Knossos some new buildings were built in LM II, and other houses of Neopalatial date were cleared and reoccupied in LM II-IIIA, other buildings abandoned during LM I were left choked with rubble (Hatzaki 2004). Survey evidence suggests a contraction in the overall size of the site, including withdrawal from what are believed to be suburban areas of the Neopalatial town, such

Crete. Whether their role was largely ceremonial, or else as a form of local defence for the primary and secondary centres of the Knossian polity, it seems unlikely they were significantly involved in the original territorial expansion (Driessen 1996). That said, were chariots ever to have been ridden for any distance in Crete, they must have stuck to the gentlest, lowland topography.

[87] In the case of the wider Pediada region, the authors of the extensive survey project in the area (Paschalidis et al. 2017) do in fact claim that relatively dense occupation was found in the region in LM IIIA and LM IIIB, with a clear but not devastating decline into LM IIIC. However, the secureness of the dating on many of these sites is now being systematically re-evaluated, and the now fully published Galatas survey probably presents a more reliable account of the changing nature of settlement in LM III in the region.

as the Ailias Hill (Whitelaw *forthcoming*). The palace, by contrast, underwent major remodelling (Momigliano and Hood 1994; McEnroe 2014), an example of concerted investment in public works which is paralleled, albeit on a smaller scale, at a number of other sites across the island. Buildings which may have functioned as elite residences or local administrative centres have been identified at Gournia (Younger 2016), Tylissos (Hayden 1984, 45–46), and Plati (Dawkins 1913-4) on the Lasithi Plateau, while Agia Triada, the likely economic hub of the Mesara region, played host to a range of newly built monumental buildings in LM IIIA1-2, including what appear to be substantial grain silos (Privitera 2014; 2015).

One perspective through which to understand these trends – the general persistence of lowland habitation and continued investment in monumental architecture, set against fragmenting settlement networks, and more restricted occupation of former centres – would be the significant but selective role that the final palace at Knossos played in stimulating particular modes of spatial, economic, and political integration, a possibility to be explored further in subsequent chapters. Many of the structures and key nodes of the Neopalatial settlement system endured, but seemingly in an attenuated form (Cunningham and Driessen 2004, 109), with Knossos asserting significant bureaucratic control over aspects of the agricultural and artisanal economy, but with many forms of production and resource mobilisation left to local actors (Halstead 2007; 2011a; Nakassis et al. 2011). This probably led to the benefits of the palatial economy being unevenly felt or distributed, but it could also have created opportunities for regional forms of political leadership to emerge beyond Knossos' core spheres of influence, and later following its decline.

As noted in Chapter 1, dating the final cessation of administrative activities at Knossos remains contentious, and at present there is no way of distinguishing pre- and post-destruction LM IIIA2 ceramics at the site, let alone anywhere else on the island (Hatzaki 2007, 199–200). This means that, were there to be settlement changes resulting immediately from the collapse of the final Knossian bureaucracy, they would be very difficult to distinguish. However, such an eventuality appears very unlikely, given the high degree of settlement continuity between LM IIIA and IIIB recognised in the previous chapter. Some 89% of securely identified LM IIIA settlements also evidence LM IIIB occupation, with an increase in the number of known settlements between the two periods (Kanta 1980, 322; Bennet 1987, 83–84). At present, it remains difficult to decide

whether this high degree of continuity is due to the fact that the palace at Knossos really did continue to operate until early in LM IIIB, or whether its collapse early in LM IIIA2 had a negligible impact on pre-existing, largely locally integrated systems of settlement. However, another interpretation, prompted by Skelton and Firth's (2016a) phasing of the Linear B tablets, and possible changes in the functions of the palace through time, might be that the decline of Knossos was a more gradual process, to which communities in its former territories were largely able to adapt, at least in the short term.

The 13th Century: Boom and Bust

The LM IIIB period – roughly the 13th century BCE – was a time of countervalent trends in settlement (Figs 4.3; 5.8-10). On the one hand the vast majority of sites known from LM IIIA continued in use, new sites were founded, and a number of important coastal centres evidently prospered (Rutter 2017; Day et al. 2011; Hallager 1988). But we can also discern the steady disintegration of the lowland settlement network which had characterised the Final Palatial period (Kanta 2001a, 13). Kato Zakro and Khondros Kefali were both abandoned around the LM IIIA-B transition (Zoitopoulos 2012; Platon 1997), while Palaikastro lingered on a little longer, following a significant decline early in IIIB (Cunningham 2017). The coastal settlements of Gournia and Agia Pelagia were likewise abandoned some time in LM IIIB (Kanta 1980, 324–25). In what may perhaps be a forerunner of later developments, settlement in some regions began gravitating towards commanding positions above long-established corridors of communication. In the Pediada, habitation was increasingly focussed along the west edge of the Pediada Plain, above the course of the Karteros stream, a phenomenon discussed in the previous chapter, and which accompanied the thinning out of settlement on the fertile plains to the east and north of Galatas. It has been suggested the sites of Agios Georgios at Voni and Astritsi Kefala, located as they are on opposite sides of the Karteros gorge, may have cooperated in the monitoring of movement through the region (Paschalidis et al. 2017). Though a settlement of LM IIIB date is yet to be securely identified in the area of Praisos, burials found through survey around the Kapsalos hill suggest the presence of such a community, the appearance of which may or may not be linked to the abandonments of Palaikastro and Zakros (Whitley et al. 1999). At Knossos, the reoccupation

of former Neopalatial buildings continued – often only on their ground floors – alongside the construction of a few smaller domestic structures utilising spoliated building materials, and the laying of new cobbled roads on axes out of line with the earlier street plan (Hatzaki 2004). A shift in the focus of habitation towards the west of the palatial town may have occurred at the end of the period (Hatzaki 2005, 72–76, 85–86), anticipating the later occupation documented for SM-PG on the *acropolis* hill, though the Knossos Urban Landscape Project has yet to identify a clear focus for habitation in LM IIIC (Whitelaw et al. 2019).

However, despite these changes, proximity to the coast still appears to have afforded significant benefits for those communities able to capitalise on the opportunities of maritime trade, even if it incurred certain risks. At Khania, which into LM IIIB still boasted a literate administration of some kind, repeated destructions throughout the 13th century were followed by rapid reoccupation and reconstruction of the town (Hallager 1997). Khania's booming export market is readily apparent from the number of Khaniote stirrup jars discovered on the Mainland, which carried oil (and perhaps wine) in bulk across the Aegean (Hallager 1988; Haskell 2011, 126–28). Monumental ship-sheds in use during LM IIIA-B have been identified at Poros (Vasilakis 2010b), in the coastal suburb east of modern Herakleion, and at Kommos on the south coast (Shaw and Shaw 1999; Shaw et al. 2006, 850–53; Shaw and Blackman 2020). In the latter case, much of the contemporary settlement has also been excavated, with imported ceramics attesting to contacts as far flung as the Levant, the Greek Mainland and the Central Mediterranean (Shaw 2004, 44–46). Agia Triada may have been the beneficiary of this seaborne trade, and into the middle of LM IIIB certain of its public buildings were still being decorated and refurbished (Cucuzza 1997). The coastal lowlands east of Herakleion were likewise experiencing a kind of fluorescence, though its nature is still poorly understood. The sites of Malia (Driessen and Farnoux 1994), Gouves (Chatzi-Vallianou 2017), and particularly Sissi (Langohr 2017b) were hives of activity in early-middle LM IIIB, with pottery production occurring in the workshop of Gouves, and communal dining occurring in the large building at Sissi. Even at Mokhlos, which in LM IIIB appears to have been in decline, the range of imported wares actually increased relative to LM IIIA, something which the excavators tentatively suggest reflects a bump in localised, independent maritime trade, following the collapse of Knossos and its likely dominance of the import-export market (Smith 2005, 185–86).

If settlement in LM II-IIIA partly reflects the integrative networks of communication and movement which underpinned Knossian palatial power, then the fracturing of those networks by LM IIIB may likewise explain some of the apparent destabilisation in lowland, coastal settlement. Even if one favours the late date for the final destruction of Knossos, there is no evidence that literate administration continued there beyond an early stage of LM IIIB. The political entities which emerged or consolidated in the aftermath of Knossos' fall will have been far more parochial affairs, resulting in a patchwork of adaptive responses by local elites seeking to maintain forms of extractive resource mobilisation and political stability. The endurance of Khania and Kommos, and even the broadened range of imports at Mokhlos, suggest that one solution was to trust in the still-active networks of maritime exchange which by this time were connecting the Southern Aegean not only to the Mainland and the Near East, but also to Sardinia, Sicily and the Italian peninsula (Rutter 2017; Day et al. 2011; Haskell 2011). The destructions at Khania demonstrate the risks of this mercantile existence, yet the rapid rebuilding attests equally to its perceived robustness as a source of economic independence. However, this strategy appears to have offered little long-term stability, with the fortunes of Khania and Kommos declining by the latter half of the period, and Kommos itself going the way of Palaikastro, Kato Zakro, and Mokhlos, being ultimately abandoned late in LM IIIB, along with its sister site of Agia Triada (Langohr 2020, 90). Interestingly, around the time of this decline, evidence of (re)occupation at Phaistos, focussed on the *Acropoli Mediana*, suggests a gravitation of local populations back towards the former palatial centre (Borgna 2017).

Further evidence of communities turning away from the traditional heartlands of LBA habitation comes not only in the form of abandonments, however, but also in the occupation of new locales. A shift towards more sheltered, elevated or naturally defensible topography has, as previously discussed, long been taken as the hallmark of LM IIIC, but the origins of this phenomenon continue to be pushed back. The recently discovered site of Kalamafka in the Aposelemis Gorge consists of a series of terraces 600m above the riverbed below, accessed by a narrow path with carved footholds. Despite its precarious location, at a bend in the gorge which further obscures it from view, the pottery assemblage at Kalamafka is surprisingly varied, largely domestic in character but with a range of drinking vessels including kylikes and a large amphoroid krater, which suggests

its inhabitants were not living a wholly meagre existence. The excavators date the site to around the same period – early in the latter half of LM IIIB – as when occupation at Malia, Sissi and Gouves was coming to end (Kanta and Kontopodi 2017). This site is arguably thus the earliest known 'defensible' settlement, and suggests that already by the middle of the 13th century some Cretans thought it propitious to leave behind the open, exposed landscapes favoured in previous generations, and seek out more sheltered and secure locales.

Taking to the Hills

By the end of the 13th century, the abandonment of the coastal lowlands, and the settling of the island's more rugged, elevated, and less accessible interior had intensified (Figs 4.4; 5.11-13). As with the previous period, the long LM IIIC phase at present lacks island-wide subdivisions, with only general Early and Late phases identified in most areas (D'Agata 2007; Hallager 2010). However, the presence or absence of LM IIIB pottery at sites has proved an important tool for discriminating between earlier and later foundations (Nowicki 2000, 235).

Among the earliest defensible settlements is Rogdia Kastrokefala, to the west of Heraklion (Kanta 1980, 324–25). On the distinctive hilltop above the Bay of Almyros, a wall preserved up to 2m in height and width stretched some 450m, encircling to the north a settlement already protected on the south side by sheer cliffs (Kanta and Karetsou 2003). Pottery from Kastrokefala shows clear continuities from the local LM IIIB-C tradition, but the defensive architecture and distinctive hearth types are among the features claimed by the excavators to indicate the presence of Mainlanders, possibly fleeing turbulence back home (Kanta and Kontopodi 2011). But despite its indisputably defensive character, Kastrokefala is not particularly representative, being one of only a handful of seemingly fortified settlements of LM IIIB-C (Thaler 2020, 396). Along with Zakros Kato Kastella, Kritsa Kastello, and Kofinas, these sites, which boasted substantial stone walls, but otherwise are poorly understood from the point of view of internal organisation, mostly date to the very end of the 13th century, or early years of the 12th, both in foundation and abandonment (Nowicki 2011d, 364)[88]. The heavy investment in defensive works evident in such locations has

[88] With the exception of Kritsa Kastello, which may have continued to be occupied until late in LM IIIC or in early PG (Wallace 2002, 75–77). Nowicki's (2000; 2001, 26), ascription of the monumental walling on Mount Juktas to a defensible site of this period

led to claims that militaristic groups, possibly led by former palatial elites, were responsible for their construction (Nowicki 2001, 26–27); even if so, they proved little more than temporary redoubts, abandoned in some cases with the walls still unfinished.

Roughly contemporary with, or just after the foundation of Kastrokefala, other upland settlements were occupied for the first time – either ever, or in centuries – including Kavousi Kastro and Monastiraki Katalimata, where the identification of small quantities of LM IIIB-style pottery attests to their early date (Mook 2004; Nowicki 2008, 82). Thronos Kefala also appears to have been founded early in LM IIIC (D'Agata 1999a; D'Agata and Boileau 2009), while, on the basis of surface material alone, similarly early occupation has been inferred at Agios Ioannis Katalimata, Adrianos Fortetsa, Mythoi Kastello, Arvi Fortetsa, Milatos Kastello, Frati Kefali, Tapes Kato Kastello, Loutraki Kandilioro, Zenia Kastokefala, and others (Nowicki 2004, 230; 2008, 83). It does appear that among the ranks of the earliest upland sites are those in particularly elevated, defensible, and sometimes even precipitous locations[89], while at a more developed stage of LM IIIC – in Nowicki's view, a generation or two post-1200 BCE – further settlements were founded, often in less extreme locations, and in some cases probably fed by groups vacating nearby refugia. The clearest example is the shift to Monastiraki Khalasmenos from Katalimata, but other examples may include Zakros Ellinika from Pano Kastello, Kato Khorio Profitis Ilias from Agios Ioannis Katalimata and Oreino Ellinika from Kastri (Nowicki 2000, 236–37). Many more sites of this period are known only through surface remains, however, and as such can only be generally assigned to LM IIIC.

If there is a single overarching trend in settlement at this time, it is undoubtedly the shift towards *proximally* defensible or inaccessible terrain. This is visible not only in the settling of mountain-top retreats like Anatoli Elliniki Korifi or Karfi, but also hinted at in the reorientation of settlement at lower-lying sites like Phaistos, where habitation in LM IIIC appears concentrated on the *acropolis* hill (Borgna 2003a). But there are serious challenges to the extrapolation from this general tendency

has, meanwhile, been called into question (Kanta 2001a).

[89] However, Nowicki's (2011b, 442) conviction that the foundation of sites like Monastiraki Katalimata and Anatoli Elliniki Korifi corresponds 'exactly [to] the time of Shuppiluliuma II's struggles on the sea between Cilicia and Cyprus, and the time of the dramatic correspondence between the kings of Ugarit and Alashiya', overstates the precision of our chronologies.

to the view that the distribution of settlement in this period was dictated chiefly by fear of coastal violence, as advocated most vocally by Nowicki (1987b; 1992; 2000; 2001; 2011c). The main arguments in favour of such an interpretation are the abandonment of many coastal centres in the LM IIIB-C periods, a few of which experienced burnt destructions; the founding of many new settlements at higher elevations and further inland, though often with views of the sea; and the rough contemporaneity of these changes with the epigraphic sources from Egypt, Anatolia and the Levant referencing 'Sea Peoples' or other naval threats, and the associated destruction horizons in those regions.

Several considerations challenge, or at least temper, the naval-threat interpretation of the Cretan evidence, however. For one, as outlined above, the abandonment of the coasts on Crete was not a rapid, uniform process, but appears to have begun well back in the 13th century, with the decline of sites like Mokhlos, Pseira, and Kato Zakros, and later Kommos and Palaikastro. Only in a couple of instances are destruction horizons apparent, such as at Agia Pelagia and Khania, and at the latter this did not even result in abandonment. A number of coastal settlements are still known in LM IIIC, including Khania (Andreadaki-Vlazaki 1991), as well as Khamalevri (Andreadaki-Vlazaki and Papadopoulou 2005), Ilias to Nisi below Vrokastro (Hayden 2001), and Katsambas in Herakleion (Kanta 1980, 27–28). Granted, most of these were themselves abandoned sometime in the middle of the period, but this horizon corresponds with the second, less defensive wave of upland settlement which Nowicki himself believes signals the amelioration of the proposed maritime threats. There are also a number of defensive sites located very close to the shore, such as Vrokastro (Fig. 5.14) and Palaikastro Kastri (Fig. 5.15). Occupation at the latter appears quite ephemeral (Sackett et al. 1965, 302–305), but Vrokastro was occupied for several centuries (Hayden 2004b). Such sites have been argued by Nowicki (2001, 28–31) to have housed pirates or raiders themselves, but it could simply be that coastal locations continued to offer opportunities that in some cases were considered to outweigh any associated threats. Furthermore, as suggested in the previous chapter, Vrokastro's location was also advantageous for monitoring terrestrial movement along the northern coast, hinting at a combination of strategies behind its occupation.

Taking a long view, from the earliest abandonments of LM IIIB, to the latest of LM IIIC, we are therefore faced with a century or more of gradual withdrawal from the coasts, and very few

instances of that abandonment being accompanied by clear destruction. A rise in opportunistic attacks by sea, or at least a blurring of the line between trading and raiding, has been proposed for the wider Eastern Mediterranean at this time (Broodbank 2013, 462–66; Sherratt 1998), and the instability associated with such a reality might have fed into coastal communities' decisions to abandon their homes in the 13th-12th centuries, but the gradual and uneven process of withdrawal argues against it being the primary motivator.

Settlement trends in two regions raise further questions about the presumed role of coastal threats in shaping the settlement patterns of LM IIIC, specifically the Pediada and the Lasithi Plateau. Both areas are far from the coasts and characterised by flat or gently rolling terrain, and in neither do we see settlement changes obviously consistent with the view of coastal avoidance. Considering the survey regions analysed in the previous chapter (Fig. 5.16), we see that in LM IIIA-B and LM IIIC, sites around Galatas were significantly further inland and generally at higher elevations than those of the Mirabello area. Yet it is in the latter region that an expansion of the settled area occurred in LM IIIC, with Galatas experiencing a marked decline. What does set the Mirabello area apart is its more dramatically varied, and more readily defensible, topography, something far less in evidence in the Pediada. Similarly, in LM IIIB, settlement on Lasitihi seems to have clustered in the south and east of the Plateau (Fig. 5.17). Come LM IIIC, the focus of occupation shifted to the northern edge of the Plateau, overlooking the Ambelos pass, the chief route of access up from the lowlands below (Fig. 5.18; Watrous 1974, 311–20; 1982, 17–19). Nowicki has suggested that sites like Karfi were situated to command views of the coast, in anticipation of threats from the sea (Nowicki 1987a, 246–47; 2004, 231). But at 800masl, and ringed all around by yet higher peaks, the Lasithi Plateau is both invisible, and several hours hike away from the north coast. Few parts of Crete could be less susceptible to piratical raids. While the sea can be seen in the distance from Karfi (Fig. 5.19), the site also overlooks the Lasithi Plateau itself (Fig. 5.20), and towers above the route connecting the two. In abandoning the plateau for its rocky fringes, the inhabitants of the sites around Karfi exhibit the preoccupation for locally defensive, commanding locations above routeways and points of access seen time and again among sites of LM IIIC. The spectre of coastal attack does not, ultimately, appear sufficient to explain the settlement patterning of period, which in many areas appears to reflect concerns with terrestrial defensibility, mobility and visibility.

How then should we interpret the undeniable shift towards more elevated, fragmented terrain, and more limited agricultural landscapes? To begin, we need to recognise the great degree of variability present in site type, size, and location, against the background of these more general trends. In the 12th century we know of settlements founded on rocky knolls or small hills along the coast, like Palaikastro Kastri and Vrokastro, Khamalevri and Petras (Tsipopoulou 2020). We know of former lowland centres with continued occupation, either with an internal reorientation of settlement as at Knossos and Phaistos (Borgna 2003a; Warren 1983), or without, as at Tylissos (Hayden 1984; Kanta 2011). There are fortifications like Kastrokefala and Kritsa Kastello, and unfortified villages on low hilltops like Monastiraki Khalasmenos, Kourtes Kefala and Vasiliki Kefala (Eliopoulos 1998a; Taramelli 1901a; 1901b; Haggis and Nowicki 1993b). There are genuine 'refuge sites', places of apparent last resort, offering security at the expense of accessibility and comfort; Monastiraki Katalimata and Anatoli Elliniki Korifi rank amongst these (Nowicki 2004, 231). There are the precipitous mountain villages and towns, like Karfi, Loutraki Kandilioro, and Kolokasia Kastri, which despite their location may have housed many hundreds of individuals (Nowicki 2002, 156). In the centre of the island especially, but also in the west and east, we know of many *acropolis* settlements, occupying large, relatively gentle and accessible hilltops, which were nonetheless distinctive and even dominant within their local landscapes. Many such places – Prinias, Gortyn, Arkades, Lyttos, Axos, Eleutherna, Thronos Kefala and, in the east, Dreros and Azoria– would go on to become important centres of population in centuries to come (see papers in Gaignerot-Driessen and Driessen 2014; Gaignerot-Driessen 2016). Finally, there are a few instances, which require further excavation to confirm their nature or extent, of settlements marked by neither particularly defensible topography nor fortification, most notably Kastelli Pediada (Rethemiotakis 1997), and Perama ta Grivila (Hood et al. 1964, 56–58).

This variability relates, at least partly, to topography, with the central third of the island lacking the polarisation of uplands and lowlands found to the east and west, leaving large, but relatively gentle hills as the best option for settlement of a more defensible aspect. As suggested in the previous chapter, the depopulation of areas like Galatas may explicitly have been a result of the limited defensive affordances of the local landscape, while regions like the Isthmus of Ierapetra may have proved attractive to those seeking more naturally fortified locations. But social forces were also

likely at play, as has been suggested by work examining the economic or communal advantages offered by the clusters of related settlements observed in some regions of the island at this time (Borgna 2003b; Perna 2009a; Gaignerot-Driessen 2016a; Haggis 2001). As discussed in the previous chapter, Haggis (1993; 2001) and others (Borgna 2003b; Gaignerot-Driessen 2016a) have advocated a model based on the increased exploitation of upland resources, and specifically the localised management of land allocation, grazing rights, inheritance, marriage, and conflict resolution via networks of inter-dependent villages, in the absence of over-arching state-level administration. Something like this appears very probable in the Mirabello region, and was endorsed by the spatial analyses in the previous chapter, with the local clustering and regional dispersion of settlement loci. However, the comparison with the Galatas area suggested that such networks are not necessarily to be expected in all regions. There, the small areas of habitation scattered along the course of the Karteros river did not form clear clusters, though many were mutually intervisible, which may still reflect forms of intentionality and interaction in their distribution. Such divergences in settlement distribution hint at differences in local organisation and integration, though the nature of these differences remain obscure. Further contrasts might be expected, in turn, at the former BA centres which continued to be inhabited, or in the environs of the few remaining truly coastal sites.

There is also no real evidence that communities sought out genuinely isolated or concealed areas to found new settlements. The Meseleroi valley emerged, in the previous chapter, as an area little visible from the rest of the Ierapetra Isthmus, and likely not on any major routes of communication through the region; however, it remained conspicuously lacking in settlement in LM IIIC, with the known settlement clusters occupying locations above major corridors of movement, with good intervisibility. More widely on Crete, there are a great many sites known from this period which occupy distinctive, even dominant features of their local topography. This visibility at times took on a striking aspect, from the cliff dwellings of Monastiraki Katalimata, to the hills of Thronos, Prinias, and Gortyn standing above the plains and valleys below, or the looming eyries of Kavousi Kastro, Karfi, and Smari Profitis Ilias. Wallace (2010, 145) has written of the mnemonic power of such places – their functions as both shorthands for the communities they housed, and waypoints for movement through the landscape – but they can also be seen as statements, as assertions of

local authority or territoriality. Indeed, we might ask how such visibility over and proximity to major routeways may have been an active choice on the part of those communities wishing to monitor, control, and reap the rewards of continuing traffic through the Cretan landscape (Haggis 2020, 1072–73).

Nucleation and Growth: Coming Back Down?

Around the tail end of LM IIIC (roughly the late 11th century) and into early PG, there seems to have been a rise in settlement abandonment, and specifically relocation, often away from the more isolated and inaccessible of locales occupied in LM IIIC (Figs 4.5; 5.21-23). Around half of all settlements occupied in LM IIIC were still in use by the G period (Wallace 2010, 234–37), which does leave open a significant window of time for said abandonments to have occurred. Given the vagaries of our chronologies, especially regarding the coarse wares typically relied on in dating surface remains of LM IIIC-PG sites, there were no doubt settlements which petered out over the course of the 12th-10th centuries, as part of the perennial cycles of growth and decline affecting small-scale, agrarian communities throughout Mediterranean history (Horden and Purcell 2000, 275)[90]. However, evidence from excavated settlements like Karfi and Monastiraki Khalasmenos, and even the poorer chronological resolution afforded by surface material, suggest that the late 11th and early 10th centuries were the most marked periods of relocation (Wallace and Mylona 2012, 66; Tsipopoulou 2004a; Judson 2018, 20–26, 169–72; Gaignerot-Driessen 2016a, 71–78).

It has been suggested these changes reflect the pressures of growing population, increasingly limited space, and mounting subsistence needs leading to the consolidation of populations in more fertile, accessible locations (Wallace 2006, 641–43; 2010, 234–42). There is no doubt a general truth in this, but the process, as with all those considered so far, reflects not so much a single moment with simple, imperative causes, but rather a complex and sustained period of cultural and political metamorphosis, arising from the particular conditions of economic and social life born of

[90] Rackham and Moody (1996, 92–93) note the perennial nature of settlement growth and decline, especially among smaller agglomerations, that is, villages and hamlets. They estimate that around half of all Cretan hamlets attested in the 14th century CE are today abandoned, with most of these having emptied out by the 16th century.

the preceding era[91].

To begin, there is clearly great variability in the processes of settlement nucleation and growth in PG-G. There are a few cases of what may be linear population movements, from a single settlement of LM IIIC date, to another occupied into PG or G, with the former exhibiting typical defensive characteristics, and the latter occupying more open, level, and low-lying ground. Such are the apparent relocations from Kolokasia Kastri down to Patsianos Kefali (Fig. 5.24C), or from the peak of Korifi down to the low hill of Kefala at Rotasi (Wallace 2006, 643–44; cf. Anzalone 2016, 202). In several other cases, it appears that a number of smaller settlements were abandoned in a region, their populations probably aggregating at a larger continuing site. Such is the case around Viannos, where people from Erganos Kefali, Pefkos Boubouli, Arvi Fortetsa and Loutraki Kandilioro all plausibly fed into the growing settlement of Viannos Korakia (Fig. 5.24B). Similarly, on the northern slopes of Lasithi, Karfi was abandoned in favour of the settlement at Agios Georgios Papoura, which may also have likewise absorbed population from the scattered smaller sites of the Ameblos pass (Fig. 5.24A; Wallace 2010, 238). However, in the case of these more complex nucleations, we commonly also see some smaller sites enduring, like Krasi Kastello and Kera Kastello on Lasithi, or the hilltop settlement of Viannos Keratos. Furthermore, in many cases, the specific movements entailed are not always clear. The former populations of Tapes and Adrianos Fortetsa, for instance, might well have abandoned their homes in favour of the burgeoning centre of Lato (Fig. 5.24D), but Dreros is also a possibility.

In Figs 5.25-28, all sites with definite or possible occupation in LM IIIC that show no sign of habitation by G are connected by lines to the closest settlement identified by Wallace (2010) as a 'nucleated site' of the G-A periods. This is not intended to provide an accurate picture of all the relocations that occurred in LM IIIC-PG. If anything, it illustrates, in the case of particularly long connections, the limitations in our current understanding of this process. For instance, it is presently unclear where the former inhabitants of the Agios Vasilios valley moved upon abandoning the sites of Frati Kefali, Atsipades Fonises and Spili Vorizi. Argiroupolis, Pantanassa Veni and Thronos Kefala are the closest larger settlements of PG-G, but all are some way from

[91] The possible impacts of agricultural and demographic factors will be considered in Chapter 6.

Agios Vasilios, in separate valley systems. Similarly, Praisos is very unlikely to have been the sole recipient of incomers from the abandoned settlements of the far north-east of the Siteia peninsula, though there is no clear evidence that Itanos was settled by PG. In other words, only certain abandonments can at present be convincingly tied to the swelling of nearby centres, though in certain regions the process does appear quite clear. Gaignerot-Driessen (2016a; 2017) has recently reaffirmed its validity for the Mirabello region, envisioning a selection process amongst the settlement clusters of the LM IIIC-PG periods, from which emerged a nucleated local centre which grew in subsequent centuries. The locations of these so-called *habitats polarisés* are typified by close association with alluvial deposits (offering not only good agricultural land, but in some cases mineral-rich clays suitable for large-scale pottery production), proximity to major routeways, commanding views of the local area, and often dominant topography, such as the summits of low hills. Examples include the emergence of Azoria, Lato (Fig. 5.29), Dreros (Fig. 5.30), and Anavlokhos (Fig. 5.31) from amongst their former constellations of small hamlets and villages.

Gaignerot-Driessen's account goes a long way to illuminating the kinds of physical qualities and affordances – indeed, the kinds of ecology, *sensu* Horden and Purcell (2000) – embodied by the nascent political centres of the Mirabello region in the first millennium. Once again, however, we should be cautious of generalising across the entire island. Returning to Figs 5.25-28, the mapping of these nucleations appears more robust in some areas than others, with many 'nucleated' centres in the centre and west currently lacking associated sites from which populations might have aggregated. This picture is partly a result of the less intensive archaeological prospection of western Crete, as well as the distribution of intensive surveys on the island, which are likely to have identified smaller, shorter-lived settlements that will have gone unrecognised in other areas (see Fig. 5.32). But different regional processes may also have been at play. For instance, many of the larger settlements of the G-A period in central Crete, like Axos, Profitis Ilias/Lykastos (Fig. 5.33), Ligortynos Kefala (Fig. 5.34), Kasteliana Kastello (Fig. 5.35), Kourtes Kefala (Fig. 5.36), Prinias (Fig. 5.37) and Afrati resemble the *acropolis* sites of eastern Crete in their balance of defensive and strategic locations. However, where the growth of such places around Lasithi and the Isthmus of Ierapetra seems to have often involved the abandonment of precipitous or inaccessible sites for larger, more accessible ones, in the gentler terrain of the island's central third, the centres of the

G-A periods stand out as amongst the more defensive locations known to be occupied from LM IIIC. Though their growth may well have been fed by the abandonment of smaller scattered villages and hamlets in their wider environs, in some cases they appear to have already been the main loci of settlement in their respective micro-regions since the 12th century (Tegou 2014; Anzalone and Allegro 2014; Perna 2011a, 2011b; D'Agata 1999a; Wallace 2010a, 246–47). In other cases, nucleation in the central region may even have involved population movements towards more defensible locations; in the Galatas survey, it was shown how the relative elevation of sites rose, and local quantities of flat land dropped, in the PG-PA periods, concomitant with the growth of Khoumeri and Astritsi (Buell and Turner 2017; Turner 2017).

Knossos may present yet another variation on the process of nucleation or settlement growth. A long-running dispute was over whether the site coalesced, as per Aristotle's description of synoecism, from several connected villages (something advocated by Alexiou 1950), or else persisted through the EIA with a single locus of occupation. Excavation and survey of the site and cemeteries (Hood and Smyth 1981; Coldstream 1984b; Kotsonas et al. 2019) now clearly endorse the latter view, with the Knossos Urban Landscape Project identifying PG as a period of significant resurgence at the site, which may have reached a size of 40-50ha by the end of the 10th century. This growth will reflect population expansion at the settlement itself, but probably also the draw of a larger village or town on its surrounding communities, due to the greater opportunities afforded for employment and security (or land ownership – see Chapter 6). This would seem to be a slightly different process to the selective nucleation in one site of a population formerly distributed across several of similar size. The continued absence of known settlements of any real stature in the vicinity of Knossos is probably expressly due to its pre-eminent scale even from an early date (Kotsonas et al. 2019, 72).

Finally, there are a number of settlements which, though very much in the mould of LM IIIC defensible sites, weathered these changes and continued to be occupied into the 9th century, further calling into question the narrative of a return to the lowlands. Among these are Vrokastro and Kavousi Kastro, Myrsini Kastello and Khamaizi Liopetro on the north coast of the Siteia peninsula, Kera Vigla below Karfi, Smari Profitis Ilias and Viannos Keratos in the centre of the island, and Trakhillo Selli in the far west. Wallace (2010, 254–73) has dubbed such places 'citadel

sites', and suggests that, despite their apparent contravention of the major trends in settlement in this period, they were, in fact, mostly incorporated into the emerging proto-polities of their nearby nucleated settlements. In the case of Kavousi Kastro, she even argues some subsection of the community now based at Azoria may have continued to reside on the Kastro, a living testament to the dramatic origins and steadfast resilience of their forebears. Invocations and manipulations of the past by EIA communities are certainly in evidence across a number of contexts at this time, as will be considered in Chapter 8. But though in some cases such an inference seems plausible, for many of these citadel sites, such relationships between new and old communities are difficult to reconstruct. Myrsini Kastello and Khamaizi Liopetro don't appear obviously associated with any larger, nucleated settlement of PG-G, for instance, and while the site of Smari Profitis Ilias, with its walled hilltop citadel, is certainly a curiosity, there appears to have been an associated settlement on the slopes below the peak, making it a probable centre of habitation in its own right (Chatzi-Vallianou 2004). Kera Vigla was probably some kind of outpost, lookout, or else small hamlet with a view over the approach to Agios Georgios Papoura (Sjögren 2003, 19–20; Wallace 2010, 259). Vrokastro, finally, should arguably be considered a 'nucleated' centre in its own right, standing at the interface between the hills to the south, and the coastal plain below, surrounded by a number of smaller habitations (Gaignerot-Driessen 2016a, 72–73). As seen in the previous chapter, and Fig. 5.28, it represents one of the more plausible cases of settlement nucleation, and was one of the three major foci of settlement on the Isthmus of Ierapetra. Its exclusion from Wallace's list appears to be largely on the basis of its LM IIIC heritage and defensible character, rather than its articulation within developing settlement networks. The lumping of these so-called 'citadel sites' together as a single type of habitation therefore feels unjustified, their uses and degrees of political and territorial integration seeming to vary in each case.

In summary, though nucleation – in the sense of multiple centres of habitation aggregating into fewer, larger ones – is certainly in evidence across Crete, especially in its eastern third, regional variations in the processes of relocation, growth, abandonment and persistence can also be traced. As argued in the previous chapter, the settlement history of the EIA cannot be read as a simple regression – or welcome return – back to the conditions of the LBA. Though we can observe a gradual shift towards lower elevations, and settlements surrounded by larger areas of gentle, well-

watered terrain, the abandonments of LM IIIC-PG were not just a case of a people coming back down from the hills. Indeed, defensible, strategically located *acropolis* sites are characteristic of the emerging centres of the G-A periods in many regions. As explored in the previous chapter, the topographic and environmental setting of habitation in the G-A periods suggests that more ready access to agricultural land was a priority, but that reoccupation of coastal landscapes was less clearly so. This last point appears borne out by the distribution of emerging political centres of the G-A periods (Figs 5.25-28), very few of which occupy coastal locations. Rather, the consolidation of larger communities appears to have occurred mostly within the local settlement systems already in evidence in the LM IIIC periods, as suggested by the analyses in Chapter 4.

A Political Landscape

As the 9th and 8th centuries progressed (Figs 4.6; 5.38-40), a plurality of settlement types existed, including large *acropolis* sites, continuing defensible settlements of LM IIIC heritage, expanding local centres fed by continued nucleation from nearby villages, as well as a few new or re-emerging coastal communities, which may have included Itanos, Khamalevri, Agia Pelagia, Falasarna and Aptera (Deshayes 1951; Andreadaki-Vlazaki 1996b; Sjögren 2003, 37, 44–45). Though it is assumed most established settlements continued to expand, a clear understanding of this process is precluded in many cases by a lack of excavation, or by the disturbances of later construction (and destruction) horizons. Such is the case at Anavlokhos, Azoria, Praisos, Gortyn and others, which are all assumed to represent substantial PG-G communities, but where contemporary contexts are difficult to discern under the remains of later buildings (Gaignerot-Driessen 2019a; Haggis and Mook 2015; Whitley et al. 1999; Allegro and Santaniello 2011). A slightly clearer picture is apparent at Phaistos (Cucuzza 1998), with its well-known 'Geometric Quarter', and at Vrokastro (Hayden 2004b), and Kavousi Kastro (Mook 2011), where continuing house construction has been noted. At Dreros, the hearth temple at least, if not the square or *agora*, has been dated to the 8th century, hinting at the development of a nascent religious and civic nucleus at the site by this time (Demargne and Van Effenterre 1937; Gaignerot-Driessen 2016a, 223–28; cf. Zographaki and Farnoux 2014, 111).

The picture becomes clearer from the end of the 8th century – that is, LG – and into the 7th, in

what appears to be another important episode in the development of the EIA settlement system, accompanied by further abandonments, major building works, and the likely consolidation of political territories that formed the heartlands of the nascent city-states (Figs 5.41-43; Gaignerot-Driessen 2016a). The continued growth and reorientation of larger centres is visible at this time, with the nucleus of habitation at Knossos expanding north- and southward, below the *acropolis* hill, and those of Gortyn and Phaistos likely extending down into the Mesara plain (Whitelaw et al. 2019, 11; Cucuzza 1998; Perlman 2000, 60). Major building works are attested at Anavlokhos, involving the levelling of earlier buildings and the utilisation of terrace walls in the construction of new edifices (Gaignerot-Driessen 2017). At Azoria, which lacks a stratified PG-LG sequence, new buildings appeared in the late 8th-early 7th century, as well as possibly newly-laid paved areas (Haggis and Mook 2015, 18–22; Haggis 2014a). This period also marked the onset of major building works at Prinias, with two large structures erected in the early 7th century, followed within decades by Temple A (Pautasso 2014).

The re-establishment of coastal communities becomes more apparent during this time, many of which may represent ports for inland centres. Such pairings may include Agia Pelagia and Axos, Kissamos and Polyrrhenia, Amnissos and Knossos, Kommos and Phaistos, and Trypeti and Gortyn (Sjögren 2003, 44–45). These emerging connections may relate to increasing overseas connections, but also the consolidation of political territories around larger centres, with the gradual extension of authority to the importation and circulation of goods and, possibly, people. Around this time, many of the last defensible settlements of LM IIIC date finally declined or were abandoned, sometimes in tandem with settlement changes nearby. Such is the case at Azoria, where the renovations mentioned above coincide with the final emptying out of the Kastro, or at Ilias to Nisi on the Bay of Mirabello, the growth of which comes fresh on the heels of Vrokastro's abandonment (Hayden 2001; 2004a; Haggis 2005c; Gaignerot-Driessen 2017, 519). On Lasithi, by the later 7th century, the site of Agios Georgios Papoura, along with several of the smaller settlements around the Ambelos pass, petered out as communities were re-established on the plateau itself, something barely seen since LM IIIB (Watrous 1982, 21).

As regards the end of the 7th and early 6th centuries, our understanding of settlement processes is quite fragmentary (Figs 5.44-46). On the one hand, recent excavations at Azoria, in combination

with evidence from the Kavousi survey, paint a coherent picture of settlement nucleation and major urban restructuring, including the erection of large civic buildings and houses whose internal arrangements, lack of later remodelling, and storage of pre-processed agricultural produce suggest a reformulation of town-country relations, likely in parallel with the consolidation of urban elite power structures (Haggis 2012b; 2014a; 2014b; Haggis and Mook 2011). Yet, on the other hand, few other sites of this period have well-excavated contexts, let alone in combination with intensive survey of the wider region, meaning that we must be cautious in extrapolating from Azoria to other contemporary communities. Indeed, as the preceding discussion should make clear, all periods have been marked by great variety in the localised expression of settlement dynamics, and we cannot expect the early Archaic to be any different. A pattern of further nucleation into the Archaic was noted around Galatas (Turner 2017, 88–90), but an opposite trend has been identified in the Mesara, of what might be farmsteads or other agricultural dwellings spreading out into the wider productive landscapes of the largest centres (Watrous et al. 2004, 313–14; Wallace 2010, 333–35). The establishment of multiple dispersed settlements in the Meseleroi valley, and along the ridge of Skhinavria to the south of Vrokastro, may be linked to the emergence of the political community of Oleros, but as seen in Chapter 4, settlement in this area contrasts with that seen in the wider Ierapetra Isthmus at the time (Hayden 1995). At Gortyn, though at the turn of the 6th century, the site on the *Acropolis* hill was seemingly abandoned, with the focus of habitation perhaps shifting onto the plain to the east, where the Temple of Apollo Pythios was built, evidence of a clear urban centre is lacking (Anzalone 2015, 134). It has even been suggested that Gortyn may have been settled *kata komas*, that is, as a set of connected villages at this time, rather than as a consolidated single settlement (Marginesu 2005, 39–42).

If a general over-arching trend can be observed, it is the presumed consolidation of political power under the auspices of certain central places, which in many cases benefitted from continued nucleation from the surrounding region, but in others may have stimulated the resettlement of formerly under-utilised agricultural landscapes (and both processes may have occurred in tandem). By this stage, the scale and political autonomy of the populations associated with each emerging city-state may have seen them rubbing shoulders with their neighbours for reliable access to sufficient agricultural resources (see Chapter 6), with disputes over land and grazing rights, taxation

and transit within and between adjacent territories becoming significant possibilities. Indeed, as the A period progressed, a series of abandonments at some of the most visible communities of the previous centuries would appear to reflect the growing pressure, antagonism, and perhaps even conflict engendered by the consolidation of the political territories of the island's most powerful city-states. Azoria (Haggis 2014a, 132), Prinias (Pautasso 2014, 63) and Dreros were all abandoned in this period, as may the lesser-known sites of Kalo Khorio Maza and Ligortinos Kefala in the island's central third (Wallace 2010, 331), for which the expansion of nearby communities[92] may be implicated. Later epigraphic sources attest to internecine conflicts, boundary disputes, covenants and treaties between various of Crete's city states, and such tensions and negotiations may have already been features of the Archaic period (Gagarin and Perlman 2016, 120–24).

The Long View

By the end of the 6th century, the political map of Crete would have begun to resemble something like that based on Perlman's catalogue of known *poleis* (Fig. 5.47). Though we do not believe these to all have been contemporary, their distribution, even as a palimpsest, manifests the contrasts between the orientation of settlement in the 15th century, and in the 6th. The places in which people lived, and the types of networks into which they were bound, had developed significantly over the course of nine centuries. Looking back over that timeframe, we can make out a number of long-term trends and patterns which characterise the transition from the Final Palatial system through to the emergence of the city-states. There was no stable period, as such, within this history, certainly no succession of equilibria aligning neatly with our ceramic phases. But at the same time, developments did not proceed linearly or at a constant rate. There were periods of accelerated change, and more persistent structures, which weathered wider shifts and reorientations.

Taking such a view, throughout the LM III period can be discerned the gradual disintegration of a lowland settlement system oriented around the political and economic structures of palatial administration, as well as the wider economic contexts of the Aegean and Mediterranean within which this state operated. The Final Palatial system was likely sustained by a network of secondary

[92] Istron for Azoria, Gortyn for Prinias, Lato or Olous for Dreros, Rhaukos or Eltynia for Kalo Khorio Maza, and Priansos or Arkades/Afrati for Ligortynos Kefala.

centres distributed along Crete's major axes of communication, which acted as bridgeheads, entrepots, and centres of bureaucratic decentralisation, offering access to the productive economies of their respective micro-regions. Beyond this system, in eastern Crete, former political centres, like Palaikastro and Gournia, were probably comparable in size to sub-centres within the Knossos polity, and may also have played roles in mobilising resources on a local level, though without the onward movement of those resources to the palace. The decline of the palatial system was counterpointed – at least in the centre of the island – by the emergence of more localised political hierarchies, and some communities, especially in coastal locations, appear to have tapped the economic potential of ongoing maritime trade to maintain some of the trappings of palatial power up until the mid-13th century.

With the ultimate collapse of these pseudo- or post-palatial elite power structures, communities across Crete were left to coordinate their own local modes of governance and security. The absence of centralised resource mobilisation and surplus extraction, coupled with declining access to dependable maritime trade, would have heavily eroded the imperative towards lowland, coastal settlement which had for so long shaped habitation on the island. As discussed in the previous chapter, there was nothing inherent or natural about this orientation, and its disintegration birthed the profound regionalism in social and settlement forms which was to follow. The possibility of increased raiding from both land and sea, and the absence of any coordinated military force to offer protection, may help explain why many small, autonomous communities relocated to places of greater security in the late 13th and early 12th century. As seen, however, this process was gradual, intermittent, regionally varied, and marked by notable outliers at every stage, from persistent coastal communities, to former palatial centres, to unfortified sites occupying large but rolling hills.

Taking such a view reminds us that, however convenient LM IIIC may seem to be in marking a clean break with the BA, its conditions are truly only explicable with regard to the system which preceded it. Perhaps the most striking feature of the ensuing settlement system is the persistence of many of its defining features well beyond the period typically assumed to represent one of major political instability and maritime threats on the island. As seen in this chapter and the last, even by the Archaic period, settlements were scattered over a greater diversity of landscapes than in LM III, including at higher elevations, in more defensible locations, on hilltops, along the coasts, in

mountain valleys and on highland plateaux. This diversity is a manifestation of the scattered and autonomous communities which emerged in the aftermath of the palatial collapse, though clearly over the intervening centuries new systems of economic, political and spatial integration developed. Many smaller villages were, in time, abandoned. Some mountain refuges clung on long into the 1st millennium. But the general pattern was one of emerging population centres, typically in commanding, topographically distinct locales, from which they were well placed to oversee the exploitation of their surrounding productive landscapes, to communicate and integrate with their neighbouring towns and villages, to monitor the movement of people along major corridors of communication, and to serve as visual markers or mnemonics of the associated community. In time, such centres may have benefited from the re-establishment of port and harbour towns, though it was suggested in Chapter 4 that this does not appear to have been a primary motivator in the processes of nucleation seen in the 10th-8th centuries.

The PA-A periods, finally, may have been marked by increasing competition over the island's productive, connective, and economic resources, at least on a regional level. That the polities involved were numerous and similar in size may be traceable to the relatively even start all experienced with the collapse of superordinate political structures at the end of the BA, and their highly localised development in the EIA. Where in the LBA, local centres were tied into the regional economy as part of larger, island-wide networks centred ultimately on the final palaces, by the 6th century such regional centres were the hubs of their own localised networks, benefiting from the demographic, agricultural, defensive and connective opportunities of their corner of the Cretan landscape. In a long-term perspective, the integration of the island into a unified state structure appears more anomalous than the existence of a number of smaller-scale polities (Whitelaw 2018, Fig. 11.2). It might be argued that the collapse at the end of the BA revealed the distorted and atypical structure of palatial governance as an integrative economic and political system, whose fragmentation in turn laid the groundwork for the emergence of the later city states, by facilitating the (re)emergence of a diverse and fragmented landscape of human settlement, wherein political power developed expressly in connection with the local exploitation of natural, physical, and cultural resources.

Chapter 6

Subsistence and Demography

Introduction

The previous two chapters have considered the development of settlement systems during the LBA, EIA and Archaic period, and specifically the changing pressures and strategies that affected the location, scale and interaction of human communities across that timeframe. This chapter focusses on the agricultural economy, which itself was a fundamental component in the development of these settlement systems, and the wider social structures of the period. Traditional interpretations of BA and Classical agriculture, reliant largely on written sources – Linear B tablets, and Greek poetry, treatises and epigraphy respectively – endorsed a view of starkly different agricultural regimes obtaining in the two periods, the one a redistributive economy operating under the auspices of a centralising, bureaucratic administration (Finley 1957; Chadwick 1976), and the other a system of private estates, with landholders practising extensive, largely arable farming with draught animals and biennial fallow (Isager and Skydsgaard 1992; Skydsgaard 1992). Neither characterisation can be seen to hold anymore, yet discussions of agriculture which span both periods remain a rarity (cf. Foxhall 1995; Palmer 2001)[93]. Here it is argued that an account centred on the fundamental pressures and strategies of agricultural production in a Mediterranean setting offers a holistic and productive way into the relationship between primary production and social organisation across the LBA, EIA and Archaic period in Crete (Nakassis 2020, 285).

The model of ancient Greek agriculture advocated here has its origins in ethnoarchaeological work

[93] Snodgrass, in *The Dark Age of Greece* (1971), was able to argue on the evidence available at the time, that stockbreeding had been the foundation of the Mycenaean palatial system, that this continued largely unchanged into the EIA, and that only in the time of Hesiod did cereal agriculture come to predominate. In the subsequent two decades, following notably the publication of Renfrew's *The Emergence of Civilisation* (1972), and growing evidence for the antiquity of mixed farming regimes, Snodgrass (1980, 1987) turned this argument on its head, suggesting instead a growth in animal husbandry after the fall of the palaces. But in both cases, as Palmer (2001, 46–50) notes, the apparent dislocation remained between the agricultural practices of the LBA and the later Classical era, a conception exacerbated by scholars of each period engaging little with the evidence from the other.

on traditional farming communities in pre-industrial Greece, but the integration of archaeological, historical, and survey data all support their extrapolation to the ancient world[94]. Horden and Purcell (2000, 175), summarise the fundamental strategies at the heart of this model of pre-industrial Mediterranean agriculture under the three headings: diversify, store, and redistribute. Diversification encompasses the many strategies of landuse, labour allocation, and crop selection by which farmers seek to mitigate potential shortfalls in one or more of their investments. The work of Forbes (1992; 1989; 2010) and Halstead (1989b; 1996; 2014), in particular, has highlighted a multiplicity of such practices which find little mention in ancient sources, but which are amply attested in recent times. These include the holding of multiple, dispersed plots of land (Forbes 1989, 90–91); cereal-pulse rotation to broaden the diet, spread the risk of crop failure, and fix lost nitrogen in the soil (Halstead 2014, 245–46); polycropping of tree crops and cereals in the same plots (Forbes 1982, 312–23); and the keeping of small herds of livestock alongside arable farm-holdings, with fallow plots turned over to pasturage, and the resulting manure used as fertiliser (Halstead 1996, 22–23), while animals' meat, milk, skin and wool can be utilised for foodstuffs, clothing and crafts.

The likelihood of such mixed agricultural regimes obtaining in antiquity has likewise been persuasively argued (see Tables 6.1-3; Hansen 1988, 41–44; Jones 1987; Garnsey 1988; Halstead 2004)[95]. On Crete, a range of domesticated crops and animals appears to have been brought to the island in the Neolithic period (Broodbank 2008)[96]. Already at 7th millennium BCE Knossos, sheep,

[94] The view of ancient Greek agriculture advanced here has been the subject of long-running debates in archaeology and classical history, which there is insufficient space to recapitulate here. Twenty years ago, Horden and Purcell (2000, 572) could write of what had been called the 'New or Alternative Model of Ancient Greek agriculture' (Cartledge 1995, 134), that 'to those working on the first millennium B.C. everywhere except in the Aegean, an ecological and ethnoarchaeological approach to primary production no longer deserves to be labelled either new or alternative'. Though the label occasionally still recurs (McHugh 2017, 6), it is here avoided, and the main insights of the approach (particularly the imperatives of diversification, storage, and redistribution) are assumed to be generally accepted. The evolution of this perspective can be traced in Forbes (1982), Spurr (1986), Osborne (1987), Garnsey (1988), Sallares (1991), papers in Halstead and O'Shea (1989) and Wells (1992), and with summaries in McHugh (2017) and the bibliographic essay in Horden and Purcell (2000, 572-83).

[95] Indeed, on the basis of floral and faunal evidence, intensive, mixed farming, with horticultural plots and the rearing of small herds of livestock, has been advanced as the original primary mode of agriculture which spread during the Neolithic through Europe (Bogaard 2004; 2005) and the Mediterranean (Bogaard and Isaakidou 2010).

[96] This process was part of a protracted sequence of seaborne colonisations which brought a common suite of domesticated species, and later pottery technology, to Crete and other Mediterranean islands like Cyprus and the Cyclades (Bogaard and Isaakidou 2010;

goats, pigs and cattle are attested, alongside wheat and barley (Warren et al. 1968; cf. Isaakidou 2008)[97]. Aside from these main domesticates, archaeobotanical remains from BA Crete point to the important role of pulses – notably lentil, broad bean, Spanish vetchling and Cyprus vetch – almond and fig, with more occasional consumption of elderberry, pear, pomegranate and terebinth, as well as wild herbs, aromatics and pharmaceutical plants (Livarda and Kotzamani 2013, 11–13; Christakis 2019, 44). Indeed, Sarpaki (1992) has suggested that legumes be viewed as part of a 'quartet' alongside the traditional Mediterranean 'triad' of cereals, olives, and grapes (Renfrew 1972). Wild animal resources were likewise exploited throughout the BA and IA, through fishing (Mylona 2016; 2021), the hunting of large game (Krzyszkowska 2014), and the capture of birds and smaller mammals (e.g. Snyder and Klippel 1996). Terracing, and the use of scattered plots for different forms of agricultural production, including the maintenance of grazing herds, are similarly attested in BA settings (Hope Simpson et al. 2005; Betancourt 2006a; Orengo and Knappett 2018), while the importance of manuring has been suggested by the common observation of off-site sherd scatters in surveys, covering both the BA and later Greek period (Osborne 1987; Pettegrew 2002; Bintliff et al. 2007; Forbes 2013; Watrous et al. 2012).

Ethnographic evidence suggests that closer to farmsteads or settlements, agricultural practices tended to be more intensive, with the use of manure, the growing of more labour-demanding crops, and the tilling of plots chiefly by hand (Halstead 2014, 46–47; Whitelaw 2019). Further out, hand-tillage was probably still common, but on the land of the more established, wealthier members of a community, traction may have been employed, with those animals lent or shared among the community in exchange for labour at harvest time (Halstead and Jones 1989, 49–50). Extensive plough agriculture was once assumed to be relatively common in antiquity (Isager and Skydsgaard 1992), but modern evidence suggests the keeping of oxen and cattle are costly expenses which must be weighed against the relative benefits, and may only be viable for those with more expansive land-holdings. Among many agricultural communities in modern Greece, those with

Zeder 2008).

[97] The maturity of this agricultural package at Knossos is suggested by both stress-related pathologies on cattle bones, implying the use of animal traction already at this early date (Isaakidou 2006), and the presence of bread wheat, which was not a Neolithic founder crop, and in later periods has been consistently linked to high-status diets (Colledge and Conolly 2007, 64; Halstead 2014, 181; Palmer 1992).

wealth or holdings sufficient enough to support oxen would often loan them out, but with the expectation that the borrower would reciprocate with their own labour at a later date (Halstead 2014, 42–57)[98].

In this model of ancient agriculture, storage strategies are considered to be an important complement to diversification in mitigating against potential shortfalls, and ensuring a supply of food through the winter months. This can and often does take the form of various physical methods of preservation – drying, salting, burying, packing in sealed containers or converting perishable goods into more durable forms, such as yoghurt and cheese in the case of milk[99] – as well as the 'on the hoof' storage afforded by grazing animals. Also common, though, are social modes of storage which see the pooling or exchanging of labour and produce between neighbouring households or communities (Halstead 1989a, 74–76).

While it might be assumed that the underlying motivation here is autarky, that is, self-sufficiency, the reality is not so simple. As Hordern and Purcell (2000, 112-15, 272-74) note, aiming to produce just enough food to subsist is a foolhardy strategy amidst the unpredictable ecological context of the Mediterranean. Instead, farmers typically aim to have sufficiently diversified and distributed their investments that they will have sufficient food to mitigate the interannual variations that may bring shortfalls in any one year. Halstead (1989a) has termed this tendency to aim at overproduction the 'normal surplus', and strategies of social storage are founded upon the fact that such surpluses are universally sought but, due to the vicissitudes of the Mediterranean climate, not universally achieved. Given the likelihood, over generations, that runs of good and bad years will occasionally arise, such strategies always contain the latent potential for spiralling relations of inequality or dependence (Halstead and O'Shea 1982). The normal surplus, in other words, offers a plausible origin point for the agricultural resources co-opted and mobilised by emerging elite groups, in the Mediterranean and elsewhere. In this manner, storage is intimately tied to

[98] In Halstead's (2014, 57) words, 'Thanks to the correspondence between muscle power and feeding costs, cultivation by hand or with small or large draft animals was associated with a trend from small-scale self-sufficiency to large-scale surplus production.'

[99] Even amongst these most tangible forms of storage, much is lost to us by the time of archaeological recovery. Only the most durable of physical storage devices, chiefly pottery, but also architectural fittings like bins, basins and pits, are likely to be found in archaeological contexts. The use of organic containers – woven baskets, wooden boxes etc. – is highly likely, though see Christakis (2008, 25:12) for the limitations of such materials for long-term food storage.

redistribution: the transfer or mobilisation of agricultural products and services among populations, which can range from the reciprocal to the profoundly unequal. Economies of scale are important in this context, and with regard to the social developments of the LBA-EIA, because the facility with which groups can weather longer-term or more severe forms of climatic variability will be related to the scales over which surpluses can be mobilised and deployed. The small annual 'normal surplus' is not aimed at mitigating the effects of more severe, rare, or unpredictable events like extended droughts or natural disasters, which may be more effectively accommodated by larger groups where resources can be reallocated in relation to the scale of the shortfall. At the same time, however, larger, more centralised structures of agricultural mobilisation may be susceptible to systemic failures if they rely on the cooperation (or exploitation) of large populations of producers. The balance between the strengths and weaknesses of differing scales and strategies of agricultural integration is therefore an important element in the specific character of subsistence practices in any given historical context.

Though such a model of ancient subsistence is based on what are considered to be the constant or recurrent characteristics of Greek – indeed, Mediterranean – agriculture, it is not an argument for an eternal, unchanging balance between the efforts of farmers and the affordances of the Mediterranean landscape. This *longue durée* perspective is not aimed at the nullification of variety and discontinuity between different periods and places; it seeks rather to highlight how, even under similar conditions, varied strategies may be employed and outcomes arise. This chapter is especially concerned with how strategies of subsistence, land management, and resource mobilisation were adapted to particular regional and historical contexts. Variability in the affordances of the landscape means variability in the emergent social forms, just as it does not guarantee continuity or stability (Horden and Purcell 2000, 275–78; Barker 2005, 46–47). Baked into this view of agriculture is the susceptibility of some individuals to become dependent on others through inequalities, amplified through time, in the relative productivity of their land-holdings, and the forms of labour and social support which can be mobilised by different individuals or groups. This chapter is, in a sense, concerned ultimately with the interlacing of agricultural production and social inequality, and the spiralling relationships of dependency which are perennially imminent in working the land.

		Cereals						Legumes					Fruits and Nuts					
Site	**Period**	Einkorn (*T. monococcum*)	Emmer (*T. dicoccum*)	Bread wheat (*T. [illegible]*)	Wheat (*Triticum*)	Barley (*Hordeum*)	General cereal	Pea (*Pisum*)	Lentil (*Lens*)	Vetch (*Vicia*)	Grass pea (*Lathyrus*)	General legume	Olive (*Olea*)	Grape (*Vitis*)	Almond (*Prunus [illegible]*)	Pistachio (*Pistacia*)	Fig (*Ficus*)	**Sources**
Knossos MUM	LM II		x	x		x		x	x	x	x	x		x			x	Jones 1984
Palaikastro Building 1	LM II-IIIA1		x			x	x			x		x	x	x	x		x	Sarpaki 2019
Mokhlos	LM II-LM IIIB						x					x	x	x	x		x	Reese et al. 2011
Kommos	LM II-III						x					x	x	x	x			Shay et al. 1995
Sissi Building CD	(LM I-)LM IIIA					x			x				x	x				Letesson 2011; Isaakidou et al. 2011
Palaikastro wells	LM IIIA						x					x	x	x	x			Sarpkai 2019
Palaikastro Building 1	LM IIIA-B		x			x	x			x		x	x	x	x	x	x	Sarpaki 2019
Malia	LM IIIA2-B	x				x	x	x	x	x	x		x	x	x		x	Sarpaki 2007
Karfi	LM IIIC		x			x	x		x	x		x	x	x				Wallace, Scarry, and Tickner 2020
Kavousi Vronda	LM IIIC/G			x		x			x	x	x	x	x	x	x	x	x	Flint-Hamilton 2016
Knossos Little Palace North	SM-PG	x				x			x?	x	x?	x	x	x			x	Hatzaki et al. 2008; Livarda 2012
Kommos	SM-A					x	x						x	x	x			Shay and Shay 2000
Thronos Kefala	EPG/MPG	x?											x	x	x		x	Livarda 2012
Knossos Villa Dionysus	PG	x	x	x	x	x	x	x		x	x	x	x	x	x		x	Livarda 2012
Azoria	A				x	x	x			x		x	x	x	x	x	x	Haggis et al. 2011a

Table 6.1 Summary of botanical assemblages from LBA and EIA contexts. Crosses signify the presence of species of genera. Question marks indicate possible presence.

Site	Period	Sample size	Sheep:goat	Ovicaprids	Pig	Cow	Sources
Knossos MUM	LM II	2760	NA	62.2% (60.3%)	24.8% (23.8%)	13% (11.9%)	Bedwin 1984
Pseira	LM IB-IIIA2			x	x	x	Reese 2009
Mokhlos	LM II-IIIA2	360	NA	99%	1%	0%	Reese et al. 2011; Soles and Brogan 2008
Mokhlos	LM IIIA2-B	1355 (81 MNI)		69%	22%	9%	Reese et al. 2011; Soles and Brogan 2008
Kommos	LM III	4279 (148 MNI)	NA	53%	28%	18%	Reese, Rose, and Payne 1995; Moody 2012
Palaikastro wells 576, 605	LM IIIA1-2	1197	1:2	67.8% (34.4%)	5.2% (3.0%)	27.0% (15.6%)	Wall-Crowther 2007; Mylona 2007; Reese 2007; Moody 2012
Palaikastro Building 1	LM II-IIIB	504	1:1.5	81.0% (80.8%)	10.4% (10.3%)	8.6% (8.5%)	Wall-Crowther 2019; Mylona 2019; Reese 2019
Sissi	LM II-IIIB	144 (MinAU)	1:1.5	79.0% (78.5%)	16.8% (16.7%)	4.2%	Isaakidou et al. 2011
Knossos Royal Road/Hogarth's Houses	LM II-IIIB	471 (MinAU)	1.5:1	56%	26%	17%	Isaakidou 2005
Knossos Unexplored Mansion	LM IIIA2	183		64%	24% (23.5%)	12%	Bedwin 1984
Khania	LM IIIA-B		1:1	64%	21%	15%	Moody 2012; Hallager and Hallager 2003
Khania	LM IIIC		3:1	52%	33%	15%	Moody 2012; Hallager and Hallager 2000

Table 6.2 Summary data on the main three types of domesticated animals found in faunal assemblages from the LBA-EIA on Crete[100].

[100] For each entry, the sample size corresponds to the number of individual specimens (NISP) of the assemblage, unless qualified with MNI or MinAU. MNI is the minimum number of individuals, while MinAU (Minimum Anatonmical Units) differs from NISP in that every pair of long bone epiphyses, even when they may belong to different individuals, adds one to the total number of specimens, to minimise the distorting effects of counting larger, fragmented bones multiple times – see Halstead (2011b; 2020). If MNI or MinAu is shown, then the percentages for each animal are given in terms

Site	Period	Sample size	Sheep:goat	Ovicaprids	Pig	Cow	Sources
Chamalevri	LM IIIC		1:2	68.5% (42.4%)	18.1% (11.2%)	13.4% (8.3%)	Mylona 1999; Wallace 2010, 37; Wallace and Mylona 2020, 257
Kavousi Vronda	LM IIIC	632	2:1	73.9% (72.9%)	20.0% (19.8%)	6.1% (6.0%)	Snyder and Reese 2016; Day et al. 2009, Tables 1-40; 2012, Tables 1-28
Thronos Kefala	LM IIIC			x	x		Wallace and Mylona 2020; D'Agata 2001; 2002
Monastiraki Khalasmenos	LM IIIC	96		76.9% (72.9%)	17.6% (16.7%)	5.5% (5.2%)	Wallace 2010, 37; Coulson et al. 1994
Karfi	LM IIIC	121	1:1	75.5% (66.1%)	7.5% (6.6%)	17.0% (14.9%)	Wallace and Mylona 2020
Kavousi Kastro	LM IIIC-G		2:1	82.1% (77.9%)	9.3% (8.8%)	8.6% (8.2%)	Klippel and Snyder 1991; Snyder and Klippel 2000
Smari Profitis Ilias	LM IIIC-A (some MM)	695	No sheep?	61.4% (50.4%)[101]	22.8% (18.7%)	15.8% (12.9%)	Tsoukala 1996; Chatzi-Vallianou and Tsoukala 2000
Knossos	EIA	513 (MinAU)	2:1	60%	17%	23%	Dibble 2012; 2017
Azoria	EIA	960 (MinAU)	1:2.3	82.1% (78.5%)	5% (4.1%)	16.7% (13.7%)	Dibble 2017
Prinias Patela	PG-G	109	9:1?	77.4% (75.2%)	16.0% (15.6%)	6.6% (6.4%)	Wilkens 2003
Gortyn (Profitis Ilias)	8th century	116	No goat?	71.8% (68.1%)	18.2% (17.2%)	10% (9.5%)	Wilkens 1996; 2003
Azoria	A	5945 (MinAU)	1:2.4	82.1%	12.8%	5.1%	Dibble 2021

Table 6.3 Summary data on the three main types of domesticated animals found in faunal assemblages from the LBA-EIA on Crete.

of that metric, or in terms of NISP if not. The percentages are as a proportion of all ovicaprid, pig and cow remains and, in brackets, as a proportion of all animal bones, where these values are different (at least as far as presented in the original source). Sheep:goat designates the ratio of the former to the latter in the assemblage, where this is inferable. In the absence of percentages, 'x' indicates presence.

[101] Chatzi-Vallianou and Tsoukala (2000) suggest the figure may be as high as 80% across the whole assemblage.

Subsistence in the Time of the Palaces

Questions of Scale

The final palace at Knossos inherited many features of the preceding Neopalatial administration, but also appears to have diverged in the scale, orientation, and complexity of some of its operations (Bennet 1985; 1990). The agricultural sphere is no exception. Whitelaw (2019) has recently argued that one of the fundamental drivers of Neopalatial Knossian expansion would have been the subsistence demands of the town's large, urbanised population, a significant portion of which would have been uninvolved in primary production. With an estimated 20-25,000 residents, the minimum territory required to support even basic subsistence for the Knossian community would have extended well beyond the two-hour upper limit which historic data suggest farmers will have regularly commuted (Fig. 2.13; Chisholm 1968; Allbaugh 1953, Table A82). Adding to this the limited surpluses likely generated by farmers operating under the constraints of pre-mechanised agriculture in the southern Aegean (Halstead 2014), and some 17-20,000 families may have, of necessity, been brought into the productive orbit of the Knossian state, requiring significant logistical investment and thus providing a major impetus to territorial expansion (Fig. 6.1; Whitelaw 2019, 101–3). However, the resultant scale and complexity of the bureaucratic infrastructure required to provision the non-agricultural sector may have proved unstable, pushing the upper limits of integration possible for such a centralised, and largely terrestrially managed state (Whitelaw 2017, 142–44).

Whether an eventuality such as this did contribute to the disturbances of LM IB, as a model of Knossian expansionism it offers some useful points of comparison for the Final Palatial period. If we calculate a likely minimum catchment for the estimated population of Final Palatial Knossos (on the order of 12,000; see Whitelaw 2019, 104), following similar principles to those employed by Whitelaw[102], we find that the town's population in LM IIIA could have been far more readily provisioned by the agricultural labour of those resident in or near the centre itself (Fig. 6.2). Indeed,

[102] That is, excluding land under 13° (10° in the case of Whitelaw 2018), allowing for 0.6ha per person, weighting the catchment by walking times, and factoring in the additional subsistence needs of 100 people per km^2 within the estimated territory.

the majority of the modelled catchment falls within a 5km radius, and all of it comfortably within a two-hour walking radius. In other words, though the Final Palatial administration also invested heavily in provisioning its non-agricultural workforce (as will be explored below), we should exercise caution in assuming this was, by LM III, a problem of redistribution brought about by population pressure, as may have been the case in the Neopalatial period.

This is not to say there were no logistical hurdles to be crossed in feeding the urban elite, craft specialists, and dependent workers of the final palace. Using the estimates of Christakis (2008, 25:29–30) and Whitelaw (2019, 104), Knossos' estimated 12,000 inhabitants would have required nearly 140 donkey loads of agricultural produce per day to meet even basic subsistence needs. When one considers that these deliveries must have included, alongside grains and legumes, many fruits, vegetables, and other perishable products arriving unevenly throughout the year and needing unloading, storing, processing and re-allocating, it is clear that various mechanisms of resource mobilisation and distribution had to be in place, including those not leaving any trace in written records (Halstead 2011a, 232). But the reduced size of Knossos, and the greater facility with which it could have fed its resident population from its immediate hinterland, raise the possibility that, in contrast to the Neopalatial period, the geographic expansion of the Final Palatial state reflected specific economic and political motivations, rather than the mounting pressures of social storage and redistribution.

Palatial Involvement in the Agricultural Economy

Whether or not the expansion of Final Palatial Knossos differed in its underlying causes to that of its Neopalatial predecessor, many and varied interactions must still have obtained between the palatial and non-palatial economies, which in reality formed a continuum bridging different scales and forms of production. Palatial interventions ranged from undocumented mobilisation of agricultural products, to broad taxation, to the direct allocation of land and livestock and the imposition of production quotas (Killen 2008; Halstead 2007, 68). Among the palace's documented taxed goods are spices, dye plants, hides, wood, flax, honey, wax, olive oil, and wool, the production of which appears to have been left largely to local communities (Halstead 1993)[103].

[103] Flax, wool and dyes were destined for textile production and though olive oil, honey and spices undoubtedly had culinary uses

Records of plough teams, sheep flocks, olive and wheat harvests, and possible nurseries for figs and vines indicate the more direct involvement of the palace in primary production (Halstead 2007, 67–68).

Even in these latter cases, however, is not entirely clear that the palace as an institution owned agricultural land. While officials within the administration and its regional affiliates had private holdings, the once-mooted existence of palatial estates (e.g. Halstead 1993) now seems doubtful. Rather, the oxen which are named (literally: Killen 1993) on the Knossos tablets appear to have been allocated to communities to reduce labour costs and assist in cultivation, probably in share-cropping arrangements (Killen 1998; Halstead 1999b). This loaning out of traction animals is in keeping with the insights from ethnoarchaeological studies which highlight the costs of maintaining such animals, specifically unreproductive oxen, testifying to the economies of scale on which the palace was able to capitalise (Halstead 2014, 60). The land itself, however, appears mostly to have belonged to the *da-mo* – a term antecedent to the later Greek *demos* – presumably signifying some form of community level ownership or allocation of land (Killen 1998). These communities, or local officials therein, appear to have had significant autonomy in the production, aggregation, and transportation of the various goods levied by the palace, with greater administrative interest shown only in tax exemptions in lieu of services rendered, and grants of land to officials and craftsmen with obligations to supply produce, labour or military service in return (Killen 1985, 244–50; Halstead 2007, 67).

The nature of local labour and resource mobilisation is poorly understood, as no records relate directly to the logistics of harvesting. It is possible that the *damos* mobilised seasonal, corvée or forced labour at harvest time, as some of the larger grain totals recorded by the palace would have required heavy, and time-sensitive, investments of manual labour (Halstead 2014, 121), but there

in and outside palatial settings, as recorded in the tablets they were largely earmarked for the production of perfumed oils (Shelmerdine 2008). Honey was also given as a religious offering, as in the KN Gg tablets (Rutherford 2013, 258). Though perhaps produced or gathered near settlements or farms, the herbs and dye plants, wood, and honey in particular would have often been sourced from further afield, beyond the arable land of the lowland (Forbes and Koster 1976; Forbes 1996). Evidence is slight for the BA, especially LM III (D'Agata and De Angelis 2014; cf. Ferrence and Shank 2006), but beekeeping in later periods evinces some association with upland areas, where the aromatic plants of the maquis and garrigue add flavour to the honey (Chaniotis 1999, 209; Moody 2012, 259).

is little evidence for such practices, and there are no specific references in the tablets to the marshalling of seasonal labour (Halstead 1993), likely managed at a local level. One potential impact of palatial demands on local production has been suggested by finds of communal olive pressing installations which, in contrast to earlier periods, are fewer in number but occupy more central locations within settlements, most notably at Kommos (Pratt 2021, 98–99; Blitzer 1993, 167). The communal processing of agricultural resources in regional centres may be one of a range of local responses to the surplus demands exacted by the palace, though a clearer understanding of these processes is at present limited by the lack of extensively excavated LM II-IIIA1 settlements.

The areas closest to the palace, and its secondary centres, appear to have been foci for the large-scale production of cereals, grown particularly to feed the inhabitants of the palace and its dependants. Recent isotope analysis on grain from the Unexplored Mansion at Knossos reveals that while nitrogen-15 values of barley are consistent with moderate manuring, and thus a more intensive cropping regime, those of emmer wheat suggest growth on well-watered land, with minimal manure inputs, conditions which align closely with the low-energy objectives of extensive agriculture, for which the use of plough oxen would likewise accord (Nitsch et al. 2019; Halstead 1995b; 2001)[104]. As Halstead (1992, 112–14) notes, such regimes run counter to the assumption that a centralising state should tend toward *intensification* of farming – through infrastructure investment, high labour inputs, etc. Rather, a large but dispersed labour pool, the use of traction, and the selective stimulation of agricultural activities on a local level present mechanisms which minimise labour costs as much as, if not more than, they maximise outputs.

Evidence for the agricultural involvement of secondary centres comes from Agia Triada, which in this period may have been associated with the name *da-wo* (or else *pa-i-to*, that is, Phaistos) in the Linear B tablets (cf. Privitera 2014). Estimating agricultural catchments for the sites identified in the Western Mesara Survey is difficult, due to the broad groupings into which sites were allocated

[104] This would also appear to endorse the view that wheat, and not barley, was the most widely grown grain within the palatial agrarian economy, and the one that received greatest investment by the palace (Halstead 1995a; Palmer 1992). Bread wheat was probably only grown on a more limited scale, and may not be explicitly identified with an ideogram in Linear B (Hansen 1988; Halstead 1992, 113–14).

based on size (Watrous et al. 2004, 24–25), but using averages of those brackets we can at least approach ball-park figures for population, using the density estimates of 100-150 people/ha outlined in Chapter 2. These estimated subsistence catchments are shown in Fig. 6.3. While in both the LM II-IIIA1 and LM IIIA2-B periods, there is some overlap in the catchments of Ayia Triada and Phaistos, and a few smaller surrounding sites, from these estimates it appears unlikely that the demands of basic subsistence in the region would have necessitated the exploitation of all available cultivatable land. The possible impacts of palatial taxation on these agricultural catchments can be appreciated by considering the grain totals recorded in association with *da-wo* on the tablet KN F(2) 582. These amount to some c.800 tonnes of wheat, requiring between 1000 and 4000ha depending on the cropping regime (Halstead 1999b, 324)[105]. Given that the estimate of 1000ha assumes dedicated production with 100% of the yield going to the palace, and that of 4000ha a system of alternating fallow, with half the crop taken by Knossos, even the upper limit is not unreasonable. The total area calculated for the catchments of LM II-IIIA1 ranges from 1410-2120ha, meaning the additional 2000ha required to meet the harvest quota (assuming 50% was sent to the palace) would more than double the total cultivated area, as mapped in Fig. 6.3E[106].

The Mesara also provides evidence for the integration of different agricultural activities within particular regions. One of the palace's major investments, aside from wheat production, was sheep herding. A minimum of around 156,000 sheep can be deduced from the total Linear B corpus from Knossos, and almost as many again may have been drawn from private flocks to restock the palatially documented herds (Halstead 1998-9, Table 2; 1999a, 166), requiring as much as one quarter to one half of the fertile grazing land in central and west Crete (Bennet 1985, 237; Whitelaw *forthcoming*). The most sheep, and the most sizeable flocks, were located in the Mesara, around Phaistos and Agia Triada (Olivier 1967, 86). In light of the large-scale wheat production in the same area, flocks may have grazed on stubble and fallow fields in winter, and summered on upland

[105] And as much as 20,000 person-days for reaping, not to mention the subsequent processing and transport (Halstead 1993, 67).

[106] The substantial overlaps produced in this simulation suggest that in geographical terms, the cultivated area would have needed to expand even further. The survey area covers only part of the wider productive region, and so these demands are likely to have been spread over a larger number of communities, but even doubling the estimated population for the area means that the grain totals in KN F(2) 582 tablet would have necessitated a 23-70% increase in the quantity of cultivated land, above that required for basic subsistence of the regional population.

pastures in the hills around the plain (Halstead 1993), something tentatively endorsed by isotopic analysis suggesting the seasonal movement of sheep flocks in Crete's central region (Isaakidou et al. 2019)[107]. The watchful eye of the palace is borne out at multiple stages of the process, through quotas and shortfalls in flocks and their productivity (Killen 1964), the allocation of wool to be worked into cloth across a number of widely dispersed workshops (Nosch 1997-2000; 2008), and even the finishing touches applied to particularly ornate textiles by specialised workers (Killen 2006, 87)[108].

The scale of this industry probably drew a significant proportion of Crete's shepherds into relations with the palace, but as in the case of land tenure, the relationships were complex. Halstead (1993; 1991) has noted a coincidence between the 17-20% annual replacement rate necessitated by flocks with a life expectancy of five to six years, and the 19% incidence of 'yearlings' on tablets which record these separately to adult sheep. However, the 8:1 ratio of males to females among the wool flocks, against 1:1 for lambs, suggests some 20,000 breeding ewes not recorded in the documents each year[109]. It seems that the palace may not have owned specific sheep, as such, but rather exercised rights over flock totals, raising the possibility that shepherds topped up deficits in palatial wool flocks through their own private herds. Given the necessary scale of these interchanges, which if real occurred outside of palatial documentation, shepherding could have presented opportunities for the quite significant accumulation of private wealth, at least for those adept at navigating these interlocking systems (Halstead 1991; 1996).

There are several areas of central and western Crete believed to be within the bounds of the

[107] Interestingly, the evidence from the study suggests sheep and goats may have been differently managed, with dietary signatures consistent with the animals' preference for grazing (that is, on grass or cultivated pasture) in the case of sheep, and browsing (on uncultivated land or *phrygana*) in that of goats. Likewise, the isotopic signatures obtained from the goat bones showed less evidence for seasonal movement. Sample sizes were small, so the results must be treated with caution, but they are suggestive, especially when sheep are the far more documented species in the Linear B tablets, specifically in the context of large scale wool production (Isaakidou et al. 2019).

[108] The basic textiles seem to have been mostly produced elsewhere, at smaller settlements across the Knossian territory and then brought to the palace, where workshops for the application of finishing touches were located, on the assumption that the lack of toponyms on tablets dealing with this last stage mean that it occurred on-site (Alberti 2007, 244–47). A sizeable share of these textiles, as well as the perfumed oils also produced by the palace, are assumed to have been intended for export (Shelmerdine 2008; Shelmerdine and Bennet 2008).

[109] The scarcity of breeding ewes on the Knossos tablets was noted long ago by Killen (1964, 13 n.63b).

Knossian polity, but for which toponyms have not been identified with certainty. In such areas, inferring the possible impact of Knossian demands on surplus production is difficult. Galatas is one such case. In the MM-LM IA period, a palace existed at Galatas, probably established under the auspices of an expanding Knossos, and no doubt involved in the local mobilisation of agricultural surplus (Rethemiotakis 2002; Buell 2014). Modelled agricultural catchments for the region in MM III-LM I overlap extensively, in both the minimum and maximum estimates, suggesting an agricultural landscape that extended continuously over much of the productive area covered by the survey (Figs 6.4-5). In contrast, by the LM IIIA-B periods, the estimated catchments are much reduced and exhibit little overlap, in line with the likely decline in population noted in Chapter 4 (Figs 6.6-7). The thinner, more dispersed settlement of good agricultural land in the region has been noted by the survey authors, who suggest it may reflect the differing strategies of local administration embodied by the LM I and LM III polities of Knossos (Buell and Turner 2017, 77–80). There is a slightly denser area of overlapping catchments around Galatas itself, where, as noted previously, some kind of storage or workshop structure was used in LM IIIA (Rethemiotakis and Christakis *forthcoming*), and could plausibly be implicated in local processes of resource mobilisation.

Characterising the Palatial Economy

The traditional view of the Mainland and Cretan palaces was that they were centres of redistributive economies, collecting agricultural products from and on behalf of the populace, storing or processing these, and then reallocating the foodstuffs or manufactured goods (Renfrew 1972; Killen 1985). Such characterisations are no longer fully tenable (Halstead 1992; Nakassis et al. 2011; cf. Halstead 2011a), however, as both the scale and the intent of the palaces' operations have been revised (Driessen 2001a). Certainly, the palace's hand in agricultural production necessitated the provision of storage infrastructure, especially in relation to those industries over which it exercised particular control (cf. Privitera 2014). The palace likewise evidently provisioned its elite administrators, its dependent workers and, on occasion, some portion of the wider populace via the oversight of religious festivities and feasts (Godart 1968; Killen 1985; Bendall 2007). But Knossos did not function primarily as a locus of 'social storage', systematically mitigating the

shortfalls of some areas with the surpluses of others (Nakassis et al. 2010; 2011, 179)[110]. Or, more specifically, it only did so in contexts which saw some benefit passed onto the palace itself; when it allocated land[111] to craftspeople, shepherds, herb-growers and presumably other agriculturalists, these actors were then obliged to work it, and return a share of their produce to the centre (Shelmerdine 2006, 74–75). It may also have been possible to bank surplus production in exchange for tax exemptions or perhaps subsistence relief down the line (Halstead 1993). But much of the palatial agricultural economy appears to have been directed towards the creation of specialised products and items, such as textiles, perfumed oils and – through exchange of these for raw materials like metals – weapons and armour, vessels, chariots, and jewellery, all of which then were distributed or circulated around the island (Shelmerdine 2006). Access to such items was, in turn, probably implicated in the negotiation of more localised power dynamics and forms of social status, within which the palace would have been an important point of cultural and political reference and legitimation. Thus the dissemination of finished goods, the staging of communal rituals featuring large-scale dining, and the occasional provision of subsistence relief were probably all methods by which the upward flow of agricultural produce was legitimised – and these are undeniably redistributive acts – but we should be in no doubt that these interactions encoded unequal power dynamics (Halstead 2011a).

However we characterise the palace's interests or operations, a wide range of activities and environments were undeniably implicated in the extractive demands it made, and the forms of production it oversaw. Not only the ploughing, sowing, reaping and distribution of arable produce,

[110] There remains the possibility that such acts of redistribution did occur, but for whatever reason were not documented in the Linear B records (or in those of which we have a sample). There is no evidence, for instance, that different regions were taxed based on the resources they were more or less endowed with, to meet the needs of those in other areas (Halstead 1993). However, though a redistributive system in this sense may not be an accurate characterisation of the LM III palaces, it has recently been stressed that a market economy is not the only alternative, and a range of economic transactions (including certain kinds of redistribution, exchange *sensu stricto*, and the giving of gifts) may all have been present in the relations between the palatial and non-palatial economy (Halstead 2011a; Bennet and Halstead 2014).

[111] There is debate as to whether the palace *directly* owned all such land, as at both Knossos and Pylos some is recorded as belonging to the *telestai* (presumably private landowners) and the *damos*. But the palace clearly played a significant role in determining to whom such land was allocated, and reaped the rewards. Some allocations were probably made to fulfil pre-existing obligations to the palace, while instances of the word *a-pu-do-si*, 'payment' presumably indicate a genuine transaction between the tenants and the palace (Shelmerdine 2006, 74–76).

but also arboriculture and viticulture, foraging and beekeeping, the sourcing of timber and firewood, animal-rearing, and the processing of textiles. Even if the greater part of agricultural production on Crete in LM IIIA-B was locally organised, the palace evidently exerted powerful influence over certain sectors, including many which lay beyond its documented interests (Halstead 2011a, 233). Given its scale and reach, the palace was able to capitalise on the benefits of a diversified agrarian economy through exercising forms of intervention that were neither consistent nor ubiquitous. While it may have exceeded in pure geographical terms it Neopalatial predecessor, the polity of Final Palatial Knossos may be more an expression of the targeted stimulation of particular forms of productive activity, mediated through local centres, than of an integrative and redistributive system directed towards supplying the demands of a growing non-agricultural population (Bennet 1990; Driessen 2001; cf. Halstead 1992, 115–16).

Subsistence Beyond (and Below) the Palace

As noted in the previous section, much of our understanding of the agricultural economy outside of palatial oversight is inferred from the lacunae of the Linear B records, and what can be gleaned from other archaeological contexts. However, the little evidence we do have is of significance, as it arguably represents a scale and general schema of agricultural production likely to have survived the collapse of the palaces.

The site of Chrysokamino, situated on the hill named Khomatas, on the eastern side of the Bay of Mirabello, provides some of our best evidence for the structuring of small-scale subsistence in LBA Crete. Though occupied at various points since the Neolithic, its clearest surviving remains date to LM IIIA, at which time it constituted a single large dwelling. The building occupies something of a natural territory, bounded to the north and west by the coast, to the south by a ravine, and to the east by the slopes running down to the *Kambos*, the lowland plain on which the modern village of Kavousi stands (Floyd 2006). This territory, however, is far from uniform, and soil and surface survey suggest at least four distinct zones of agricultural activity (Fig. 6.8). An area of *terra rossa* soils, lying close to the building on the south side and thickly scattered with highly worn sherds (an area the excavators dub 'Type 1'), probably corresponds to intensively cultivated horticultural plots, where manuring was used to improve the somewhat poor soils, and vegetables

and pulses were grown. These same soils, though lacking any evidence of manuring ('Type 2'), are also found further to the south and north of the dwelling, and were probably utilised as grazing land. Meanwhile, phyllitic soils of higher quality were identified to the immediate north of the farmstead, and represent the best candidates for fields and olive groves ('Type 3'). Finally there is the *Kambos* to the east, which probably did not represent prime arable in antiquity, and may therefore have served as an area of winter pasturage (Betancourt 2006a, 2006b)[112]. In the building itself, several built installations including hearths and possible storage bins were found, as were cooking and storage vessels, stone querns and grinders, and a variety of animal bones and shells (Floyd 2006; Betancourt 2006c; 234)[113]. Alongside sheep, goat, and cattle, the remains of weasel, hare, agrimi and limpets suggest occasional supplementation of agricultural diets with wild meat and seafood (Floyd 2006, 212–13), while bee-keeping in the area has also been suggested (Ferrence and Shank 2006). The dwelling therefore provides a good example of small-scale agricultural production, based on the exploitation of a range of cultivated and wild resources, making use of the affordances of the local environment. Modelling catchments for the wider Mirabello region at this time, the condensed, localised catchment of Chrysokamino does not seem atypical. Beyond the Knossian realm, this region appears characterised at this time by small, scattered agricultural settlements (Fig. 6.9).

Sadly, Chrysokamino is more or less unique for the period, and other evidence of non-palatial subsistence is more piecemeal. Though they only tell us a limited amount about the scale or organisation of agricultural production, botanical and zoological remains from a handful of other LM III sites confirm the common exploitation of a range of species (Tables 6.1-3). Legumes including lentils, fava, and grass pea, figs, almonds and various wild herbs have been identified at Mokhlos and Pseira, as have remains of sheep, goat, cattle and pig (Reese et al. 2011; Betancourt

[112] The *Kambos* is today densely farmed, particularly for olives, but this present abundance belies the fact that only with the installation of hydraulic infrastructure in the 1960s was the plain rendered desirable for oleiculture. Before this time it seems its colluvial, terra rossa soils were liable to drying out in summer, with survey suggesting that ancient settlement in the area aggregated more commonly on the low flanks of the hills, only extending into the *Kambos* in times of agricultural extensification (Haggis 2005; Betancourt 2006; cf. Morris 2002).

[113] Though no botanical remains are reported from the farmstead itself, impressions on furnace chimney fragments from the nearby metallurgical workshop associated with the habitation site attest to the presence of two-row barley, wheat, and olive in the area since at least the EM period (Jones and Schofield 2006).

and Hope Simpson 1992; Reese 2009). Similarly broad ranges of fauna and flora are known from Sissi, Malia and especially Palaikastro in LM II-IIIB, though their generally small quantities and scattered nature preclude any real analysis of agricultural production, distribution and consumption (Isaakidou et al. 2011; Sarpaki 2007b; 2007a; 2019). However, the relative proportions of ovicaprids, pigs and cattle at these sites, as well as from the Unexplored Mansion at Knossos (Halstead 1993, 64), do contrast somewhat with the marked palatial preoccupation with sheep herding, suggesting more balanced husbandry practices – though still with a general preference for sheep and goats – obtained across most communities within and beyond the orbit of Knossos (see Table 6.2).

In other words, these assemblages – like those at Chrysokamino – point toward more diversified forms of small-holding, and likely more intensive modes of agricultural investment, in contrast to the more extensive practices promoted by the palace. There is evidence that such a distinction can be found even at Knossos itself. From floral remains in LM II levels at the Unexplored Mansion, it appears that barley, peas, grass peas, Celtic beans and figs were all stored separately, with lentil and bitter vetch found in small amounts, perhaps as unintentional contaminants, but nonetheless hinting at their production and/or storage alongside these staples (Jones 1987, 116). At Gypsades to the south of the palace, a recently excavated dwelling, in use during LM IIIA2-IIIB, yielded a similar range of pulses which appear to have been stored in perishable containers in the upper storey of the building, perhaps skin bags or baskets (Christakis 2020, 95)[114]. Recent isotopic analysis of pulses from the Unexplored Mansion suggest enriched nitrogen-15 values consistent with heavy manuring, making them unlikely to have been grown through a system of cereal-crop rotation with the extensively farmed wheat which, as mentioned earlier, appears to have been grown on un-manured land (Nitsch et al. 2019).

An important distinction may thus have existed between the extensive, traction-based arable farming and large-scale flock management overseen by the palace, and the hand-tilled horticultural plots, diversified cereal, pulse and vegetable holdings, and small-scale management of sheep, pigs and cattle which persisted among most smaller communities on the island. The undocumented

[114] And see 'Knossos, Gypsades - 2015, *Archaeology in Greece Online*, report 5570.'

circulation of many of these products, and the modes of production they suggest, imply that as an institution Knossos never made itself essential, as such, to the viability of individual or household subsistence, much as it may have dramatically shaped the exploitation of certain landscapes (Foxhall 1995). The power of the palace lay in the relationships it established and maintained between its economic interests, and the subsistence practices of the general populace, rather than in the fundamental or lasting alteration of these practices (Nakassis 2020, 284–85).

Subsistence After the Palaces

Palatial Twilight

We know almost nothing about the organisation of agricultural production in the time between the final destruction of Knossos (even if we assume a date for this in LM IIIA2) and the general relocation of settlements in later LM IIIB. Floral and faunal remains (Tables 6.1-3) are largely all we have to go on, especially given the general uncertainty about how the putative small-scale polities or collectives of early LM IIIB may have been structured and overseen. The one significant exception comes from the site of Agia Triada, where the LM IIIA2 period witnessed the construction and elaboration of a number of large grain silos and short-term storage spaces, which increased overall capacity at the site on the order of three to four times. Privitera (2014) has demonstrated that this increased storage capacity approximates the total quantities of grain recorded in LM IB Linear A texts from the site, and suggests the upscaling seen from LM IIIA1 to IIIA2 may reflect the site taking on a wider range of economic roles as an independent polity, such as storing fodder for plough oxen. This increased capacity could also reflect longer-term storage, as the site was presumably no longer functioning as a conduit for grain to be shipped on to Knossos or mobilised across its territory[115]. As of yet, no other site has yet evidenced similar large-scale storage at this time, but the existence of a small but well-integrated polity, based on the maintenance and adaptation of Ayia Triada's role as a former secondary centre of palatial power, is certainly conceivable. In those areas where the connective networks of palatial oversight had

[115] Similarly, it seems likely that the scale and elaboration of building public works at Ayia Triada and neighbouring Kommos in LM IIIA2 were partly facilitated by declining extractive demands from Knossos, making available a greater range and quantity of resources for those in a position to mobilise them on a local level.

already stimulated investment in specialised, extensive modes of arable farming and stockkeeping, there would have been opportunities for local actors to co-opt the structures of labour and resource mobilisation even with the decline of Knossos.

As discussed in the previous chapter, LM IIIB appears to have witnessed the gradual disintegration of lowland settlement networks in many areas, and given the already selective interests of the final palace at Knossos, we have reason to suspect more localised modes of subsistence organisation obtained across much of Crete. The idea that population decline in this period resulted from the inability of groups to feed themselves in the absence of palatial organisation and redistribution seems unlikely (Palmer 2001); as stressed, the parts of the agricultural economy most visible in the tablets only represented a minority of total production, and the majority of communities on the island would have continued to primarily support their own needs (with, of course, the aid of local networks of support). Thus, viewed from the ground up, the collapse of Knossos should not in of itself have impacted dramatically the ability of rural Cretans to subsist, and there is little reason to assume the technology, character or composition of agricultural regimes changed dramatically for the general population (Foxhall 1995).

A Pastoral Shift?

Despite the general evidence for continuity in agricultural practice in the immediate aftermath of the collapse of Knossos, it has been suggested that an increase in pastoralism may have occurred with the shift towards higher elevations across much of the island at the LM IIIB-C transition, perhaps as part of complementary networks of landuse connecting upland and lowland communities (Borgna 2003; Perna 2009; for wider Greece, see Snodgrass 1987, 170–210; Dibble 2017, 277–84). The exploitation of the Cretan uplands is well documented historically and ethnographically, with specialised settlements (*metokhia*) and dwellings (*mitata*) seasonally occupied by herders, who have in previous centuries depended for their livelihoods on dairy products, meat, wool and hides exchanged with lowland communities (Blitzer 1990; Rackham and Moody 1996, 161). Pairs of settlements could be twinned in *ano-kato* (high-low) relationships, facilitating seasonal exploitation of contrasting environments, often involving transhumance, but also the use of different arable zones or marine resources (Cherry 1988, 10–11; Bintliff 1977; in a Classical-

Hellenistic context, see Chaniotis 1999). The life of mountain communities in Crete has certainly been vividly depicted in the ethnographic literature, and there is a temptation to use these insights as a template for visualising LM IIIC-PG society on Crete, complete with animal thefts, conflicts over grazing rights, and the codes of power and prestige embedded in transhumant lifeways (Vardaki 2004; Haft 1996; Herzfeld 1985).

Other archaeological and historical evidence, however, suggests we should exercise caution in positing the existence of a highly pastoral economy at the dawn of the EIA. The visibility and distinctiveness of pastoral societies in the ethnographic literature is no measure of their typicality in recent history or in antiquity (Forbes 1995, 327–28). Indeed, far from representing some essential feature of Mediterranean subsistence, dedicated pastoralism appears to only arise under certain conditions, often involving state-level organisation and an integrated upland-lowland economy (Cherry 1988, 12–17; Halstead 1987, 80–81). The involvement of the final palace(s) in woollen textile production, in other words, is rather more likely to have promoted systems of transhumance than the mere fact of living at higher elevations. Furthermore, only a minority of sites on Crete in LM IIIC were situated high enough to occupy distinct environmental or climatic niches from those closest to them at lower elevations, such as would necessitate seasonal movements (Wallace 2003a, 602–5). Clear patterns of higher and lower settlements, which might support a putative *ano-kato* system, are in reality not that common; Karfi, for which Watrous (1974; 1977) originally proposed the idea, is something of an exception[116].

Perhaps the clearest evidence arguing against an increase in pastoralism is that floral and faunal remains from sites of LM IIIC date exhibit a remarkable consistency with those of the Final Palatial period. At Karfi, wheat, barley, grapes, olives and a range of legumes have been recovered (Wallace et al. 2020), as they have in the more stratigraphically mixed assemblages at Kavousi Vronda (Flint-Hamilton 2016). Sheep, goats, cattle and pigs are ubiquitous, and while there may have been a slight increase in the proportion of caprids across most sites, relative to LM IIIA-B, age-at-death profiles where available fall within a generalised 'meat' model of consumption, which in reality

[116] There is likewise yet to appear any clear differentiation in architecture or layout between those settlements at lower and higher elevations. This may change with more excavation, but no EIA structures akin to the *metokhia* or *mitata* of more recent centuries have yet been identified in the uplands of Crete (though, of course, they would be easier to miss than substantial settlements).

probably corresponds to a balance between wool, milk and meat production (Moody 2012, 240; Halstead 2008, 242–44)[117]. At Karfi, which is among the very highest of all upland sites, continued rearing of cattle (in what might be considered far from optimal terrain) and the consumption of olives (which cannot grow at that height and so must have been obtained from lower elevations) are in fact strong indications that communities in LM IIIC consciously maintained the diversified plant-, meat- and dairy-based diets of previous centuries, even under the constraints of less productive environments (Wallace et al. 2020; Wallace and Mylona 2020).

Lost Connections and Marginal Landscapes

As outlined in previous chapters, though the locations occupied by defensible settlements from the end of the BA cannot be unequivocally linked to coastal threats, they were undeniably more elevated, rugged, and agriculturally limited. Wallace surveyed the productive landscapes of a number of sites founded or occupied in LM IIIC-PG and showed that in all cases they had more restricted access to arable land than those of the LBA or the modern period. There is evidence in the vicinity of some sites, which now stand above the upper limits of locally cultivated land, that until recently such elevations were historically terraced and farmed (Wallace 2003a, 608–9; Nowicki 1999, 162–63), yet they remain marginal in comparison to surrounding foothills and valley bottoms[118]. We do not know to what extent elements of land ownership weathered the collapse of the palatial system or the major relocations of late LM IIIB-C (and in any case these are essentially unknown in any context outside of the Linear B tablets)[119]. It has been suggested that in those places where settlement shifts were limited, or involved the continuity of former centres – as at settlements like Khania, Knossos, Phaistos, Khamalevri, and Kastelli Pediada – greater continuity might be expected in forms of property or land tenure (Wallace 2020a, 251–22). However, it is

[117] The assemblages published from house A.2 at LM IIIC Monastiraki Khalasmenos include similar proportions of sheep/goat (78.3%), cattle (11.9%), and pig (7.7%) to other contemporary settlements, but Dibble (2018, 88) notes that the small sample size means these should not necessarily be considered representative of the whole site.

[118] In some cases, such as around Tapes, there are no known LM IIIA-B settlements in the area, suggesting also that land would have had to be cleared ahead of its use for agriculture (Wallace 2002, 83, 87–89).

[119] Zurbach (2016, 2017) has suggested the possibility of a continuous line of development between the land allocated by the final palaces to various individuals – which, as revealed by the Linear B texts, came with a set of obligations or responsibilities with regard to the palace – and later conceptions of private property. However, archaeological evidence for such a process would prove very difficult to identify.

also possible that, given the Final Palatial economy seems to have encouraged more extensive modes of agricultural production in the vicinity of such centres, the collapse of the associated administrative systems may have dramatically altered the exploitation of these productive landscapes, which may have had major implications for land-holding. Sadly, the reality is that we do not know how arable and grazing land were claimed and reclaimed in LM IIIC, especially where settlement relocations took place within the same general landscapes as were previously occupied. In attempting to trace lines of development in landuse through this period, therefore, we must rely on the excavation and survey data currently available to explore some general agricultural and demographic constraints and possibilities.

For example, though they might have been more marginal compared those of LM IIIA-B, the most important question to ask of the agricultural landscapes around settlements in LM IIIC is whether they were able to readily supply the subsistence demands of their populations. In her assessment of the productive potential of eight LM IIIC settlements[120], Wallace (2001b; 2002; 2003a) concluded that a one-hour hinterland was sufficient to support their estimated populations, though often only just. However, her study employed estimates of 210-250p/ha of surface remains at each site and 1ha of land per person which, as discussed in Chapter 2, tend towards the high end of what we might expect for small communities making use of diversified, intensive agricultural regimes. Using the present estimates of 100-150p/ha and 0.6ha of agricultural land per person, a one-hour walking range in truth appears ample for most of these sites. This can be seen in the Mirabello area, where the modelled catchments for the LM IIIC period exhibit overlap within clusters of settlements (Figs 6.11-12), something in keeping with Haggis' (1993; 2001) argument that, within these clusters, agricultural landscapes were shared, meaning that marriages, inheritances, and any reserved areas of public land would have precipitated regular negotiation between the households of neighbouring hamlets and villages. However, between clusters there is very little to suggest pressure arising over access to agricultural land[121], and in no cases does the

[120] These were Frati Kefala and Kefali in the A0067ios Vasileios Valley, Profitis Ilias Rokka and Korifi in central Crete, and Anavlokhos, Tapes Epano and Kato Kastello, and Kritsa Kastello on the western side of the Bay of Mirabello.

[121] Indeed, given the reservations previously stated about viewing the *Kambos* around Kavousi as prime agricultural land, the actual catchments of this area might in reality have extended further up into the hills to the southeast. The practice of terracing would only reduce the distances these modelled catchments extend away from their associated settlements.

cultivated area approach a one-hour walking radius. The areas regularly exploited by the residents of these villages may have been somewhat larger if we take account of livestock, but given the lack of evidence for large-scale pastoralism, and the ability to graze animals on fallow fields and make use of less flat terrain, even this is unlikely to triple or quadruple the amount of land used, which would be required for the catchments of each cluster to begin rubbing shoulders with the others.

Around Galatas, the land was very sparsely settled in LM IIIC, and the modelled catchments for this territory exhibit little to no overlap (Figs 6.13-14). Similar processes of local integration, as seen in the Mirabello are, are thus not readily inferable. The modes of connectivity operating across the small sites of the Karteros valley, whatever they might have been, are therefore unlikely to have stemmed from the need to manage access to shared areas of agricultural land, as may have been the case in the Mirabello area. Evidence from both regions, however, supports the idea that, more agriculturally marginal though they might have been, the landscapes which surrounded the settlements of LM IIIC were more than ample to supply the needs of their small populations.

New Connections

Despite their frequent inaccessibility, upland communities of LM IIIC evince a significant degree of connectedness with their wider productive landscapes, and often defy our expectations about the sorts of marginal agricultural practices which might be expected in such locales. For one, a range of wild resources appears to have been exploited in many locations, supplementing the products of domesticated ones. Hare and badger have been found at Kavousi Kastro and Vronda, as have deer at Kastro, Vronda, Karfi and Thronos Kefala, with small amounts of wild goat or agrimi at Kastro, Vronda and Karfi (Snyder and Klippel 1996; 2000; Snyder and Reese 2016; Wallace and Mylona 2020; Karamaliki and D'Agata 2000; D'Agata 2002). Wild weed species with possible alimentary uses have been identified at Karfi and Vronda, as have fish and mollusc remains (Snyder and Reese 2016; Wallace and Mylona 2020). These latter are particularly remarkable at Karfi, the site being some 1000masl and several hours walk from coast. Indeed, putting these finds together with the olives probably sourced from around Krasi, the likely exploitation of the Nissimo and Lasithi plains for arable land and pasture, and the possible over-wintering of livestock down in the lowlands, Karfi paints a vivid picture of the forms of local and

long-distance movement and interaction which underpinned subsistence at even the most remote and seemingly inaccessible of upland sites (Fig. 6.15; Nowicki 1999, 160–64).

Indeed, many sites of the period appear to show balancing acts between the twin aims of defensibility and agricultural viability. Springs are commonly found in the vicinity of settlements, according to Nowicki (2000, 25–56, 232), oftentimes closer than at many sites of LM IIIB. The communities of Karfi, Khandras Voila, Khristos Skistra, Frati Kefali and Spili Vorizi had water sources either just below the settlement or within its bounds. Though less frequently sited on arable land than in LM IIIA-B, settlements of this period did commonly overlook it, as with Kritsa Kastello, Anavlokhos, Prinias, Gortyn, Thronos Kefala and those sites situated above the Agios Vasilios and Ierapetra valleys. In travelling to and from their fields each day, communities of LM IIIC may have been far less dislocated from the agricultural landscapes of their predecessors than their former centres of habitation. Finally, even in the case of practices which might be thought indicative of resource stress or marginal subsistence, the reality is not so clear. At Kavousi, the great majority of animal bones were found intentionally broken, in a practice which has been interpreted as marrow extraction, possibly via boiling and the production of stews and broths. However, this practice apparently continued right down into the LG period, suggesting that, far from being primarily a food-stress response, this was a culturally favoured form of preparation which had an associated benefit of increased dietary protein and fat (Snyder and Klippel 2000)[122]. Given the longevity of many upland settlements and the possible role of population expansion in the abandonment of those more short-lived, it would appear on balance that the communities of LM IIIC-PG were adept at navigating the line between defensibility and agricultural viability.

Our knowledge of how subsistence practices in the lowlands compared with those of more defensible communities is relatively slim. Khania and Khamalevri are notable for their high proportions of deer remains, suggestive of hunting practices and perhaps wooded areas in the vicinity of the coastal plains (Wallace 2003a, 607–8; Mylona 1999). Slightly later evidence from

[122] At Archaic Azoria, a high degree of fragmentation in the faunal remains is also seen, which Dibble (2017, 127-28) suggests may well be linked to marrow extraction. This process is also reflected more conclusively in the location of cleaver chops on animal limb bones, though Dibble (2017, 209-15, Fig. 7.25) notes such cuts are less common than those reflecting the dismemberment or apportioning of the carcass.

Prinias has also presented a range of hunted game, including agrimi, red and fallow deer, boar, fox, hare and badger (Wilkens 2003, 86). Whether hunting was a larger component of lowland diets is unclear, though we should expect food procurement strategies to have varied according to environment[123]. It does seem likely that in much of the island's flatter, lower-lying regions, communities would have faced fewer pressures and compromises in the production of sufficient food, as illustrated at the two sites at Profitis Ilias by Wallace (2002, 81–82). Significant communal dining occasions appear to have occurred at Phaistos in this period (Borgna 1997; 2004b), though the implications for the mobilisation of agricultural labour are unclear. We are in need of more botanical and faunal remains, and excavated settlement contexts in the lowlands before we can build up any clear picture of regional or contextual variation in subsistence practices.

Similarly elusive is evidence for hierarchisation in food production and consumption. It seems likely that the level of production was that of the household, a fact suggested not only by ethnographic parallels today (Forbes 2010), but by the layout and growth of villages and single dwellings of the period (Glowacki 2004; see Chapter 8). Almost every excavated settlement has at least one building which given its size, location, ratio of fine to coarse wares, or storage space has been put forward as a possible leader's dwelling or else location for communal dining (Tsipopoulou 2011a; Glowacki 2007, 136; Day and Snyder 2004a). However, distinguishing between these two possibilities is difficult, when forms of social storage and commensality, inclusive and exclusive access, and distinctive architecture are all plausible features of both. Evidence is plentiful that storage was common on the household level (Day 2011; 2017, 34; Nowicki 1999, 156–57; Tsipopoulou 2011b), and even if some pooling of resources or a degree of social stratification is likely, the scale of most of these communities makes it improbable that these were predicated upon structural inequalities. Most small settlements of the period – including a site like Monastiraki Khalasmenos – would have been well within the limit where humans can maintain face-to-face interactions across an entire group (Dunbar 1993), and within such communities, entrenched hierarchies, still less elite surplus extraction, seems questionable.

However, there are good reasons for thinking beyond the scale of single settlements when

[123] It has been noted generally across the Neolithic to Roman periods, for instance, that ovicaprids appear in greater proportions at more elevated sites (Moody 2012, 243).

considering agricultural production, landuse, and demography in this period. Working on the basis of the population estimates employed so far, it seems likely that most individual communities of LM IIIC housed populations in the tens, or low hundreds. This fact is significant because evolutionary anthropology (Wobst 1974; 1976; Bintliff 1999) suggests that human communities must attain of a minimum size of 5-600 individuals to be sustainably reproductive via endogamy. That is, though people in the small hamlets and villages of LM IIIC might have been agriculturally self-sustaining, they could not have been demographically so. One way of understanding the various mechanisms of connectivity still evident in the subsistence practices of this period – be it the cooperation of local site clusters, the sourcing of certain products from neighbouring villages, or the seasonal movement of livestock – is as part of a necessary intermingling of communities such that they could sustain small but stable populations[124]. Similarly, it places limits on the kind of structural inequalities that could feasibly develop within these populations, there being even less possibility for those of achieved rank to maintain endogamous relations only with those of equal social status (Bintliff 1999, 53 n.5). The power structures of these societies, as far as they were derived from agricultural production, are thus likely to have been fluid, contested and ultimately limited.

The Long Geometric

A Period of Silence

Our understanding of the subsistence systems of the 10th-8th centuries is extremely poor. There are but a handful of archaeobotanical and zooarchaeological samples corresponding to the period, and even among these we are confronted with a lack of fine chronological resolution and the problematic interpretation of non-domestic assemblages. Similarly, the number of excavated settlements of PG-G date is low, with the evidence such excavations have afforded seldom offering any direct insight into food production, still less systems of agricultural organisation and integration. The situation is particularly frustrating given the reorientations of settlement which

[124] Whitelaw (2015) has argued for similar kinds of mobility and interaction as linked to demographic sustainability in the context of EM settlements in the Mirabello area.

characterise the period. What follows is an attempt to tentatively map out some of the plausible developments in agricultural production which might have accompanied the settlement changes outlined in Chapters 4-5.

As far as composition of the agricultural package is concerned, broad continuity is likely. Botanical remains from PG levels of the Villa Dionysus and Little Palace North excavations at Knossos both include a wide array of cereals, legumes, fruits and nuts, while cereals, grapes and olives have been found at contemporary Thronos Kefala (Table 6.1; Hatzaki et al. 2008; Livarda 2012)[125]. The relative numbers of sheep to goats in faunal assemblages from Gortyn and Prinias – including apparently no goats at the latter – are curious, but in the broad ratios of ovicaprids to pigs and cattle they are consistent with those of the preceding era (Table 6.3; Wilkens 1996; 2003). In EIA deposits at Knossos, cattle are represented in higher proportions relative to ovicaprids than at most other sites of the period, and it is possible that some of these animals were used for traction, though this is by no means certain[126]. Age data on cattle are scant for the EIA, and though at later HL-Byzantine Eleutherna cattle are generally older, suggesting their use in ploughing, nothing of the sort can be readily inferred for PG-G (Moody 2012, 239). An increase in the proportion of pig at Kavousi Kastro from PG-LG has, on the other hand, been interpreted as reflecting a gradual shift away from reliance on sheep and goats, particularly through increasing exploitation of lower-lying terrain (Wallace 2010, 264). Yet from Archaic Azoria, ovicaprids comprised some 82% of

[125] The first half of the first millennium in Greece is the period traditionally assumed to have witnessed a transition from the primary use of glume to free-threshing or bread wheats (Halstead 2014, 178), but these assemblages shed little light on the process. Both emmer and bread wheat were found at the Villa Dionysus, while only einkorn was recovered from the Little Palace North.

[126] Dibble (2017, 291) has suggested that later, in the Archaic to Classical period, divergences in taxonomic composition may have existed between smaller and larger settlements, as assemblages from Knossos, Kassope and the Athenian Agora for these periods exhibit a more even distribution of species than those from the smaller sites of Azoria, Eleutherna, New Halos, and Rakhi. He suggests this could relate to smaller communities focussing on specific species for export and local consumption, while larger ones supported a wider range of stockkeeping strategies. The composition of the EIA assemblages at Knossos could be interpreted as an early reflection of similar processes. However, it is not clear that economic systems were in place that would have encouraged smaller communities to specialise in the rearing of, say sheep and goats, rather than maintaining a diverse agricultural base, as indeed is suggested by the available botanical assemblages. Another possibility is that differences in taxonomic composition relate to topographic or environmental contexts. For instance, Knossos' lowland situation could have been more conducive to plough-based agriculture, or at least the raising of cattle, than the hinterlands of more elevated or defensible contemporary settlements, where ovicaprids might have better suited the terrain. However, the proportion of cattle remains at Karfi (see Table 6.3) would appear to complicate such assumptions as well.

the faunal remains (Dibble 2021).

We are left, then, to reason mostly from the evidence afforded by settlement location change, which nonetheless is suggestive of certain broad trends. As discussed, the nucleations of the PG and G periods were regionally varied, but the greater agricultural affordances of sites founded during the 10th-8th centuries, as reflected especially by lower relative and absolute elevations, and increased availability of flat land, are apparent, though with the important caveat that *acropolis* sites were also popular locations which offered continued defensibility and more ready access to cultivatable land. In Wallace's (2002) study of agricultural potential around sites of LM IIIC date, the two sites with the most prime arable land also proved the longest lived, occupied into the A-CL periods (namely Anavlokhos and Profitis Ilias Rokka). Sites like Agios Georgios Papoura, Patsianos Kefali, Viannos Korakia, Kato Khorio Profitis Ilias, Azoria, Rotasi Kefala and Praisos were all, compared to those abandoned in the course of their growth, lower-lying, and with more ready access to flatter, better-watered land (Wallace 2010, 259). Even in less clear-cut cases – as with the probable abandonment of Vryses Profitis Ilias for Dreros, or Kritsa Kastello for Lato – the shifts seldom involved an obvious diminishment in agricultural potential, and issues of topography, visibility, and communication were no doubt also involved[127].

Wallace (2010, 234) has suggested that increasing commodity production from the 10th century onwards, with an accompanying expansion in the subsistence requirements of a non-agricultural workforce, may have precipitated much of the nucleation which occurred from PG-G. While the growth of non-farming specialists may have been linked to these changes, I would suggest certain demographic factors would also have been important. Beyond the question of whether communities in defensible locations simply grew too large for their more confined situations, an important threshold that may only have been consistently surpassed from PG onward is the 5-600 person minimum necessary to maintain endogamous reproduction (Tables 6.4-5). Looking only at our survey sites, Astritsi Kefala and Khoumeri in the Galatas region probably reached this scale

[127] In the Mirabello area especially, the proximity of alluvial deposits in karstic basins – as circumscribed areas of highly fertile land – has been implicated in the growth of communities such as Lato and Dreros (Gaignerot-Driessen 2016, 79–80; see Fig. 6.26). In the less fragmented, and generally more productive landscapes of the Pediada, such criteria may not have exerted quite such a force over settlement nucleation, however (see Fig. 6.27).

sometime in the PG-A periods (Figs 6.16-17; Table 6.5), while by the end of LM IIIC so may have Vrokastro, Kato Khorio Profitis Ilias and perhaps Azoria, though PG-LG remains have proved difficult to identify at the latter site (Figs 6.18-19; Table 6.4; Haggis and Mook 2015, 18). Bintliff (1999), in comparing the emergence of the Greek city-states with urbanisation in Medieval and Early Modern Europe, considers this threshold significant, because it marks the point at which communities, formerly existing in networks of marriage and inheritance with other nearby settlements, become able to minimise the leaching of agricultural land to such neighbours through consolidation within a largely endogamous centre. Around this larger community, the hinterland may shift and be redivided, but it achieves a kind of aggregate integrity.

Period	Cluster	Min. population	Max. population
MM III-LM I	**Total**	**7564**	**11371**
LM IIIA-B	**Total**	**800**	**1212**
LM IIIC			
	Kavousi	372	558
	Vrokastro	910	1366
	Kato Khorio	525	788
	Monastiraki	387	583
	Total	**2194**	**3295**
PG-G			
	Kavousi	50 5	1398
	Vrokastro	955	1496
	Kato Khorio	912	1368
	Monastiraki	149	224
	Total	**2947**	**4486**
PA-A			
	Kavousi	1566	2351
	Vrokastro/Istron	3017	4527
	Kato Khorio	425	638
	Oleros	2650	3977
	Total	**7658**	**11493**

Table 6.4 Population estimates for the Mirabello region, based on the size of settlements as recorded in the three regional surveys, and utilising estimates of 100 and 150 people per hectare. From LM IIIC, estimates are given for each of the settlement clusters which emerge in this period, as well as totals for the whole region.

Period	Cluster	Min. population	Max. population
MM III-LM I	**Total**	7908	11882
LM IIIA-B	**Total**	2197	3301
LM IIIC	**Total**	**719**	**1086**
PG-PA			
	Khoumeri	1444	2168
	Astritsi	1308	1963
	Total	**2752**	**4131**
Archaic			
	Khoumeri	1066	1600
	Astritsi	1217	1827
	Total	**2333**	**3502**

Table 6.5 Population estimates for the Galatas region. For the PG-A periods, estimates are given for each of the settlement clusters which emerge in this period, as well as totals for the whole region.

Something of this kind may be in evidence in the Galatas region, where the sites of Khoumeri and Astritsi Kefala emerged in this period as larger communities from a preceding scatter of small and largely undifferentiated settlements. Each was surrounded by a handful of continuing smaller settlements, something predicted by Bintliff's (1999, 47) model, and which are likely to have from that time existed in a somewhat subordinate position to the more consolidated centres. It is also in this period that the estimated catchments for these two clusters of sites begin exhibiting substantial internal overlap, as well as beginning to approach one another along the Karteros valley (Figs 6.16-17). These are merely approximations – which, however, are intentionally conservative, and do not factor in the additional demands of livestock – but they at least raise the possibility that by the PG-G periods, the productive landscapes of the region were becoming more crowded, with social strategies developing to avoid or mitigate potential conflicts within and between settlement clusters. In this scenario, nucleation may not have only provided a means of consolidating the agricultural holdings of each extended community, but also a source of security in the face of similarly expanding communities elsewhere in the same region. In the Mirabello region the estimated catchments for PG-G do not imply impingement between clusters, though they continue to exhibit significant internal overlap. The process of nucleation clearly observed in this region, along with the population estimates outlined in Table 6.4, may however support a model

based on the consolidation of land-holdings at the emerging centres of each cluster (Figs 6.18-19). A further possibility is that the depopulation of the central Ierapetra Valley at this time may be linked to the expansions around Kavousi and Kato Khorio. Caught between two growing agricultural territories, and unable to command the main routes of access in or out of the valley, residents of these former villages may have relocated either north or south, further fuelling the nucleation process.

Open Questions

Whether comparable developments can be inferred for those regions where nucleation is less apparent, and where occupation from LM IIIC appears more stable, is not clear. Knossos apparently grew to some 40-50ha in PG, implying by the present estimates a population in the order of 2500-5000 (Kotsonas et al. 2019). This would make it a quite singular political community in the period – indeed, it very probably was (see Chapter 7). Gortyn, meanwhile, appears to have fissioned into multiple settlement nuclei in LM IIIC-PG which may have only coalesced later, if at all, implying a different pattern of developments again (Allegro and Santaniello 2011; Allegro 1991; Judson 2018, 201–2).

Whether the emergence of regional centres able to maintain largely endogamous marriage networks holds explanatory value, it does offer an additional line of enquiry and interpretation regarding the growth of regional centres in the PG-G periods. It does seem likely that, where nucleation and growth occurred, changes in the organisation of agriculture were probably involved. The consolidation of populations would have opened up increasing opportunities for the emergence of more systemic inequalities in the ownership and management of agricultural land. The possible role played by cattle, as a form of agricultural capital, to be both used and loaned out as plough animals by those in command of larger holdings, has been raised as one mechanism by which growing dependencies and inequalities within populations were exacerbated (Palmer 2001, 71; Wallace 2020a, 252; Halstead 1996, 35). Similarly, increasingly complex relationships of debt and social storage could have gradually underpinned the accumulation of agricultural wealth by certain members of the community, especially in the context of consolidated hinterlands which would have developed around the larger settlements of the period (Wallace 2010, 265). Though all

plausible, these suggestions must remain at present largely speculative.

The establishment of new settlements in remote locations had, in LM IIIC, necessitated the formation of new modes of land use and micro-regional connectivity. In contrast, the consolidation of populations within larger settlements from the PG period must have occurred in the context of pre-existing bonds of social, political, and agricultural cooperation and competition. We should not presume that the lands surrounding former sites were simply abandoned, except in cases where they fell impracticably far from the new regional centre. Rather, these shifts probably incurred reconfigurations of access, ownership, and governance with respect to the now more integrated territories of these larger settlements.

Subsistence and the City-State

By the Protoarchaic-Archaic periods, there is increasing evidence that the growth of the island's incipient city-states might have begun to precipitate tensions around access to, and control over, agricultural hinterlands. Modelled catchments for the Mirabello region in this period for the first time produce significant overlaps between site clusters (Figs 6.20-21), most clearly between the putative hinterlands of Istron and the Meseleroi valley, while those modelled for Istron and Azoria come very close to overlapping in the area of Pakheia Ammos on the north coast. In the latter case, the less cultivatable terrain along the coast east of Istron may have served as a natural buffer zone between the hinterlands of these two centres[128]. More broadly we can also model catchments for the other emerging centres of the Archaic era. For this, population estimates of 3000 were used, a figure arrived at from several considerations. Firstly, Ruschenbusch's (1985; Bintliff 2006) 'Normalpolis', based on comparisons between the estimated sizes of *poleis* across the Aegean, comprises 2-4000 individuals. Secondly, this figure aligns with the average upper population estimates for the PA-A survey clusters in the Mirabello area (2875). Thirdly, looking across the rest of Crete, and utilising estimates for approximate settlement size in the G-A eras, 3000 appears as

[128] The apparent contraction of Kato Khorio Profitis Ilias to four hectares at this time is curious, given that it apparently spanned nine in PG-G and 11 in the Classical era. Whether this is a quirk of survey recovery, or perhaps linked to population shifts on the southern side of the Isthmus of Ierapetra (the city-state of Hierapytna itself is not attested until the CL era), I would hazard that the agricultural landscape of this subregion was not so empty at this time as it appears from survey. There does remain, however, a dearth of known sites in the area datable to the G-CL periods (Chalikias 2013, 31–32).

a reasonable estimate (see Table 6.6). These catchments, along with those modelled for the PA-A Mirabello survey sites are shown in Fig. 6.22, along with hypothetical 'boundaries' between the main centres of the region, which are weighted by estimated walking times, to approximate the mid-points between these communities, from the perspective of overland travel. The resulting picture is one of settlements whose agricultural catchments were likely beginning to exceed one-hour walking ranges, and in some cases coming close to or even intersecting with those of neighbouring centres.

Site	Size	Periods	Low estimate	High estimate	Source
Knossos	>60ha	G-A	>6000	>9000	Trainor 2019
Dreros	Traces of wall suggest 28ha possibly enclosed	G-A	2800	4200	Sjögren 2003
Istron	25ha	PA-A	2500	3750	Hayden 2004
Gortyn	Armi and Profitis Ilias together comprise c.22ha	LG-PA	2200	3300	Sjögren 2003
Azoria	15ha	PA-A	1500	2250	Haggis 2005
Phaistos	13ha	PA	1300	1950	Sjögren 2003
Prinias	Patela is 11.5ha	LG-PA	1150	1725	Sjögren 2003
Mean estimate including Knossos			**2690**	**4035**	
Mean estimate excluding Knossos			**1862.5**	**2793.75**	

Table 6.6 Population estimates of G-A centres on Crete.

Around Galatas, the picture is less clear (Figs 6.23-24). The total settled area within the survey region actually declined in this period, though the clusters centred around Astritsi and Khoumeri continued, albeit with the former evidencing a more nucleated pattern of settlement. The lack of growth from the preceding era raises questions about the long-term trajectory of settlement in the area. Taking a wider view and applying the same populations as above to the emerging centres of the Pediada (Fig. 6.25), Astritsi and Khoumeri appear somewhat trapped between the growing political communities of central Crete. Though these population estimates are very coarse, with the nature of occupation at several of these sites being unclear, we do know that most represent attested *poleis*, and so achieved a level of political stability and continuity that the smaller

communities around Galatas may not have (Perlman 2004a).

This all raises the spectre of conflict and contestation over land. It has been suggested that the abandonment of Anavlokhos in favour of Milatos may have been linked in part to the growth of Dreros, and increasing pressure around land use in the Neapoli valley (Gaignerot-Driessen 2017, 517–19). Ligortynos Kefala was abandoned sometime in LG-A, for which the growth of nearby Ini has been suggested as an explanation (Wallace 2010-1, 55–61)[129]. Azoria was also destroyed in the Archaic period, though later, in the 5th century (Haggis 2014a, 132). Though Istron and Oleros are attested in later CL-HL sources, the former was in time apparently made subservient to Lato (Faure 1967; Perlman 2004a, 1167), while the latter may have only ever been a dependent city-state (Hayden 1995, 94–96). It is unlikely the island as a whole was becoming objectively over-crowded. But the intersecting concerns of consolidating prime arable land and seasonal pasturage, of securing terrestrial routes and points of maritime access, and of negotiating boundaries, buffer zones and modes of engagement with surrounding communities, would all have produced complex and contested landscapes at this time (Figs 6.26-27).

Possible insights into these tensions come from what are admittedly later sources, belonging mostly to the HL era. Several accords between Hierapytna and other Cretan city states are known, including one with Praisos, which grants the citizens of the two cities rights to graze their flocks on the land of the other, provided they do no damage, and to move flocks seasonally between the two territories, provided they have a representative from the other city (Chaniotis 1995, 59–60; 1996, no. 5 B 33-68). A similar agreement is known between Hierapytna and Priansos (Kasteliana Kastello), which would have necessitated the movement of flocks through the territory of at least two other city-states, namely Biannos[130] and Malla, implying both complex accords between multiple polities and something more akin to large-scale transhumant pastoralism (Chaniotis 1996, no. 59 ll. 13-15). These agreements and others also make clear that charges were levied by cities on the use of pasture in their territories (in that these isopolity accords mention exemption from such charges). Similarly, treaties between Olous and the polities of Lato and Lyttos respectively

[129] Ini has been mooted as the historically attested Arkades, as has Afrati, which is in turn also a possible candidate for the town of Datala (Gagarin and Perlman 2016, 181). Perlman (2004a, 1152) favours the identification of Ini as the ancient Arkades.

[130] As the ancient name is typically rendered, in contrast to the modern community of Viannos (Perlman 2004a, 1154).

task each city with policing certain inviolable roads which probably connected these communities, over Mt. Kadiston in the first instance and Lasithi in the second (*IC* I xvi. 5 34-48). In the treaty between Lato and Olous, abduction and theft are specifically alluded to as crimes to be punished, and it may be that the movement of shepherds and what is known today in Crete as *zooklopi*, or animal theft, were of particular concern (Chaniotis 1995, 67–70; 1999, 191)[131].

We must be cautious in reasoning back from such evidence to an understanding of how the emerging political centres of the Archaic era negotiated territories, routeways, pastures and dues with their peers. As mentioned in the context of the end of the BA, pastoralism appears to be an economic mode favoured under certain political and economic conditions, and we cannot be sure such conditions obtained by the 7th or 6th centuries, though they might have been coming into being. Slightly closer in date to our period are the Archaic laws codes, though these refer to agricultural landscapes and production largely tangentially. In a decree from Lyttos (**Lyktos1B**, c.500 BCE) which may pertain to the pooling of private herds of sheep, goats, cattle and pigs, in anticipation of seasonal migrations, the paths and boundaries delimiting these activities are enumerated (Chaniotis 1999, 194–96). We might infer that animal husbandry by this time had achieved sufficient scale to necessitate state intervention, especially if the demarcation of space entailed by the decree reflects concerns about the potential damage to fields and orchards the amassing and driving of such livestock might have caused (Gagarin and Perlman 2016, 104)[132].

As concerns arable farming, an agreement between Gortyn and what may have been a dependent city-state, Rhitten, mandates that citizens of each community could build and plant trees on land belonging to the other, and then sell these on (**G80**.3-4). This would appear to suggest that unclaimed, public or common land still existed at the interstices of these communities, the motivation of the law perhaps to render that land productive and thus taxable (Gagarin and Perlman 2016, 102). Agricultural assets could apparently be bought and sold, as well as inherited, and there is a clear sense from Gortyn that at least part of the population commonly owned land

131 On agriculturalist-pastoralist relations in modern Greece, see Koster and Koster (1976).

132 Several laws from Gortyn mandate sacrificial offerings of all the main domesticates (**G1**, **G2**, **G3**, **G4**, **G26**, **G65**) and also cover penalties for damage done to livestock (**G41**.1-2), but there is very little indication of how large herds were, and thus what part animal husbandry played in the Archaic Gortynian economy. Perhaps at Lyttos, with its links to the Lasithi Plateau, such production strategies were more significant.

both within the town itself and in the countryside, where slaves are mentioned residing. Indeed, terms for both the town (*polis*) and countryside (*apamia* or *kora*) suggest that a distinction was by this time significant in the minds, and laws, of at least some communities (Gagarin and Perlman 2016, 97–98)[133].

Given this, it is notable that excavation at Azoria has hinted at restructuring in the relationships between the urban centre and the wider productive landscape in the Archaic period. The town at this time was significantly remodelled, with the construction not only of several apparently public buildings, wherein acts of communal dining occurred, but also new houses, with plans which differ from the agglutinative forms typical of the earlier settlements of Vronda and Kastro (Haggis et al. 2011a; Haggis and Mook 2011). Storage spaces in these new houses communicate more often with halls or central rooms than kitchens, and organic remains suggest the presence of cooked pulses, wine lees, and whole olives, while grain glumes and chaff are notably absent. It is possible that, by this time, certain higher-ranking members of society – those able to reside in the heart of the developing town – were in a position to delegate elements of primary production and processing of foodstuffs to others, such as lower-status freedmen, dependent farmers and even slaves (Haggis 2014a, 136). Produce might then have been transported to the centre, procured either by private ownership, market exchange or, in certain cases, some means of public redistribution, such as the historically attested men's dining halls or *andreia*. As to this last possibility, it may be significant that large-scale olive pressing equipment was also found in the so-called Service Building at Azoria, in the only evidence we have for the super-household processing of oil since the possible communal press at Kommos in LM III. This building communicates with the two large, probably public structures where evidence of large-scale communal dining has been unearthed, and so may have been serving the needs of various private and public gatherings (Pratt 2021; Haggis et al. 2011b). Nonetheless, we should be cautious in assuming any kind of binary separation between a land-owning class freed from agricultural labour, and poor and dependent farmers providing for their subsistence needs. It is likely that a significant proportion of the population remained directly

[133] The opposition of these two terms is found explicitly in **Ele16Ab**2-3 ('in the country [*apamia*] and in the city [*polis*]'), but is also implied by **G72**.4.32 and 8.1-2, referring to houses 'in the *polis*', **G79**.10, regarding those 'who live in the *polis*' and **G72**.4.35, mentioning the slave who 'lives in the country [*kora*]' (translations: Gagarin and Perlman, 2016).

involved in primary production, even if more unequal relations had developed in the management or mobilisation of the resulting resources.

In Bintliff's (1999) model discussed above, at those communities which continued to grow after crossing the important 5-600 person threshold, growing pressure and fragmentation within their hinterlands is argued to result in eventual, and sometimes quite dramatic, restructuring of the ownership and distribution of agricultural land, often through the initiative of a small, elite section of the population. The scale and rapidity of architectural changes at Azoria do not seem out of line with such a prediction[134]. There is, meanwhile, some evidence for expanding rural habitation in this period. It is regionally variable, and has not shown up in survey around Azoria, where we might most expect it, given the evidence from within the settlement. However, a dozen or more small sites, interpreted as farmsteads by the survey authors, have been detected around Phaistos, dating to c.625-550 BCE (Fig. 6.28; Watrous et al. 2004). On Lasithi, the site of Agios Georgios Papoura was slowly abandoned during the Archaic period, with resettlement of the plateau's fringes, something not seen since the LBA (Fig. 6.29; Watrous 1982, 21)[135]. Wherever they were located, it may be that by the Archaic period, if not before, certain members of communities all over Crete had moved decisively across the boundary between what Foxhall (2007, 38) terms 'subsistence production' and 'household production', that is from operating under the primary concern of minimising risk in agricultural production, to maximising the gains available from

[134] Later evidence of the existence of public land, particularly for grazing, raises the question of when such spaces were codified (Cooper 1978; Chaniotis 1995). Their being long-established even by the Archaic period is possible, but equally so is the codification of such land through the intervention of increasingly powerful civic institutions, something for which evidence only really becomes clear in the Archaic period.

[135] The clearest – and yet perhaps the most complex – example of newly expanded agricultural settlement is the Meseleroi valley, discussed in Chapters 4-5 (Hayden 2004a). There are several notable features about these sites. Many comprise large buildings, often with accompanying outlying structures, and their scale in terms of surface pottery scatters may thus belie relatively small populations at any one site. However, there are also a couple of much larger concentrations of dwellings and in the case of survey site SK11, a substantial walled settlement. This last may originally have served as the political centre of the region (perhaps along with SK1 and SK6), as settlement of the valley floor – where the historically attested community of Oleros is probably located – appears to have occurred slightly later. Many of these structures are assumed to represent large farmsteads or estates, perhaps occupied by extended families, and maybe attendant slaves (Hayden 1995). However, a greater variety of functions across these sites has recently been suggested from re-assessment of the survey material, with the possibility that, in contrast to what has been inferred at Azoria, the larger structures in the Meseleroi valley may have housed wealthy families, complicating assumptions about the urban rich and rural poor (Erny 2021; *pers. comm.*).

consistent surplus generation[136]. Those still in the former situation, in turn, may have been increasingly reliant on, or even dominated by, the latter.[137]

The regulation and protection of private property features prominently in surviving legal inscriptions, especially at Gortyn. The lion's share of the preserved laws in Gortyn's Great Code is concerned with regulating issues of familial property and inheritance, notably in the case of lone female heirs. While women did, in some ways, experience greater liberties in Gortyn at this time than, say, Athens, it seems clear that the underlying thrust of these laws was to minimise the degree to which land and assets could pass out of control of the extended citizen family (Lewis 2013, 74–75)[138]. Women received half the inheritance of their brothers, and in the case of being the sole heir were expected to marry their father's brother, or else one of an expanding circle of male kin (Gagarin 2012; Gagarin and Perlman 2016, 91). Only in exceptional cases, once all other options were exhausted, might women choose their preferred husband from outside their extended family. Indeed, there is throughout Gortynian law, from regulations on debt bondage to divorce, adoption, and even items that can and cannot be pledged as security on loans, a recurrent concern with preventing the impoverishment of the citizenry, and perhaps especially the wealthier propertied class (Lewis 2018, 163–64).

Based on the historian Dosiadas' account (*FGrH* 458 F2) of the *andreia* at Lyttos, as well as inscriptions from Gortyn mentioning harvest collection (**G77B**) and the contribution of one tenth of production to the state (*IC* IV 184.8-11), it has been suggested that tithes were a common means of mobilising resources for the *andreia*, and as such would serve to respect differences in production between the richer and poorer citizen households (Davies 2005). Indeed they would have

[136] This does not mean, as Gagarin and Perlman (2016, 105-107) note, that freemen or citizens no longer worked the land. Regulations like that in the Great Code at Gortyn (**G72**.4.34-35), which references slaves living in the country, in no way implies that all slaves were resident in such locations, nor that their masters lived exclusively in the town and did not engage in agricultural work. However, a situation where individuals owned land and property in both the town and the country is indicative of a level of wealth and status which would act as an additional buffer against the pressures of subsistence production.

[137] Whitelaw (e.g. 2019; *forthcoming*) has explored the relationship between intensive and extensive agricultural production in the economies, and associated settlement systems, of the palatial era. It may be that changes in the balance of these different production strategies may also be of significance to the social hierarchies of the Archaic period, with more powerful groups possibly promoting extensification on more substantial land-holdings.

[138] Or, alternatively, in the case of limitations on female property ownership and inheritance, to minimise the loss of goods that, under male ownership, were contributed to the *andreia* (Link 2003).

minimised the possibility of losing one's citizenship, in contrast to Sparta where, if one failed to pay fixed rations to the communal mess each month, citizenship could be withdrawn (Lewis 2018, 143; Hodkinson 2000, 177–79). This, in turn, would have served to protect the integrity of the communal institutions of the elite class.

Though it is increasingly recognised that Crete cannot be painted as a purely, let alone backwardly, agrarian economy (Perlman 2004c), the foundation of wealth at this time is likely to have been land-holding and surplus agricultural production, and as such the codification of laws specifically designed to mitigate the leaching of these assets out of family lines is instructive, particularly in light of the wider evidence of social reconfigurations in this period. The *andereia*, whatever their precise form, represent forms of social storage and redistribution, but ones which pool the resources of the community chiefly to support commensality and camaraderie among the adult male citizenry. That those groups excluded from these institutions – women, slaves, and perhaps lower-ranking freemen – were no doubt still directly involved in the agricultural regimes which supported them, is evidence of the degree to which structural inequalities in production and consumption had by this time become entrenched.

The issue of slavery, in this context, should be at the forefront of our minds when considering the consolidation of agricultural territories in the 7th and 6th centuries. Frustratingly, and as Foxhall (2007, 4) notes, slaves and 'ancient "peasants" are like post holes – you can see the places where they ought to have been, but frequently the evidence for their existence is only indirect'. Such is the case for the Archaic period, where the surviving laws make common reference to those of servile status, but evidence in epigraphy, history and archaeology for the origin of such indentured statuses in the EIA is scant. The old idea, that the 'serfs' of Crete represented the descendants of the island's Minoan stock, overrun by Dorian incomers, seems scarcely plausible today (Willetts 1955; cf. Dickinson 2020). Yet we lack evidence for the timing and processes of mass enslavement on the island. Whether such statuses developed slowly, through the accrual of debts based on unequal subsistence production, or else emerged rapidly, say through the subjugation of neighbouring communities, we simply do not have the evidence to decide (and they are not necessarily mutually exclusive). What seems likely is that, by the end of the 7th century at the very latest, structural inequalities were increasingly baked into the subsistence regimes of Crete's

political centres, in ways that had not been seen for many centuries.

Summary

Because it encodes so much about human communities, from basic survival to the foundations of state administrations, agricultural production offers a vital window into the diachronic developments of social systems. Though they may appear to embody contrasting scales and modes of production, there is a common thread linking subsistence in the time of the final palaces and the early city-states, and that is the recurrent tendency towards the transcending of self-sufficiency by some cohort of the population, and the resulting manipulation of the perennial strategies of diversification, storage, and redistribution. What represent, on the household level, the farmer's primary recourses in the face of environmental uncertainty, become on larger scales the means by which structures of inequality are established and maintained. For the BA palaces, or even the wealthier landowners of the Archaic period, diversification can entail localised specialisation, for those entrusted with – or confined to – some part of the wider agricultural regime. Similarly, modes of storage and redistribution, which on small scales serve as risk buffers and entail relatively egalitarian exchanges between peers, in more complex communities take on the form of codified systems of resource mobilisation, be it quotas on palatial flocks, taxes on agricultural produce, or the contributions of citizens to the *andreion*. The recurrent strategies of Mediterranean subsistence – the distributed plots, the range of species, the integration of arable and stock-keeping – form an undercurrent to the more volatile expansions and contractions of larger social configurations. This is not to say these strategies represent a static or separable part of the economy, but they are the starting point from which more complex systems emerge. What differentiates the agricultural economies of the LBA from the Archaic era are structures by which those underlying strategies were co-opted and rendered as tools of power and control, and the scales and regional contexts over which the resulting agricultural systems operated.

Chapter 7

Death and Burial

Introduction

This chapter aims to build upon the arguments of the preceding analyses of settlement patterning and subsistence practices, to examine how mortuary practices during the LBA and EIA may relate to elements of social organisation, networks of interaction, and regional variation across the island of Crete. For much of the LBA and EIA, the number of known tombs far outstrips that of known settlements (let alone excavated ones), and thus getting a handle on this substantial dataset offers the opportunity to trace broad patterns of continuity and change in an important sphere of social practice, with implications for wider systems of social organisation. Following an overview of the main developments in mortuary practice from LM II-A, this chapter considers the relationship between burial locations and the kind of environmental affordances explored in previous chapters. Next, chronological developments in tomb and cemetery use are examined, and compared to those outlined in Chapter 4 for settlements. Drawing on this evidence, a comparison is offered between the different networks of interaction which may have influenced regional differences in burial practice in the LBA and EIA, particularly with regard to tomb types and burial rites. Finally, developments in burial assemblage composition are analysed, and related to the changes in the structure and interaction of communities on Crete through the LM II-A periods.

Historical Overview

Burial Practices into the Final Palatial Period

A striking feature of burial in the LM IB period has been its longstanding archaeological elusiveness. Curiously few burial grounds from this time are known – particularly given the contemporary evidence of flourishing urban and palatial centres (Younger and Rehak 2008a, 170–

71; Evangelou 2009, 55–56; Devolder 2010). Along with nearby Arkhanes, Knossos is a notable exception, where groups of chamber tombs were in use at Mavro Spelio and the harbour area of Poros, as was the singular Temple Tomb (Dimopoulou 1999; Hatzaki 2012, 310, 2016, 197–98).

With the onset of LM II, this greater visibility of burial continued at Knossos, but otherwise the period heralded major changes in funerary practice (Fig. 7.1). New cemeteries appeared at Knossos, including diverse tomb forms like pit caves, shaft graves, monumental built tombs and single-chambered chamber tombs (Evans 1905; 1914; Hood and de Jong 1952; Hood 1956; 1959; Hood and Coldstream 1968). Many of these forms, along with their associated rites and assemblages, appear to either be of Mainland derivation or else possess some Cretan precedents, which may have been adopted and adapted on the Mainland before being reintroduced to the island (Popham, Catling, and Catling 1974; Popham 1980; Hägg and Sieurin 1982; Matthäus 1983; Cavanagh and Laxton 1981, 131–33; cf. Kanta 1997). Certain artefact types, especially weapons, bronze vessels, and items of personal adornment, are found across these tombs in combinations taken by some to be indicative of rank or role within the Final Palatial administration at Knossos. A martial, 'warrior' ideology, betokened by such finds, is a central tenet of the argument for military intervention at Knossos in this period by Mainland populations, of which the novel tomb types are likewise deemed indicative (Driessen and Macdonald 1984; Kilian-Dirlmeier 1985; Alberti 2018).

Others, however, have questioned this presumption of a Mainland takeover at Knossos, at least by a substantial incoming population. Isotopic evidence has been argued to undermine claims of foreigners arriving at Knossos in LM II-IIIA1 (Nafplioti 2008), though the datasets and methods employed in these analyses have been questioned (Alberti 2018). More fruitful, perhaps, has been the suggestion by Preston (1999; 2000; 2004) that given, among other things, the evidence for Near Eastern as well as Mainland influences in tomb construction, the diversity of funerary rites on display at early Final Palatial Knossos may be indicative of a new semantics of mortuary display, informed by elite practices from around the contemporary Mediterranean, as much as a simple reflection of invading Mainlanders.

Recent evidence shows that Knossos was not alone in the early adoption of these new funerary

practices, however. Excavations at Khania in 2003-2005 uncovered over 50 tombs of LM II-IIIB date, including pit-caves, shaft graves, and chamber tombs (Andreadaki-Vlazaki and Protopapadaki 2009). Similar accoutrements to the 'warrior burials' of contemporary Knossos have likewise been found in these tombs (Galanakis 2018, 92–93). Given the other evidence for Khania's unique position both prior to and following the final collapse of the Knossian administration (Hallager 1988; Petrakis 2014), these tombs add to the impression that similar processes of political, social and ideological change were underway at these two centres in LM II-IIIA1.

The Return of Visible Burial

With only a few exceptions, visible forms of burial beyond Knossos and Khania in LM II are hard to come by. From LM IIIA1, however, the situation began to change (Fig. 7.2), with chamber tombs built at Keratokambos Viannou (Banou 2002), Maroulas (Papadopoulou 2014, 155–56), and Episkopi Ierapetras (Kanta 1980, 150–58)[139]. The Mesara also saw renewed burial activity; many of the Kalyvia chamber tombs were likely constructed in LM IIIA1, as was the tomb at Goudies, while the MM III *tholos*[140] at Kamilari received new interments (Cucuzza 2002; Privitera 2011a; Girella 2019). Some of the earliest tombs at the Armenoi cemetery were also dug at this time (Tzedakis and Kolivaki 2018). Burial activity at Knossos and Khania appears to have continued apace, with the major cemetery of Zafer Papoura at Knossos coming into use, while more broadly the tomb types adopted across the island had, with a few exceptions like the burial enclosure at Arkhanes Fourni, clear Knossian (or else Khaniote) precedents (Kallitsaki 1997; Preston 2000, 202).

The number of known tombs is even greater in the subsequent LM IIIA2 period (Figs 7.3-4), something typically considered linked to the collapse of Knossian power (Preston 2000, 180;

[139] Though some LM IIIA1 pottery has been found in the tombs of Limenaria at Mokhlos, the excavators consider these most probably heirlooms, with the earliest tombs in the cemetery constructed in LM IIIA2 (Soles and Triantaphyllou 2008, 129–30).

[140] This is a *tholos* in the Cretan or 'Minoan' sense, taking the form of an above-ground tomb of circular plan, constructed from courses of stone. The Mainland or 'Mycenaean' *tholos* takes the form of a chamber dug into a hillside, and lined with courses of stone, with the capstone or final few courses rising above ground level, and in turn buried under a small tumulus of earth (Cavanagh and Laxton 1981; 1982; Belli 1991; 1997; Kanta 1997).

Karetsou and Girella 2015, 363; Girella 2020, 271–72). If the palace had exercised forms of control over who was and was not permitted formal burial in LM II-IIIA2 early, then its destruction could account for an expansion of such rites amongst the broader population. Nonetheless, the majority of known LM IIIA2 tombs are precisely those forms most common at Knossos, namely chamber tombs, and to a lesser extent large *tholoi*. Some sites are notable for bucking this trend, such as with the cremations of Olous (Kanta 2001b), or the reused MM *tholos* and unique 'house tomb' of Ayia Triada (Paribeni 1904; Girella 2020, 270–72), but these are in the minority. As will be explored below, though the funerary repertoire of LM IIIA2 late represented an admixture of different architectural and ritual elements, with histories of local and foreign development, in many areas burial practice was evidently influenced structurally and artefactually by rites hitherto most visible at Knossos and Khania.

Growth and Decline in the 13th Century

As is the case with settlement, the 13th century has produced more known tombs than the previous period, especially those with use spanning the tail end of LM IIIA2 and the early part of LM IIIB (Fig. 7.5). These are found across the whole island, but although the full range of burial types seen in the previous century continued, certain forms appear to have fallen out of favour, such as shaft graves and pit-caves (see Tables 7.1-2). Similarly, a decline in the quantities of certain artefacts – notably seals (Krzyszkowska 2005, 215), weapons (Deger-Jalkotzy 2006, 152; Blitzer 1990; D'Agata 2020, 303–4), and objects of bronze (D'Agata 2015, 94–95) – has been argued to herald a decline in the circulation of prestige goods on the island, and perhaps more broadly the fragmentation of elite power structures, which had previously been such a visible part of the mortuary landscape, though elements of this picture will be reconsidered below.

Though there remains much regional variation, the later 13th century seems to have entailed a decline in the practice of archaeologically visible burial. This may not have been a rapid process; at Knossos, use of chamber tombs appears to have been in decline throughout LM IIIA2 late and LM IIIB, so that the lack of LM IIIC tombs at the settlement need not reflect a sudden break in burial activity (Preston 2005, 86). Meanwhile, several burial grounds evidence use across the LM IIIB-C transition, such as Kritsa (Tsipopoulou and Vagnetti 2006), Milatos (Kanta 1980, 125–28)

and Myrsini (Smith 2020). Generally, however, the large-scale relocations of settlement evident across the LM IIIB and IIIC periods frequently entailed the abandonment of former cemeteries (Fig. 7.6).

	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	23	21	181	258	278	20
Tholos	4	1	10	14	21	30
Shaft grave	1	5	3	9	1	0
Pit-cave	1	3	12	17	4	0
Cave/Rock shelter	0	0	28	41	14	3
Pithos burial	1	0	7	7	8	27
Total	**32**	**33**	**255**	**372**	**360**	**92**

Table 7.1. Counts of the main tomb types represented within each ceramic phase of the Final and Postpalatial periods. Tombs listed under LM IIIA include all those dated to LM IIIA1 and LM IIIA2, and also those only generally datable to LM IIIA.

	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	72%	64%	71%	69%	77%	22%
Tholos	13%	3%	4%	4%	6%	33%
Shaft grave	3%	15%	1%	2%	0%	0%
Pit-cave	3%	9%	5%	5%	1%	0%
Cave/Rock shelter	0%	0%	11%	11%	4%	3%
Pithos burial	3%	0%	3%	2%	2%	29%

Table 7.2 Relative proportions of the main tomb types represented within each ceramic phase of the Final and Postpalatial periods.

It seems that the establishment of formal burial grounds at this time lagged behind the settling of new locations, perhaps implying that the inhabitants of upland, defensible settlements originally considered them only temporary refuges. Former cemeteries may have been frequented for some time, before new ones were founded in the vicinity of these new sites (Nowicki 2000, 233–34)[141]. The earliest tombs in the vicinity of Monastiraki Khalasmenos (Coulson and Tsipopoulou 1994, 86–88; Tsipopoulou and Coulson 1994-6, 372–78), Vrokastro (Hayden 2003, 2–3), Atsipades Fonises (Petroulakis 1915; Nowicki 2000, 204–6), and Kourtes Kefala (Taramelli 1901a; Nowicki 2000, 233) appear to belong to a later phase of LM IIIC than their associated settlements, while at

[141] Only in a few cases do we know of cemeteries in use from earlier periods into LM IIIC in the vicinity of defensible settlements – such as around Milatos (Xanthoudides 1918, 11; 1920-1, 154–57; Tsipopoulou 2005, 67), Myrsini (Smith 2002; 2020, 285), and Praisos (Bosanquet 1901-2; Whitley et al. 1999) – and in such cases the associated LM IIIB settlements have proven hard to identify. It is true, though, that many sites founded in LM IIIC do lack tombs contemporary with their foundations.

Kavousi Vronda the first tombs may have been cut at the very end or after the settlement's occupation (Day et al. 1986, 386–87; Day 2017, 4). The evidence for burial at continuing lowland sites is patchier. At Knossos, only one example of a tomb plausibly constructed in LM IIIC is known (Grammatikaki 1996), though burials were made in the earlier, monumental Isopata built tomb and Kefala *tholos* (Preston 2005; 2007), probably long after they had fallen into disuse, and a number of LM IIIC-SM infant burials were noted in the Stratigraphical Museum Extension excavations (Warren 1983). The Liliana cemetery was in use at this time to the north of Phaistos (Savignoni 1904), while at Tylissos a single chamber tomb has yielded LM IIIB-C material (Kanta 1980, 10). Burial evidence is lacking along the north coast between Khania and the plain east of Rethymno for this period, when in LM IIIA-B a number of burial grounds and large, standalone *tholoi* were in use (Galanakis 2011)[142].

In general, cemeteries of this period appear to have been relatively small, comprising anything from several, to a few tens of tombs, no doubt reflecting the generally limited size of the communities they served (Perna 2011), though, as at some earlier sites, it is possible that settlements may have had multiple loci of burial, rather than single consolidated cemeteries. Though the number of tombs currently known from this period represents a significant drop from LM IIIB, some caution is needed in interpreting this fact. Many of the settlements of LM IIIC are known only from survey or prospection, and there remains a strong possibility, in the absence of excavation, that burial grounds have gone unnoticed around many of these sites[143]. Similarly, the situation in LM IB is reminder that a decline in archaeologically visible forms of burial need not, *de facto*, suggest declining population – though as seen in Chapter 4, this may have been the case in certain regions in LM IIIC.

[142] The one exception being a chamber tomb near Mesi, southeast of Rethymno, where an early LM IIIC amphora accompanied a larnax burial (Tzedakis 1976).

[143] A further complication is that some 40% of the tombs apparently in use in LM IIIB are associated with just three sites: Knossos, Khania and Armenoi. Excluding these tombs, the 75% drop in tomb numbers between LM IIIB and LM IIIC is reduced to 60%. The decline is still significant, but it is a reminder of how our sense of the scale of tomb use in any one period can, given our patchy record, be significantly affected by the excavation of even a few large burial grounds. In the later EIA, an opposite situation is found, where the number of known tombs will, come the publication of the Eleutherna and Prinias cemeteries, jump by several hundred, something which has the potential to change our views on the nature or timing of population changes across the period.

Signs of Change in LM IIIC-SM

The late LM IIIC (and, where identified, SM; see Fig. 7.7) period represents a time of change in the structure and development of mortuary spaces on Crete, in ways which appear to signal social changes tied to the growth of larger communities from the 11th-9th centuries. Burial grounds associated with what would become political centres of the G-A periods were first established, such as near Afrati (Halbherr 1901b) and Eltynia (Rethemiotakis and Egglezou 2010). At Prinias, the earliest depositions at the site of Siderospilia were made within a large stone tumulus, in the vicinity of which the cemetery gradually expanded (Rizza 2011). A similar situation is discernible at Knossos, where the pit-caves T. 186 and T. 200+ were among the earliest in the Knossos North Cemetery, and around which later tombs were likewise constructed (Catling 1996a; 1996b).

This period also witnessed the steady growth of cremation as a major burial rite on the island. Cremation had been found at the scale of a whole cemetery in LM IIIA-B at Olous (Kanta 2001b; Ruppenstein 2013), but this was a unique case, with other LBA cremations being scattered instances at sites including Kritsa (Tsipopoulou and Vagnetti 2006), Phaistos Liliana (Savignoni 1904, 640–46) and Melidoni (Mavrigannaki 1967-8). The jar burials of Atsipades contained cremations from at least LM IIIC, as did the earliest burials at Prinias, while from the SM period the rite was practised at Knossos (significantly, in the above-mentioned Ts. 186 and 200+), Dreros, Kourtes, Vrokastro, Pantanassa and Kouvanoi/Eltynia (Catling 1996; Whitley 2016; Gaignerot-Driessen 2016, 229–32; Taramelli 1901; Hall 1914, 123–51; Tegou 1995; 1998; 2001; Rethemiotakis and Egglezou 2010). There is much spatial and chronological variation in the uptake of cremation burial through the EIA, though the existence of both inhumation and cremation in certain cemeteries, and even the same tomb, suggests that to at least some communities the rites were not necessarily in conflict with one another.

Consolidation of Burial Locations in PG-G

The 11th-9th centuries appear to have involved the consolidation and expansion of many pre-existing burial grounds (Figs 7.8-9)[144]. The major cemeteries of Knossos (Brock 1957; Coldstream

[144] There are, however, some difficulties in inferring this, as many tombs from these centuries are assigned to broad chronological phases (LM IIIC-SM, SM-PG, LM IIIC-PG) often on the basis of limited diagnostic pottery, rather than clear evidence of

and Catling 1996b), Prinias (Rizza 2011) and Kounavoi/Eltynia (Rethemiotakis and Egglezou 2010) continued, while burial activity at Afrati began to be concentrated in what would remain the main cemetery into Archaic times (Levi 19279). At Eleutherna, the Orthi Petra cemetery came into use, late in the PG period (Stampolidis 1990b, 2004a). The impression of continuity and growth at such larger cemeteries continued into the subsequent 8th and 7th centuries (Figs 7.10-11). This is especially clear in the case of Knossos, where the number of interments, particularly inurned cremations, rose notably between LPG and EG (Cavanagh 1996, 659–64). Continuity and/or expansion of burial activities are likewise apparent at Afrati (Levi 19279), Eleutherna (Kotsonas 2011c), and Prinias (Rizza 2011), in line with the evidence for political consolidation at these and other *acropolis* settlements in the central area of Crete in the 8th-7th centuries.

A slightly different picture emerges at Kavousi, where the cemetery established at the former settlement of Vronda continued (after what may have been a brief hiatus in MG) into the LG-EPA periods, perhaps serving the population still resident at Kavousi Kastro until early in the PA period. With this renewed use, the area underwent an apparent change in tomb type, away from the small tholoi of SM-MG to a range of cremation-bearing pits and cists (Day 1995; Liston 2007). These latter have similarities to the funerary or bone enclosures of Vrokastro, themselves constructed from at least PGB/G (Hall 1914, 155–69; Hayden 2003, 12–13). At Kavousi Vronda, many of these cists were constructed within – and even incorporating the walls of – long-abandoned houses (Day 1995; Gesell et al. 1995, 70–89). A similar situation may be observable at Monastiraki Khalasmenos, where a possible PG tomb was built into the wall of House B1 in the by-then abandoned settlement (Tsipopoulou 2011b, 465). The mortuary or ritual reuse of former settlements is known from a number of sites during the EIA (Wallace 2003b), raising questions about the social or ideological context in which groups living nearby continued to frequent such places. In parallel to Kavousi Vronda, at both Dreros and Anavlokhos there is evidence of burial activity from early in the occupation of the settlement – LM IIIC/SM-PG – continuing or being renewed in the G period, potentially including a similar shift from *tholoi* to cists or funerary enclosures (Demargne 1931; Tsipopoulou 2005b, 41; Van Effenterre 2009; Gaignerot-Driessen

continuity. See discussion below.

2016a, 208, 229–33). In the case of Dreros, the burial ground even appears to have been walled off sometime in the 8th century, in a demarcation of formal mortuary space not commonly found on the island at this time (Van Effenterre 1948, 15). In different ways, across Crete, many communities during the G-PA periods continued to frequent what were by now centuries-old loci of burial.

Fade Out: The Proto-Archaic and Early Archaic Periods

The LG-EPA periods were still a time of highly visible burial practices on the island. The above-mentioned cists and funerary enclosures of Kavousi, Dreros and Praisos (not to mention the Praisian *tholoi*), the chamber tombs of Knossos, and the *tholoi* of Afrati all continued in use, but by the LPA period many of these and other burial grounds ceased to receive interments (Fig. 7.12). The cemeteries of Knossos fell out of use in the final third of the 7th century (Coldstream and Catling 1996a, 722), while those at Afrati, Eleutherna and Prinias appear to have petered out by the late 7th or early 6th centuries (Rizza and Rizzo 1984, 48; Stampolidis 1998, 175; Kotsonas 2002, 42–43; Erickson 2010). At Eleutherna, this involved a shift towards the use of simple *pithoi* or urns, in contrast to the diverse rites of previous centuries, which had included cremations in pyres and trenches, chamber tombs, and *pseudotholoi* (Erickson 2010a, 250–52)[145]. At Afrati, however, jar or *pithos* burials were already the norm in the 7th century and, as made clear from recent re-examination of the grave assemblages (Biondi 2013), such interments were made until the middle of the 6th century at least.

A shift towards simpler, individual forms of burial is also discernible at Knossos in the latter phases of the North Cemetery. Chamber tomb construction appears mostly to have ceased during the 8th century, from which time amorphous pits and individual *pithos* burials became more common[146]. Recent rescue excavations have uncovered large numbers of such pits and cists, densely interspersed between chamber tombs of the PG-PA periods (Rousaki and Anagnostaki 2012). Though these are not yet fully published, and so their exact dates remain unknown, they may

[145] For *pseudotholoi* as a type, see Eaby (2007, 321).

[146] More common, that is, as a form of newly built tomb. As shall be seen below, the vast majority of actual burials continued to be made in the reused chamber tombs.

corroborate the impression of a shift towards more limited, individual modes of burial[147]. If this is a genuine trend at several of the centres of the G-A periods, it raises important questions about the broader political, economic, and religious structures of the associated communities (Kotsonas 2002; Sporn 2014). It is clearly not always a case of settlements themselves going out of use; as noted previously, the once perceived 'gap' in habitation at a number of sites in the 6th century has increasingly been called into question (for Knossos: Trainor 2019; cf. Erickson 2014). The decline of archaeologically visible burial in the A period is, like changes in religious practice and settlement patterning at the same time, a historical process still in need of further investigation.

Summary

This overview of burial practices gives some sense of the major changes and continuities which may be traced across the LBA and EIA. The remainder of this chapter utilises the database outlined in Chapter 2 to further interrogate these developments. The great strength of this database is that it permits comparative analysis of burial locations, types and contents across this entire period, something rarely if ever attempted in previous studies of mortuary practice on the island (the overview of Hatzaki 2012 is a notable exception). Therefore the approach adopted here is less concerned with a thorough enumeration of all the variations in burial activities and assemblages from every location across the LBA and EIA – though undeniably important, such a presentation of the data is already available in the catalogues of Löwe (1996) and Eaby (2007) – than with highlighting the aspects of mortuary behaviour which align with the prevailing concerns of the present thesis, namely the intersection of human activity and the affordances of the local environment; the importance of connectivity between communities; and changes in the scale and form of societal structures which evolved during the course of the LBA and EIA.

[147] There have been long-running issues, as mentioned previously, with identifying Archaic material across the island (Coldstream et al. 1999; Erickson 2010; 2014). This picture is starting to change, thanks to growing appreciation of the classificatory problems which may have artificially exacerbated the perceived dearth of Archaic ceramics in survey and excavation contexts, both on Crete and in the wider Mediterranean. As with Biondi's (2013) recent re-examination of the material from Afrati, it is not inconceivable that other mortuary deposits may be down-dated into the 6th century. This would prompt reconsideration of the trends in burial discussed here, though the decline in cemetery use and adoption of more constrained modes of deposition appear to be genuine trends, even if their timing might be revised in light of future research.

Landscapes of Burial

Before turning to the analysis of diachronic trends in burial practice, it should be noted that, as in the case of settlement and subsistence, the landscape of Crete has impacted on the form and character of burial practices throughout prehistory, often in ways that relate to the island's underlying topography and geology. These influences feed, in turn, into the spatial relationships which have recurrently developed between living communities and the areas demarcated for the disposal of the dead. Throughout both the LBA and EIA, burials were made across a comparable range of physical locales – from coastal to montane landscapes – and geographic regions (Figs 7.13-14)[148]. Similarly, the predominant tomb types in all periods were various forms of (at least partially) hypogean tombs, especially chamber and *tholos* tombs, alongside less elaborate types like cist, pit and shaft graves. There is good evidence that locations favourable to the construction of such tombs were consciously sought out by communities across the island. The soft white marls known on Crete as *kouskouras* were regularly exploited for the cutting of tombs, as noted around Knossos (Roberts 1981, 5), at Mokhlos (Soles and Triantaphyllou 2008, 130), Praisos (Bosanquet 19012, 249), and in the Mesara (Karetsou and Merousis 2018) and the districts of Mylopotamos and Rethymno (Hood et al. 1964, 55, 67). At Armenoi, geological survey of the site has shown that only those lithologies soft enough to be carved by bronze tools were utilised for tomb construction (Gize 2018a).

Particularly for those tomb forms (chamber tombs and *tholoi*) with *dromoi* leading to a subterranean chamber, slopes, ridges and hillocks were regularly exploited, their form being particularly conducive, even suggestive, for such constructions. This can be seen at Limenaria at Mokhlos (Soles and Triantaphyllou 2008, 130), the North Cemetery at Knossos (Cavanagh 1996, 651), and at Armenoi (Gize 2018b), Maroulas (Papadopoulou 2017, 133) and Prinias (Rizza 2019), among many other locations. It is no doubt part of the reason why so many tombs have been exposed

[148] The only areas to exhibit any kind of real discrepancy in the presence or absence of tombs between the LBA and EIA are the coastal strip to the south and southwest of Lasithi – where several notably early burials are known from LM II-IIIA1 – and, more significantly, the environs of Rethymno. In the LBA, the major cemetery of Armenoi and a number of large *tholoi* mark the region out as one of probable social vibrancy and economic importance, yet in the EIA almost no traces of burial have been found beyond the important cemetery of Eleutherna (Eaby 2007, 367–69).

during the building or widening of roads, where banks and slopes are cut back (Platon 1951, 444–45; Tzedakis 1969, 432–33; Rethemiotakis 1981, 389; Eliopoulos 1998c; 1998b; Papadopoulou 2010).

Broader regional patterns are discernible as well. In both the LBA and the EIA, burials in caves or rock shelters (that is, small niches or cavities) are known almost exclusively from the eastern third of the island (Figs 7.15-16). The LM III cemetery at Olous represents the largest concentration of such burials (Van Effenterre 1948, 7–13)[149], which are typically found only as isolated examples and only occasionally containing multiple interments (Platon 1961, 224; Tsipopoulou 2013). This may be partly a result of looting as these caves and rock shelters, seldom sealed following their use for burial, are easily plundered. However, even in apparently unlooted cases, only a limited range of artefact materials and types has been recovered. Occurring typically as single interments, in spaces requiring little to no construction or modification, and lacking elaborate built coffins or costly rites like cremation, these cave burials may represent the resting places of less wealthy, more rural populations, making use of spaces in some sense offered up for interments by the local landscape.

Issues of topography and geology appear, in turn, to have been weighed against a general concern for burial grounds to be located close to – though largely still distinct from – areas of habitation. There are, in the mortuary database, 97 cemeteries whose locations are known with a fair degree of accuracy, and which have been associated with a specific settlement. Plotting the distances to these cemeteries from their respective settlements (Fig. 7.17), there are some notable points of similarity and difference between the cemeteries of the LBA and EIA. In both periods, relatively few cemeteries were in use between 400 and 800m from settlements, but from 800m outwards were much more common, before declining in frequency again towards 1600m[150]. Many of the burial grounds of major LBA centres appear in this range, including several around Knossos and Khania, and the Kalyvia cemetery of Phaistos. There are exceptions, however, with the cemetery

[149] It should be noted that the forms of these burials – either inhumantions in larnakes, or cremations in *pithoi*, both of which were inserted into cavities in the rock – are unusual for caves/rock shelters, which typically contained inhumations, mostly without burial containers. Larnakes are found in caves and rock shelters, however, around the important settlements of Malia, Palaikastro and Zakros dating to LM III.

[150] And we may question the associations with particular sites that have been made for those cemeteries still further away.

of LM III Agia Triada found just to the northeast of the *Villagio* sector of the settlement (Paribeni 1904), though this may be a result of continuing use of an older cemetery, from a time when the site was smaller. In the EIA, however, there are a larger number of cemeteries much closer to settlements, with sites including Kavousi Kastro, Vrokastro, Eleutherna, and Karfi all having burial grounds within 0.25km. As these distances are measured from points approximating the centre of settlements, these close spatial relationships may be a reflection of the small size of many of these sites, where in larger population centres a distance of a couple of hundred metres may not have taken one much beyond the bounds of the occupied area.

Settlement	Intervisible burial ground(s)	Era
Agia Triada	Agia Triada	LBA
Arkhanes	Fourni	LBA
Khania	Multiple	LBA
Mokhlos	Limenaria	LBA
Phaistos	Kalyvia	LBA
	Liliana	
Afrati/Arkades	Afrati/Arkades	EIA
Anavlokhos	Lami	EIA
	Kako Plaï	
Atsipades Fonises	Atsipades	EIA
Dreros	Dreros	EIA
Eleutherna	Orthi Petra	EIA
Itanos	Itanos	EIA
Kavousi Kastro	Kavousi Vronda	EIA
Karfi	Ta Mnimata	EIA
	Astividero	
Kourtes Kefala	Kourtes Kefala	EIA
Prinias	Siderospilia	EIA
Vrokastro	Kopranes	EIA
	Karakovilia	

Table 7.3. Selection of LBA and EIA settlements which are intervisible with their associated cemeteries, as evidenced by excavation reports, construction of viewsheds in GIS, and on-site observation.

This distribution accords with the understanding of cemeteries as spaces typically located towards the periphery of habitation areas[151]. Cemeteries are likewise often, though not always, found along

[151] There are, also, several instances of intramural interments, these typically being child burials (McGeorge 2011). Indeed, there is good evidence – visible throughout the LBA and EIA – that the burial of subadults was often treated in a different manner to that of adults, with intramural burials, for instance, typically being those of children (Warren 1983; Eaby 2010). At PG-G Knossos, the

the major routes into and out of settlements. The cemetery of Prinias appears to have flanked a main artery leading from the *acropolis* (Rizza 2019), while a network of ancient roads has been discerned at Armenoi, possibly linking the cemetery to the settlement and the wider region (Chappell et al. 2018). The many tombs of LM III Khania likewise lie along a broad south-eastern trajectory, which may trace a major route leading to the settlement on the Kastelli hill (Fig. 7.18). As well as lying along corridors of movement out of settlements, cemeteries of both the LBA and EIA were also very commonly visible from within said settlements (see Table 7.3).

At Knossos, given the density of known mortuary activity at the LBA and EIA site, we can examine these spatial relationships more fully. Modelling routes to the settlement of Knossos, from 720 random points at a radius of 4.5km from the site, the locations of many of the LBA and EIA cemeteries exhibit correspondences with these likely axes of movement (Fig. 7.19). The burials around Gypsades and the Temple Tomb lie close to plausible points of entry to the valley from the south and southeast, whilst the EIA Fortetsa cemetery is within the vicinity of a possible routeway over the Acropolis hill. Particularly clear relationships with possible routes exist at the North Cemetery, which is bisected by one modelled route, while the tombs of the Kefala ridge lie close to another[152]. Several of these routes align closely with the modern roads of the area[153]. In the case of visual relationships, the evidence may be stronger still. In Figs 7.20-21, lines of sight were simulated from twenty points around the perimeters of the estimated LBA and EIA settlements respectively[154], to the tombs of the same periods. In both cases, visual relationships exist for almost every tomb, from at least one location around the settlement perimeter[155].

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re-deposition of Minoan *larnakes* has been linked by Coldstream (1998, 58–59) to infant interments, given the common absence of clear skeletal material in these sarcophagi and their association with miniature vessel forms.

[152] The cemetery of Zafer Papoura appears as something of an outlier, though the modelled route which runs to its east follows closely the course of the Kairatos stream, and so any real historical route along this valley should be further up the slope, bringing it potentially much closer to the cemetery.

[153] It could be suggested that part of this correspondence results from many of tombs of the North and Fortetsa cemeteries having been discovered during construction work along such roads (Brock 1957; Serpetsidaki 1994; Coldstream and Catling 1996b, 1–3). However, there is a very real possibility this coincidence reflects the historic use of similar arterial routes leading to and from the area of the ancient settlement, which were also constrained by stream crossings, in similar locations to those used by modern roads (Whitelaw, *pers comm.*).

[154] Based on the approximations given in Whitelaw, Bredaki and Vasilakis (2019, Figs. 7–8).

[155] An interesting case is the EIA Fortetsa cemetery, which would have been invisible from the western edge of the LBA site, but

These recurrent spatial and visual relationships between settlements and their associated cemeteries, across all periods of the late second and early first millennia BCE, are likely to reflect the great significance of these mortuary spaces to their living communities. The landscapes of the living and the dead intersected, and though, as seen, the latter were normally kept at some distance, the frequency with which cemeteries were both visible and readily accessible from their associated settlements suggests that these areas were active, powerful venues within the social and religious lives of their communities. These close spatial and visual relationships represent an important vein of continuity across the LBA-EIA transition; though the number of known burial locations dropped significantly across this horizon, their resurgence was marked by similar concerns with proximity, visibility and the physical affordances of the local landscape.

Trends in Tomb and Cemetery Use

Quantifying Tomb and Cemetery Use

With the data on tomb and cemetery use assembled in the mortuary database, it is possible to compare the trends already explored in the context of settlement and demography in Chapters 4-6 with the use of burial spaces, to assess the correspondences or divergences that exist between them. To begin at the broadest level, Figs 7.22-23 present counts of cemeteries and tombs definitely and possibly in use by period, while in Figs 7.24-25 these counts are divided by the length of the respective periods in decades. In all cases, similar trends are observable, with the LM IIIA-B periods representing a peak in cemetery and tomb use, followed by a significant decline in LM IIIC, a gradual rise to a second peak in G, and thereafter a second decline. The only inconsistency visible here is the number of tombs per decade, which declines slightly in PG, before rising again to G. There is, however, much uncertainty around the dating of a large number of EIA tombs, where only very broad assignations like 'EIA' or 'G-A' have been made[156], meaning smaller

with the likely extension of the EIA site onto the *acropolis* was brought within view of the contemporary settlement. Even accounting for the margin of error in the simulations, and possible changes in the natural and built landscape around Knossos, these reconstructions hint at dense visual connections between the spaces of the living and those of the dead

156 This is a result of both of difficulties with close ceramic phasing, but also the limited state of publication, with more precise dates as yet unconfirmed.

oscillations in these counts must be treated with caution. The broad chronological trajectory of known cemeteries – a rise post-LM II, a decline in LM IIIC, and a second rise to the G period – follows that of known settlements, as discussed in Chapter 4, and shown here in Fig. 7.26, where there two are compared. In Fig. 7.27, the relative proportions of settlement and cemetery counts are shown. For the LM II, LM IIIC, PG and G periods, cemeteries comprise between 36% and 46% of known sites; however, in LM IIIA-B this proportion is as high as 60%, while in the PA-A periods it drops to 30% and then below 5%. These two phases correspond with the growth and decline of visible burial practices discussed above in the context of the Final Palatial and Early Archaic periods respectively.

As with settlements, the rates of abandonment and continuity between periods offer further insight into the use of tombs and cemeteries across the LBA and EIA. The proportions of cemeteries and tombs abandoned or continuing into subsequent periods are shown in Figs 7.28-29, and the patterns are similar in each case. Cemeteries exhibit strong continuity in the LBA, with well over half of all LM II and LM IIIA burial grounds remaining in use into the subsequent phase. In LM IIIB, however, the level of continuity plummets, to less than 20%. Despite a wide margin of error for the LM IIIC-SM periods, there appears to be greater continuity, with a subsequent period-on-period decline between SM and G, though with the rate of continuity remaining between 60 and 40%. Then in PA there is another major drop, with little more than 10% of cemeteries continuing into the A period. These trends are very akin to those seen in Fig. 4.4 for known settlements, though they diverge in the PG-PA periods, where settlement continuity is seen to keep rising, while cemetery continuity declines. Individual tombs (Fig. 7.29) exhibit similar trends[157]. Here too, the LM IIIB and PA periods represent low-points for tomb continuity, while the LM IIIC-PG periods oscillate around 40%, with continuity between PG and G being above 50%.

The extent to which the tombs and cemeteries of each period were inherited or newly founded offers a complementary perspective on these trends (Figs 7.30-31). As with settlements, the low number of LM II cemeteries compared to those of LM IIIA means that, despite high continuity,

[157] Continuity in tomb use is lower across the board, but this is to be expected, as the use-life of single tombs is typically shorter than their respective cemeteries. Most tombs of LM II and LM IIIA, for instance, were abandoned, while most cemeteries continued.

relatively few cemeteries of the latter period were inherited from the former (Fig. 7.30). Also as with settlements of the time, LM IIIB is marked by high degrees of continuity from LM IIIA. In a reversal of the LM II-IIIA pattern, the large-scale abandonment of LM IIIB cemeteries was nonetheless accompanied by a reasonable rate of cemetery inheritance, given the smaller number of known LM IIIC burial grounds. Once more, the LM IIIC-PG periods are difficult to characterise with certainty given the large proportion of insecurely dated cemeteries, but there appears to have been a broad stability in the ratio of inherited to newly founded cemeteries. The PA period, finally, was marked by a high degree of inheritance from G. Individual tombs exhibit similar trends (Fig. 7.31), but a major divergence is visible in the A period. Here, cemetery continuity is total (no new burial grounds were established) but tomb continuity was very low (most tombs in use in the PA period were abandoned). Putting this evidence together with that of Figs 7.28-29, the G-A periods appear characterised by declining tomb and cemetery continuity which, in contrast to earlier periods, was not offset by new graves and burial grounds.

There is broad continuity in the main types of tombs in use during the LBA and EIA, though with significant changes in the relative proportions of the different types. As mentioned earlier, and as shown in Figs 7.32-36, hypogean tombs of chamber or *tholos* type were amongst the most common forms, with various kinds of pit and jar or container burial oscillating in popularity throughout the LBA and EIA, before becoming major rites in the G-A periods. Shaft graves were, with a few exceptions, essentially a BA form, with the funerary enclosure a characteristically East Cretan type increasingly common from the 9th century. As seen clearly in Fig. 7.33, no period witnessed a change in the relative proportions of different tomb types as major as that between LM IIIB and C[158], with the collapse of chamber tombs as the dominant rite across the island, and the rise in the use of small *tholoi*. This situation recalls that of settlement patterning, with the LM IIIB-C transition marking the single most dramatic shift, followed by more gradual developments thereafter. In the case of burial, this dramatic shift in the proportion of different tomb types may relate in part to the major drop in known tombs between LM IIIB and IIIC, with the high proportion of *tholoi* comprising only 39 examples. This form is especially common in east Crete from LM IIIC (see

[158] Excluding the A period, though this is a product of almost all centuries going out of use, with jar burials from Afrati comprising the vast majority of A period graves.

Fig. 7.36), and this region has likewise been more thoroughly explored for this period, given the visibility of the defensible settlement phenomenon there. Nonetheless, the near total abandonment of chamber tombs as a form by LM IIIC, and the emergence of the distinctive EIA *tholos* type - which contrasts with earlier LBA *tholoi* (see Kanta 1997) – does offer another indication of the major reorientations in cultural practices which accompanied the transition to the 12th century.

The different tomb types of the LBA and EIA do not diverge simply in their physical form or mode of construction. There is a broad distinction, for instance, between those burial forms almost exclusively used for the deposition of single individuals, and those tombs more commonly destined to receive multiple interments over years or generations. Plotting the distribution of burial estimates by tomb type (Figs 7.37-38), chamber and *tholos* tombs stand out as often accommodating several – and sometimes several tens – more burials than caves and rock shelters, funerary enclosures, *pithos* burials, pit-caves, *pseudotholoi* and shaft graves, with the wide range of pit burials representing a middle ground, where multiple burials are common, but seldom very numerous.

Tomb periods/ locations	Estimated number of interments					
	Min.	1st Quartile	Median	Mean	3rd Quartile	Max.
All periods	1	1	2	3.56	4	72
All periods Knossos	1	2	2	5.022	4.25	72
All excl. Knossos	1	1	2	3.044	4	44
LBA	1	1	2	3.062	4	48
LBA Knossos	1	1	1	2.403	3	48
LBA excl. Knossos	1	1	2	3.244	4	20
EIA	1	1	2	4.744	4	72
EIA Knossos	1	2	4	8.273	10	72
EIA excl. Knossos	1	1	2	2.854	2	44

Table 7.4 Summary statistics on the estimated number of burials across tombs of the LBA and EIA. Statistics are presented for all tombs, tombs at Knossos, and tombs outside Knossos, as well as for all periods, the LBA, and the EIA.

As seen in Table 7.4, in all periods, burials usually contained between one and four individuals, though Knossos stands out in the LBA with particularly low averages per tomb, and in the EIA with particularly high ones. Final Palatial Knossos has produced many burials of single individuals, including those with accoutrements linked to 'warrior' identities (Driessen and Macdonald 1984; Hatzaki 2012, 310–11), while in the EIA the site boasted a particularly strong collective burial tradition, focussed especially in chamber tombs. These contrasting traditions may relate to

differences in the social and political contexts within which burial was articulated during the LBA and EIA respectively.

There are diachronic patterns in the number of individuals buried in tombs during the LBA and EIA, which can be considered via the ratio of tombs containing multiple or single burials by period. Both kinds of deposition are known from every period under consideration here, but changes in their relative frequency may be tied into broader societal developments and structures. As shown in Fig. 7.39, multiple burial was more common across the LBA and EIA as a whole, though with clear variation between periods. In LM IIIA-B, single burials occurred in 40% and 28% of tombs respectively, with multiple burial by far more common. However, for the LM IIIC-SM periods, about half of all known tombs contain only single burials. In the PG-PA periods, multiple burial becomes again the dominant rite. The shift in the A period is particularly dramatic, but is largely explicable by most tombs for this period coming from Afrati, where single burial appears to have been common since at least the PA period. As regards the shift towards simpler or single burial that has been observed for the A period, these data suggest that the change, if genuine, was not necessarily a gradual process. Even in the PA period, multiple burial was far more common. A final observation is that, though excluding Knossos from consideration does not greatly change the island-wide pattern (see Fig. 7.40), the evidence for Knossos is actually quite distinct (Fig. 7.41), with single burial tombs being in the majority in LM IIIA, and very rare from PG onwards.

One further consideration is the nature of the burial locations themselves, and specifically whether tombs were isolated, in small clusters, or else situated in larger cemeteries. The relative proportions of these different contexts of burial have implications for the structure of the communities in question, as recently explored for EIA Attica by Rönnberg (2021). Drawing on the method employed by Rönnberg, tombs in use in each period are here split into three categories, namely single tombs, and those occurring in groups of less than 10, and more than 10. These are shown as counts in Fig. 7.42, and relative proportions in Fig. 7.43. Nearly half of all LM IIIA burials were made in cemeteries of more than 10 tombs, while in LM IIIB this was closer to 25%. Isolated tombs are similarly common in these two periods, with LM IIIB characterised by increasing use of small burial grounds comprising fewer than 10 tombs. In LM IIIC, larger cemeteries were slightly less common again, though the main change in this period appears to be a growth in the

proportion of isolated tombs. The SM period shows a shift back towards larger cemeteries, with the burial grounds of Knossos, Eltynia and Atsipades all coming into use in this period. A slight decline in larger cemeteries, and a rise in single burials is seen in PG, but following this there is a decline in isolated tombs, and a marked growth in the proportion of tombs situated in larger cemeteries. In the Archaic period, nearly all known tombs are found in such contexts, though in this case these tombs belong to the single cemetery of Afrati.

Taken together, the foregoing observations complement the evidence from settlement patterning explored in Chapters 4-5. The LM II-IIIA periods saw an increase in known burial contexts, with significant continuity into the subsequent LM IIIB period in terms of tomb and cemetery use, and the types of tombs employed. The LM IIIB-C periods witnessed major turnover in both settlements and cemeteries, with very limited continuity, a drop in the number of sites of both kinds per decade, and a decline in large burial grounds, with growing numbers of single interments and isolated tombs. The subsequent PG-PA periods exhibit far greater continuity of both settlement and burial locations, while an increasing proportion of tombs belonged to larger cemeteries, and multiple burial was the dominant practice. In the PA-A periods, however, a bifurcation occurs in the evidence from habitation and burial contexts, with cemeteries increasingly abandoned despite continuity at many of their associated settlements, with the trend towards burial in larger cemeteries continuing. The Archaic period involved the disappearance of visible burial in many areas, and though the Afrati cemetery in this period hosted mostly single interments, more evidence is needed to decide whether this situation was typical[159]. Rönnberg (2021, 154–57) has interpreted shifts in the ratio of tombs appearing singly, in tomb groups, and in large cemeteries as reflecting changes in the scale of communal social relations and structures, with the growth in the latter representing the consolidation of larger, stratified and heterogenous communities. On Crete, such an interpretation may also be appropriate, with LM IIIC especially characterised by more modest burial practices, with more isolated tombs and greater frequency of single interments, and the LM IIIA-B and particularly the PG-PA periods marked by wider use of larger cemeteries and, within these, burial practices placing greater emphasis on elements of group membership. In

[159] Though a similar pattern has been observed at Eleutherna (Erickson 2010a, 250–52).

these respects, tomb and cemetery use may reflect aspects of wider social organisation in the LBA and EIA periods.

Tomb Types in the Final Palatial Era

A central argument to emerge from the preceding chapters is that many of the contrasts observable in the organisation and practices of communities either side of the LBA-EIA transition can be linked to reformulations in the nature and scale of networks of communication and interaction that operated across the island both locally and between regions. Aspects of the trends in mortuary practice explored above may also be interpretable in these terms, such as the expansion of archaeologically visible burial in LM IIIA2. As mentioned, the general absence of visible tomb forms in LM II beyond Knossos and Khania was followed from LM IIIA1, and particularly in LM IIIA2, by the reappearance of such forms across much of Crete (Preston 2000, 176–77). As seen above, the growth in the number of known cemeteries between LM II and LM IIIA even outstrips the simultaneous rise in the number of known habitation sites. Though the number of tombs with use dating to LM IIIA1 has increased in the past couple of decades (Apostolakou 2001-4; Banou 2002; 2004; Andreadaki-Vlazaki and Protopapadaki 2009; Andreadaki-Vlazaki 2011; Papadopoulou 2010), a significant expansion in archaeologically visible tomb use does appear to have occurred in LM IIIA2.

The resurgence in visible burial in LM IIIA2 may be related to a decline in Knossian restrictions on mortuary practice (Preston 2000, 180; Karetsou and Girella 2015, 363; Girella 2020, 271–72), but the tomb types and burial assemblages which were widely adopted in this period still evidence the kinds of networks of movement, information transfer, and cultural integration which have been argued to characterise the Final Palatial period. Indeed, Knossos (and perhaps Khania), emerges as the likely origin point for much of the behavioural and material repertoires of LM IIIA-B burials. For example, concomitant with the resurgence of visible burial across the island is the (re)adoption of the *larnax* or clay sarcophagus, a form which is generally assumed to derive from contemporary wooden chests, perhaps with reference to earlier Cretan *larnakes*, which are known from the late EM-LM IA periods (Hägg and Sieurin 1982; Marinatos 1997; Catania 2019). Comparing the proportion of tombs at Knossos which contained *larnakes* from LM IIIA2-B, with

the proportions across Crete, we find that the central region was the real heartland of the practice (Table 7.5). Knossos, where over half of tombs in use in LM IIIA2 and IIIB contained *larnakes*, and where the wooden coffins which may have inspired the form are likewise most common in LM IIIA1, is probably the origin point for the use of these sarcophagi in LM III[160].

West Crete

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	1	17	6%
LM IIIA	2	28	7%
LM IIIB	2	45	4%
LM IIIA-B	2	157	1%

West Central Crete

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	22	74	30%
LM IIIA	31	95	33%
LM IIIB	39	114	34%
LM IIIA-B	53	239	22%

Central Crete

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	39	55	71%
LM IIIA	51	85	60%
LM IIIB	72	91	79%
LM IIIA-B	104	159	65%

Knossos

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	21	35	60%
LM IIIA	27	96	28%
LM IIIB	25	38	66%
LM IIIA-B	47	163	29%

East Central Crete

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	4	33	12%
LM IIIA	13	44	30%
LM IIIB	14	22	64%
LM IIIA-B	33	77	43%

[160] There are regional trends in the use of *larnakes*. For instance, though *larnakes* are found across much of Crete in LM IIIA-B (Fig. 7.44), the bathtub type of this vessel has a distinctly eastward distribution, in comparison to the more widespread chest type (Figs 7.45-46). This distribution raises the recurrent question of the east's cultural distinctiveness from the rest of the island, but it is worth noting that chest *larnakes* were by no means rejected in this region, often occurring alongside bathtub *larnakes* in the same cemeteries (Preston 2000, 230–32). In addition, *larnakes* are vanishingly rare in the far west, though whether this should be interpreted in light of the local administration at Khania – which may have exercised a political authority and cultural influence at least partly independent of Knossos – is unclear, given the relatively low number of burials known from this region in the period.

East Crete

Period	Larnax count	Tomb count	% with larnakes
LM IIIA2	18	36	50%
LM IIIA	22	59	37%
LM IIIB	31	66	47%
LM IIIA-B	42	121	35%

Table 7.5. Counts of tombs with larnakes, of all tombs, and the proportions of tombs containing larnakes by period and by region. Knossos is accorded its own entry, and the Central region excludes Knossos.

Beyond *larnakes*, Knossos was also very probably the source of the predominant tomb type employed across Crete in LM IIIA-B: the single-chambered chamber tomb (see Fig. 7.47). Its popularity from LM IIIA2 is marked; indeed, the chamber tomb is even more common outside Knossos than at the site itself (Table 7.6). As shown in Fig. 7.36, the chamber tomb was the most popular type in every region except the mid-east in the 14th and 13th centuries, including in the far east. This is notable because this region is almost certainly beyond the ambit of the Final Palatial administration at Knossos (Bennet 1985; 2011). While, as noted above, burial in caves and rock shelters appears to be a distinctly east Cretan practice in the LBA and EIA, in LM III the region also witnessed the construction of many chamber tombs, and several *tholoi*. The rejection, or simply the absence, of Knossian authority in this region did not prevent the uptake of burial practices in vogue at the palatial centre.

Larnakes and chamber tombs are two of the most visible elements in the re-emergence of visible burial across Crete in LM IIIA2-B. Given that they are they mostly traceable to Final Palatial Knossos (and perhaps Khania), there spread across the island can thus be seen as another manifestation of the lowland, coastal networks of movement and political integration explored in previous chapters in relation to settlement patterning and subsistence practices. Such an interpretation can stand regardless of whether an early or late date is favoured for the end of political authority at Knossos. The Kalyvia cemetery near Phaistos began in LM IIIA1, where chamber tombs and shaft graves on the Knossian model were constructed, within which inhumations were placed on benches, on wooden biers and in pits, and where grave goods included gold jewellery, bronze vessels and weapons (Savignoni 1904, 501–627; Privitera 2011a). The Armenoi cemetery, likewise, was founded in LM IIIA1. Here, the use of large chamber tombs, and even one large *tholos* tombs, parallel the burial forms in evidence at Knossos and Khania

(Papadopoulou 1997; 2017).

A) KNOSSOS	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	18	14	16	35	14	0
Tholos	3	3	1	1	1	2
Shaft grave	1	1	1	7	0	0
Pit-cave	1	3	7	11	1	0
Cist grave	1	0	3	3	0	0
Total	24	21	28	58	18	2

B) KNOSSOS	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	75%	67%	57%	60%	78%	0%
Tholos	13%	14%	4%	2%	6%	100%
Shaft grave	4%	5%	4%	12%	0%	0%
Pit-cave	4%	14%	25%	19%	6%	0%
Cist grave	4%	0%	11%	5%	0%	0%
Total	24	21	28	58	18	2

C) CRETE	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	1	6	145	220	259	19
Tholos	0	0	9	13	20	28
Shaft grave	0	1	0	2	1	0
Pit-cave	1	0	6	7	4	0
Cave/Rock shelter	0	0	27	32	15	3
Pithos burial	1	0	7	7	8	27
Total	3	8	212	306	334	89

D) CRETE	LM II	LM IIIA1	LM IIIA2	LM IIIA	LM IIIB	LM IIIC
Chamber tomb	33%	75%	68%	72%	78%	21%
Tholos	0%	0%	4%	4%	6%	31%
Shaft grave	0%	13%	0%	1%	0%	0%
Pit-cave	33%	0%	3%	2%	1%	0%
Cave/Rock shelter	0%	0%	13%	10%	4%	3%
Pithos burial	33%	0%	3%	2%	2%	30%
Total	3	8	212	306	334	89

Table 7.6. Counts and proportions of tomb types by period at Knossos (A-B) and across the rest of Crete (C-D). Note there are differences in the tomb types listed, as certain forms (notably the cave/rock shelter) are not found at Knossos. The total counts also include other forms not enumerated in the tables, which is why they don't always match the sum of the listed types. Proportions are calculated from this total.

Even in later cases, potentially following the collapse of the final administration at Knossos, the

widespread adoption of the chamber tomb and *larnax* evidently references, draws on, or else adapts conspicuous features of burial previously employed at the palatial centre(s) [161]. Such a situation can be seen in Tomb 2 at Ligortynos and Tomb 15 at Mokhlos Limenaria, which, as D'Agata (2015, 94–95) has highlighted, each contained a *larnax* burial outfitted with drinking sets, bronze vessels and *rhyta* – all quite rare in LM IIIA2-B contexts – with clear parallels to the mortuary repertoires of Final Palatial Knossos. The resurgence of visible burial in LM IIIA2 might thus be interpreted as reflecting local elite monopolisation or exploitation of ostentatious funerary rites, which largely evoked those of Final Palatial Knossos (Preston 2000, 202; Hatzaki 2012, 311; Galanakis 2011). If the variability seen in the tomb forms and rites of LM II Knossos reflect a turbulent period of elite competition and rivalry manifested in experimentation with exotic funerary practices (Preston 1999), then by LM IIIA2 a more stable and restricted repertoire of mortuary rites had crystallised (Preston 2000, 150–52), and it is adaptations of this form that we largely see playing out across LM IIIA2-B Crete.

Such a view is also consonant with a more gradualist interpretation of Knossian decline. As discussed in Chapter 1, the new chronological phasing suggested by Skelton and Firth (2016b) draws attention to possible changes in the structure or orientation of Final Palatial administration through time. What are dated as the latest set of tablets by Skelton and Firth probably belong in late LM IIIA2 or IIIB early, and still reflect a territory similar in size to that inferable from the earlier tablets (Whitelaw *forthcoming*), but this does not mean the nature of its governance or cultural influence was unchanged. The growing stature and freedom of local political elites is a possible feature of a declining centralised administration, and it may be that, during the transition to the Postpalatial period, visible burial again became a powerful means of local status differentiation or social signalling, which drew on the prevailing forms of burial at Final Palatial Knossos, even as the centre's political dominance waned (Galanakis 2011). Central to this process of adoption – and adaptation – would be the networks that, as explored in previous chapters, likely served to integrate

[161] For instance, the motifs employed on many *larnakes* in LM IIIA2-B harkened back to the symbols of palatial religion and display, such as Horns of Consecration, double axes, chariots and hunting scenes. Though their adoption may reflect a metamorphosis of such symbols within more localised ideological and ritual frameworks (Heywood and Davis 2019, 703–5), they still make clear visual reference to the iconography of palatial era ritual.

the lowland and coastal regions of Crete, even during and after the process of palatial decline[162].

Regional Patterns in EIA Burial Practice

If the resurgence in visible burial practices in the LM IIIA-B periods can be tied to networks of political, economic and cultural interaction largely centred on the final palace(s), then the spatial and chronological patterns of mortuary activity evident in the EIA would appear, in turn, to be a reflection of the smaller scale, less integrated networks which developed following the major reorientations of settlement across the LM IIIB-C transition. The adoption of cremation across the island is a good example (Fig. 7.48). Unlike the spread of chamber tomb or *larnax* use in LM III, the gradual uptake of cremation as a major rite in the EIA appears to have been a piecemeal process without any single site or community obviously serving as a model. Cremation burial is known in LM III (Figs 7.49-50), as previously mentioned, at Olous on the Bay of Mirabello. This cemetery contained some 25 cremation burials in *pithoi*, alongside interments in *larnakes*, inserted into niches in the rock (Van Effenterre 1948; Kanta 2001b). However, this is not guaranteed to be the source of the practice in the EIA, as the latest cremations at Olous date to LM IIIA2. One possible and two definite cases come from two tombs in the vicinity of Kritsa (Tsipopoulou and Vagnetti 2006)[163]. Evidence becomes more extensive in LM IIIC (Fig. 7.51), with the 25 jar burials near Atsipades, probably associated with the site at nearby Fonises (Petroulakis 1915). The form of these burials is unusual, and without clear precedent within the region. Once thought a burial ground exclusively for youths, recent evidence suggests adults were also cremated here (Agelarakis et al. 2001). Other instances of adult cremation burial in LM IIIC-SM are known from Tomb A at Myrsini (Xanthoudides 1904, 21–38), *tholos* tomb V at Vrokastro Kopranes (Hall 1914, 149–51), and the stone *larnax* found at the Fythies location at Arkhanes (Sapouna-Sakellaraki 1990, 83–85), while Tomb D at Phaistos Liliana (Savignoni 1904, 639–46), and the Fatoula *tholos* at Praisos contained subadult cremations (Platon 1960, 303–5). Several of the earliest burials at Prinias were

[162] That communities were able to weather this transition, whilst continuing to draw on longer distance connections, both by land and by sea, can be seen in the tombs of Mokhlos. Hwere, while imported vessels from Knossos (known from LM IIIA1) declined during LM IIIA2, imports from the Mainland and Khania began arriving, and those from Palaikastro grew more diverse, something reflected in the mortuary assemblages of the Limenaria cemetery (Smith 2005; Soles and Triantaphyllou 2008).

[163] Both the confirmed cases, however, are of infants, while the adult remains were all inhumed, suggesting it was by no means a standard rite for all members of this community.

likewise cremations in LM IIIC (Rizza 1996).

The SM period (Fig. 7.52) saw the adoption of cremation at Knossos, where a number of tombs at the North Cemetery contained burnt remains, including the above-mentioned tombs 186 and 200+ (Catling 1996b, 645–48). Further instances are known from Dreros (Van Effenterre 2009), Anavlokhos (Demargne 1931, 374–79), Kourtes Kefala (Halbherr 1901a, 290), Pantanassa (Tegou 1995; 2001), Kounavoi/Eltynia (Rethemiotakis and Egglezou 2010, 35–85) and Tylissos (Marinatos 1931) in this period, with continuing employment of the rite at Prinias, Vrokastro, and Atsipades. In PG (Fig. 7.53), cremation appeared at Rotasi (Platon 1958), Gortyn (Alexiou 1966, 189–91), Phaistos (Chatzi-Vallianou 1979), and Eleutherna (Stampolidis 1990a, 383 n.13), whilst continuing at Knossos, Dreros, Anavlokhos, Kourtes, Vrokastro and Kounavoi. By the G period, the practice was widespread, representing a majority of tombs and known interments (Fig. 7.54).

The transition from the near-total dominance of inhumation as a rite can thus be slowly traced across much of the island (Figs 7.55-56), though there are regional differences (Fig. 7.57). In the far west of Crete, cremation may never have become the main funerary rite; in the far east, both rites remained common; in the central west region, the evidence is too scant to interpret; but between Eleutherna and Vrokastro it was more common than inhumation by the G period at least, and probably PG at Knossos and in central Crete. But beyond these broad regional differences, the preceding overview of its appearance in the LBA and EIA mortuary record makes clear that no single community of origin, nor obvious mode of dissemination, has yet been identified. Origins in Asia Minor, the Levant or else the Italian peninsula have been advocated (Ruppenstein 2013; Agelarakis et al. 2001). The precise reasons why cremation was gradually adopted as a major burial rite in several regions of EIA Crete are likely to remain somewhat obscure, but this regionally varied process with no clear single point of origin contrasts markedly with the dissemination of chamber tombs, *tholoi* and *larnax* burials in LM IIIA, where the Knossian and Khaniote precedents are clear.

The lack of obvious origins in the spread of cremation burial finds parallels in the distribution of tomb types across the cemeteries of EIA Crete. This is not to say there are no regional patterns. Indeed, there are a great number of local patterns of tomb use (Eaby 2011). Caves and rock

shelters, as mentioned, are more common in the east of the island, and the same is true of *tholoi* (Figs 7.58)[164]. These EIA *tholoi* are typically not like the monumental forms seen during LM II-IIIA at Knossos (Hutchinson 1956; Hutchinson and Boardman 1954) and elsewhere (Platon 1961-2; Davaras 1971; Prokopiou 1994; Papadopoulou 1997a; 1997b; 2006; Tsipopoulou and Vagnetti 1995). They are small, generally cut into the ground like a chamber tomb, and subsequently lined with stone. They have short or non-existent *dromoi*, and their entrances are typically small. A class of large *tholoi*, more akin to the typical LBA form, is also known from the EIA, from a handful of sites including Afrati, Praisos, Prinias, Kavousi, Gortyn and Knossos (Fig. 7.65; Eaby 2009). Regional variations in *tholos* tomb architecture are even discernible. In the area of Lasithi, for instance, multiple examples have been noted whose exteriors were built up to form a sort of masonry enclosure or tumulus, with a few possible examples in the western Siteia mountains[165].

Chamber tombs, on the other hand, were largely found in the central region of Crete in the EIA (Fig. 7.59). Those found in the eastern part of the island only occur as late as LM IIIC, and so probably represent a legacy of the Final and Post Palatial form. The concentration of these tombs around the former centres of Knossos and Phaistos is unlikely to be a coincidence, while their use at Kounavoi/Eltynia may reflect interactions with Knossos from an early point in the EIA. These tombs were also apparently popular in the north-western Khania region (Platon 1953; Tzedakis 1976; 1977; Andreadaki-Vlazaki 1993), though whether this relates to the earlier presence of the tomb type at the LM III settlement at Khania is unclear. A palatial legacy can perhaps also be detected at Knossos in the continuing use of pit-caves and shaft graves in the SM period (Figs

[164] The closest parallels for the small EIA *tholoi* in LM III come from the area of Apodolou in the southwestern foothills of Psiloritis, where they are found alongside the larger, more traditional LBA type. Kanta (1997a) has argued that these tombs may be a direct continuation of the earlier built *tholoi* of the Mesara, as well as the forerunners to the smaller *tholoi* of LM IIIC onwards. This in turn is part of a wider debate on the origins of the LM II-III *tholos* form on Crete, which is taken by some to reflect a Mainland innovation and introduction (Cavanagh and Laxton 1981; 1982), though Kanta (1997a) has argued for a continuous Cretan tradition. Kanta and Karetsou (1998, 170) have further suggested that, in the LBA, the large type with Mainland precedents and the smaller forms found to the southwest of Psiloritis might reflect contrasting 'Mycenaean' and 'Minoan' traditions and identities, which in turn had an enduring legacy in the large and small *tholoi* of the EIA.

[165] These sites include Agios Georgios Papoura (Watrous 1980, 271–77), Karfi Ta Mnimata and Astividero (Pendlebury et al. 1938, 100–9), Adrianos (Nowicki 2000, 119), Kritsa Lakkoi (Platon 1951, 444–45; Tsipopoulou and Vagnetti 2006), Adromyloi (Platon 1954), Pefkoi (Nowicki 1994) and Krasi (Eliopoulos 1994; 1996), among others. Their distribution is certainly consistent with a regional tradition maintained through interaction between communities of the wider Lasithi area.

7.60-63). This is the only site where these forms appear in the EIA, and given their visibility as part of the suite of changes in funerary practice seen at LM II-IIIA Knossos, their brief reappearance a few centuries later is intriguing. It is clear from later tombs in the North Cemetery that LBA tombs were encountered in considerable numbers by EIA Knossians – LM III *larnakes* and other objects were redeposited in and around several tombs of the PG-G periods (Crowe 2018) – so it is very possible that shaft graves and pit-caves were known about in SM through similar encounters.

One other tomb form known from multiple areas in EIA Crete is the burial or funerary enclosure, though as a type it exhibits much variation (Fig. 7.64). In the east of Crete this was typically a structure with low stone walls, with the interior sometimes dug slightly into the bedrock, and used for cremations (Eaby 2007, 325–27). Those of Vrokastro contained multiple adjoining compartments or rooms (Hall 1914, 155–74), while those elsewhere in east Crete (Dreros, Anavlokhos, Praisos, Kavousi) had only single compartments. Those at Kavousi Vronda incorporated the walls of abandoned houses (Day 1995). Structures akin to these enclosures are known from Prinias and Eleutherna too, but at the former these were low structures built as extensions of the large stone tumulus, used for cremation and then filled, as if to become part of the tumulus (Rizza 2011), while at the latter enclosures surrounded trenches that were possibly used as crematoria ahead of final deposition in the chamber tomb A1/K1 (Stampolidis 1990a, 85:383). In sum, this tomb 'type' actually covers a range of forms, linked by their probable association with cremations *in situ*.

Despite the regional patterns discernible in the use of many of these tomb types, the prevailing impression from the major burial grounds of the EIA is a lack of consistency in mortuary practice. At Knossos, burials were mostly in chamber tombs, with some early use of shaft graves and pit-caves, with occasional later *larnax* (re-)burials and a range of less formal pit and *pithos* burials (Brock 1957; Coldstream and Catling 1996b; Rousaki and Anagnostaki 2012). At Eleutherna, a single chamber tomb has been reported (though it contained a very large number of interments: Agelarakis 2005; Kotsonas 2008), while open burials on wooden stretchers, *pithos* or jar inhumations, *pseudotholoi* and pyres covered with small mounds are also attested (Stampolidis 2004b). At Prinias, cremations were made at an early date in *pithoi* or loose within pits, followed

later by *tholoi*, and cremations in urns set beneath small stone tumuli, which were set sometimes on their side, like *pseudotholoi*, and sometimes vertically (Rizza 2011; Rizza 2019). At Afrati, both small and large *tholoi* were in use, while the predominant rite involved cremations placed in clay jars or basins, or bronze cauldrons, closed with a lid or plate and then covered by upturned *pithoi* (Levi 19279, 78–380). At Dreros there is evidence for the early use of small *tholoi*, with the predominant practice in the G-PA periods being cremations in cist graves or bone enclosures (Van Effenterre 2009; Gaignerot-Driessen 2016a, 229–33). These were sometimes placed in urns, but other times were left loose in the enclosures. Finally, at Praisos, large *tholoi*, a chamber tomb, burial caves, possible funerary enclosures, and a large pit grave have all been discovered in the vicinity of the *acropolis* town (Droop 1905-6, 36–37; Bosanquet 1902; Platon 1953, 485; 1960; Whitley et al. 1999; Tsipopoulou 2005, 241–54).

These settlements all became important centres during the PG-A periods. It is therefore striking how distinct – idiosyncratic, even – are their respective funerary landscapes. While in the LM III period, the dominant burial practices of what we assume to be elite groups across the island can plausibly be read as emulations of Knossian or Khaniote practices, at the nascent political centres of the Geometric era, no such set of common referents can be found. There are certainly parallels in some of the rites and tomb types employed – at Afrati, Eleutherna and Knossos, for instance, longer-lived, collective tombs receiving large numbers of interments co-existed alongside individual forms, but with cremation the dominant rite in all cases. Furthermore, the larger type of *tholos* distinguished by Eaby (2007, 201–203) – that with a greater resemblance to the LBA form – is found almost exclusively at sites that arguably became local centres in the PG-A periods, including Praisos, Gortyn, Prinias, Afrati, Phaistos, Knossos, Eltynia and Kourtes, as well as Kavousi (Fig. 7.65). This tomb type, with a strong BA heritage and association with collective burial, appears especially characteristic of the larger communities of the EIA, perhaps reflecting developments in the scale and prominence of certain social collectives not witnessed at smaller settlements. But a more consistent 'package' of tomb types, funerary rites, and grave goods (as can, for instance, be seen in the adoption of chamber tomb and *larnax* burials in LM III) remains difficult to identify amongst the island's nascent *poleis*. If there is a single over-arching contrast between the burial practices of LBA and EIA Crete, it is probably that, while the funerary practices

of Knossos and Khania served as an undeniable reference point for burial across the island in LM II-IIIB, in the EIA, the absence of any culturally hegemonic political centres resulted in more of a patchwork of local, distinct mortuary cultures.

Quantifying Burial Assemblages

The preceding section examined trends in the use of tombs and cemeteries across the LBA and EIA. The following discussion considers the nature of the grave goods recovered from these tombs. The focus is placed particularly on ceramic assemblages, for three main reasons. Firstly, ceramic vessels are by far the most common type of grave good, occurring in nearly all tombs (Fig. 7.66A), and comprising by far the greater part of the total mortuary assemblage (Fig. 7.66B). Secondly, while pots can generally be assigned to single ceramic periods or centuries, most other grave goods can usually be grouped only by the century or period in which the tomb they came from was built. This is because only certain other artefact classes have independent chronologies, and in many cases individual grave goods cannot be associated with specific burials (and their accompanying vessels), meaning they cannot be tied to specific periods. Thirdly, ceramic vessels are more often directly implicated in forms of mortuary ritual, including drinking and dining, the pouring of libations, and the anointment and containment of the remains of the deceased (see D'Agata 2015; D'Agata and De Angelis 2016). As such, diachronic changes in the composition of ceramic burial assemblages have the potential to inform us about developments in funerary practice, even where the precise significance or meaning of these rituals may remain difficult to assess.

Figures 7.67-69 present data on four main classes of ceramic vessel, namely drinking vessels, liquid or storage vessels, mixing and serving vessels, and oil vessels. Figure 7.67 shows the proportions of all tombs in use in each century which contained vessels of each category, Fig. 7.68 the proportions of all ceramic vessels represented by each category in the corresponding century, and Fig. 7.69 the mean number of vessels from each category recovered from tombs in use in each century. In these figures, the tombs of Knossos and those of other sites are distinguished, along with a combined figure representing all tombs. Figures 7.70-75 present the same three metrics, but for items other than ceramic vessels. Figures 7.70-72 concern the most common artefact materials,

while Figs 7.73-75 present the data on major artefact types. As noted, most of these artefacts are not themselves closely dated, and so here they are ordered by century of tomb construction.

15th-13th Centuries

To begin with the LBA, that is the 15th-13th centuries, drinking, liquid/storage, and oil vessels were fairly common, and in the 14th century comprised 20-30% each of the total ceramic assemblage (Fig. 7.67). Drinking vessels and liquid/storage vessels typically numbered between one and two per tomb (Fig. 7.69). However, across the 15th-13th centuries, there are also chronological developments not necessarily shared by the tombs of Knossos and those elsewhere. All three vessel types declined at Knossos, across all three metrics shown in Figs 7.67-69. While comparable developments may be discerned (though less clearly) for drinking and liquid/storage vessels in other parts of Crete, the use of oil vessels outside of Knossos appears to have increased during the LBA. As shown in Fig. 7.76, the *alabastron* was the most common oil vessel shape in the 15th century, but this was replaced by the stirrup jar as the dominant oil vessel in subsequent centuries[166]. In the LM IIIA-B periods, stirrup jars – and perhaps more importantly, the oil they contained – became one of the chief commodities exported from Crete, particularly from Khania and the Mesara following the decline of Knossos (Pratt 2016). It is tempting to interpret the decline in oil vessel deposition in tombs at Knossos in this period as linked to the collapse of the palace and its own perfumed oil industry, while the regional centres of production at Khania and in the Mesara continued[167].

Trends in the deposition of certain other artefacts also show contrasts between Knossos and the rest of the island. Items of bronze occurred in steadily fewer Knossian tombs between the 15th and 13th centuries, and in decreasing average numbers (Figs 7.70; 7.72), a development mirrored in the

[166] The stirrup jars deposited in tombs are generally not the larger transport version, but smaller vessels into which oils were probably decanted in domestic, ritual or commercial contexts from larger transport or storage containers (for exceptions, see Haskell 2011a, 153–55).

[167] Known transport stirrup jars from Knossos, both with and without inscribed Linear B signs, date largely to the LM IIIA2-B periods, suggesting local production of perfumed oil, and perhaps even export, were still occurring in this phase (Haskell 2011b, 110–11). Depending on the date favoured for the final collapse of the administration at Knossos, such production belongs either to a late phase of the palace's operations, or the period after their cessation. Either way, Khania and Kommos appear to be the more significant producers and exporters of such stirrup jars (and, by extension, perfumed oils) in this period, at least based on the current corpus of these vessels on Crete and the Greek Mainland (Haskell 2011a; 2011b).

deposition of arms and armour, themselves fashioned from bronze (Figs 7.73; 7.75). However, outside of Knossos the frequency with which bronze and arms and armour appear in tombs of the 15th-13th centuries is far more stable, as are the average quantities in which they were deposited. An interesting pattern can also be seen in the case of seals, which were typically made of stone, and were used in authenticating transactions within the palatial bureaucracy, though their use may have been more limited than in Neopalatial times (Younger 2018, 350–51). Knossos appears to have been the centre of production, and with its destruction new seals ceased to be made. They were still used in LM IIIB, even as part of the ongoing administration at Khania (Hallager et al. 1992, 70–72), but these were invariably antiques (Krzyszkowska 2020, 557). It is notable, therefore, that outside of Knossos the proportion of tombs containing seals remained essentially unchanged between the 15th and 13th centuries (Figs 7.73-75), as did the quantities they were typically deposited in. The collapse of Knossos appears not to have greatly impacted the circulation of these items which, even if no longer employed bureaucratically, may have served as status symbols.

It was suggested in previous chapters that the collapse of Knossos may not have undermined networks of interaction which extended across the island in the LBA, even if certain kinds of economic activity or integration declined, and the evidence from oil vessels, bronze arms and armour, and sealstones in tombs of the 14th-13th centuries may support this view. Items such as these have been argued to decline in tombs of the LM IIIA2-B periods[168], but the data examined here argue for a more nuanced picture, with their distribution outside of Knossos especially remaining relatively stable across this timeframe. Burials at Knossos appear, in some sense, to have converged with those across the rest of the island in the frequency and quantities of these various grave goods, perhaps reflecting a decline in its pre-eminent access to rare materials, in its role as a production centre for such prestige items, and in local capacity for, or interest in, the kinds of mortuary display seen at the site in the LM II-IIIA1 periods.

12th-11th Centuries

In the 12th-11th centuries, drinking vessels were found in fewer tombs, as were liquid/storage

[168] Namely seals (Krzyszkowska 2005, 215), weapons (Deger-Jalkotzy 2006, 152; Blitzer 1990; D'Agata 2020, 303–4), and other objects of bronze (D'Agata 2015, 94–95).

vessels, with the exception of 11th century Knossos, where they are found in over half of tombs (Fig. 7.67). Despite a drop in average quantities and as a proportion of the total ceramic assemblage in the 12th century (Figs 7.68-69), oil vessels were still found in over half of all tombs in this period (Fig. 7.67). In the 11th century, when evidence from Knossos is more numerous, oil vessels were found in over 60% of all tombs, and comprise around a third of all ceramic vessels, though as in the 12th century they typically only number around one per tomb. As noted above (see Fig. 7.76), during the 13th-10th centuries, stirrup jars were almost the exclusive type deposited in tombs. Recently, a stirrup jar from a LM IIIC tomb at Tourloti has, based on residue analysis, been shown to have contained oil perfumed with a range of herbs and botanicals, demonstrating that the knowledge, technology and value associated with this product weathered the upheavals of the LM IIIB-C transition (Koh and Birney 2017). As seen in Fig. 7.69, the average number of stirrup jars deposited in tombs halved between the 13th and 12th centuries, which could reflect more limited availability of perfumed oils, though they still occurred in more than 50% of tombs. Looking at Figs 7.70-72, items of stone and glass, paste and faience became far rarer in tombs of the 12th century, something reflected also in the decline of seals and items of adornment (Figs 7.73-75), which were among the LBA products commonly fashioned from these materials. One interpretation of the high representation of stirrup jars in tombs of the 12th and 11th centuries would thus be that they remained an important, perhaps locally produced token of luxury, even as other forms of material wealth (especially those which had relied on palatial involvement in or stimulation of artisanal production, or else imported materials and products) became scarce[169]. It has already been seen that the LM IIIC period was characterised by a high proportion of individual interments, and isolated tombs not part of larger cemeteries. The evidence for more limited quantities of ceramics and other artefacts in this period, as visible in Figs 7.69, 7.72, and 7.75, reinforces the impression that this was a time of more modest burial practices, coinciding with a reduced emphasis on wider social collectives either within tombs, or between them.

Returning to Figs 7.67-69, the 11th-9th centuries witnessed a drop off in the deposition of oil vessels, while drinking vessels and liquid/storage vessels became more common and more numerous

[169] A similar pattern is observable in the deposition of stirrup jars in tombs on the Mainland in the Postpalatial period (Pratt 2021, 173–78).

within tombs. Up until this time, mixing and serving vessels had been a limited part of mortuary ceramic repertoires[170], but they became more common in the 10th and 9th centuries, particularly at Knossos. Similarly, in the LBA, liquid/storage and drinking vessels had typically only numbered between one and two per tomb, but in the 10th-9th centuries these averages also rose (Fig. 7.69). These increases in the frequency and quantity of depositions involving vessels associated with pouring, serving and drinking may in turn reflect a growing focus on such activities as part of the mortuary ritual. Rabinowitz (2014) has examined the deposition of kraters, the main mixing vessel, in EIA tombs on Crete and suggested that the 10th-9th century peak in their use, especially at Knossos, represents a shift towards more participatory funerary rituals, and away from more limited, patronage-based drinking rites which may have typified the preceding 12th-11th centuries. In this earlier period, interment with kraters – in clay or bronze – was far rarer, but occurs in several tombs with notably rich assemblages, such as that from the *tholos* tomb found near Pantanasa (Tegou 2001), or the 'warrior'-type burial at Mouliana (Xanthoudides 1904). These tombs, and others commonly identified as amongst the richer or more distinctive of the 12th and 11th centuries – such as that at Praisos Fotoula (Platon 1960) and Tombs 186 and 200+ at the Knossos North Cemetery (Coldstream and Catling 1996b, 191–95) – are variously distinguished by rarer materials like gold and early examples of iron artefacts, by items imported from or influenced by Cypriot metalwork, by the presence of weapons, and by precocious adoption of cremation, which was still a minority rite (Kanta 2003; Prent 2014, 659–71). There is evidence at Knossos that certain items were deposited on the funerary pyre (e.g. Catling 1996a, 517–18), something which Whitley (2002; 2016) has argued may imply an entangling of the persona of the deceased, and the ornamental, martial and exotic items associated with them, both of which were ritually obliterated in the act of cremation. These burials have inspired a range of interpretations, though particular attention has been paid to the correspondences they evince with Homeric funerary rites, as well as the rare or imported items they contained. The esteem that appears to have been accorded these individuals – if their burials in any way reflect their living personae – may have stemmed from their military prowess and leadership, and their knowledge of, or

[170] Though, as Kanta (2003, 181) stresses, they are known in tombs as early as LM IIIA, and so their use for convivial funerary rituals is likely to have LBA origins.

engagement in, seafaring and long-distance networks of movement and exchange, during a time in which the horizons of many communities may have been narrower and their encounters with the wider Mediterranean more limited (Catling 1995; Whitley 2002; Kotsonas 2018; and see Helms 1989).

10th-9th Centuries

If, in 12th-11th century contexts, convivial funerary rites may have been more limited, and focussed on the persona of the deceased, the increased popularity of pouring, mixing and drinking vessels in the 10th-9th centuries may betoken the development of more inclusive or participatory practices (Rabinowitz 2014, 99–102). The focus of such rites may have widened or reorientated towards a celebration or affirmation of the social collectives to which the deceased individual belonged, and which patronised the tomb. Several factors contribute towards such an interpretation. Firstly, as noted above (Fig. 7.39), the 10th-9th centuries witnessed a shift back towards multiple burial being the most frequent practice, in contrast to the more common single interments of the 12th-11th centuries. Secondly, at Knossos, while kraters were not uncommonly used as cremation vessels in the 11th-10th centuries, by the later 10th and 9th centuries *pithoi* became the *de facto* urn. Kraters continued to be deposited, but their specific role as a mixing vessel becomes more apparent, as evidenced by the pouring and drinking sets that have been found in some PG kraters, and which in turn make clear the associations between these different vessel types (Coldstream 1996, 368; Cavanagh 1996, 660). Admittedly, mixing vessels always remained uncommon relative to the other categories considered here, especially outside of Knossos, where the 10th-9th centuries peak in their popularity is more muted, but the increase in drinking and liquid/storage vessels in this same period is certainly discernible beyond Knossos (Figs 7.67-69). Thirdly, if we look at imported ceramics at Knossos, we find a correspondence in the types of vessels becoming more common in graves in the 10th and 9th centuries, and those that were imported during the same period. Figure 7.77 shows the counts and relative proportions of imported ceramics at Knossos by century, while Fig. 7.78 shows the aoristic sums (see Chapter 2) of the three main vessel types, to give a more precise view of their chronological distribution. The main imported vessel type in the 10th and later 9th centuries was clearly the drinking vessel, while liquid/storage vessels appeared in smaller quantities in the 10th century, but more commonly throughout the 9th. That these correspond to

the most popular locally made forms at the time suggests in turn that such shapes carried a contemporary significance or cultural cachet, which was perhaps even more pronounced in the case of imported versions. Finally, a possibly related development is the decline in the deposition of oil vessels (Fig. 7.67), which were no longer found in a majority of tombs following the 11th century, making up less than 20% of vessels in the 10th century, and less than 10% in the 9th. Imported oil vessels were likewise barely deposited in tombs until the early 8th century. There could be many explanations for this decline, but it may be that, in contrast to the LM IIIC-SM periods, when stirrup jars were a particularly common grave good, changing funerary rituals or forms of prestige item may have brought about a decline in their popularity. With the increasing popularity of cremation, for instance, the former roles of scented oils in anointing the body or perfuming and purifying the tomb may have declined in significance. It is likewise possible that the act of cremation itself, focussed on the costly and visually arresting setting of the funerary pyre, may have contributed to an increasing focus on acts of congregation and commensality at the graveside. These conclusions are tentative, and the spatial variation in burial practice on the island should not be forgotten, but they may go some way to explaining the changes identifiable in the total ceramic assemblage of the 10th-9th centuries.

8th-7th Centuries

The late 9th-early 8th centuries at Knossos appear as a particularly vibrant period in mortuary practice. These decades witnessed a peak in imports being deposited in tombs, from both the Aegean and, especially from the late 9th century, from the Eastern Mediterranean (Fig. 7.79). These imports were also found in a higher proportion of tombs during the decades between 850 and 760, before declining in the mid-8th century (Fig. 7.80). The potential artistic and artisanal influence of these imported items has been argued for in the idiosyncratic and hybridising styles of PGB pottery, with its combination of Attic, East Mediterranean, and even BA Cretan motifs (Brock 1957, 143; Coldstream 1998; Kaiser 2006), while the presence of foreign craftsmen has even been suggested at the site in this period (Boardman 1961, 129–59, 1968; Coldstream 1980, 261–62, 1985b, 137; cf. Hoffman 1997, 177–86). This phase also involved the redeposition of BA artefacts, most notably *larnakes*, in certain tombs (Crowe 2018). There was a fluorescence, in other words, of decorative and material practices which looked both abroad and back in time, possibly in the

context of reformulating social collectives. Such has been argued previously on the basis of the significant turnover in tomb use detectable at this time, especially at the Knossos North Cemetery (Coldstream 1994).

Knossos is likely to have been unusual at this time for the range and intensity of its off-island connections, but there are hints that the kinds of material changes occurring in the context of these connections at the site were mirrored in other parts of the island. Oil vessels began to become more common grave goods again in the 8th century, though these were no longer stirrup jars, but *lekythoi* and *aryballoi*. The adoption of these shapes at Knossos was probably a result of exposure to imports in the 9th-8th centuries (Coldstream 1984a; Coldstream and Catling 1996a, 721; Antoniadis 2017), a timeframe which, as shown in Figs 7.79 and 7.81, saw a dramatic rise in imported oil vessels. These shapes became the standard forms beyond Knossos too (Fig. 7.82), however, and across the island it seems that they grew more popular as offerings in the 9th-7th centuries, increasing in frequency and quantity (Figs 7.67-69). In contrast to oil vessels, mixing and serving vessels became less common during the 9th 7th centuries, as did drinking and liquid/storage vessels, particularly in terms of average quantities per tomb (Fig. 7.69), and as a proportion of the total ceramic assemblage (Fig. 7.67). Drinking vessels occurred in a greater proportion of tombs at Knossos than elsewhere in the 7th century, and on average in greater numbers, though here too they did represent a diminishing proportion of all ceramic vessels. Kotsonas (2011a) has noted that, despite their declining representation in tombs of the 8th-7th centuries, cups from across Crete grew in volume during this period. He links this to the concurrent decline in the deposition of kraters in tombs, suggesting that where once wine would have been mixed in these larger vessels and distributed to smaller cups, the larger cups of the 8th-7th centuries permitted the mixing of water and wine in a single vessel, which may have been passed around at graveside gatherings. This could hint at further changes in funerary rituals, perhaps towards more restricted modes of conviviality, or the offering of libations, as opposed to larger-scale drinking occasions.

The evidence from Knossos is particularly abundant in this period, and permits closer inspection of trends in tomb assemblages during the 8th-7th centuries. Figure 7.83 shows the aoristic sums by decade of *pithoi*, which became the primary cremation urn by the mid-9th century, for the Fortetsa and North Cemeteries, and all other tombs of the EIA. There is a clear rise in the number of

cremations in *pithoi* made in the later 8th and early 7th centuries, across all burial locations, something which has been noted previously (Cavanagh 1996; Kotsonas 2011c). Looking at the distribution of *pithoi* and other vessels (Fig. 7.84), we find that the greatest number of vessels date to the 8th and 7th centuries (Fig. 7.84A and C), but that these were recovered largely from tombs of 9th and, to a lesser extent, 10th century date (Fig. 7.84B and D). In other words, the bulk of later burials were made in older tombs. New tombs were dug in the 8th and 7th centuries, though many were not the traditional chamber tomb favoured at the site since the LBA, but rather a mix of pit and *pithos* burials, and other uncertain types (Fig. 7.85). The tombs that received the greatest numbers of burials in the 8th-7th centuries were the already established chamber tombs, and in some cases the increased rates of burial in these tombs were dramatic (Fig. 7.86). In Tomb P at the Fortetsa cemetery, nearly 71 burials were made between c.710 and 630 BCE, a rate of nearly one a year.

What is perhaps most striking about these trends is that, though they appear concentrated in certain tombs, especially those of 10th-9th century date, burials made in these tombs do not appear to differ greatly from those in others. The median number of burials per tomb in the 7th century at Knossos, as represented by *pithoi*, is three. In Fig. 7.87, counts of the main vessel types are shown for those tombs which contained up to three 7th century *pithoi*, and those with more than three, to broadly separate those tombs receiving more burials in this period, from those receiving less. In Fig. 7.88, the relative proportions of these different vessel types are shown. Though the quantities of vessels in these two sets of tombs clearly diverge between the 9th and 7th centuries, the relative proportions of the main vessel types exhibit almost identical developments, matching those outlined above with regard to the growing popularity of oil vessels, at the expense of drinking and liquid/storage vessels. This suggests that, even in those tombs receiving more burials in the 7th century, the composition of their ceramic assemblages did not diverge greatly from those in tombs used less frequently in the same period.

It is not only in composition, but also in scale, that ceramic assemblages appear to follow similar developments at Knossos, regardless of the frequency with which the tombs were used. Figure 7.89 shows the mean and median values for the aoristic sums per decade of the EIA Knossian tombs, as well as a shaded envelope representing the interquartile range (IQR, that is, the middle 50%) of those values in each decade. Figure 7.90 shows the same mean and median values, but

with a shaded envelope representing one standard deviation above and below the mean value. The IQR and standard deviation provide an indication of the spread of the values represented, with a wider envelope demonstrating a greater spread in the aoristic values for that decade. The mean and median values track each other quite closely until the late 8th century, when the median drops but the mean continues to rise. The mean is more responsive to outliers, suggesting that from the late 7th century, there was an increasing gap between the quantities of vessels being deposited in most tombs, and those being deposited in greater quantities in a limited number of other tombs. This is seen also in Fig. 7.90, where the standard deviation for the aoristic sums continues to rise to a peak in the 7th century. At no other point in the preceding centuries, in other words, had there been as wide a distribution in the quantities of vessels being deposited in different tombs. However, these figures deal only with raw counts of vessels. In Figs 7.91-92, the aoristic sums of all vessels (excluding *pithoi*) have been divided by those of *pithoi* from the same tomb, giving an estimate of the quantity of ceramic vessels *per burial*, with similar IQR and standard deviation envelopes then applied. As mentioned above, the use of *pithoi* as the primary main cremation vessel only became fully established by the mid-9th century, so the earlier parts of these graphs should be treated cautiously, but even so they show a decline across the 8th and 7th centuries both in the median and mean number of vessels accompanying each *pithos*, but also in the total range of values around those averages. In other words, the number of pots accompanying burials in the 8th and 7th centuries became not only smaller, with an average of three to four, but also less variable. This does not mean variation did not occur, and certain individual interments may have involved richer grave goods, but from a site-wide perspective such burials were a less common feature of the later 8th and early 7th centuries. Putting this evidence together with that for the changing composition of ceramic assemblages, a typical burial of this period would appear to have been accompanied by an oil vessel or two, a drinking vessel and a serving vessel. This limited repertoire hints at a more formulaic or restricted set of accompanying funerary rites, perhaps corresponding to the pouring of ritual libations, and the passing of a single cup around the attendees.

In summary, though there was an increase in funerary activity at certain established chamber tombs, many others, including those newly founded in the 8th and 7th centuries, evidenced more modest rates of burial. At the same time, however, across all tombs, a more limited and

standardised burial kit appears to have developed. The main distinguishing feature of the burials made in tombs like those shown in Fig. 7.86 would thus seem to be the scale of the social collectives emphasised or reflected in their inclusion within those tombs, rather than the accoutrements of each individual interment. Many of the older chamber tombs were found literally overflowing with urns, which had in some cases been deposited in niches or *dromoi* once the tomb chamber was full (e.g. T. 107: Coldstream and Catling 1996b, 150), while in others, older vessels were even removed from the chamber to make way for later burials (e.g. Ts 76 and TFT: Cavanagh 1996, 658; Brock 1957, 3–4). There appears to have been a contestation in the Knossian community about the appropriate spheres of kinship or corporate membership demonstrated in burial. Other kinds of association – such as between neighbouring tombs, or tombs within a single cemetery – may also have been significant, but the tombs shown in Fig. 7.86 come from the North Cemetery, Fortetsa, the Gypsades hill and Atsalenio, suggesting that similar processes were operating across multiple sectors of the Knossian population.

An expansion of access to burial appears likely in the case of many of the most-used chamber tombs, something which recalls Morris' (1987) model of the nascent *polis*, characterised by a tension between the desire for ostentatious funerary rites amongst elite groups, and the denial or down-playing of inequalities of rank or status within the broader population, something encouraged by the nascent 'middling' ideology of the city-state. Proposing a shifting relationship between the *agathoi* and *kakoi* – essentially, the elites and commoners – in such communities, Morris argued that the spheres of kinship evidenced in burial could both expand and contract, with more and less distantly related lineages granted access to visible burial as a strategic form of elite social cohesion, until kinship ceased to be the primary determinant or symbol of societal rank within the emergent civic structures of the *polis*. However, this model does not seem fully applicable to the Knossian case, for where Morris argued that expanding access to burial likewise corresponded with increased assemblage diversity, the more numerous burials of the 8th and 7th centuries at Knossos became in many ways more standardised and less materially diverse (Pollard 2021). One interpretation of the evidence at Knossos would be that a more homogenising kind of identity expression was at play, with membership of and participation within elite collectives being increasingly emphasised, above individual expression or exceptionalism within those groups.

Several of the changes in aggregate assemblage composition noted at Knossos for the 9th-7th centuries appear reflected across the island (Figs 7.93-94). Oil vessels became increasingly common again, while drinking and liquid/storage vessels declined, with possible implications for their use in funerary rites. What is more, a similar, though more limited, expansion in burial activity late in the 8th century is discernible in the aoristic sums for all tombs outside Knossos (Fig. 7.95). Finally, though there is much regional variation, with some areas lacking sufficient mortuary evidence to infer clear trajectories, there appears to have been a general increase in more modest burial types at other sites during this period, including interment in vessels like *pithoi* or simply in pits (Figs 7.32-34). As mentioned, at sites including Eleutherna (Agelarakis 2005; Kotsonas 2008) and Afrati (Levi 1927-9, 202–304), these more modest burials appear alongside larger collective tombs, with the former typically outlasting the latter, suggesting processes of negotiation about collective representation and funerary ostentation that may have parallels at Knossos. If these broad similarities hold water, then the 9th-7th centuries on Crete represented an important period of change in the kinds of social collective represented in death, which in most areas had, from at least the time of the re-emergence of visible burial in LM IIIA, generally involved the burial of small groups, probably families or similarly close-knit social collectives[171]. At Knossos, these groups appear to have expanded or reformulated, at least as far as burial practice is concerned, during the 9th-7th centuries, and it is possible similar changes occurred elsewhere, though at present our evidence is limited.

Prelude to the 6th Century

These developments culminated in the significant decline in archaeologically visible burial practices which accompanied the transition to the Archaic period across Crete. Many cemeteries, including those at the foremost political centres of the period, went out of use in the late 7th-early 6th centuries. Given the preceding diversity of burial practice across these communities, and in light of the debates surrounding the historicity of the Cretan *politeia* – that is, the degree of homogeneity in Cretan legal and political frameworks of the Archaic-Hellenistic periods (Perlman 1992; Link

[171] Additionally, the burying of individuals within different cemeteries at the same settlement, or within clusters of tombs within single cemeteries, represent forms of identity or group expression whose implications are still little understood in the EIA, as they do not appear to correspond with clear differences in tomb or burial types, or associated grave goods.

2002; Seelentag 2015) – this apparent convergence on less elaborate, more ephemeral forms of burial by the 6th century is potentially hugely significant. It could be suggested that, whatever accounted for the disparities between the burial rites practiced at these settlements hitherto, something of a consensus was emerging by the Archaic period that discouraged ostentatious, highly visible, or collective modes of interment.

What the detail available for the Knossian case demonstrates is that among some Cretan communities at least, the late 8th-early 7th centuries were a time in which large-scale societal affiliations and collectives were a visible and potent force within the funerary – and, no doubt, the social and political – landscapes of the time, but that this did not necessarily lead to an endlessly mounting cycle of ostentatious display or conspicuous consumption. Rather, forms of group affiliation and identity were mediated through material repertoires and practices, with more restricted, and ultimately archaeologically invisible, modes of funerary ritual becoming established. The situation at Knossos makes clear that this process need not have involved a gradual shift towards single burial, or more modest tomb types; indeed, the 8th-7th centuries were the most active period of chamber tomb use in the whole of the EIA. But the scale and composition of the ceramic assemblages provide indications of the kinds of tension and negotiation that may have been operating at the time among the Knossian community. With the publication of other large cemeteries of the EIA, these developments may be fruitfully compared across several of the island's nascent *poleis*, in ways that could shed light on the major changes in burial practice that accompanied the transition to the Archaic period.

Summary

The foregoing discussion has only been able to elucidate certain aspects of the funerary practices of LBA and EIA Crete, which were hugely varied in both space and time. Nonetheless, certain important long-term patterns or consistencies can arguably be discerned. Firstly, there were a range of physical constraints, priorities or affordances which impacted the locations and forms of burial in both the LBA and the EIA. Appropriate locales for the disposal of the dead were selected through consideration of topography, lithology, proximity, accessibility and visibility, as well – no doubt – as a range of more intangible qualities, that nonetheless often resulted in burial grounds

set close to, and within sight of, human settlements. These spaces were kept separate from, and yet closely bound to, the areas of the living, evidencing the importance that rituals for the dead held across all communities of the LBA and EIA.

Secondly, the adoption (and rejection) of different burial practices is, of necessity, rooted in the movements and interactions of different groups, and aspects of these processes are discernible in the archaeological record of the LBA and EIA. These in turn suggest important contrasts in the kinds of interactions operating across regions in the two eras. In the LBA, though debates have long been held about the timing, causes, and implications of resurgent visible burial practices beyond Knossos in LM IIIA2, it seems likely that the mechanisms underpinning this phenomenon are rooted in the kinds of integrated, lowland and coastal networks which characterised the Final Palatial period and its immediate aftermath. Even where elements of it were altered, the prevailing syntax of burial in this period owes a clear debt to the rites that emerged in the LM II-IIIA1 periods at Knossos and Khania. What is more, the ways in which burials at a significant distance from one another (such as Ligortynos and Mokhlos) exhibited close correspondences in assemblage and funerary rites, speaks to the networks of material and ideological exchange which laced the island even after the decline of the palaces. By contrast, the mortuary landscapes of the EIA appear more variable in the combinations of tomb types, rites and assemblages found across different regions, in a manner which may reflect the localised emergence of independent political centres during the early 1st millennium.

That said, certain correspondences can be seen between the island's emerging political centres, such as in the juxtaposition of collective built tombs with simpler pit, cist or jar burials. These may reflect similar tensions operating across these different communities regarding the scales of kinship or collective self-identification represented in death, and appropriate forms of mortuary performance. This is representative of a second long-term trend, namely the (by no means simple) correspondence between forms of social organisation and access to formal burial. For instance, the relatively low numbers of burials per tomb (including a great many single interments) at Final Palatial Knossos, may be a reflection of the kinds of identities or personae represented in death, particularly if we were to view the so-called 'warrior graves' as reflecting individuals of particular rank, status or position within the developing administration of the palace. More generally, tombs

of both the LBA and EIA typically housed between one and four individuals in all periods, especially outside of the major cemeteries, no doubt reflecting how, in most periods, the kinds of lineal or corporate group patronising a tomb was likely to be small, short-lived, or open to reformulation with the passing generations. Consistent increases or decreases in average burial numbers, and changes in the ratio of individual to collective burials, or of tombs founded alone, in small groups, and in larger cemeteries, may signal important social developments at various points during the LBA and EIA.

Finally, the island, though its engagement with maritime connections varied a great deal, was never completely shut off from interaction with other regions across the sea, in ways that carry implications for funerary practice. Looking across the whole period from LM II-Archaic, mortuary ritual was clearly receptive to the adoption, imitation, alteration or rejection of material and behavioural practices from abroad. When such overseas connections were more scarce, such as in the 11th-10th centuries, individuals who nonetheless ventured abroad and returned with stories or prestigious items from other lands might have been accorded particularly notable funerary rites, while in periods where such items arrived more frequently, as in PGB-EG Knossos, they may have ranked alongside other items carrying particular cultural cachet, like LBA antiques, or experimental forms of burial urn. The adoption of Mainland-style chamber and *tholos* tombs in the Final Palatial period, or small oil vessels from the 9th century onward, or even perhaps the rite of cremation itself, are all instances of Cretans drawing on ceramic and mortuary repertoires with connections to other areas in the Aegean and Eastern Mediterranean.

In these ways, various forms of physical, social, economic, and political connection and interaction were tied into the sphere of death and burial. There is no simple story of continuity across the mortuary landscapes of LBA and EIA, though certain of the developments in each era are illustrative of wider social trends, and illuminate aspects of the contrasting networks of interaction and social organisation which characterised the late 2nd and early 1st millennia BCE.

Chapter 8

Historical Synthesis

Introduction

In the preceding chapters, I have drawn on forms of archaeological evidence which are represented across the period spanning the mid-15th to mid-6th centuries BCE to identify regional patterns and diachronic trends in social organisation and practice, through which we might better theorise and understand this complex period of Cretan history. I have focussed primarily on the structure, scale, and interaction of different networks or systems of behaviour, and how these developed between the LM II and Archaic periods. In doing so, I have moved between local, regional, and island-wide contexts, rooting my analyses wherever possible in the affordances of the Cretan landscape, and the forms of connection and communication operating between communities at and across these different scales.

I have suggested that certain continuities in settlement patterning, agricultural regimes, and burial practices throughout this period, and across what have been typically identified as moments of social upheaval or rupture – such as the collapse of the final palace(s), the move to upland locations, or the widespread nucleation of settlements in the PG periods – reflect the embedded or recurrent concerns and strategies of human communities interfacing with the affordances of the landscape. Such continuities include the diversified plant and animal diets evidenced in all periods, and the modes of agricultural activity involved in securing them; the centrality of interactions with neighbouring communities, through proximity, intervisibility, and probably exchange, marriage, communal ritual and complex land-holdings; and the siting of burial grounds close to settlements, making use of appropriate topographies, with most burials in most periods housing the remains of a select few individuals, probably derived from families or close lineal groups.

I have suggested that the changing articulation of these forms of practice within wider networks of movement, communication, and political integration offers a useful way of framing, and understanding, the historical processes operating across the LBA and EIA on Crete, and the wider Aegean. As Nakassis (2020, 284–85) has recently argued, the contrasts traceable between the Final Palatial and Archaic periods should not be attributed "to revolutionary changes in basic practices and regimes (i.e. a change from one economic type to another), but to relational changes: that is, changes in the way that different parts of the system relate to each other". In line with such a view, I have suggested how forms of settlement patterning, primary production, and burial practice were transformed by wider economic, social and political conditions, becoming implicated in structures of inequality, identity formation, and connectivity. Rather than viewing the 15th-6th centuries BCE on Crete as a progression through various discretely defined phases, characterised by particular types of social organisation or economic system, I suggest attention should be paid to the ways in which more perennial forms of social practice varied in their scale, spatial distribution, and interconnectedness through time, where both slow or limited developments (what we tend to think of as continuities) and more rapid reorganisations (discontinuities or changes) are treated as meaningful historical processes.

In this chapter I will further develop this perspective by integrating the findings from the foregoing analyses of settlement, subsistence, and burial into a more overarching account of social change across the LM II-Archaic periods, drawing on evidence for wider economic, religious, political and material culture systems.

LM II-IIIA2: The Final Palatial Era

The Nature of the Knossian State

The Final Palatial administration at Knossos was an institution with a significant, but variable impact on the economic, political and cultural character of LM II-IIIA2 Crete. Its power was not ubiquitous, with bureaucratic oversight only in evidence for the west and central thirds of the island, and even within this geographic area the type and intensity of palatial intervention varied

(Bennet 1985; 2017)[172]. A greater range of offices is attested in the Linear B texts for the central region, that which included Knossos, than for other regions, while the Khania area may have been accorded a degree of local independence from an early date (Driessen 2001a, 99–112; Petrakis 2014). The far east of the island has provided evidence for quite distinct ceramic and cultural traditions from LM II-III, with little sign that Knossian material culture was closely imitated by local workshops or deployed in similar contexts to those found in central Crete (Langohr 2019).

As discussed in Chapter 6, the palace appears to have devolved the actual mobilisation of many agricultural products to secondary centres and figures such as the so-called 'collectors' (Bennet 1992; Rougement 2009), something which was achieved through the integration of the more navigable and agriculturally productive landscapes of the island, utilising pre-existing networks of communication and – most probably – local power structures, with histories extending back into the Neopalatial period. The result was a system with inefficiencies and inconsistencies, but which, as Halstead (2011a, 232) has stressed, manifested the inequalities of power operating between Knossos – which remained an undeniable centre of bureaucratic and probably military dominance – and the regions over which it exercised extractive demands.

Broadly speaking, the palace appears to have stimulated investment in certain kinds of – largely extensive – agricultural production, such as the use of plough oxen (Killen 1993; Halstead 1999b) and the management of large, palatial and private flocks (Isaakidou et al. 2019), to provision its dependent workforce in the creation of value-added goods, particularly perfumed oils and textiles (Killen 1979; Alberti 2007; Shelmerdine 2008), as well as to support the administrative and service personnel at the palace itself, and to host and contribute towards feasts and religious ceremonies (Bendall 2007; Lupack 2011). Particularly in the earlier part of the Final Palatial period, these functions represented a clear interweaving of secular and religious power, display, and integration.

There remain difficulties in defining precisely the economic goals of the palace, because the final

[172] It has been noted, for instance, that Linear B tablets from the palace at Pylos have produced a far greater density of toponyms than those at Knossos, that is, the number of place names relative to the scale of the presumed territory, something with implications for how these two palatial centres oversaw bureaucratic and political control of their associated hinterlands. These densities amount to one placename per 8.1km^2 of the reconstructed Pylian polity, versus one every 46-51km^2 for that of Knossos (Bennet 2011, 10-11). One possibility is that Knossian authority was more devolved, based on inherited or rejuvenated elements of Neopalatial administrative structures, which were absent on the Mainland.

dissemination of the goods it produced is poorly documented, in comparison to the actual mobilisation and processing of the materials involved (Halstead 1993). It is presumed that perfumed oils and textiles were largely exported (Haskell 2004; Shelmerdine 2006, 82-83; Nosch 2008, 149), though some no doubt circulated within Crete as prestige items, and networks of gift exchange amongst high-ranking individuals, both at home and abroad, have been inferred from occasional textual references to *xenwia* (related to the later Greek *xenia* or 'guest friendship')[173] on the Linear B tablets, though the relative importance of these different processes is difficult to weigh (Killen 1985, 263–64; Halstead 2007, 68–69). But a likely scenario is that oils and textiles were among a range of products exported in exchange for other rare or precious materials, particularly metals, which could then be allocated to further craftspeople to produce weapons, armour, chariots and vessels (Driessen and Langohr 2007, 188–89). Such items are likely to have then circulated across Crete and the wider Aegean.

Specialisation and Hierarchisation

Whether viewed as the seat of a genuine territorial state, or a more limited economic enterprise (Driessen 2001a), Final Palatial Knossos integrated a wide range of productive environments, and communities across much of Crete, giving rise to complex relationships of cooperation, obligation, patronage, dependence and employment centred on the palace. We find evidence in the Linear B texts for workers involved in the production of coarse-ground meal, fine-ground flour, and the preparation and baking of bread; bronze workers of various types; a range of textile specialists including wool combers, spinners, and weavers; leather workers; functionaries of different rank including the so-called *balsileis*; religious officials, priests and priestess; and not to mention slaves, recorded in Linear B as *do-e-ro* (fem. *do-e-ra*), antecedent to the later Greek *doulos* (Billigmeier and Turner 1981; Palmer 1992; Killen 2006; Nosch 2008; Landenius Enegren 2008). There were the scribes themselves, without whom such professions would likely not be known. And, finally, there were all the productive occupations implicated by the taxes Knossos levied, in herbs, honey,

[173] Another possibility is that items labelled as *xenwia* should be translated as 'for foreigners', designating products destined for export abroad (Shelmerdine and Bennet 2008, 298)

animals, cereals, oil, flax, bronze, animal hides and certain textiles (Halstead 2007, 67)[174].

The varied involvement of Knossos in different forms of production and mobilisation likewise generated a range of relationships between the relevant workers or communities and the palace. There are records of slaves being bought and sold, but more common are dependent workers given rations to perform productive labour for the palace (Killen 2006, 88; Nakassis 2013, 14–15). These included men and women, and indeed women are recorded alongside their children, whom they may have schooled in their respective crafts, implying such statuses were heritable (Nosch 2003, 17). A system of allocating raw materials to craftsmen in exchange for finished goods – known in Linear B as *ta-ra-si-ja* – was practiced with both dependent and semi-dependent workers, and underpinned the production of bronze vessels, chariots, textiles, and probably also weapons and items of furniture and leather (Halstead 1993; Nosch 2000; Montecchi 2012). By contrast, the so-called collectors were seemingly given great personal liberty over the regional collection and management of resources, while the *damos*, which must have been some kind of local collective or self-identifying community body, clearly owned its own land and managed the pooling of its own taxed goods ahead of their shipment to Knossos (Bennet 1992; Killen 1998, 23; Lupack 2011). There were also clear variations in the nature or degree of spatial integration achieved by the palace in certain industries. The oil intended for perfuming was gathered, like many other agricultural products, through regional quotas – rather than, say, through production overseen directly by the palace – but the actual storage and processing of the oil does seem to have taken place at Knossos itself (Pratt 2021, 98–116). In contrast, wool was sourced from herds for which the palace maintained tallies, and allocated to a sequence of mostly female workers, based in workshops across the Knossian polity (Nosch 2003, 21)[175].

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[174] Morpurgo-Davies (1979, 99–102, 102–5) noted that some 115 occupational names or titles from the Linear B documents are not attested in later Greek, with the roughly 40 that are, tending towards the less specialised or more generic, such as *kerameus* (potter) or *khalkeus* (bronzesmith), suggesting that the lexical stock of the Final Palatial period reflected the high degree of specialisation which developed within certain industries under palatial influence. By extension, the absence of such terms in later Greek may reflect the fact that the period following the collapse of the palaces witnessed a contraction in the range or specialisation of craftspeople formerly supported by the structures of the palatial economy.

[175] Interestingly, though there are close correspondences between how women are recorded on the tablets from Pylos and Knossos – some by their home village, some by occupation, and some by association with a collector – at Pylos there are also women recorded by ethnonyms that appear to relate to locations in the East Aegean, who have been interpreted as captives or slaves

From the Centre Outwards

Given the devolved nature of many of its operations, the Final Palatial state created opportunities for the accrual of wealth, the consolidation of political power, and the adoption of palatial symbols and practices on a local and regional level. Pottery imported from, or emulating the styles of, Knossos has been identified at Ayia Triada (D'Agata 1999b), Khania (Hallager 1990), Malia (Farnoux 1997), Khamalevri (Andreadaki-Vlazaki and Papadopoulou 1997) and the area of Viannos (Banou and Rethemiotakis 1997) in the LM II-IIIA1 periods. At Kommos, a development has even been observed from Knossian wares being imported but little imitated in LM II, to being both imported and replicated locally by LM IIIA1 (Arvanitakis 2007). However, it is worth noting that, though it likely stimulated the appearance of certain ceramic, architectural, and behavioural features across Crete in this period, Knossos itself contrasted with other political centres of the island in important ways.

The built environment provides one particularly illustrative case. In LM II-IIIA1, at the palace of Knossos, major structural renovations occurred, resulting in much of the layout still visible today (McEnroe 2010, 119–24; Momigliano and Hood 1994; Driessen 1990), with a number of large-scale frescoes also apparently created in this period (Immerwahr 1990, 84–89; Hood 2000). Such activities attest to the continued availability of craftsmen skilled in specific architectural and artisanal crafts, as well as the significant mobilisation of labour and resources of which the palatial authorities were capable, even at an early stage of the Final Palatial era (Whitelaw *forthcoming*)[176]. There is a sense that the physical layout of the final palace reflects a conscious adaptation and evocation of Neopalatial artistic, symbolic and ideological schemata. Except for a possible '*megaron'* structure built against the LM IIIA1 ruins of the Room of the Chariot Tablets (Evans 1928, 6–7; Palmer 1963, 63–68; Driessen 1990, 86–100; McEnroe 2014, 126–27), the layout of the final palace is notable for how little it resembles those of the Mainland palaces, something which Driessen and

brought back to Pylos (Billigmeier and Turner 1981, 6–7). Such ostensibly foreign women are not identified as such in the Knossian tablets (Olsen 2014, 264).

[176] The names of several professions linked to construction are found in the documents of Knossos and especially Pylos. These include: *to-ko-do-mo* (*toikhodomoi*), probably masons or builders; *te-ko-to-ne* (*tektones*), carpenters; *pi-ri-e-te-re* (*priotires*), possibly sawyers; and one instance of a *pa-te-ko-to* (*pan-tekton*), an 'all-builder', perhaps akin to a foreman or oversee (Thaler 2020, 377).

Langohr (2007, 184–85) believe to have been an intentional act, to preserve the emblematic position of Knossos as an ancient seat of Cretan palatial power[177].

By contrast, the networks of communication and organisation centred on the palace may have played a role in disseminating Mainland architectural conventions to other areas of Crete. This influence is found in many different forms, from a general tendency towards axial or linear arrangements of rooms, to specific layouts including the aforementioned *megaron* (the canonical form of which includes a large hall with central hearth and four pillars, a vestibule, and a porch with two columns *in antis*)[178], and the so-called 'corridor house' (a main room with a hearth, flanked by a rear chamber and vestibule, with a parallel corridor opening onto subsidiary rooms: Hiesel 1990, 111–45; Shear 1968, 459–60), of which the classic megaron itself is a variant. Several examples of this latter type have been identified on Crete in LM IIIA-B, including Gournia House He (Boyd 1908, 26; Watrous et al. 2015, 439–43; Younger 2016; Pantou 2014), Plati Houses A and B (Dawkins 19134; Watrous 1982, 17–18), and Ayia Triada *Edificio P* (in combination with *Edificio Nord-Ovest*; Cucuzza 1997). In each case, the settlements associated with these buildings have been suggested as either secondary centres within the Knossian polity (Bennet 1985), or else, in the case of Gournia, as an offshoot or emulation of palatial authority implanted within the remains of a former regional centre (Pantou 2015)[179].

The case of Ayia Triada is especially illustrative, as extensive excavations have revealed a complex sequence of architectural constructions spanning the LM IIIA1-IIIB periods, with the earliest period (LM IIIA1) represented by four, mostly small buildings, which went out of use during the more major developments of LM IIIA1/A2 early, during which time the large '*Megaron'* ABCD[180]

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[177] A negotiation between local and introduced forms of tomb construction and burial rites has already been discussed, and contrasts somewhat with the architectural evidence in exhibiting a greater degree of departure from Neopalatial precedents (Preston 2000; 2004). This raises the possibility that the mortuary sphere was an active arena in which competing symbolic and behavioural modes were negotiated between groups implicated in the restructuring of the Knossian administration.

[178] The term was originally employed by Dörpfeld (1885) at Tiryns. On the development and structure of the Mainland *megara*, see Müller (1944), Graham (1960), Wright (2006) and Thaler (2020, 378–80).

[179] Particularly in the case of Gournia and Plati, the contemporary settlements appear otherwise too small to have commanded the kinds of labour and architectural skill necessary to construct such buildings (Driessen 2001a, 96).

[180] The so-called *Megaron* ABCD in fact bears few close resemblances to the canonical Mainland *megaron* type, at least based on its foundations. With its frescoed, gypsum bench, and Neopalatial-style columns, it harkens back to many traditions of Cretan palatial architecture (McEnroe 2010, 130–31).

was built, as well as the *Casa delle Camere Decapitate* (Privitera 2015, 140–41). This building included square, doorless rooms likely to represent silos or storage spaces, with a capacity reaching 100,000 litres in early LM IIIA2, later surpassed by the *Edificio Nord-Ovest/Edificio P* complex, which could have housed up to 400,000 litres of grain. The monumentality of the buildings and the specialised storage functions in evidence at Ayia Triada from at least late LM IIIA1-early LM IIIA2, in combination with the Linear B evidence for the agricultural significance of the Mesara region, make it probable that connections with Knossos stimulated redevelopment of this erstwhile centre, particularly through its incorporation into networks of resource mobilisation and storage (Cucuzza 1997; D'Agata 2005, 109; Privitera 2015, 145).

In the case of more obviously domestic architecture, the Final Palatial period on Crete was marked by the presence of architectural schemes with both Mainland and Cretan parallels, complementing the evidence for widespread engagement with Mainland-style burial practices and material culture. The four types of Neopalatial building identified by Hayden (1981, 100–120) continued into the Final Palatial period, especially in those settlements where earlier houses were reused or repurposed, such as Knossos, Tylissos and Palaikastro (Hazzadakis 1934; Hayden 1984; Macgillivray et al. 1989, 418, 431). At Gournia and Mokhlos, by contrast, very little heed was paid to preceding house-plans when these sites were resettled, something which has been argued to suggest a lack of association felt between the LM III inhabitants their predecessors (Brogan 2019). The site of Khondros Kefali is invaluable in this context as it represents a new foundation in LM II-IIIA, unaffected by earlier architecture. Here, the houses were generally smaller than those seen in LM I, ashlar masonry was scant – and those blocks that were used appear to have been spoliated from a nearby MM settlement – the arrangement of houses exhibited little obvious urban planning, and the paths between buildings were narrow and winding (Platon 1957; Hayden 1990, 204–10)[181]. While anterooms with benches, a possible light-well and enclosed courts are features with clear LM I precedents, the axial arrangements of many of the rooms hint at Mainland influence in architectural forms (Hayden 1981, 120–21; 1990).

[181] However, Platon (*forthcoming*) has recently suggested that the site may have begun in LM II with the founding of a large, rectangular building, around which the other dwellings were constructed, with the possibility that – as has been suggested for the larger buildings at Plati and Gournia – this occurred under the influence of an expanding Knossian administration.

Generally speaking, the impact of Mainland architectural styles is most apparent in the centre of the island; at Palaikastro, for instance, earlier house plans were more closely replicated (Hayden 1981, 169–70; Cunningham 2012). Yet even within single settlements, different buildings exhibited varying degrees of adherence to Mainland and Cretan traditions, as well as varying levels of quality in their construction (Hayden 1990, 210). Though some settlements witnessed the construction of buildings emulating – or maybe even demonstrating – the handiwork of palatial craftsman, the reuse of former dwellings, and the more modest construction techniques employed in those newly built, suggest in many places disparity between those who benefitted from the material opportunities afforded by the Knossos polity, and those whose lives remained little enriched by them.

Declining Religious Centrality

There remain major difficulties in characterising the principles, objects, and contexts of religious worship in the Final Palatial period. There is a disparity between the archaeological contexts of religious practice identified for the period – which are relatively few in number, and typically small structures, integrated within larger building complexes – and the evidence from Linear B, which records offerings made to a range of sanctuaries, sacerdotal officials and deities (Betancourt 1999). There are debates as to nature of the relationships between the LM III palaces on Crete and the Mainland and the sanctuaries recorded in the texts, and whether the recorded offerings reflect direct control (Rougement 2009, 144, 152), ideological domination (de Fideo 2001, 17–18), or more selective provisioning of religious festivals and ceremonies, as a tool of political legitimation (Lupack 2011)[182]. Particularly important in the Cretan context is the at least partial disintegration of the centralised religious landscape reconstructed for the Neopalatial era, where peak sanctuaries, settlement shrines, and elite architecture formed a complex of palace-centred religious practices (Peatfield 1994; 2016, 10–14). Only six of the roughly 20 cult places named on the Linear B tablets at Knossos appear in any other economic context (Hiller 1997, 207), implying the existence of dedicated religious contexts, but though continuity of worship at some pre-existing cult places is

[182] Bendall (2007), for instance, has argued that the relatively high representation of religious disbursements in the Knossian tablets, in contrast to the modest quantities of resources they actually entail, suggests that recording of such offerings was done for symbolic and ideological, rather than chiefly economic, reasons (cf. Shelmerdine 2009).

known, such as the Idaean Cave (Vasilakis 2006), Mount Juktas (Sapouna-Sakellaraki 1990) and Kato Syme (Kanta 1991), likely palatial shrines or sanctuaries have proven elusive in LM II-IIIA1.

It is difficult to infer precisely what this signifies about the organisation of religious practice on a local and regional level at this time, but an important consideration might be the chronology of the Knossian administration. Setting aside the issue of precisely when the palace was destroyed, it does seem possible that the LM IIIA2-B periods witnessed a decline in its broader cultural pre-eminence. Attempts have been made to trace changes in the scale and complexity of the palace's operations (Driessen 2001; Driessen and Mouthuy *forthcoming*), with the analysis of Skelton and Firth (2016a, 208–11) suggesting a contraction in the range of offices recorded on tablets they assign to a late phase in the administration[183]. The palace itself appears to have experienced less architectural and artistic elaboration at this time; few to no new figural frescoes were painted from later LM IIIA2 onwards, colonnades and pier-and-door partitions were repaired with rubble walls, with some doorways even blocked up, and circulation within the building became more restricted (Macdonald 2005, 208–31; McEnroe 2010, 133–35; 2014, 126). From the contemporary town, reoccupied LM I buildings – some of which suffered destruction in LM IIIA – had their upper stories closed off, while structures dating to LM IIIB found at Makritikhos had rubble walls and uneven, earthen floors (Hatzaki 2005, 72–75). If the palace's operations did continue into LM IIIA2 late or LM IIIB, it seems they may have become restricted to a set of core economic and bureaucratic functions, with more limited symbolic and ceremonial significance (Whitelaw *forthcoming*). In this context, the evidence for smaller-scale ritual practice in LM IIIA2-B especially might reflect the already diminishing role played by the palace in shaping forms of religious worship.

Knossos – The Great Integrator?

A central tenet of Knossian power in LM II-IIIA2 thus appears to have been the integration of people, places and products from across a large swathe of the island into networks of resource

[183] Though Whitelaw (*forthcoming*) cautions that the evidence for subject-specific zonation of the different scribal groups at the palace, in combination with the partial and uneven distribution of burnt deposits preserving the tablets, could account for much of these perceived discrepancies.

mobilisation, processing, and dissemination. Many of these networks appear to have devolved responsibility to local actors and communities, but they still served to facilitate the functioning of a complex array of economic roles, specialised crafts, and political offices. These, in turn, offered opportunities for well-placed individuals in local contexts to accrue personal wealth and emulate elements of palatial material culture and practice. This may help explain why, as suggested in Chapters 4-7, although Final Palatial Knossos was a major force in the political economy and ideological frameworks of LM III society, many aspects of settlement patterning, subsistence practice, and mortuary ritual continued after its collapse, as did material and cultural traditions in areas of the island over which it had exerted no obvious authority.

LM IIIA2-B: Beyond and After the Palace

The later LM IIIA2-B periods were marked by countervalent trends of continuing interaction and prosperity on the one hand, and growing regionalism and fragmentation on the other. Following the collapse of the Knossian administration, many communities were able to adapt and even flourish, either by replicating, on a local level, elements of palatial economic integration, or else by tapping into still-active wider Mediterranean maritime networks (Kanta 2003). However, at the same time, certain forms of specialised production and political integration clearly waned in the decades following the collapse of Knossos and later Khania. This is turn presaged the major relocations which would typify the end of the period.

Regional Centres

The consolidation of independent, local political centres alongside the decline of Knossos is most clearly visible at Ayia Triada, where in LM IIIA2 late a second, larger wave of architectural modifications followed those already mentioned in LM IIIA1-2 early. The north of the settlement was reorganised around a set of monumental buildings, the *Edificio Nord-Ovest/Edificio P* complex, the *Stoa dell'Agora*, and the *Edificio Ovest*. These may have formed an administrative and storage hub for a small, independent polity, while the *Piazzale dei Sacelli* in the southern part of the site appears to have been a focus of ceremonial activities from LM IIIA2 onwards (Cucuzza 1997; 2001; 2003; La Rosa 1997; Privitera 2015, 135–45). It seems likely that after the fall of Knossos, Ayia Triada

continued to act as a local centre for the mobilisation of local agricultural resources (see Chapter 6).

Other kinds of economic activity are visible at Kommos and Khania, which exhibit clear engagement with maritime networks of trade and exchange in this period. A major form of export from Khania, and probably Kommos[184], were transport stirrup jars, sometimes inscribed with Linear B signs, which have been found in Mainland Greece, the Cyclades, Cyprus and Sardinia (Haskell 2011c; Pratt 2016). At Khania, we also have Linear B documentation, suggesting some kind of bureaucracy might have overseen elements of this economic activity, after its counterpart at Knossos had collapsed (Hallager and Vlazaki 1997). The restructuring of trading activity on Crete following Knossos' fall is suggested not only by the pre-eminence of Khania in the export of transport stirrup jars (Hallager 1987; Haskell 2011a, 119–20)[185], but by the possible emergence of new corridors of trade. Examples of what may be Kytheran *pithoi* with dense, micaceous fabric have been identified at Pylos, Kastri on Kythera, and Kommos, implying the existence of routes between Messenia and southern Crete which bypassed the central north coast entirely (Rutter 2005). Such overseas markets may have provided a source of revenue even as political and settlement systems began to fragment on Crete. The peak for imported Cretan transport stirrup jars at Tiryns seems to have been LH IIIB2, which, barring recalibrations of the relevant ceramic chronologies, pushes the continuation of this export market beyond the date of the latest Khaniote tablets, and towards the end of habitation at Kommos (Langohr 2017c, 23)[186].

There are indications that the orientation of wider Mediterranean networks shifted during LM IIIA-B, with the so-called 'route of the isles' connecting the eastern edge of the Mediterranean to

[184] Most Cretan transport stirrup jars are traceable to Khania and to central Crete, though with the latter comprising both northern (almost certainly Knossos) and southern (Phaistos/Ayia Triada/Kommos) subgroups (Haskell 2011b, 2011c)

[185] While other Khaniote exports are found from the eastern to the central Mediterranean in the same period (Hallager 1985; Hallager and Tzedakis 1985).

[186] Interestingly, though similar stirrup jars were made in east Crete in LM IIIA-B, none have been identified beyond the island (D'Agata and Moody 2005, 13). This situation may suggest that such trade relied on higher levels of political and economic organisation, which were not present in the east at this time, or else that the island's integration into wider Mediterranean economic systems had been led by Knossos in the Final Palatial period (as per the 'directional gateway' model of Cline 1994, 87), and those areas formerly incorporated into its territory were able to continue operating independently within such networks. A related development may be seen in the distribution of items with Central Mediterranean connections, such as Handmade Burnished Wares, and Peschiera bronzes, no examples of which have been found in the far east of the island (Borgna 2003b, 162–63).

Cyprus, southern Crete, and Sardinia becoming increasingly significant (Alberti 2016). At Kommos, Cypriot, Egyptian and Canaanite vessels were imported in LM IIIA-B, but declined into the latter period, as imports from Sardinia became more common (Shaw 2004, 44–46; Rutter 2017, 273–75). Increasing connections to the Central Mediterranean have also been noted at Khania, where small quantities of Handmade Burnished Wares have been identified, in both imported and locally made forms. These wares have been traced primarily to Italy, and their presence on Crete, particularly when locally produced, may reflect the arrival of Central Mediterranean groups, though in what capacity in unclear (Hallager 2011, 371–72; Lis 2009, 154–55; D'Agata et al. 2012; Rutter 2020).

Changing Local Networks

Communities across Crete also remained actively interconnected with one another after Knossos' fall, almost certainly via similar networks of lowland, coastal and maritime interaction as had obtained during the Final Palatial period. However, there were changes in the articulation and orientation of some of these networks. In LM IIIA2-B, Knossian pottery is less in evidence in the Mesara, though the general ceramic style of the two regions remained aligned (Watrous and Blitzer 1997, 514)[187]. The influence of Khania was increasingly felt both nearby – the absence of *larnakes* in the Khania area may reflect local elite preferences for mortuary display – and further afield, with Khaniote vessels found even in the east of the island, and inland areas like the Amari valley, where such products have been found in tombs of LM IIIA-B date (Kanta 1994, 70–71).

A decline in connections with Knossos is especially evident in east Crete. In tombs in the area of Viannos, and at Mokhlos, Palaikastroan imports became more common in LM IIIA2-B, as Knossian examples declined (Banou and Rethemiotakis 1997; Banou 2005). A common pottery tradition, with a distinctive repertoire including pulled-rim bowls, bell bowls, and trefoil-mouthed or beak-spouted jugs, was already in evidence at Palaikastro, Kato Zakros and Mokhlos by LM II-IIIA2, but during LM IIIA2 appeared more widely, at Myrsini, Tourloti, Khrysokamino, Petras and sites in the area of Praisos (Langohr 2019). Mokhlos stands out as a site which weathered these

[187] At House X at Kommos, Knossian imports are almost entirely absent from LM IIIA2 early levels, from which time Rutter (2017, 229–30) identifies a divergence in the ceramic repertoires of Kommos from those of Knossos.

changing networks of interaction. Its coastal location allowed it to capitalise on maritime trading networks, in contrast to contemporary smaller, or more inland communities like Myrsini, which evidenced more localised ceramic traditions, with any imports probably transported overland from nearby areas (Smith 2020, 294; Nodarou 2007, 80–82). Indeed, imported vessels at Mokhlos became more varied in both form and origin in LM IIIA2-B, with Khaniote and Mainland items increasing as those from Knossos dried up (Smith 2005, 186–92).

Disintegration and Deskilling

Despite these indications of continuing interaction and adaptation among communities of LM IIIA2-B, signs of destabilisation are also observable. The final palace at Knossos undoubtedly supported the work of a diverse range of craftspeople, and there is evidence that, following its decline, such occupations became rarer, along with their associated products. Metalworking, over which Knossos had a significant influence, became less homogenous from LM IIIA2 onwards (Driessen and Macdonald 1984, 68), while the quantities of copper known from the island diminish dramatically between LM II-IIIA1 and LM IIIA2-B (Hakulin 2011, 341–51). Evidence for bronzeworking has been found at Palaikastro (Hemingway 1996) and Kommos (Watrous and Blitzer 1997), but both cases have been suggested to reflect a rise in the recycling of scrap metals (Hakulin 2011, 343–44)[188]. Regional ceramic workshops also emerged, which Kanta (1980, 288) traced to Khania, Palaikastro, Episkopi, Kalokhorafitis, and Olous (see papers in Langohr 2017a). The LM IIIB potters' quarter at Kato Gouves (Chatzi-Vallianou 1989; 1997; 2017), which contained wheels, cisterns and some nine kilns, offers a window into what this kind of regional production – on a reasonable scale but at a remove from former political centres – might have looked like.

The period between LM IIIA2 late and LM IIIB also witnessed a decline in the scale and elaboration of built architecture. As seen, even in LM II-IIIA2 early, many settlements witnessed reoccupation of pre-existing buildings, but at those sites where new houses were built, like

[188] Indeed, at Kommos, Watrous and Blitzer (1997, 515) argue for a transition from metal production in large clay crucibles in the harbour complex, to the use of smaller forms found across the settlement, as part of the settlement's shift away from an economy focused on subsistence farming to one predicated on imports and small-scale industry.

Mokhlos (Soles and Brogan 2008), Khondros Kefali (Platon 1997), and Khania (Hallager 1997), they were typically smaller than those of LM I, for which a particularly wide range of house sizes has been observed, including at the upper end the elaborate mansions for which little evidence exists in the Final Palatial period (Whitelaw *forthcoming*). Sequences of abandonment and reoccupation are also documented at Kommos and Khania in LM IIIA2-B, including several destructions at the latter (Shaw and Shaw 1997; Rutter 2017; Hallager 1997). Rebuilding in LM IIIA2 at Khania also witnessed the arrival of new forms of central hearth, which the excavators link to contemporary Mainland examples (Hallager 1988, 117). An important exception to the general reduction in the scale of built architecture is the monumental set of ship-sheds (Building P) at Kommos (Shaw et al. 2006, 850–53), a reminder of the continuing opportunities afforded by coastal proximity, even as other kinds of economic activity appear to have been disintegrating.

Fragmentation of Religious Practices

Similar processes of fragmentation are observable in the realm of religious worship. Contexts of palatial ritual, like pillar crypts and lustral basins, had gone out of use by LM IIIA2-B, with the period witnessing the proliferation of small shrines within settlements, often integrated within larger buildings and featuring benches set against the walls (Gesell 1985, 41; D'Agata 2012, 278; cf. Hallager 2009). An array of objects was placed on these benches, but in LM IIIA2-B the repertoire of these items remained eclectic. Tubular stands with wavy attachments (termed 'snake tubes'), *kalathoi*, and female figurines, all rendered in clay, are known from so-called bench shrines of LM IIIB date, but while together these would form a ritual package commonly observed at shrines of LM IIIC date, in the 13th century female figurines (without this full suite of associated items) are known only from Knossos (Evans 1928, 335–44), Kannia (Levi 1959), Gazi (Gesell 1985, 44) and Gournia (Eliopoulos 2004), while snake tubes without accompanying figures have been discovered in bench shrines at Sissi (Gaignerot-Driessen 2011), Quartier Nu at Malia (Driessen and Farnoux 1994), Kommos (McEnroe 1996), Ayia Triada (Privitera 2011b), and Khondros Kefali (Platon 1957).

Many of these bench shrines thus incorporated items or iconography with palatial heritage – birds, bulls, snakes and *agrimia*, horns of consecration and double axes – but these typically took the form

of attachments to vessels or figurines, rather than standalone objects (Gesell 1985, 41)[189]. In terms of religious and eschatological beliefs, it would appear that aspects of the symbolism of the former palatial era were increasingly incorporated into local contexts, perhaps reflecting the persistence or reinterpretation of those foregoing beliefs and practices most salient to the communities of the Postpalatial era. In this period of smaller communities, lacking state-level forms of religious integration, arenas for worship were increasingly demarcated within the local lived environment of individual villages across the island.

Things Fall Apart?

While the 13th century clearly still afforded opportunities for maritime trade and exchange, and witnessed the continued circulation of products between different regions of the island, there is also evidence for political destabilisation and a decline in the forms of economic specialisation visible in LM II-IIIA1. Some of this fragmentation is almost certainly the result of the collapse of Knossos, but it must be stressed that its collapse did not obviously cause the retreat to upland, defensible locations that occurred many decades after it ceased to function as a political centre. It is possible that regional centres like Ayia Triada and Khania attempted to maintain elements of the productive economy formerly overseen by the Knossian palatial bureaucracy, such as extensive agriculture and large-scale centralised storage, but that these proved ultimately unsustainable on the local level, in the absence of technologies of power like scribal literacy, or as reliable an internal or external export market, through which secondary and luxury products could be acquired and disseminated. As argued in Chapters 4-5, a range of factors probably account for the large-scale abandonment of lowland, coastal locations in LM IIIB-C, but the destabilisation of extensive agricultural systems, maritime trade, and integrative political authority are likely all implicated.

[189] A few instances are also known of the reuse of actual Neopalatial or older artefacts in LM IIIA2-C contexts, such as the stone bowls and offering table found at Kannia, the offering table found in a chamber tomb at Ligortyno, and the stone vessels known from Vasiliki Kefala Building E, Monastiraki Khalasmenos House A1, and Room I3 at Kavousi Vronda (Cucuzza and Palio 2019).

LM IIIC: Narrower Horizons?

New Landscapes of Settlement and Interaction

The shifts in settlement which accompanied the LM IIIB-C transition on Crete had significant impacts on the articulation of regional systems of interaction, social organisation and cultural traditions. As shown in Chapter 4-5, though this process had its origins in the preceding period (Kanta 2001a, 13; Langohr 2020), played out over a century or more (Nowicki 2000, 36–37, 235–37), and varied regionally in its manifestations (Borgna 2003b, 172–73), it did represent a significant reorientation of the human landscape. Communities across Crete continued to rely on diversified agricultural regimes (Foxhall 1995; Palmer 2001), and connections to nearby settlements (Haggis 1993; Gaignerot-Driessen 2017, 514–15). Nonetheless, the collapse of the island's last regional polities did have major ramifications. The disintegration of the kinds of lowland- and coastal-focussed networks that had operated during the 15th-13th centuries impacted on the degree of specialised economic activity and regional interaction visible during the 12th century. Networks of long-distance connectivity became more attenuated and impacted on different elements of material culture and behaviour than they had in previous periods. This resulted in something of a bifurcation between localised forms of movement, interaction, and identity formation, and those which operated over longer distances, the effects of which were more restricted and variable.

Certain kinds of longer-distance connectivity are implied by the presence of relatively homogenous ceramic traditions on Crete in LM IIIC. Similar ceramic repertoires – including, especially, deep bowls, kraters and *kylikes* – and decorative styles have been noted at sites from Khania, Thronos Kefala, Khamalevri, Phaistos and Knossos, to Palaikastro in the east, for which Mainland influence is often inferred (D'Agata 2001, 346–47; Warren 2005; Andreadaki-Vlazaki and Papadopoulou 2005; Wallace 2010, 188–89; Langohr 2017c). The mechanisms responsible for this pattern are little understood, but are typically assumed to reflect either intra-island circulation of ceramics or their makers, or else common exposure across Crete to various external influences. In the first instance, there is some evidence for continued movement of pottery over some distance in LM IIIC. Transport stirrup jars from other regions of Crete have been identified at Khania (Hallager and Hallager 2000, pl. 50), Thronos Kefala (D'Agata and Boileau 2009, 185, 196, 202), Kavousi

Kastro (Haggis et al. 1997, 349, no. 49) and Monastiraki Khalasmenos (Tsipopoulou 2004a, 108). These examples are relatively few, however, and greatly outnumbered by local wares, while at Karfi this shape – once the hallmark of the long-distance and maritime trade in commodities – has only been found in locally made forms, likely used for domestic storage (Pratt 2021, 188).

There is also evidence that Crete remained, for a time, connected to wider Aegean networks of mobility and trade. Exported Cretan stirrup jars have been discovered as late as mid-LH IIIC at Tiryns, as well as in Cyprus and perhaps Egypt in the 12th century (Maran 2005; Eder and Lemos 2020, 138–39; Pratt 2021, 190–91), with pottery production in southern Italy also exhibiting affinities to Cretan forms (Borgna 2009). However, during the later 12th century, Crete's role as an exporter apparently declined (Alberti 2016, 300–301; Wallace 2010, 174–75), likely in relation to the eventual abandonment of coastal hubs like Khania and Khamalevri. Wallace (2022) has recently suggested, based on XRF analysis of metal artefacts from Karfi, that smiths may have had limited access to pure tin, instead remelting tin bronze ingots or items to fashion new products. Such a situation may reflect the more limited access to imported raw materials experienced by some communities on Crete in the 12th century.

Another putative kind of wider connection in this period concerns the arrival of newcomers to the island. The presence of Italic groups has been inferred from forms of cup and razor at Kastrokefala, as has that of Mainlanders, based on the shape of cooking vessels found at the site (Kanta and Karetsou 2003; Kanta and Kontopodi 2011). Groups from the central Mediterranean have also been suggested at Knossos, given the presence of handmade burnished wares there in LM IIIC (D'Agata et al. 2012, 307–9, 319–20). Mainlanders have also been linked to deep bowls and possible apsidal buildings at the Stratigraphical Museum site at Knossos (Warren 1983; 2005), the so-called *megara* at Monastiraki Khalasmenos (Tsipopoulou 2005; 2011a), the warrior burials of LM IIIC East Crete (Basakos 2016), the ritual building at Vasiliki Kefala (D'Agata 2001, 350), and the depositing of clay figurines in tombs across Crete (Hallager 2009).

As explored in Chapter 1, the difficulties presented by such inferences are not simply their equation of particular material signatures with ethnic identities but, particularly in the case of putative Mainlanders on Crete, the fact that they remain rooted in a framework which juxtaposes 'Minoan'

and 'Mycenaean' features of the archaeological record, in ways which have muddied the waters about the relative homogeneity or regional diversity of LM IIIC Crete (Perna 2009, 39). If some of these cases do reflect the genuine arrival of foreign groups, then one contrast observable with LM II is that, where major changes in material culture and practice were apparent first at the coastal centres of Knossos and Khania before appearing more widely on Crete in the Final Palatial period, in LM IIIC, these kinds of influences are identified across the island, with no equivalent chronological sequencing. This suggests that, were groups of settlers from abroad arriving at Crete during the 12th century, the process appears far more decentralised and variable than it had in the Final Palatial era.

Specialisation and Craft Traditions

As explored in Chapters 4-7, much of the evidence for LM IIIC points to communities adapting to the opportunities and constraints of their local natural and cultural environments, particularly through the development of micro-regional systems of resource exploitation, security, inter-community communication, and cultural practice, such as distinctive burial rites. Similar processes can be seen in the architectural and artefactual character of many of these sites, especially those newly founded in late LM IIIB-C.

The built environment in many of the new upland and defensible settlements reflected little of the Cretan palatial traditions still evidenced in some places in LM IIIA2-B. Though not always smaller than buildings of the Final Palatial period, such as those from rural locations like Khondros Kefali, houses in LM IIIC were typically more modestly sized and with less differentiated spaces (Hayden 1981, 176–77; Wallace 2010, 113–14; 2011, 325–26). Though some features of domestic architecture may represent the continuing influence of Mainland schemes, such as axial arrangements of rooms, central hearths, or entrances on the short sides of buildings, others may simply relate to new topographic and environmental realities. Houses at some defensible sites were clearly built to incorporate the uneven, underlying bedrock (such as the Northwest Building at Kavousi Kastro: Mook 1993), while in other cases, the use of terracing may have contributed to the replication of elongated house plans (Day 2017, 31). Moody (2009a) has even suggested the single-storied plans and limited ventilation of many LM IIIC houses could reflect adaptation to

cooler, more arid climates, which may have obtained during the 12th-11th centuries[190].

Limited differentiation in house size is also accompanied by similarities in the material assemblages found among dwellings. Dedicated storage structures, of the kind seen at Final Palatial Knossos, or even Postpalatial Ayia Triada, are little in evidence, with storage on the domestic level likely. Nowicki (1999) has shown how most every house at Karfi would have had sufficient storage space to provision the estimated number of inhabitants, while analyses of the assemblages from the houses at Karfi and Kavousi Vronda suggest a similar suite of household activities – cooking, weaving, perhaps domestic ritual – was replicated across most, if not all dwellings (Day 2011, 320; Glowacki 2007, 136). Larger central rooms, which typically contained hearths, may have been the focus of a wider range of activities, though most rooms were probably multi-functional, something already noted in more modest dwellings of the LM IIIA-B periods, as at Khondros Kefali and Katsambas (Wallace 2011, 326). Given all this, it seems probable that the household formed an important – if not fundamental – unit within these settlements, with responsibility for primary production, storage, cooking, and even craft activities like weaving (Glowacki 2004; 2007; Haggis and Nowicki 1993a; Haggis 2020).

Further evidence for this is seen in the agglutinative growth of some houses over several generations. Building I-O-N at Kavousi Vronda is a clear example, where the original three-roomed dwelling was supplemented by successive extensions, each replicating the pattern of larger central hearth room, and adjoining smaller rooms (Glowacki 2004, 127–33; 2007, 131–32; 2012). This kind of agglutinative development is also seen at Kavousi Kastro (Mook 1993; Haggis et al. 1997, 353–88) Karfi, Vrokastro and Monastiraki Khalasmenos (Wallace 2010, 111). The presumption is that such dwellings represent successive generations of a single lineage, which remained physically proximate following marriage or the transition to adulthood, though whether they were matri- or patrilocal is unknown.

Unfortunately, we know very little about the architecture of contemporary sites not characterised by defensive locations. At Knossos, a possible apsidal structure has been noted (Warren 1983, 74),

[190] She argues that colder temperatures are unlikely to have been a function of the locations of such communities; though many defensible settlements were in rugged, mountainous terrain, few were sited at very high elevations.

a form common on the Mainland during the LBA-EIA transition (Mazarakis Ainian 1997; 2001), but never adopted widely on Crete. Dwellings excavated at Khamalevri had walls of stone and hard-packed earth, with hearths at floor level, features seen at other sites of the period, while grey ashy layers above the floors of these buildings – something also noted at Knossos, Khania and Thronos Kefala – may suggest the presence of timber roofs (Andreadaki-Vlazaki and Papadopoulou 2005). Other settlements in the centre and west of the island are known largely through surface remains, partially uncovered buildings, or ritual deposits, frustrating any systematic regional comparisons.

Parallels to the situation with domestic architecture are found in forms of crafts production, which had become less diverse during LM IIIA2-IIIB (Poursat 1997), and by this time were probably undertaken at the level of the household or perhaps the village cluster[191]. As Murray (2018, 82–83; 2020, 203–4) has pointed out, in the context of similar changes across the wider Aegean, this is not a simple case of disintegration or deskilling; if anything, there is greater evidence for localised production in the 12th century than the 13th, when in that earlier period potting, metalworking and the creation of perfumed oils and textiles may have still been focussed in regional centres, or dedicated installations. Certain specialised technologies continued, such as the use of the potter's wheel (Crewe and Knappett 2012, 179), but the scale of the communities in question, and their degree of integration on a regional level, did impact on the nature of localised production. Stirrup jars and oval-mouthed *amphorae* of transport/storage type were largely produced and consumed locally during LM IIIC, in contrast with the preceding era, at sites including Khania, Thronos Kefala, Karfi, Monastiraki Khalasmenos, Kavousi Vronda and Palaikastro Kastri (Pratt 2021, 183)[192]. Kilns have been found at Kavousi Vronda (Coulson et al. 1989), Khamalevri (Andreadaki-Vlazaki and Papadopoulou 2005, 361), and Monastiraki Khalasmenos (Rupp 2014, 167, 175), and inferred from what may be wasters at Karfi (Day 2011, 318). In contrast to the LM IIIB ceramic

[191] The ceramic fabrics observed at Karfi, for instance, are closely matched by those recovered from the surrounding sites of Kera Vigla, Krasi Siderokefala, and Kera Papoura (Wallace 2010, 125).

[192] Pratt also notes that the techniques for producing transport stirrup jars in this period were simpler, being no longer produced in two separate halves, nor making use of different clay pastes for the handles, spouts and bases. The base of these vessels was also widened, making them more suitable for storage functions in a domestic context, perhaps reflecting the more localised production and utilisation of these shapes (Pratt 2021, 187; Day 2005).

workshop at Gouves, however, these kilns were single installations, located towards the edges of their associated settlements or even, at Khalasmenos, just off the open square in the centre of the village (McEnroe 2014, Fig. 6). There is little indication of large-scale production or export.

The situation with metalworking is less clear. Metal objects continued to circulate on Crete, mostly items of jewellery and adornment, as well as weapons and tools, but evidence for production is slight, following the disappearance of metallurgical deposits from Poros-Katsambas (Dimopoulou 2012) and Palaikastro (Hemingway 1996) in LM IIIB (Wallace 2010, 191–92; Murray 2017, 179–80). At Khania, bronzes have been found together with slag and crucibles, in LM IIIC contexts, with the copper traced via lead isotope analysis to Sardinia (Bruun-Lundgren and Wiman 2000), while lead run-offs from the Great House at Karfi might indicate metalworking in the building (Day 2011, 318). Analysis of metal finds from Karfi, and similarities with those from sites in the wider Lasithi area, suggest that such products may have been made by itinerant smiths, bringing with them knowledge of styles and techniques from the wider Aegean or Mediterranean (Wallace 2022). Nothing approaching industrial production is in evidence anywhere, however.

Many other palatial industries had essentially vanished from the Aegean by this point, not only literacy, but seal engraving (Krzyszkowska 2020), ivory working (Tournavitou 2020, 630), and glassmaking (Nightingale 2008). The fate of other formerly palace-supported industries is less clear-cut. The production of textiles evidently continued, with loom weights and spindle whorls discovered in many buildings of LM IIIC date[193], and is likely to have occurred on the domestic level. Perfumed oil was likewise still produced, at least in some areas (Koh and Birney 2017). In both cases, as with pottery, these products were based on resources – wool, olives, herbs and clays – as readily available to small rural populations as to the larger political entities of the preceding era, while the palaces likewise probably never exerted monopolies over their production. Their continuation and evolution speaks to the ongoing relationships between communities and their local material and productive environments, as well as the utilitarian and more precious items that retained social significance even within the more modest circumstances of LM IIIC communities

[193] These include Khania (Bruun-Lundgren and Wiman 2000), Khamalevri (Andreadaki-Vlazaki and Papadopoulou 2005, 357–59), Phaistos (Borgna 2004a, 250–54), Karfi (Day 2011, 318; Wallace 2020b, 60), Monastiraki Khalasmenos (Tsipopoulou 2005a, 304, 322), Kavousi Vronda (Day 2016b, 156–58), and Palaikastro Kastri (Sackett et al. 1965, 302–305).

(see Chapter 7).

Broadly speaking, the built worlds and material repertoires of LM IIIC appear to have been tied closely to topographic and environmental considerations; the utilisation of readily obtainable materials; more spatially or technologically constrained forms of specialised production and labour mobilisation; declining demand for the most elaborate prestige goods; and the familial structures at the heart of most communities. Certain architectural or artefactual forms may have retained a cachet from their previous association with larger political centres, but there is little evidence that, as was seen in the Final Palatial period, this might reflect sustained political interaction or the large-scale provisioning or employment of artisans. Though people and products may have circulated frequently on a local level, there is less evidence for sustained technological or stylistic exchanges over long distances, especially by the later LM IIIC period.

Contrasting Landscapes of Worship

The religious landscapes of LM IIIC Crete reflect similar developments in terms of the emergence of localised systems of material culture and practice, but with certain indicators of wider-reaching connections and interactions. Prent (2005, 174–76) defines two dominant types of ritual assemblage in LM IIIC: those based around combinations of female figures with upraised arms, tubular stands or snake tubes, *kalathoi* and plaques all fashioned in clay; and those featuring large wheel-made terracotta animals, often cows, smaller zoomorphic and anthropomorphic figurines, animal-human hybrid figures, and clay horns of consecration. The former generally derive from shrines or buildings within settlements, where they were often displayed on benches or platforms, while the latter have more typically been recovered from extra-urban sanctuaries, cave sites, or open-air venues. The bench shrines with female figurines are a key development in religious practice in this period, and in line with the evidence already explored, represent a localisation of practices with echoes of palatial tradition, but probably imbued with new meanings and significance (Kanta 1980, 324; Gesell 1985; D'Agata 2006).

It is unclear whether the emergence of the canonical bench shrine – which was typically a standalone building, with a bench set against the wall and the figurines, snake tubes, plaques and *kalathoi* placed on top – should be viewed as a regionally specific phenomenon, as in LM IIIC the

clearest examples all come from east Crete (Eliopoulos 2004; Day et al. 2006; Tsipopoulou 2009). Its closest forerunners in LM IIIA2-B are the shrines with female figurines at Knossos, Gazi, Kannia and Gournia in LM IIIA2-B, or those with tubular stands and *kalathoi* at Sissi, Malia, Kommos and Katsambas, but these either lack the full repertoire of ritual items, or were set in larger building complexes which contrast with the single structures typically employed in LM IIIC (Gaignerot-Driessen 2014; Gaignerot-Driessen et al. 2016; Klein and Glowacki 2009, 153). In LM IIIC, figurines with upraised arms in central Crete are only known at Prinias, where they have been found in fragmentary states, and not yet within a building (Prent 2005, 133; Babbi 2015, 101), and in the Spring Chamber at SM Knossos, where the figurine in question is set into a hut model, and so may reflect a different form or object of worship (Evans 1928, 129–30; Prent 2005, 135–36). At Khamalevri and Thronos Kefala, there is evidence for a distinct type of ritual practice, which involved the deposition of ritual paraphernalia, and the remains of communal dining occasions, in ceremonial pits, within the bounds of the settlement (Prokopiou 1991, 400; D'Agata 2002; Andreadaki-Vlazaki and Papadopoulou 2005).

It is possible the presence and absence of these various features and artefacts across Crete does reflect genuine regionalism in forms of religious worship – something that would certainly be in keeping with other evidence for the period. But all share in a more general pattern of religious ceremonies taking place within the bounds of settlements[194]. At Karfi, no fewer than eight 'shrines' have been proposed, based on assemblages found in rooms and independent buildings across the site[195]. This has been suggested to reflect the lack of an over-arching authority at the site, and the presence of competing groups and their associated cults (Gaignerot-Driessen 2014, 515–16). But while this may be an appropriate interpretation of the more clearly demarcated shrine buildings, the more modest ritual assemblages may reflect a co-existing sphere of domestic religious practice (Day 2009). As noted, visual hallmarks of palatial religion are found as attachments on figurines

[194] This pattern may also be linked to issues of archaeological visibility. Shrines in open, off-site locations are likely to be underrepresented compared to those located in excavated settlements. However, in the PG-G periods, we do know of many more rural or off-site shrines and sanctuaries, suggesting that, at least relative to those later periods, LM IIIC does appear marked by a greater focus of ritual activity within the bounds of settlements.

[195] Wallace (2012, 5–18; 2020, 26–38) associates the recently excavated Building A with forms of communal gathering and commensality, but does not identify it as a shrine or religious building *per se*.

of LM IIIC, suggesting elements of the symbolic or ideological frameworks of these practices continued to resonate for communities of the 12th century, but they were evidently adapted to the changing circumstances of habitation, livelihood and social organisation. The location of many bench shrines in areas of open ground does suggest larger gatherings were a feature of at least some religious ceremonies (Glowacki 2007, 137–38; Day 2009, 139), but there is no reason to suspect this didn't occur alongside forms of domestic worship.

A contrast to this localisation of cult is found in the extra-urban shrines and sanctuaries of the same period. These were typically centred on caves or rock shelters – as in the case of the Idaean Cave, Patsos, Psychro and Faneromeni – while the sanctuary of Kato Syme was located near an upland spring (Prent 2005, 200–201). Many of these locations had received votive offerings earlier in the BA, and so stand out as important ongoing foci of religious worship, despite major demographic, political and cultural changes. Some of these sanctuaries may have been closely associated with particular sites, such as Faneromeni (Wallace 2010, 137–38), a situation that may also be in evidence near Anavlokhos, where an open-air shrine was located about an hour from the settlement (Gaignerot-Driessen 2019b, 67–68), or at Ayia Triada, where the *Piazzale dei Sacelli* became a focus of ritual activity in LM IIIC, perhaps for the community now resident at Phaistos (D'Agata 1997). But others are far from contemporary settlements, and likely to have been centres of pilgrimage. As noted above, the ritual assemblages at these sites typically contrasted with those within settlements, the focus more often being on zoomorphic and anthropomorphic figurines (though unlike the large female figurines with upraised arms). One possibility is that they reflect different forms of religious ritual with distinct concerns from those practiced within settlements, the focus being more on aspects of the natural world or wider landscape.

These two main contexts of cult practice might also shed light on the different scales of mobility and interaction operating during LM IIIC. It was argued in Chapter 6 that, giving the small scale of most communities at this time, marriages between villages would have been necessary to support stable populations. Petrographic analysis of the female figurines with upraised arms at Monastiraki Khalasmenos indicates clay sources spread between the north and south coasts of the

Isthmus of Ierapetra, suggesting that these figurines[196] were brought to the site from different locales (Chlouveraki et al. 2010). The precise significance of this remains unclear, but Gaignerot-Driessen (2016b; 2020) has suggested these figurines, rather than representing specific goddesses, were emblematic of the dedicating groups, and specifically of different lineages based at each settlement. Petrographic, iconographic and technological similarities between figurines in different sites might thus reflect extended lineages, with members living across a number of villages. One possibility, therefore, is that the distribution of these figurines is at least partly a function of exogenous marriage practices – something necessitated by the modest populations in question – with the kin-based linkages between these communities ceremonially reinforced or celebrated through forms of religious congregation.

At the other end of the scale, extra-urban sanctuaries might have facilitated connections between more widely dispersed populations. Most of these were frequented in the BA, demonstrating that knowledge of their locations, and their religious significance, outlived the final palaces (Sakellarakis 1988; Kanta 1991), while the general consistency in the represented offerings may suggest they played host to rituals based around a widely shared set of core beliefs (Prent 2005, 205–6). Records of dedications at sanctuaries in the Knossian tablets (Lupack 2011), and the presence of Knossian style storage *pithoi* at Kato Syme (Banou and Rethemiotakis 1997, 51) suggest palatial investment in, or even direct control over, some extra-urban sanctuaries in the Final Palatial period, but by LM IIIC such political involvement appears unlikely. Close links between specific settlements and extra-urban sanctuaries may be in evidence at Ayia Triada (D'Agata 1998) and Anavlokhos (Gaignerot-Driessen 2019b, 67–68), but this seems less likely in the case of sanctuaries like the Patsos and Psychro Caves, the Idaean Cave, or Kato Syme. Their distance from contemporary major settlements, their long histories of ritual use, and even their later association with widely worshiped deities (Zeus for Psychro and Ida, Hermes and Aphrodite for Kato Syme) suggest they may have been pilgrimage sites, existing outside of the control of any particular settlement or community (Chaniotis 1988, 29–32; Watrous 1996, 102; Papasavvas and Fourrier 2012, 289–93). These would have been visited more rarely than shrines within or at nearby settlements, and so

[196] Or, at the very least, the raw clays.

would have only facilitated more sporadic interactions, but as venues for the shared articulation and negotiation of religious, material and cultural traditions, they may have had a significant role in the maintenance of long-distance connections within the island.

Characterising Communities

There has been much debate as to how to characterise the social organisation of communities in LM IIIC, particularly regarding the degree of inequality or social differentiation we might expect. Models advocating a chieftain or 'Big Man' type society (Donlan 1985; Whitley 1991a) have been challenged (Wallace 2010, 165), with distribution of social power between lineages or clans emphasised by some (Tsipopoulou 2009). It has even been suggested that major differences existed in how social hierarchies were structured in contemporary settlements (Day and Snyder 2004b)[197]. The foci of such debates have generally been buildings identified as those of religious leaders, elites, or else more public structures where communal rituals or meals were hosted. The Great House, Priest's House and so-called *megara* at Karfi (Day 2009), Building A-B at Kavousi Vronda (Day and Snyder 2004b), Building A at Vasiliki (Eliopoulos 1998a), and another set of *megara* at Monastiraki Khalasmenos (Tsipopoulou 2011b) are among such buildings.

These buildings have been associated with acts of communal dining, which, in open-air contexts, have also been inferred at contemporary Phaistos (Borgna 2004b), Khamalevri (Andreadaki-Vlazaki and Papadopoulou 2005), Thronos Kefala (D'Agata 2002), and Kalamafki Kypia (Whitley 2006a, 601–5). Suspected acts and venues of collective drinking and dining are cultural phenomena visible throughout the LBA and EIA, and their significance for characterising the communities in question has been greatly discussed[198]. The long-standing and important recognition that such occasions offer countervalent opportunities for minimising and accentuating social difference

[197] They argue the so-called 'Big House' (House A-B) at Kavousi Vronda was likely to have been the residence of an elite family, while the more varied architectural and artefactual patterns evident at Karfi indicate a more distributed or shifting system of political organisation, in a considerably larger community. However, much of the Karfi settlement remains unexcavated, meaning this impression could well change with the uncovering of further buildings.

[198] The Cretan case appears to contrast, for instance, with the situation observed in much of the Greek Mainland, where a more obviously exceptional building in many settlements may have been the home of local leaders or dominant families, and which served as a focus for communal dining and religious rites (Mazarakis Ainian 1997; 2001). Settlements like Karfi or Monastiraki Khalasmenos lack evidence for such distinctive buildings, having instead a range of different structures.

(Dietler 1996; Hayden 1996; Dietler and Hayden 2001; for the BA Aegean: Hamilakis 1996; 2000) has led many to interpret their visibility in the ceramic assemblages of LM IIIC sites as evidence for elite feasting, the hosting of banquets by powerful families, or else religious festivities (Borgna 2004a; Day and Snyder 2004b; Whitley 2006a, 301–5; Glowacki 2007, 135–36). All are possible, but the small scale of many of these communities – as stressed in Chapter 6 – recommends caution in overinterpreting the evidence as representing agonistic, competitive displays of social status amongst putative 'elite' groups. Though charismatic leaders or individuals of local renown are certain to have existed in each generation, these statuses are likely to have been individually achieved, rather than ascribed by descent. Duplouy (2006a; 2018a) has argued convincingly that even by the A-CL era, aristocratic standing was as much a performance as a guaranteed status, and this can only have been more acutely true in the 12th century, when control over the mobilisation of resources, and access to prestigious items through local production or imports, would have presented serious challenges to communities numbering in the tens to low hundreds.

It could equally be contended that acts of communal dining in this period represented genuine forms of socially integrative risk spreading and bond building (Wallace 2011, 325). Many of the settlements of LM IIIC were newly founded, their populations small, their agricultural landscapes sufficient but not without limitations, and their viability as communities dependent as much on the survival of the poorest as the richest members. Evidence from settlement patterning, demography, agricultural regimes, architecture and material culture points towards small communities reliant on close cooperation and communication with their neighbours, out of which ritualised forms of group cohesion and camaraderie appear just as likely as regular acts of competitive elite display. The forms of social distinction that did exist are likely to be closely tied into the material and demographic conditions of the time, as well as the forms of connection individuals were able to form[199].

[199] Hence some of the earliest burials with significant material elaboration in the 11th century – such as T. 200+ at Knossos (Coldstream and Catling 1996b, 191–95), or the Pantanassa tomb (Tegou 1998; 2001) – exhibit novelties in practice (for cremation was at this time an uncommon rite), material (bronze vessels and stands, iron knives), and in their connections to the wider Mediterranean (imports from Cyprus), conflating aspects of militarism, distant or exotic lands or material traditions, as well as the transformative and visually striking act of the cremation rite (Stampolidis and Kotsonas 2006, 340; Perna 2009, 42).

Staying Local

The social systems of the 12th-11th centuries are best characterised as highly localised, with many and varied forms of interaction and cooperation between proximate communities, with far more limited relationships to more distant regions. This is not to say that no island-wide connections or patterns can be observed, but there is little to suggest regular exchanges of ceramics or craft products over large distances. Communities adapted to their new circumstances, and settlement patterning, architecture, and specialised production reflect the conscious, active exploitation of local environmental and material opportunities. Nonetheless, the decline of more integrated, specialised economies of production and exchange is demonstrated by the more modest forms of material elaboration found in this phase. The adaptation of former technologies, practices and beliefs to a new set of material circumstances is seen too in the religious sphere, where acts of worship were more visibly set within settlements, and aspects of palatial era iconography were redeployed. Religious practice, in turn, may have underpinned certain kinds of ritualised interaction over both local and interregional scales, as with the possible movement of goddess figurines between settlements on the Ierapetra isthmus, or else the journeys made to the rural sanctuaries of Mount Ida and Kato Syme. The increasing frequency of longer-distance interactions, including those which extended beyond the shores of the island, would, in turn, be a central characteristic of the economic and political developments of subsequent centuries.

PG-G: Regrowth and Reconnection

In Chapters 4-6, I argued that the 10th-9th centuries were a period of demographic growth, though with regionally varied processes of nucleation (the abandonment of settlements and consolidation of populations at others) and expansion (the continued growth of what had already probably been the largest settlements in their local area in LM IIIC). The abandonment of many defensible settlements, in favour of strategically located *acropolis* sites, with access to prime arable, diverse natural resources, and corridors of movement, is a clear development. But as noted previously, Wallace (2006; 2010) has argued these movements reflect the early consolidation of genuine polities, with social structures akin to those of the later *poleis* already in place, a viewed critiqued by Gaignerot-Driessen (2016a, 2017, 515), who envisages the nucleated sites of the PG period as

merely strategically located population centres, offering little clear indication of developed political institutions. The arguments presented in Chapter 6, that one of the push-factors involved in nucleation may have been the consolidation of demographically self-sustaining populations, with more integrated productive environments, by no means requires that these communities had developed anything like the civic institutions evidenced by the Archaic law codes. It would imply these relocations were largely the product of demographic, or agricultural concerns, rather than institutional ones. But although the political influence of the larger communities of the 10th-9th centuries remained small, they do present evidence of greater involvement in regional networks of communication, and the extension of economic or religious interests into local landscapes.

Signs of Growth

Tracing internal changes at PG settlements is difficult at present. Only at a few have excavations revealed clear stratified sequences of architectural development during the 10th-8th centuries (Haggis 2020, 1076; Judson 2018). As explored in Chapters 4-6, settlement growth and nucleation appear to have been widespread phenomena, though often only detectable through surface remains. An important exception is the site of Kavousi Kastro, where excavation has revealed clear restructuring of the built environment, particularly during the EPG phase. House plans were regularised, interior space was compartmentalised, with room sizes becoming more uniform in dimensions, and terracing employed to expand the settled area to the west (Haggis et al. 1997, 333–53). Hints of a similar investment in more formalised layouts may be present at Phaistos, where a paved PG road has been located, probably making use of an arterial route with BA antecedents. It went out of use sometime late in PG, when the first buildings of the so-called Geometric Quarter were constructed over it (Cucuzza 1998; La Rosa 2013).

It is frustrating that in many other settlements of this period, PG remains have proven ephemeral or unstratified, often recovered from underneath later buildings. Such a situation is found at Gortyn – at both the Profitis Ilias (Allegro and Santaniello 2011) and Agios Ioannis sites (Rizza and Scrinari 1968) – Prinias (Lefèvre-Novaro et al. 2013, 8), Azoria (Haggis and Mook 2015, 18), and Anavlokhos (Gaignerot-Driessen 2019a, 5–6), while some kind of PG occupation is plausible, though as yet unconfirmed by stratified deposits, at Praisos (Whitley 2006a, 605) and Dreros

(Gaignerot-Driessen 2016a, 223). At Thronos Kefala, the buildings and ritual pits of LM IIIC date appear to have continued in use on the central and north parts of the hill, and a large building may have been built in the late 9th century to the south, but the ceramics recovered from it date to the 8th century (D'Agata 2000). At Knossos, survey indicates that the core area of the site expanded significantly in PG (Kotsonas et al. 2019), but excavated remains have yet to clarify the nature of this occupation. A few stratified floor deposits, and dumps of ceramic material, have been recovered from various locales in the area of the PG settlement, but a coherent picture is still lacking (Coldstream 1960; 1972; Coldstream and Hatzaki 2003)[200]. It seems probable, though, that the inhabited area in PG was not densely or evenly occupied throughout. It remains difficult to integrate, at present, the wider evidence for settlement nucleation and growth in the 10th-9th centuries, as explored in Chapters 4-5, and the actual built environments discernible at many sites, though Kavousi Kastro hints at processes that may have had parallels at other locations.

Expanding Landscapes of Worship

Better evidence for the expanding horizons of communities in PG comes from extra-urban shrines and sanctuaries of the period, both those continuing from earlier periods and newly founded in the 10th and 9th centuries. Characterising cult practice within settlements – as with much else – is problematic, though it does appear the female figures with upraised arms, and their associated buildings and assemblages, were largely abandoned at the same time that many populations relocated (Prent 2009, 231–32)[201]. Even at Knossos, where occupation clearly continued, the Spring Chamber went out of use by the end of SM, with evidence of cult activity at the nearby site of the Sanctuary of Demeter only appearing in the later 8th century (Coldstream et al. 1973, 181). Cult activities continued at several of the long-running extra-urban sanctuaries, though, including the Idaean Cave and Kato Syme. Interestingly, the latter was remodelled somewhat during PG,

[200] It does still appear, however, that even if occupation was less dense than during the LBA, the site still represented a single continuous settlement, rather than a collection of villages, as has been previously debated (Alexiou 1950; Hood and Smyth 1981, 16-18; Coldstream 1984; 2000).

[201] There are later instances of figures both painted and fashioned in clay and bronze from the 10th-7th centuries, but these later forms exhibit changes in the articulation of the gesture (which is also later found on male figurines), appear in a less standardised range of contexts, and in some cases, such as the figurines on the bronze votive 'shields' from the Idaean Cave and Palaikastro, derive from Eastern Mediterranean models rather than local Cretan ones (Prent 2009, 232–35).

with the construction of an open-air altar, near the monumental podium of Neopalatial date, a trapezoidal bench, and a building with a hypaethral hearth (Lebessi 1977, 416–17, 1985, 12, 17–19), reflecting renewed investment in the built environment of worship at the site.

The 10th-9th centuries also witnessed the founding of a number of new extra-urban cults. Though the site of Pachlitzani Agriada – a small rural cult site established near Kavousi, perhaps as early as the 10th century – may reflect a broader process of emerging suburban or extra-urban shrines, it has long been something of an outlier for the period (Alexiou 1956; Klein and Glowacki 2009, 162; Prent 2005, 504–6). Recently, however, a cult building of PG has been identified at the location of Kako Plaï at Anavlokhos, situated between the contemporary settlement and cemetery (Gaignerot-Driessen et al. 2020; Gaignerot-Driessen 2020; 28-31). It is probable, therefore, that other shrines located in environs of settlements at this time are waiting to be discovered, and if so would represent an interesting contrast with the intramural focus of cult practice in LM IIIC, as well as presaging the later proliferation of suburban or extramural shrines in the G period.

Further indications of an expanding landscape of ritual practice come in the establishment of sanctuaries at former BA centres. Ritual activity had occurred at Ayia Triada already in LM IIIC (D'Agata 1997), and perhaps around the same time at Tylissos (Kanta 2011), though the dating of this activity is less clear (Prent 2005, 131). But by the end of the 11th or early in the 10th century, ritual reuse of both Amnissos on the north coast (Schäfer and Alexiou 1992), and Kommos on the south (Shaw and Shaw 2000), had begun. Both of these sites can be associated with nearby centres – Knossos and Phaistos, themselves with important BA histories – and in both cases visible BA architecture appears to have been a focus for ritual activities which included acts of communal dining and probably sacrifice (Schäfer and Alexiou 1992; Shaw 2000b, 8–12; 2000a, 682–98). Architectural remains of the EIA at Amnissos are lacking, but at Kommos a sequence of temples was erected between the 10th and 7th centuries. At both sites there is evidence for imported items – including, at Kommos, early evidence for Phoenician ceramics and bronzes – and as such it has been suggested their foundation may relate to the ritualised re-establishment of harbours for their associated inland settlements (Prent 2005, 523–31; D'Agata 2006, 407–10)[202]. If so, this would

[202] At Knossos, there is evidence the harbour area of Katsambas was reoccupied around this time (Coldstream 1984b, 317–19).

imply an increasingly active interest on the part of the associated communities, in the opportunities afforded by tapping into wider maritime networks, which were expanding at this time, particularly via the east-west expansion of Phoenician trading ventures (Sherratt and Sherratt 1993; Babbi et al. 2015; Bell 2016).

Overseas Connections

This interpretation of the sanctuaries of Amnissos and Kommos ties into evidence for increasing overseas connections in the 10th-9th centuries on Crete. One obvious instance is the emergence of the PG style itself. This occurred (though, at some delay) under the influence of Attic forms (Coldstream 2008, 234–35), which dominate the imported ceramics of the 10th century in the Knossian cemeteries. But Cypriot and soon Phoenician items are attested also in the PG period, such as the inscribed bronze bowl from Tomb J at the KNC (Coldstream and Catling 1996b, 30) and the storage jars from Kommos (Callaghan et al. 2000, 302–12). The contexts in which imports of the 10th-9th centuries appear are typically sanctuaries or tombs, suggesting their use was limited and conspicuous, likely implicated in the negotiation of certain kinds of outward looking social personae or statuses (Hoffman 1997; Prent 2014). Kourou (2000; 2016, 60) has, however, noted an important shift in the nature of Cypriot imports between the 11th and the 10th-9th centuries, from only a limited range of metal objects, to a broader repertoire of items including ceramics, hinting at an increasing scale or at least diversity in these economic relationships.

The evidence for imports in the 10th-9th centuries must be treated with caution, though, given that such items still represent a very small minority of excavated material, even in contexts like tombs or sanctuaries, where they are likely over-represented[203]. As Jones (2000) suggests, the presence of imports in and of themselves does not necessitate changes in the orientation of the wider economy; indeed, until imported items were also being imitated by local craftspeople, or the techniques for their manufacture actively being conveyed by foreign artisans, such items are unlikely to have provided much stimulus to the productive economy. Wallace's (2010, 234) contention, that the

[203] As Murray (2017) has argued for the wider LBA-EIA Aegean, raw counts of imports by period should be weighed against both the length of the periods in question, and the evidence for population size, for both may distort our view of the actual scale of import activity.

growth of commodity production, and an accompanying increase in subsistence demands, fuelled the settlement relocations of the EPG period, therefore seems somewhat unlikely.

It also appears that the flow of products into Crete was not matched by the export of local products. Problems of identification aside, Cretan exports in the EIA are far outnumbered by imported items (Jones 2000, 6–7)[204], with those very few pieces found on Cyprus, for instance, possibly transported by Euboean sailors rather than Cretans themselves (Kourou 2016, 66). Those communities like Phaistos and Knossos (via Kommos and Amnissos), where maritime connections are in evidence from the 10th century, were more likely capitalising on the necessary stopovers of long-distance traders, than actively generating commerce through renewed export of primary or secondary products (cf. Kotsonas 2009; 2017, 15-18). This does not mean such items did not carry a significant cultural cachet on Crete, but their impact probably remained relatively restricted from an economic perspective. Imported goods in the PG period are more likely to have been a reflection, rather than a foundation, of the material wealth or social standing of individuals buried with them, or dedicating them at sanctuaries.

There is some evidence, however, that already by the 10th-9th centuries, Cretans were imitating styles and items of external origin, or else incorporating them into local craft traditions which hint at the existence of specialist workshops, or at least artisans. A particular class of juglets imitating Cypriot Black Slip seem to have been produced from at least the 10th century, at Knossos, Prinias, Kourtes, Afrati, Dreros and Kavousi, suggesting they may have circulated across the island, though a clear production centre is as yet unknown (Kotsonas 2012, 160–65). Similarly, bronze tripod cauldrons, bowls, and stands were probably already being dedicated at the Idaean Cave by the 9th century, in forms with clear links to Cyprus, though most are believed to have been made on Crete (Matthäus 2000a, 273; 2011; Papasavvas 2012). The diversity of imitated ceramics and metalwork would increase dramatically by the end of the 9th century, but these examples already indicate a receptivity and increasing degree of craft specialisation on Crete in the PG period.

[204] And a number of these in Cyprus in the 11th century, and Italy and Sicily in the later 8th-early 7th centuries, may reflect the movement of populations, rather than trade (Jones 2000, 6–7).

Persistent Regionalism

Despite these renewed engagements with the wider Mediterranean, there persisted evident regionalism and limited interregional connections during the PG period, as reflected in the range of local ceramic traditions. The Early, Middle and Late PG phases identified at Knossos are difficult to trace anywhere outside the central region, though evidence for communication between the north and south coasts is probably reflected in the development of the PG style in the Mesara, for which Knossian (and not direct Attic) contact is likely to have been the major stimulus (Coldstream 2008, 26). Attic imports – and influence on ceramic traditions – are lacking in east Crete, and the impact of central Cretan ceramic styles on PG pottery appears far more diffuse (Tsipopoulou 2005b, 556–57). Indeed, very few imported ceramics of PG date are known anywhere in east Crete, with the exception of an LPG Euboean hydria from Kavousi (Tsipopoulou 1991, 137, 140; 2005b, 88, Fig. 54). Similarly, the PGB style, which probably originated at Knossos under influence of a range of wider Mediterranean (and perhaps reencountered BA) styles, does not appear as an island-wide phenomenon. Similar vessels are found in number at Eltynia and Prinias – sites close to, and well-connected with, Knossos – with a slightly contrasting tradition in evidence at Eleutherna, and few to no true PGB specimens identified in the east of the island, though some attenuated replication of elements of the style may be in evidence (Whitley 2013, 414–15; Tsipopoulou 2005b, 557). Out of nearly 1000 vessels, only a single plausibly Knossian import appears in Tsipopoulou's (2005b, 114) catalogue of EIA east Cretan pottery.

The localised circulation of ceramics would appear to be a feature of Cretan communities through much of the 12th-9th centuries. Furthermore, the arrival of imports on the island may have occurred largely through a handful of gateway communities, situated close to the coasts, and so perhaps more receptive to the development of new ceramic and artefactual styles and decorative schemes. Such patterns are reflected in a petrographic analysis of sampled pottery dating to the LM IIIC-PA periods from Knossos and Thronos Kefala (Boileau et al. 2010). In both cases, non-local Cretan wares typically derived from nearby areas, such as the Mesara for Knossos, and the Western Mesara, the Agyios Vasileios valley, and the area of Khamalevri for Thronos Kefala. But while Cypriot and Sardinian wares were identified at Knossos, no off-island imports were present among the assemblages from Thronos Kefala. Thus, despite the evidence for settlement relocations,

population growth, and what may represent the politically motivated establishment of cult sties in the ruins of former BA centres, consistent economic interaction between different regions on Crete appears to have remained relatively muted for much of the 10th-9th centuries, while many communities may have had only limited engagements with off-island networks of mobility and exchange. This last point especially should be considered in light of the argument in Chapter 4, that settlement relocations in the PG-G periods were not strongly motivated by the reoccupation of coastal locations.

Emerging Identities

Though the evidence for the PG period is regionally and diachronically patchy, certain broad developments can be outlined, which together may preface important features of the subsequent centuries. For one, whether communities relocated in PG, or remained in settlements established in LM IIIC or earlier, it seems likely this period witnessed population growth, and the consolidation of productive landscapes in the vicinity of regional centres. Intermarriage between small settlements probably still occurred, but amongst those communities large enough to be demographically self-sustaining, there was increased potential for certain families, lineages or other corporate groups within the population to achieve more established forms of notability, heritable wealth, and perhaps social status. The persistence of even relocated communities within micro-regional contexts now inhabited for centuries, may have fostered more rooted conceptions of place and history, that is, forms of real or fictive social memory, through which populations envisaged their relationships to each other, and their local landscapes. To such phenomena we might link the establishment of cult centres among the ruins of former BA towns like Kommos and Amnissos.

There remain many challenges to interpretation of the evidence for 10th-9th century Crete, however. Limited excavation, and the obscuring effects of later occupation make characterising the internal layouts of most settlements very difficult. Settlement relocations hint at important demographic developments, but the scale of most communities, and the intensity of their engagement with more distant areas were still quite limited. Nonetheless, there is evidence for steadily increasing offshore connections, greater openness to forms of external iconography and material culture, and more visible expressions of what might broadly come under the banner of social memory or heritage,

expressed through the growing significance of families and extended lineages, and the reuse and restructuring of former centres of habitation and worship.

G-PA: Consolidation and Connection

The 8th and 7th centuries witnessed a continuation and intensification of many of these trends, namely increasing investment in the development of the built environment; growing craft specialisation and economic connections between settlements on a regional and interregional level; engagement with off-island forms of material culture, iconography, and practice; and the articulation and negotiation of social roles and ideals through the frequentation of religious spaces both integrated with and set apart from contemporary settlements.

Changes in the Built Landscape

The 8th-7th centuries offer the first clear evidence since the BA for major building works at the settlement level, including more regular arrangements of dwellings, and the monumentalisation of public architecture. From the end of the 9th century, a few sites have yielded more substantial architectural evidence, such as Thronos Kefala (D'Agata 2000) and Phaistos (Levi 1957-8, 264–74; 1961-2, 397–418), with buildings that continued in use through the 8th century. Geometric evidence at Phaistos comes from several areas, including Khalara to the southeast of the palace, where a sequence of domestic dwellings was constructed, Agia Fotini to the northeast, where two possibly Geometric kilns underlay 7th century dwellings, and the so-called Geometric Quarter, immediately to the west of the old palace. Buildings in this quarter included the large building AA, which had an associated courtyard, a central hearth, and an adjacent small room, EE, which contained evidence of cooking activities. It has been suggested this complex was a focus for communal dining activities in the 8th century, before its abandonment in LG/EPA (Cucuzza 1998, 65–67; Sjögren 2007, 152). Paved roads were identified at both Khalara and the Geometric Quarter, which probably linked these areas of habitation together, though it is not clear whether habitation spread continuously between them (Cucuzza 1998, 63).

At many other settlements, though, it is the end of the 8th century which appears to mark a watershed in terms of the built environment. Major episodes of private and public building work

have been recognised across Crete at this time. Extensive terracing, and the continued expansion, regularisation and elaboration of dwellings at Kavousi Kastro characterised this final phase of activity at the site (Haggis et al. 1997, 352–53; Mook 2011). In contrast to earlier periods, when some houses were built to incorporate underlying bedrock, these terracing works acted to generate large, regular surfaces for the development of the built landscape. Major terracing work was undertaken at Anavlokhos in LG also (Gaignerot-Driessen 2017, 516), while on the Profitis Ilias hill at Gortyn, rectilinear houses were found across two terraces, separated by a paved road (Allegro and Santaniello 2011). Much of the town plan of Prinias dates to the late 8th, and particularly the 7th centuries, during which time densely packed houses on common alignments were constructed, intersected by well delineated streets and open spaces (Rizza 1991; Pautasso 2014; Rizza and Pautasso 2015).

An important development in this same period was the construction of larger, more elaborate buildings with public or ritual character at the centre of many settlements. The earliest of these is probably the so-called Temple of Apollo at Dreros, which dates to the mid-8th century, and comprised a large room with a central hearth, and a roof probably supported by a central column or columns. A large open space next to this building, initially interpreted as an *agora*, may be contemporary with it (Demargne and Van Effenterre 1937, 10–15), though this has been questioned (Gaignerot-Driessen 2016a, 226–27). Another large building with a slightly different plan but also a central hearth was found on the west hill of Dreros, dating probably to the 7th century. Prinias Temples A and B (the latter constructed in the 8th century, and the former in the 7th) had a similar layout to the Temple at Dreros, and Temple A in particular appears to have been built as part of a wider restructuring of the built environment in the centre of the settlement. The area of Temple A had been the focus of ritual activity from an early stage in the settlement's life, as suggested by the snake tubes and female figurines of LM IIIC date discovered in the vicinity (Pernier 1908, 120; Palermo 1999). A similar situation is seen at the building at Aï-Lia at Afrati, constructed some time in the first half of the 7th century, which overlay a LG structure, and PGB paving, with evidence of animal sacrifice (Lebessi 1969; 1970). The precise functions of buildings such as these are disputed, though they are generally assumed to have housed gatherings of a religious or civic nature, accompanied by acts of communal dining or drinking. Their emergence

within and on the outskirts of 8th-7th century towns offers further evidence for the formalisation of built environments at this time, and for the demarcation of spaces where communal acts of commensality appear likely.

Workshops and Industries

Also in the 8th-7th centuries, there is growing evidence for craft production becoming more specialised, diverse and centralised. In the late 9th-8th centuries, this is admittedly largely inferable only from the artefacts themselves. Already at Knossos, Cypriot ceramics, in a manner akin to the earlier adoption of Attic PG styles, had begun to be imitated by local Cretan potters by the end of the 9th century (Kotsonas 2012; Kourou 2016; Antoniadis 2017), and from PGB onwards at Knossos and Prinias, there is evidence for specialised potting workshops, as evidenced by distinctive decorative styles, particularly on vessels designed for elite or funerary consumption (Coldstream 1996, 318–20; Kotsonas 2013, 237–38). Skilled metallurgical workshops are also apparent from the elaborate bronze items deposited at the Idaean Cave. From the end of the 9th century, North Syrian and Phoenician iconography and artefact styles were imitated and manipulated by Cretan bronzeworkers, in the form of large 'shields' and bowls, which acted as focal pieces for ceremonies of pilgrimage and dedication (Kunze 1931; Matthäus 2000b; 2011). A jewellery workshop has been proposed at Knossos based on the finds from the Tekke *Tholos* (Boardman 1961, 129–59; 1967). Boardman once attributed these wares – and the use of the tomb – to an immigrant Syrian goldsmith, but this has been challenged (Hoffman 1997, 191–245)[205]. Similarly contentious has been Coldstream's suggestion for an unguent workshop at Knossos in the 8th century (Coldstream 1979, 261–62; 1984a, 137), with locals producing imitation Cypriot oil vessels to serve as containers for the products of resident Phoenician perfumers (for criticism, see Jones 1993; Hoffman 1997, 176–85), though Kotsonas (2011b) suggests the presence of genuine Cypriot potters is also possibility. Specialised stoneworkers are likewise implied by the architectural sculptures on Temple A at Prinias, the earliest such pieces in the Greek world, as well as the carved

[205] Kotsonas (2006), has proposed instead that a wealthy Knossian family or group patronised the work of a goldsmith, limiting the availability of their wares to others in the community, something reflected by a contemporary restriction in the presence of gold, silver, amber and crystal in other tombs.

stelae from the Siderospilia cemetery (Lebessi 1976; D'Acunto 1995; Kotsonas 2021, 71).

Little direct evidence for metallurgical production has been found. A metallurgical furnace was identified in the fill of one of the terraces at Anavlokhos, along with some 250kg of iron slag and pottery from the PG-LG periods (Zographaki et al. 2013, 524–25), while 7th century smelting remains from Kommos may point to the presence of itinerant iron workers (Birringer 2015). But in the 7th century there is good evidence that ceramic production was significantly upscaled, and conducted in dedicated workshop buildings. Other kilns from the EIA (with the exception of the Agia Fotini examples at Phaistos) had been close to the centre of settlements, and single installations. The site of Mandra di Gipari represents a significant break with these earlier precedents (Rizza et al. 1992). Set at the top of a valley to the west of Prinias, this building consisted of three rooms, the central one containing several small kilns, and the outside two containing a single large kiln each. The largest kiln could have accommodated 10-12 large *pithoi*, while small-medium sized vessels were probably fired in the others. Fragments of basins, *pithoi*, *hydriai*, jugs, kraters, cups, *pyxides* and *aryballoi* were found along with clay figurines and a few loom weights or spindle whorls, attesting to both large-scale vessel production, and what may be the more occasional firing of domestic or ritual objects brought to the site. Its location may have capitalised on northerly winds channelled up the valley, which would have served to carry the smoke away from the settlement. Similar workshops have been identified at Lato (Ducrey and Picard 1969, 792–805), where a cluster of kilns was found in an area probably at the edge of the 7th century settlement (Kotsonas 2021, 70), and Gortyn, where substantial deposits of ceramic wasters have been found to the east of the main settlement, dating to the final 7th-early 6th centuries (Santaniello 2004).

Thus, in the 8th-7th centuries, there is evidence for an increasing diversity of artisanal production on Crete, which may have been stimulated by, and developed alongside, increasing connections with technologies and craftspeople from abroad. Additionally, ceramic vessels, though they had been continuously produced throughout the EIA, can by this stage be tied to dedicated installations, often at the fringes of settlements. The overall impression, therefore, is of growing demand for a range of manufactured products, as well as an increasingly specialised workforce and its associated material signatures.

There is also some evidence to suggest the period from the late 8th to mid-7th centuries saw an increase in the level of interconnectedness within the island[206]. Kotsonas has shown that Cretan imports at Eleutherna were most abundant in the early 7th century (Kotsonas 2008, 235–56; 2013, 245; Nodarou 2008), with Eleuthernian pottery in turn identified at Thronos Kefala in the same period. Knossian exports may have reached a greater number of sites in this period, and Tsipopoulou (2005b, 554) has suggested connections between east and central Crete may have intensified from the late 8th century, evidenced by the close similarities in *aryballoi* and cups between the two regions. Consonant with the increasing industrial pottery production at Prinias, Gortyn and Lato, there is evidence for trade in large, stamped storage *pithoi*, for which a workshop has been inferred at Afrati. To this workshop, Brisart (2007, 107–11, 117–20; 2011, 239–53) has attributed pieces from Agios Georgios Papoura, Plati, and Agia Anna on the Lasithi Plateau, Lyttos, Smari, Astritsi and even Knossos, suggesting that itinerant potters, akin to those known from historical times on Crete, may have been operating across this wide region. Whether this, or trade in the vessels themselves accounts for the distribution, it represents the first evidence we have in the IA for networks of communication operating between the Pediada and Lasithi, something attested in later textual sources, especially in connection with Lyttos (Watrous 1974, 335–36; 1982, 21–23; Chaniotis 1999, 201).

At the same time, there is increased evidence for Cretan engagement with wider networks of maritime trade. Cretan pottery is known from Andros, Delos and Melos in the late-8th and 7th centuries, and on Thera Cretan pottery, jewellery and small stone sculptures have been found in various tombs and sanctuaries (Kotsonas 2017, 20–22, with references). In contrast to earlier periods, when long-distance east-west routes provide a plausible explanation for Cretan access to a range of imported items, this Cycladic evidence might plausibly be taken to reflect local maritime networks between Crete and its neighbouring islands. Wider Aegean connections in this period include the range of Cretan bronze armour, stands, and tripods dedicated at Delphi (Snodgrass

[206] Few studies have explicitly been made on the circulation of Cretan pottery on the island or abroad in this period, with Kotsonas (2017) an important exception, which serves as the source for many of the examples cited in this section.

1964, 28–29; Rolley 1977, 145–46; Papasavvas 2001, 165–70, 252–56), which may have been brought directly, or else imported via intermediaries, such as Cypriots, Corinthians, or else, as Kotsonas (2009) has contended, Euboeans. A few Cretan exports are known in the late-8th-7th centuries in the Eastern Mediterranean, at sites including Al Mina, Amathus and Ras el Bassit (Kotsonas 2008, 286, 288, with references). Accounts of Cretan participation in the founding of colonies are few, namely the settling of Gela on Sicily with Rhodians in 688 BCE (*Thucydides* VI.4.3) and Cyrene in Libya in 639 BCE with Therans (*Herodotus* IV.151-3), and should be treated with caution. Nonetheless, Cretan pottery is attested in both these regions from the mid-late 7th century (Boardman and Hayes 1966, 78–80; Lo Porto 1974, 179–83; Schaus 1985, 10–14, 97–98). Though the artefacts involved in all these instances of Cretan exportation are relatively few, they nonetheless temper traditional interpretations of the island as cut off from the maritime dynamism typically ascribed to the 8th-7th centuries (Kotsonas 2017).

Further evidence of engagement with overseas networks of mobility and communication comes from Temple B at Kommos, built over the remains of the earlier Temple A at the start of the 8th century (Shaw 2000b, 14–24). Within this building was an aniconic shrine consisting of three stone pillars, behind which a bronze shield was set some time in the 8th century. Shaw (1989) has contended that this 'tri-pillar shrine' has Phoenician origins, which if true would make it a unique case not only on Crete, but in the Aegean for the adoption or incorporation of such forms of worship (Negbi 1992, 608–9; Burkert 1992, 20–21; though cf. Pappalardo 2002), presumably from traders or other groups who stopped, and perhaps resided, at Kommos, given its opportune location along east-west sailing routes. Crete's relations to the wider Mediterranean in this period were clearly varied, and perhaps increasingly involved active participation, especially within local Aegean sailing networks.

Wider Landscapes of Cult

Prent (2005, 211–610) identifies a number of different contexts for ritual activity in the 8th-7th centuries, distinguished by location, physical context, and material assemblages. Firstly, there are buildings in central or urban locations, among which the hearth shrines mentioned above are the clearest examples (*ibid.* 441-75). Secondly, there are the continuing cults at extra-urban or rural

sanctuaries such as the Idaean Cave and Kato Syme (*ibid.* 554-610). Thirdly, and in an important development during this period, we find a large number of what might be considered sub-urban cult sites (*ibid.* 476-507), which vary in form from built structures like the terrace, altar and temple constructed on the Agios Georgios Hill at Gortyn (Rizza and Scrinari 1968) to springs like the shrine of Vavelloi near Praisos (Halbherr 1894; Bosanquet 1901-2), or other notable landscape features. Despite this variety, these sub-urban shrines have produced material assemblages that set them apart from the previous two types. Finally, there are the handful of cult sites and localised ritual activities sited on the remains of BA palaces or settlements, which represent an amorphous group exhibiting varying degrees of similarity to one or other of the previous types (*ibid.* 508-553)[207]. The developments across these different contexts are complex, no doubt reflecting local diversity in forms of worship and belief, for which our modern categories fail to fully account. But several broad trends serve to tie into the wider evidence for mounting social hierarchies, the consolidation of more formalised modes of religious belief, and the incorporation of the local landscape into religious rituals of an increasingly civic nature.

Extra-urban sanctuaries in this period, which from back in the BA may have served as gathering points for widely dispersed communities, exhibit an increased range of ostentatious dedications and artisanal votives such as bronze tripods, stands, cauldrons, bowls and a range of decorated, circular sheet bronzes traditionally interpreted as shields or tympana (Matthäus 2011; Matthäus and Vonhoff 2020). The largest deposit of these items comes from the Idaean Cave (Matthäus 2000b), but shields are also known from Kommos (Hayes et al. 2000, 363–71), Kato Syme (e.g. Lebessi 1977, 411, 416), and the sanctuary of Palaikastro, where open-air rituals focussed on a large ash altar probably began in the 8th century (Benton 1939-40; Prent 2005, 350-53), while tripods are recorded from Amnissos and Palaikastro. Though all of these sites may have served as venues for religious rituals frequented by individuals seeking to assert or garner social standing through the deposition of rich votive pieces, two sanctuaries stand out as particularly materially rich, namely the Idaean Cave and Kato Syme. As Prent (2005, 560) points out, these sanctuaries

[207] The cult site at Kommos, for instance, was focussed in the 8th-7th centuries on Temple B, which resembled the hearth temples of Prinias and Dreros, while the sanctuary at Palaikastro, which probably came into being in the 8th century, received offerings of bronze tripods and shields, aligning with sites like the Idaean Cave.

have in common 'many objects in bronze, such as shields, Oriental(-izing) stands and cauldrons, tripod-cauldrons, small 'discs', arrow- and lance heads, animal figurines (including horses, sometimes with chariots), male figurines, fibulae and pins, as well as precious jewellery and orientalia'. The large bronzes in particular exhibit strong affinities to North Syrian decorative styles, and their association with forms of ostentatious display is supported by their appearance in a restricted number of contemporary tomb contexts. Even in these shrines, however, more modest offerings are known, and it seems likely a range of people were travelling to take part in their associated ceremonies.

The LG-EPA periods also mark a horizon for what appear to be offerings, or remnants from modest religious ceremonies, held in association with LBA tombs, in a practice reminiscent of the much-discussed tomb and hero cults of the contemporary Mainland (Lefèvre-Novaro 2004)[208]. Lefèvre-Novaro argues that, while Crete has typically been excluded from discussions of these phenomena, the finds of cups, and liquid and pouring vessels from tombs at Achladia, Mokhlos, Ayia Triada and Kamilari, probably have similar significance for understanding the civic appropriation or incorporation of 'ancient' monuments, into the mytho-historic landscapes of emerging political centres. Related phenomena in the 8th-7th centuries include the construction of a small structure over the ruins of Monastiraki Khalasmenos (Tsipopoulou 2004b), where communal drinking ceremonies may have occurred, and the building of burial enclosures in the vicinity of LM IIIC-PG *tholos* tombs (Gaignerot-Driessen 2017, 517), an association visible at Anavlokhos (Demargne 1931, 369, 372, 374–79), Dreros (Van Effenterre 1948, 15–38; 2009), Vrokastro (Hall 1914, 154–69) and Meseleroi (Hayden 2005, sites 122-25). At Kavousi Vronda, burial enclosures were inserted into the ruins of LM IIIC buildings from the LG period, in what has been interpreted as an act of appropriation or association by the inhabitants of the contemporary Kastro (Day 1995; Liston 2007; Day 2017).

Another notable trend in ritual practices during the 7th century is a shift in the kinds of dedications made at sanctuaries, with clay votives – particularly mould-made figurines and plaques – and armour – both full-size articles, and miniature versions – becoming increasingly popular (Prent

[208] For the discussion of tomb and hero cult on the Mainland, see Coldstream 1976; Hägg 1987; Morris 1988; Whitley 1988; 1995; Antonaccio 1994; 1995; Mazarakis Ainian 1999, and references in Lefèvre-Novaro 2004.

2005, 422). With the exception of Palaikastro, dedication of armour is not known from any extra-urban site; instead, these items were deposited in urban or suburban contexts, at Axos (Levi 1930-1), Gortyn (Levi 1955-6, 231-32, 260-61; Rizza and Scrinari 1968, 157-58), Afrati (Lebessi 1969; 1970), Dreros (Xanthoudides 1918, 28) and Praisos (Bosanquet 1901-2, 255–57). Multiple pieces from the Aï-Lia structure at Afrati bear inscriptions which imply they were taken as booty, perhaps even in a single episode, given the stylistic consistency of the pieces, from which four complete panoplies can be reconstructed (Hoffmann 1970; Raubitschek 1972).

The class of sub-urban sanctuaries is therefore particularly important in this period, as they appear to have become increasingly popular foci for worship of an arguably civic character, in that the associated rituals may have included rites of passage for young men and women, which emphasised their idealised societal roles. The clearest and best-documented cases of these cult sites are found at Axos, the Gortyn *Acropolis*, Kako Plaï at Anavlokhos, and Vavelloi at Praisos, with deposits at Eleutherna, Siteia, Anixi and Lapsanari more tentatively assigned to the class by Prent (2005, 477). These suburban contexts are typified by large numbers of clay plaques or figurines, generally mouldmade, and featuring archetypal renderings of nude females and nude or warrior males. At Gortyn, the richest such deposit, where the earlier site of ritual activity on the *Acropolis* was terraced and outfitted with a temple building during the 7th century, finds included clay figurines, stands and vessels, bovine, equine and bird figurines, and miniature tripods and armour in bronze (Levi 1955-6, 231-32, 260-61; Rizza and Scrinari 1968, 157-58; D'Acunto 2002). Female figurines are more dominant in the assemblage at Axos, which has historically been interpreted as a shrine to Aphrodite (Levi 1930-1, 65; cf. Rizza 1967-8, 293), while at Vavelloi there are representations of kourotrophic females, male and female couples, and male warriors, but no weaponry as such, which Prent (2005, 496-97) suggests may betoken a different object of worship again, perhaps Hera. These Olympian attributions are all speculative, but many of these suburban sanctuaries do appear to reflect concerns with idealised social or civic roles, particularly gendered ones, and are frequently interpreted as locations where rites of passage occurred (Lebessi 1985, 188–97; 2002, 269–82; Erickson 2009; Langebeck 2019, 33), which may have occurred on the outskirts or beyond the bounds of the civic community.

Between the 8th and 7th centuries, then, we can discern a trajectory away from more ostentatious,

exoticising dedicatory practices, which took place in the visible, inter-community context of extra-urban sanctuaries and found occasional parallels in well-furnished contemporary burials, towards a range of rituals more strictly focussed upon a suite of idealised social, perhaps even civic, roles, involving marriage, childbirth, and military service[209]. It seems significant that the foci for rituals emphasising these social ideals are largely to be found on the outskirts or in the hinterlands of settlements, which may thus represent an association of the natural landscape and its productive affordances with the processes of civic becoming, by which individuals were socialised into the structures and beliefs of their community. Though models like that of De Polignac (1994; 1995) – which emphasised the role of sanctuaries in the establishment of territorial boundaries between nascent *poleis* – are generally agreed to inadequately describe the Cretan situation, there does appear to be a growing intersection between the surrounding landscape and civic conceptions of personhood and belonging (Whitley 2020, 177–78). Where shrines of the LM IIIC periods had largely seen communities look inward for the appropriate contexts of religious worship, and those of the PG-G periods had begun to appear more commonly in off-site locations, those of the LG-A periods extended from the bounds of settlements into the surrounding landscape, perhaps reflecting the growing strength of the political and territorial claims of these nascent polities.

The Letter of the Law

It is precisely at this time, in the middle of the 7th century, that the earliest legal inscription on Crete is dated (**Dr1**). The stone on which it is engraved may once have belonged to the so-called Temple of Apollo, an association between written law and religious architecture that is paralleled at Gortyn, and perhaps Axos (Perlman 2002; 2004). The short text from Dreros affirms that a holder of the office of *kosmos*[210] cannot take up the position again for 10 years, something to which the 'oath-swearers', the *damioi*, and the 'twenty of the *polis*' bore witness, while an incomplete reference to an unnamed 'god' may hint at some kind of divine invocation as part of the legal procedure. Dating to only slightly later, a second Drerian inscription (**Dr2**) records something unknown initiated by

[209] These themes came to be reflected in the mortuary sphere as well, at Prinias, in the form of carved stone stelae which stood above some burials, largely displaying men in military garb, but occasionally also women with spindles or distaffs (Lebessi 1976).

[210] The *kosmos* was probably the highest political office across many, if not most, of the Cretan *poleis*, though the number of *kosmoi* at each city-state appears to have varied, as may have their specific roles (Gagarin and Perlman 2016, 67–73).

the *Prepsidai* and *Milatioi*. The former term is otherwise unknown, but the latter almost certainly refers to the community of Milatos, located on the coast to the north of Dreros (Gagarin and Perlman 2016, 120). A third law also from the second half of the 7th century at Dreros (**Dr3**), records what appears to be a time limit, set to the 20th of the month of *Hyperboios*, for the *hetaireiai* and the *agelai*[211]. These groups, based on parallels at Athens and Sparta, are believed to represent collectives of aristocratic men, and of educational groups or age-sets of boys or adolescents, though their structure and function at Dreros, let alone across the many different polities of Archaic Crete, remain dimly perceived (*ibid.* 65-67, 92). Though our understanding of these early laws is highly limited, in the absence of the other provisions to which they no doubt make reference, they do already suggest the existence of several important features of the Cretan *polis* as conceptualised in the A-CL periods, namely: a civic self-awareness, reflected in terms such as *damioi* and *polis* (whatever their precise significance to the lawmakers); decision making-bodies with the power to impose restrictions on political office; the recognition of other, perhaps similarly composed, groups such as the *Milatioi*; and various internal structures of corporate membership, perhaps based on social status, lineage, or age. Though many of these features are likely to have pre-dated, in some form, the earliest texts, their presence at this point is certainly in keeping with the wider evidence of growing intra-island interaction, more formally structured habitation spaces, and a landscape increasingly shaped by the economic and political agency of the island's growing centres.

The Archaic Period: A New Political Landscape

The analyses in Chapters 4-7 suggested a complex range of developments in the late 7th-early 6th centuries. Some areas, particularly around the Bay of Mirabello, witnessed continued nucleation at a small number of increasingly large settlements, notably Azoria and Ilias to Nisi/Istron. But in the Meseleroi Valley, Lasithi Plateau, and west Mesara Plain, there is evidence of the resettling of landscapes formerly little inhabited, though these may not all represent the same kinds of settlements (Watrous et al. 2004, 313–14; Hayden 1995). Only by this time did the minimum

[211] Though a limit on what is unclear – perhaps the joining of those collectives by citizen males.

agricultural catchments modelled in Chapter 6 suggest any real likelihood of pressure over the productive landscapes surrounding larger settlements. In the case of burial practice, the late 7th century saw a major decline in archaeologically visible burial, with those cases still known largely taking the form of simple, or individual pit or jar burials. There has been increasing recognition that the reduced archaeological visibility of the period may be linked to long-running issues of classification and typology, and aspects of the material culture and practice of 6th century communities are coming into focus (Erickson 2010a; 2010b; 2014; Haggis 2012b; 2014a). However, there remain limitations, which are only partly offset by the existence of legal inscriptions which shed light on elements of social organisation during this important period. Nonetheless, the evidence we do have points towards developments that, in some cases, continue the trajectories traced in previous centuries, but in others signify major changes in the material and social circumstances of Archaic Cretan society.

Rebuilding From the Ground Up

The best evidence to date that the Archaic period brought about major changes in the built environment comes from Azoria. Late 8th-early 7th century building activity has been noted at the site, but the most intense remodelling occurred at the end of the 7th (Haggis and Mook 2015, 21–22). At this time, megalithic spine walls were constructed across the hilltop, underpinning the new settlement layout, which included the construction of two large, probably public buildings that may have hosted communal dining occasions, and a third which has been identified as a service building, where food may have been stored and processed, and meals prepared (Haggis et al. 2011b; Haggis 2012b). These buildings were located at a prominent part of the settlement and so, like the Temples of Prinias, appear to have established or codified areas of civically oriented space at the heart of their communities. The structures of these two buildings are slightly different. The Monumental Civic Building (MCB) had a large main room lined with benches, around which 60-80 people could have sat, while at one end a doorway led to a small two-roomed structure interpreted by the excavators as a hearth shrine. The Communal Dining Building (CDB), meanwhile, was segmented, with a number of dining rooms and associated kitchens and storage spaces, where it is suggested smaller groups may have met to dine. Differences in the faunal assemblages of these buildings support their contrasting functions. Larger cuts of meat, including

whole limb joints, have been inferred at the MCB, based on the frequency of cut marks near epiphyses and burnt foot bones, while smaller cuts, and a wider range of species are attested in the CDB assemblages (Haggis et al. 2011b, 24–27). These buildings may thus have served as venues for contrasting forms of collective dining, emphasising different scales or forms of group membership, though the nature of these collectives remains unclear.

Domestic architecture was also overhauled at Azoria at the end of the 7th century (Haggis et al. 2011a; Haggis and Mook 2011). New houses were larger than those of preceding periods, were integrated into the wider urban plan, and in contrast to the agglutinative houses of neighbouring Kavousi Vronda and Kastro in the LM IIIC-EPA periods, changed little in their layouts for decades after their construction. Rooms were more clearly differentiated than in previous periods, with distinct kitchen and storage spaces, and larger main halls where dining and perhaps hosting occurred (Haggis and Mook 2011; Haggis 2012; 2013, 80–90). The excavators compare these dwellings to the 6th century structure excavated at Onythe Gouledianα (Platon 1956), identified as two large dwellings, incorporating a similar kind of spine wall, and represented by a scale and formal arrangement of rooms with similarities to the Azorian houses (Haggis and Mook 2011, 373, 377). As noted in Chapter 6, the floral assemblages from the new houses at Azoria hint at elements of food processing occurring outside of the main settlement, with possible implications for the hierarchisation of primary production. Unfortunately Azoria remains more or less unique in the scale of its stratified Archaic contexts, and developments at other centres of the late 7th-early 6th centuries remain far more obscure. As such, great caution should be exercised in extrapolating from the site to the whole of Crete.

Elites: Middling or Meddling?

Even accounting for difficulties of archaeological visibility, the 7th-6th centuries are characterised by diminishment or reorientation in various kinds of material or behavioural ostentation. These include the increasing homogeneity of burial assemblages, the abandonment of large collective tombs, or else whole cemeteries, and declines in the dedication of large bronzes at extra-urban sanctuaries, counterpointed by a rise in armour and mould-made terracottas reproducing a limited range of figures and scenes. Figurative pottery was rare, with plain black glazed wares, particularly

those for drinking and dining, becoming a highly standardised feature of A-CL ceramic repertoires (Erickson 2010a). Economic decline, once seen as a feature of 6th century Crete (e.g. Morris 1992), is increasingly viewed as insufficient explanation to account for these changes (Erickson 2022). More likely is that, rather than somehow running counter to the epigraphic evidence for more highly structured, stratified societies, they are deeply implicated in their emergence.

Recent work on citizenship and political organisation in the A-CL *poleis* has, rather than focussing on abstractly defined statuses or hierarchies, drawn attention to the performative foundations of civic identity (e.g. Duplouy 2006; 2018a). This more participatory view of the *polis* is reflected in recent work by Blok (2014; 2018), who has suggested that the key to understanding A-CL citizenship is what she terms the 'covenant between gods and men' that was established by Greek city-states through the performance of communal religious rites, most especially sacrifice. To be a citizen was rooted the relationship between *hiera* and *hosia*[212], that is, one's obligations to the divine and to the human realm, a relationship maintained through due acts of religious and civic participation. Whitley (2018; 2022), in assessing the applicability of Blok's model on Crete, has suggested that given the lack of evidence for large state-run sanctuaries or sacrificial rites comparable to those on Mainland, the participatory basis of the citizen state in Crete should be sought in the institution of the *andreion*.

The *andreion* is an institution that has long been central to accounts of the Cretan *polis* (Prent 2005, 450–58; Erickson 2011; Gagarin and Perlman 2016, 93–95), attested as it is in both historical and epigraphic sources, and many scholars have sought to identify its material correlates in the larger buildings or open-air sites with substantial evidence for communal dining found on Crete in the LBA and EIA. Even into the Archaic period, there is evident variety in the kinds of contexts which played host to communal meals, with the Temples at Prinias (Lamaze 2019), the building with dedicated armour at Afrati, the public buildings at Azoria (Haggis et al. 2004, 367–393; cf. Haggis et al. 2011a, 4–6), and the Profitis Ilias hill and area of the later Almond Tree House at Praisos

[212] The equivalent terms on Crete would appear to be *thieia* or *thina*, and *anthropina*. Particularly relevant to Blok's argument is the clause from **G72** 10.42-4, which requires an adoptee to fulfil *ta thina kai ta antropina*, that is the divine and human obligations of the adopter. In other words, the act of being adopted, for it to be considered legitimate, specifically entailed participation in those religious and civic practices considered most constitutive of citizenship.

(Whitley 2014) all suggested as venues for such activity in this period. Whether this diversity reflects genuine variability in the manifestations of the *andreion* as an institution in different areas of Crete, or else the tendency for researchers to conflate diverse contexts of communal dining in light of this historically attested institution is unclear. What seems certain is that large – but, importantly, still selective – gatherings do appear to have taken place at sites across Crete at this time, in monumentalised or central areas of settlements, and that around the same time earlier forms of material ostentation appear to have been waning.

In attempting to reconcile the archaeological and historical evidence, Seelentag (2020) has recently proposed a model of cartelisation, which he describes as the intentional minimisation of certain kinds of competitive practice amongst elite groups, aimed ultimately at the solidification of elite parity, to the exclusion of lower status groups. Taking this perspective, the early laws imposing limits on the re-election of officials were not ultimately aimed at the suppression of unchecked political power, but rather the assurance that power would circulate within a restricted segment of the population. Similarly, the *andreion*, given that it appears to have served only citizen men – and perhaps not even all of them – represents a powerful symbol of equality amongst peers, at the same time that it excludes the participation of those unable to contribute through lack of land-holdings, citizen status, or (perhaps) military equipment. Participation in the *andreion*, thus, creates idealised citizens at the same time as it excludes those who do not possess the material foundations of such a status. While more publicly ostentatious forms of ritual practice – such as elaborate burials or rich votive offerings at extra-urban sanctuaries – were minimised, Seelentag's contention is that the suppression of these overtly individualising forms of social signalling actually strengthened the hold of emerging elite groups over the contexts of civic participation, camaraderie, and militaristic bonding.

Landscapes of Dominance

Further textual evidence supports such a reading of the processes of institutionalisation occurring in 7th-6th century Crete. Davies (2005, 167) has suggested that, in the A-HL period at Gortyn, contributions to the *andreion* may have been made on the basis of a tithe[213], something which would

[213] The sources Davies draws on are: a Gortynian law (**G77**) referring to 'harvest collectors' or 'produce distributors' who were

contrast with the Spartan system, where a fixed quantity was demanded to support the communal messes. This disparity would suggest that, where in Sparta the loss of citizenship could be incurred by a failure to pay (Hodkinson 2000), at Gortyn, if not more widely on Crete, some protection was made against this eventuality by making the contributions proportional (Zurbach 2013, 647; Lewis 2018, 163–64). An anxiety about the possible loss of land and livelihood is evidenced from the earliest laws at Gortyn, those inscribed on the walls of the Pythion temple. Though poorly preserved, there is evidence that matters addressed in these laws included damage to livestock, issues of inheritance in the case of adoption, and the giving of securities (Perlman 2002). Far more elaborate provisions appear in the Great Code of Gortyn and other later laws. Here we find regulations around trespassing (**G46**), water damage to neighbours' property (**G52** and **G73**), and boundary disputes (**G42**). Restrictions are imposed on pledging a relative's property as security, while an incomplete list of various material possessions (**G75B**) is often interpreted as those items which cannot be pledged or seized. These include military equipment, iron tools, a plough, a team of oxen, millstones, and whatever the implicated party provides to the *andreion*. These are precisely those possessions which would permit a citizen male to fulfil his idealised obligations to the state, namely military service and contributions to the communal messes.

The lengthy passages on inheritance in the Great Code reflect similar concerns, and reveal more about the corporate bodies at the heart of the citizenry. Daughters inherit only half the share of that their brothers do, in a system of partible inheritance, but there are also certain kinds of property – seemingly the main house in the town – that were reserved for the male heirs (**G72** 4.39–43). In the absence of male heirs, heiresses were expected to marry a paternal uncle, or failing that a paternal cousin, and so on through increasingly wide circles of the *pyla* or tribe (**G72** 7.15-8.30). Only after such options had been exhausted could the bride marry someone of her choice. Adopted children could inherit, though in the case of biological children also existing they received a half share, while the adopted child of an adopted child could not inherit (**G72** 10.33–11.23).

empowered to seize produce and impose fines on individuals who did not contribute a share of their harvest; a 2nd century BCE treaty between Gortyn and Kaudos (*IC* IV 184.8-11), which requires the inhabitants of Kaudos to contribute a tenth of their arable produce to Gortyn, as in turn the Gortynians do to the state; and Dosiadas' account (*FGrHist* 458 F 2) of the *andreia* of Lyttos. In this last account, one tenth of each citizen's produce is contributed to the state, which redistributed the supplies to the messes, where citizen males dined together.

Adoption may have been a necessary act for certain wealthy families who failed to reproduce, but these provisions suggest an anxiety around how far such practices should be repeated. A woman who had a child after a divorce had to present it to the former husband at his current residence, for he had the right to take it in (**G72** 3.44-4.23). But if the father had no house of his own following the divorce, the woman was under no obligation to do so.

Taken together, these laws give a fairly coherent impression of a community at pains to preserve the material, and most especially the productive property of family or tribal lineages (Guizzi 2011; Lewis 2018, 163–64). The laws appear to protect forms of practice that may have been foundational to local conceptions of citizenship, such as the owning of a town house, the capability to work or manage one's land, and the contribution of agricultural products to the *andreia*. Indeed, Mackil (2017) has suggested that rather than later coming to intercede in property disputes, the Archaic Cretan state was in many ways brought into being through arbitration in such matters, something then sanctified in the enactment of formal laws[214]. Privately owned land formed the basis of civic rights and military obligations (Duplouy 2018b, 17–19), and so the land over which the state could assert its authority in legal matters was coextensive with its physical 'territory' and political autonomy.

The corollary of this situation was that, to support the larger land-holdings and civic participation of certain sectors of the population, others were excluded. The communities of Archaic Crete were not simple binary societies with a free and unfree class, nor a land-owning and land-working class. Those termed *apeteirai* in the laws were probably free but, as their name suggests, excluded from the *hetaireiai*, the men's societies which formed the basis of participation in the *andreia* (Gagarin and Perlman 2016, 79). Similarly, even citizens must have varied in their wealth and political power, and given the relatively small size of Crete's early *poleis* – probably numbering in the low thousands – even richer citizens are unlikely to have been fully divorced from agricultural production. Nonetheless, the free citizenry of the Archaic period were almost certainly supported in part by servile labour. There has been disagreement in the past about how to characterise the two statuses represented by the terms *dolos* and *woikeus* in the Cretan laws, with the traditional view being that

[214] This not necessarily being contemporary with when they were physically inscribed.

the former were slaves in the true sense, while the later were serfs, tied to the land of elite families (e.g. Gagarin 2010). Recently, Lewis (2018; 2021) has convincingly argued that this is erroneous, and that the two terms are interchangeable, both describing slaves subject to the same laws, penalties and rights[215].

We know very little at present about how slavery came into being on Crete in the 1st millennium, however. The appearance of servile labour in the Linear B tablets raises the spectre of continuity, but while we cannot rule out cases of slaves being captured from other communities, or instances of debt bondage brought about by the kinds of highly variable agricultural production typical of the pre-industrial Mediterranean (see Chapter 6), the possibility that an indentured sector of the population remained a perennial feature through the 6-700 hundred years separating the final palaces from the earliest written laws seems unlikely[216]. Only by the Archaic period is there consistent evidence for communities whose populations numbered in the thousands, and where, on the basis of highly unequal distributions of property and social power, forms of heritable, indentured servitude may have become viable on a large scale. The resolution of our data is not good enough to solve the issue at present, but the developments traced here find common ground with the work of those advocating a relatively late emergence for widespread slavery, something brought about either by direct violence (van Wees 2003) or else through spiralling relations of debt, perhaps fuelled by a transition from reimbursements made in kind, to those denominated in metal, particularly silver (Zurbach 2013)[217]. What does seem likely is that the highly visible concern

[215] That these individuals may have been able to acquire petty cash, get married, and even inherit property in some very rare circumstances does not diminish the fact that they could be bought and sold, could be pledged as security for loans or made to serve in lieu of their masters in debt bondage, and were the responsibility of their masters in matters of legal penalties or repayments (Lewis 2013; 2018; 2020).

[216] The estimates presented in Chapter 6, if they approach even the correct order of magnitude, suggest that community populations in the LM IIIC-G periods were generally very small, and to be demographically self-sustaining had to regularly engage in exogenous marriage practices with other communities. Taking, on the simplest model (as e.g. in Morris 1987), a binary division of each community into an elite and lower (or free and slave) class, would halve the size of each reproductive community at a settlement and, by extension, double the size of the exogenous population with which marriage exchanges or reproduction would need to occur. This would then require the circulation of two distinct populations between multiple settlements, assuming these statuses were inherited. The complexity of such a system is difficult to reconcile with the limited evidence for material inequality or ostentation in the 12th-11th centuries.

[217] In this regard, it may be relevant that the earliest penalties recorded on the Pythion temple at Gortyn mandate payments in *lebetes* or cauldrons. Later fines in the Great Code include values in *obols*, a unit of currency believed to have its origins in the iron spits or

for the protection of private property in the Archaic laws is reflective of longer-running tensions surrounding land-ownership and relations of debt, which at least by the time of the Archaic law codes had resulted in the permanent enslavement of sectors of the population.

Political Landscapes of Religion

As well as continued expansion of the settled and worked environment, the political consolidation of the late 7th-early 6th centuries impacted on the nature of the religious landscape. Many of the sanctuaries and shrines identifiable in this period can be interpreted as hosting religious ceremonies oriented around civic identities and ideologies. The suburban shrines described above have produced assemblages – clay figures and plaques, and clay and bronze items of armour, in miniature and full-scale form – which tie into idealised male and female roles, and several have been interpreted as the location of rites of passage for young men and women. A passage from Strabo (*Geography,* 10.4.20-21), quoting from Ephorus (*FGrHist* 10.149), has proved influential in interpreting this evidence as it pertains to male initiatory rites. These sources report the sorting of Cretan youths into *agelai*, as part of which they were schooled in hunting and armed combat[218]. Emphasis is placed on the place of the wild, of landscapes where hunting, and not agriculture, must be relied upon to survive. Hunting has a long history in the iconography of Crete, stretching back well into the BA, when it also appears to have been an elite pursuit (Hamilakis 2003; Wilkens 2003; Papadopoulos 2009). In this context, it is interesting to note the distinctive repertoire of bronze cut-out plaques known from Kato Syme in the 7th-6th centuries, which largely depict male hunters, equipped with bows or in the act of subduing or carrying wild goats, and sometimes hares and bulls. Some of these plaques explicitly show two men side-by-side, with one seemingly delivering the captured animal to the other. Syme's excavator, Lebessi (1985, 188–198), has

obeloi of earlier centuries (Gagarin and Perlman 2016, 107–8). The transition from physical items to currencies of fixed value may relate to the standardisation of debts under the influence of the adoption of metal standards, as argued by Zurbach (2013).

[218] The later stages of a youth's education involved his ritualised kidnapping by an older man, who then lived with him outside the city for two months, hunting and living off the land, until at the boy's return he was granted gifts of military costume, a cup, and an ox to be sacrificed to Zeus. This idealised account should be treated with great caution, but it does present certain resonances with the archaeological evidence for social status and identity in the period: the ox as a symbol of agricultural wealth; the cup representing civic commensality; and the military costume reflecting the martial role likely to have been filled by many adult citizens (see Erickson 2009).

interpreted these plaques as representing love-gifts or offerings made by initiates to their elders, as part of initiation rites like those described by Ephorus.

Erickson (2009) has suggested a similar situation at the sanctuaries of Vavelloi and Roussa Ekklesia, in the environs of Praisos, where plaques have been found depicting female deities, griffins and sphinxes, and most notably male votaries and men abducting youths. These sites, like that of Kato Syme, are also in the vicinity of springs, which may have been imbued with further ritual associations. It might be suggested that, precisely when land-holdings around Crete's larger communities were becoming increasingly consolidated amongst a wealthy, landowning class, rituals arose that took citizens – or soon-to-be citizens – out of these environments, and confronted them with untamed, but ultimately tameable, forces of nature[219].

The possible extension of civic patronage over places of worship may have, by the 6th century, even incorporated the great extra-urban sanctuaries of Kato Syme and the Idaean Cave. From around 600 BCE, Erickson (2002) identifies a shared ceramic tradition between Afrati and the sanctuary of Kato Syme, suggesting that by this time, potters from the former were employed in the provision of ceramics at the latter. Interestingly, from around 400 BCE, this tradition was superseded by one traceable to Lyttos. Erickson interprets these two episodes as reflecting the assertion of political control over the sanctuary by these two *poleis*. More tentatively, Seelentag (2015, 47–48) links the decline of rich offerings at the Idaean Cave to a similar process of civic assimilation by Gortyn, though the earliest inscription to mention sacrifices conducted on Mount Ida by Gortyn (**G80**) dates to the 5th century BCE.

Exceptionalism at Home and Abroad

A final important consideration for the Archaic period is the degree to which communities across the island were in communication, and over what scales. The trend towards increasing interconnectivity is one observable over much of the EIA, but the picture becomes less clear with

[219] Whitley and Madgwick (2018) have recently argued for a similar invocation of the wild in a civic context, based on the presence of *agrimia* and a large proportion of wild hares in the faunal remains of what might have been communal dining events in the area of the later Almond Tree House at Praisos. They contend the ritual consumption of wild species in an urban context may have served as a possible mode of social unification and camaraderie, especially if the community represented engaged in forms of coming-of-age rite akin to those described by the historical sources.

the declining archaeological visibility of the 6th century. There has been much debate among ancient historians as to the degree of homogeneity and – implicitly, if not explicitly – the degree of interaction, emulation or competition between the law-writing communities of the A-CL periods. Perlman (1992) argued that the legal inscriptions themselves present a far less unified picture of Cretan political organisation than that which emerges from Aristotle (*Politics,* 2.1271b 20-1272b 22). Only with the establishment of the Cretan *politeia* (an island-wide association of city-states) in the HL period is there clear textual evidence for any kind unified 'Cretan' identity, and beyond the political office of the *kosmos*, very few legal offices or civic bodies find widespread reference in the A-CL legal codes. This view has been challenged (Chaniotis 1996; 2005; Link 2002; Lewis 2021), and certain commonalities between the Cretan *poleis* seem assured, despite the variations in their legal codes, such as their small scale, stratified political organisation, possession of slaves, martial iconography, and focus on commensality amongst what are likely to be wealthier elements of the population. The emergence of these features in relative synchrony is likely to reflect forms of communication between political centres across the island, perhaps via the frequentation of extra-urban sanctuaries, or else trade in perishable goods, conflict, or formal political interactions (say through envoys)[220]. Much of this interaction could plausibly go unnoticed, given the patchiness of the archaeological record.

A few of the Archaic laws do refence interactions with other polities, but they are generally brief, or later in date than the 6th century. One Gortynian inscription (**G80**) records agreements between the town and another, Rhitten, which Gortyn may have conquered. It concerns land ownership, the actions of magistrates, and seizure of property as security, and seems generally aimed at maintaining amicable relations, as does a fragmentary accord between Gortyn and Lebena (**G63**; Perlman and Gagarin 2016, 121). A Lyttian inscription (**Lyktos1A**) concerns *allopoliatai* or citizens of other *poleis*, and imposes restrictions on the hosting of such people, though Link (2014) suggests it is specifically designed to discourage private hosting, with foreigners required to receive hospitality in a dedicated public venue. Gagarin and Perlman (2016, 122-23) suggest these few

[220] That there was a recognised need for overseeing the affairs of non-locals is suggested, for instance, by the existence of an official known as the *ksenios kosmos* or 'foreigners' *kosmos*' at Gortyn. This individual is mentioned in both a 6th century (**G30**.4) and 5th century inscription (**G78**.4), the latter referring to the protection they offered to settlers from Lato in the territory of Gortyn, forbidding them from being robbed or enslaved.

texts point to more peaceable inter-polity relations than are typically attributed to Crete (Gehrke 1997, 29; Davies 2005, 161), but really they are too scant to decide the matter. Cretan warfare has generally been peripheral to the extensive debates about the emergence of phalanx warfare and its relationship to the city-state[221], and typically regarded as being based on different principles (Link 2014, 170–71; Lewis *forthcoming*; a key reference being Plato (*Laws*, 1.625c-d)), though this may not be borne out by the archaeological evidence[222]. Ritual dedications, both of real and miniature armour, and terracottas with martial themes, evince a strong vein of militarism in the iconographic and ideological frameworks of the period, while inscriptions on the 7th century armour recovered from the Aï-Lai building at Afrati suggest they were war booty, perhaps even taken in a single event (Raubitschek 1972). It is true that several towns suffered destructions or abandonment in the 7th-5th centuries, including Azoria, Dreros, Prinias and Ligortynos Kefala, though the processes involved are seldom clear (Wallace 2010, 330–31; 2013). Similarly, clearly identifiable fortification walls are not very common in the EIA, and there is little indication that they became more so by the 6th century (Sjögren 2003, 26–28). At present, then, it remains difficult to assess the nature or frequency of inter-polity conflicts in the late 7th-early 6th centuries, though if nothing else, it is clear that arms and armour were a potent visual and material element in many contexts of civic and religious life.

The civic militarism traditionally accorded A-CL Crete is part of a broader characterisation of the island as economically stifled, and politically disengaged, that has only begun to be seriously revised in the past two decades (Perlman 2004b; Erickson 2006, 69–79; 2010a, 10–15; Gagarin and Perlman 2016, 113–17). So-called Cretan 'austerity', betokened by the decline in figurative arts, homogenisation of material culture, and limited involvement in wider Aegean political developments, has been nuanced in recent discussions partly through recognition that some of its tenets are overstated – forms of private dining, with parallels to the *symposium* have been suggested,

[221] On which, see e.g. Hanson 1989; van Wees 1998; 2013; Kagan and Viggiano 2013; Viggiano 2013; cf. Konijnendijk 2017; Lloyd et al. 2021. For an archaeological view on the 'hoplite revolution', see Foxhall 2013.

[222] Current doctoral research by Obert (*Violence and State Formation on Crete in the Age of Hoplite Warfare, 700-400 BCE*. UC Berkeley) includes a catalogue of all archaeological artefacts and textual references pertaining to Cretan militarism and warfare for the A-HL periods, and should shed new light on the organisation of Cretan armies. Early indications are that the peculiarities of Cretan warfare have been overstated (Obert *pers. comm.*).

for instance (Erickson 2011) – but mostly because its manifestations are increasingly understood to reflect social strategies, rather than reflective of cultural or ethnic characteristics (Whitley 2005; Brisart 2014). The decline in ostentatious burials and sanctuary dedications are implicated in this process, as is the proliferation of suburban shrines linked to idealised civic personae, and dedicated venues for civic or ritualised dining practices. The spread of the plain, high-necked cup has been linked to this last phenomenon, the shape being attested across Crete from the 6th-5th centuries, with recent volumetric analysis suggesting a significant degree of standardisation in its form across at least the central third of the island (Erickson 2022). Distinct pottery workshops are noted across the island in the Archaic period, with regional variation as in previous periods, but the shift towards more limited decoration, and the actual range of shapes, are significant points of commonality.

Evidence for the circulation of pottery is limited at many sites, but the known exceptions are informative. Knossos, Eleutherna and Itanos exhibit connections (in the form of imports and exports) to settlements a great distance away, including Khania and Ierapetra for Knossos, Khania, Gortyn, Afrati, Olous and Itanos for Eleutherna, and Afrati (and Eleutherna) for Itanos[223] (Erickson 2010a, Figs 9.2-3, 9.6). Though the quantities involved remain fairly small, it is likely many of these connections betoken maritime movement, something which is not necessarily implied by earlier forms of internal exchange. Though these connections may have remained selective, they point to greater long-distance relations between the polities of the Archaic period than earlier. Itanos is of particular interest, given the near total abandonment of the far east coast of Crete since the end of the BA; its emergence may be expressly linked to the greater opportunities maritime accessibility offered by this period, as suggested by the models of intra-island mobility explored in Chapter 3.

With regard to external relations, there may well have been different orientations across the island, with greater evidence of Attic and Laconian connections in the centre-west, and Cycladic ones in the east (*ibid.*, 228–33). Imports themselves are relatively few in number, though this may not be a simple case of Crete being cut off from major trading routes. Indeed, it seems likely that routes connected Laconia, and the Cyclades and East Aegean, with the coasts of North Africa,

[223] While more recently, evidence for significant importation of Gortynian wares at Itanos has been noted (Erickson, *pers. comm.*).

respectively passing the west and east coasts of Crete (*ibid.*, 280-98). But while a range of fine and decorated imports are known from Cyrenaica and Egypt, those vessels acquired by Cretans tend to be less elaborate, or monochrome forms, something which Brisart (2014) argues was a conscious selection rooted in the more restrictive material repertoires favoured by communities on Crete at the time. A complementary view of this selective engagement with the wider Mediterranean comes from the growing evidence for A-CL Cretan exports. Recently, Cretan banded *hydriai* have been identified in 5th and 4th century contexts in the Levant (Gilboa et al. 2017), adding to the already-known Archaic imports at Tocra (Boardman and Hayes 1966, 78–79) and Cyrene (Schaus 1985, 10–14, 97–98). These banded *hydriai* are rare in Cretan settlement contexts of the 6th-5th centuries, and it is possible that their production was largely directed towards the export market. At present, it would be difficult to extrapolate the existence of such economic activity back to the earlier 6th or 7th centuries – though it is possible earlier examples of Cretan exports await identification.

Active Insularity

The broad picture emerging for Archaic Crete is one not so much of exclusion but selective engagement, both internally and with regard to the wider Aegean and Mediterranean. On a local level, the island was a patchwork of landscapes increasingly incorporated into the ideological and cosmological worlds of civic identity and institutionalisation. Communities could and did interact, sometimes over large distances, but this did not negate the strong autonomy they exercised over their local affairs, and the modes of civic and ritualised practice by which the citizen body was manifested and replicated. Limited forms of material expression, and social practices such as communal dining and systems of corporate membership, served to simultaneously integrate and differentiate those of greater material means and ancestral standing, while the widespread use of slave labour further entrenched these social divides. Further excavation and study is needed to gain a clearer view of the physical contexts of settlement during this period, but it seems likely that regional centres formed the economic, ideological and political focal points of the island's small-scale polities, which though diverse in their specific forms of organisation, shared many common structural features.

Chapter 9

Conclusions

Recapitulation

The trajectory I have traced from the LM II-A periods is one of major changes in the nature of integration and connection between communities, over multiple scales. The Final Palatial period was one in which both terrestrial and maritime forms of movement and communication were common, with the focus of political control being on those environments most readily integrated by lowland and coastal travel. The existence of major networks of maritime trade and exchange underpinned the economic operations of the palace, as did the stimulation of certain kinds of agricultural activity. The evidence from LM IIIA2-B suggests it was not the loss of the Knossian palatial administration as such which fundamentally undermined these structures, though it did form part of a longer-term decline in the dependability of economies founded on maritime trade and agricultural extensification, especially in the context of disintegrating structures of political organisation and integration.

The large-scale relocations of settlement at the end of this period had a significant impact on the extent and significance of interregional connections in LM IIIC, though as argued these reflected longer-term processes, and did not mark a simple cultural break. Connections between communities were strong but localised, with restricted forms of longer-distance interaction (for instance, in the continued use of some important rural sanctuaries with BA heritage) and limited travel abroad (as has been suggested for some of the exceptionally richly buried individuals of the 11th century)[224]. The broad contemporaneity of the nucleations that occurred in the later 11th-10th

[224] These patterns have much in common with what, in network theory, are known as 'small worlds', where strong and numerous local connections are counterpointed by a few, but thus potentially significant, longer distance ones. Such networks have been modelled in other parts of the Greek world in the EIA (Malkin 2011; Knodell 2013), and they may prove a fruitful avenue for future study on the relationships within and between regions in LM IIIC Crete, as well as its limited off-island connections.

centuries suggests that similar processes prompted these developments across Crete, and I have proposed that demographic factors could have played an important role. This would also suggest that communities across Crete witnessed comparable developments in land-holding, the productive economy, modes of settlement (re)organisation, and forms of territorial consolidation, though at present there is insufficient evidence to clearly reconstruct these processes. It also seems likely that imported items in this period were more a reflection, rather than the basis of material wealth for individuals who had access to them, and in this context the deployment of such products (and those inspired by them) in burials and sanctuaries of the 10th-8th centuries almost certainly represents performative acts of status competition and negotiation. The networks which connected communities across long distances in the 10th-9th centuries appear to have remained diffuse, but sanctuaries again would have provided important loci for the interaction of groups (perhaps especially those of higher status) from different regions.

The 8th-7th centuries witnessed a certain re-emergence of lowland and coastal networks of interaction. However, these lacked the territorial control and economic centralisation which characterised the Final Palatial period, and, as explored in Chapter 4, proximity to the coast appears less clearly as a motivating force in the settlement patterns of the G-A periods, when the island's nascent political centres were generally to be found in prominent, inland locations. Especially in the PG-G periods, the few larger communities set closer to the coast, such as Knossos and Phaistos (via Kommos), may have benefited from precocious engagements with the economic and cultural milieu of the wider Mediterranean. The re-establishment of other coastal settlements, an increased diversity of imported and imitated items, and evidence of specialised production and the dissemination of its products on a regional level, all attest to networks of intra- and extra-island mobility and communication becoming more active during the 8th-7th centuries. But the later 7th century witnessed a decided turning away from many of the more elaborate material signifiers of this renewed connectivity, in line with evidence for more restrained forms of material consumption on the island itself. By the 6th century, on- and off-island interaction appears to have been consciously selective, and not, as in the LM IIIC-PG periods, born of limited exposure to external networks of trade and mobility, or else, as interpreted based on later historical sources, of economic decline or isolation. Rather, I would argue it to be a product of the political structures

of Crete's emerging polities, the powerful members of which de-emphasised the ostentatious practices of earlier mortuary and religious contexts, and instead encouraged participation within a more strictly defined set of civic institutions, cults and household roles. The landscape around these polities came increasingly to reflect economic and religious concerns, with laws governing landuse and inheritance, the possible role of servile labour in primary production, and the proliferation of suburban and rural cults which were the focus of initiation rites and the worship of Olympian and Cretan deities. Thus, in the EIA, we witness a long-term change in how forms of interregional and overseas connection were viewed and employed by Cretan communities. From the 10th-8th centuries, they appear to have been restricted, and served as sources of exotic items, novel technologies, and social prestige, while in the late 8th-6th centuries they were more accessible and better known, but increasingly engaged with in a selective manner which suited the material and ideological concerns of (some of) the populace[225]. A fundamental contrast between the social landscapes of Final Palatial and Archaic Crete would thus be the pronounced localism that obtained in spite of regular forms of communication in the latter period, for which the developments of the preceding centuries were fundamental.

Study Aims and Future Research

The first objective of this thesis was to bring together datasets spanning the LBA and EIA, which have seldom been integrated in previous analyses, and to apply methodologies still seldom utilised in their study, particularly spatial and quantitative approaches. The second was to integrate the insights from these analyses into a coherent account of social change across the 15th-6th centuries BCE, with a particular focus on landscapes of settlement, subsistence economy, and mortuary practice. Several points in particular have arisen from the present study that contribute to ongoing discussions of settlement patterning, subsistence and demography, and burial practices for this period.

Firstly, it was argued that though the settlement changes of LM IIIB-C were stark, they also played out over the course of a century or more, and within the general picture there was also regional

[225] Or, at least, that part of the populace that proved particularly influential in the establishment of codes of material and social practice.

variation, with less dramatic relocations in the island's central third. Subsequent centuries, in turn, were shown to be characterised by greater stability, and adjustment within pre-existing networks of habitation and landscape utilisation. More importantly, however, this thesis has stressed that the settlement pattern of the Final Palatial period should not be thought of as somehow typical or natural, from the long perspective of Cretan history, and even by the Archaic period Cretan communities had not returned wholeheartedly to the kinds of lowland coastal environments favoured in the LBA[226]. The relationship between Cretans and the sea – with all its potential risks and rewards – was a complex one in the EIA, and there is little to suggest that settlement strongly gravitated back towards coastal environments as soon as the instability of the LBA-EIA transition had subsided. If we can avoid the twin rocks of denying or overstating Crete's significance to networks of maritime trade, mobility and interaction in the 8th-6th centuries (see Kotsonas 2017), further explorations of the island's selective engagement with the wider Mediterranean in this period are much to be desired, especially if evidence for exported pottery continues to grow (e.g. Gilboa et al. 2017).

Secondly, the importance of population size on a settlement or micro-regional level was stressed in Chapter 6, with implications for theorising community inter-connections, mobility and settlement change, especially in the EIA. For one, it was argued that a causal mechanism in the mobility and interaction of communities on a local scale would be the demographic limitations of small populations, which would necessitate marriages between villages, and have implications for the distribution of agricultural holdings. It was also suggested that an important factor in the nucleations of the PG period onwards may have been the development of demographically self-sustaining populations at certain settlements, around which agricultural land would have continued to be divided and inherited, but which in aggregate could have diminished the degree to which holdings were widely distributed between neighbouring communities. This in turn may have fed into the relationship, visible in the later law codes, between the territorial reach of the state, and the protection it ensured for private landowners. The environmental affordances exploited by

[226] The greater resemblance of the later Roman settlement pattern to that of the LBA may, in turn, support arguments that have suggested a link between forms of externally-derived, or integrated island-wide governance, and particularly lowland- and coastal-focussed settlement (Bennet 1990; Rackham and Moody 1996, 53–56).

many of these nucleated settlements – their balance of defensibility, accessibility, and proximity to natural resources and major routeways – were certainly still vital elements in this process, but the mechanisms explored in Chapter 6 offer an additional lens through which to consider the specifically demographic processes which may have been at play, over and above simple models of upland, defensive sites becoming too crowded. Finally, despite the possible effects of growing population, this thesis has also stressed the small-scale of most EIA communities, even following the consolidation of the *poleis* as political entities. The peculiar nature of ancient Greek statehood appears closely bound up in this question of scale, and further research is needed – especially in a Mediterranean and global comparative frame – into just how the structures of state governance developed amongst these communities with populations numbering only in the low thousands.

Thirdly, in the discussion of burial practices, it was shown that important correspondences can be observed between the use of tombs and cemeteries on the one hand, and settlements on the other, and that in both cases these can be argued to correspond to changes wider societal structures. Periods in which single burial or multiple burial were more or less common may likewise point towards expansions and contractions in the scale of social collectives emphasised in death, and their importance in structuring community life. It was argued that, in line with wider evidence from settlement and ritual contexts, mortuary repertoires of the LM IIIA-B periods were particularly influenced by those at the Final Palatial centres of Knossos and Khania, while those of the EIA were more regionally varied and localised in their development. Developments in ceramic assemblages through the LBA and EIA were argued to reflect changes in the nature, scale and ostentation of funerary rituals, as well as providing evidence for engagement with foreign ceramic shapes and styles, which could be marshalled in the negotiation of collective identities and social prestige. It was suggested that in the PA-A periods, mortuary assemblages at Knossos became increasingly materially consistent, perhaps as a result of more formal or established codes of funerary ritual, and that these served as a prelude to the widespread abandonment of more visible modes of burial by the 6th century, developments that may have parallels in other parts of Crete, and point towards contestation over scales and forms of collective identity, and modes of material expression.

The datasets employed in the present thesis did, however, also highlight issues of chronology,

publication, and representativeness. In the case of the settlement databases, the effects of our current ceramic chronologies – often based on a limited range of fine wares or funerary types – on the identification and dating of sites, especially in survey contexts, remains a point of concern, as does the continuing issue of whether certain ceramic styles (LM II or SM, for instance) are island-wide phenomena, or else coincide with other contemporary styles in other parts of the island. Nonetheless, there remains definite value in legacy survey data and in long-term perspectives on settlement change made possible by collating known sites from across a wide chronological span. The mortuary data present more severe difficulties, however. The state of publication remains a major concern, especially for several large cemeteries of the EIA, which could provide great comparative potential when considered against the large datasets already available for Knossos. Many of the patterns identified in Chapter 7 must be treated with great caution, given the degree to which certain phases are dominated by the published assemblages of a small number of cemeteries. Regional ceramic styles also pose problems for identifying contemporaneous developments across the island. The Knossian data demonstrate the potential for studies based on quantification of mortuary deposits, but more thorough comparative analyses between cemeteries will benefit greatly from further publication.

These issues notwithstanding, the assembled datasets have the potential to be expanded, developed, and reused for further research on the LBA and EIA on Crete; indeed, one of the chief motivations for digitising these datasets was expressly the ongoing utility they would offer. These databases will be made available to other scholars, in the hope that they will provide a rich and convenient resource for future investigations of settlement, subsistence, demography, burial practice and more. The creation and dissemination of such digitised datasets is becoming an increasingly common desideratum of archaeological research in the Aegean (Mazarakis Ainian 2017; Kotsonas 2020; Tsiafaki and Katsianis 2021), and it is hoped that the data from the present thesis represent a contribution to this wider effort.

The present thesis has emphasised the importance of mobility, connectivity and interaction over multiple scales. Potentially fruitful avenues for ongoing research would include an updated

investigation of imports to and from Crete in the LBA and EIA[227], as well a study of the internal circulation of pottery and other products on Crete[228]. Such approaches were not attempted in the present thesis – and would be significant in scale – but could serve to greatly enrich our understanding of the kinds of networks of interaction that have been hypothesised in the foregoing analyses, but which remain to be more thoroughly quantified, mapped and interpreted. Future work could also look to place the developments on Crete within a wider regional context, either as a part of the Aegean world, or as one of the Mediterranean's great islands, along with Cyprus, Sicily, Sardinia and Corsica, all of which experienced unique historical trajectories across the LBA and EIA that could be fruitfully investigated from a comparative perspective. Such studies would add further to our understanding of the diverse, vibrant and historically contingent forms of intra- and interregional mobility and connectivity which characterised the ancient Mediterranean.

[227] Building on the earlier work of Cline (1994), Hoffman (1997), Jones (1997), Stampolidis and Kotsonas (2006) and the edited volume of Kypriaka in Crete (Karageorghis et al. 2014), and Murray (2017) among others.

[228] Again, building on work such as that undertaken at Knossos and Thronos Kefala (Boileau and Whitley 2010; Boileau et al. 2010).