Pottery technology and socio-economic diversity on the Early Helladic III to Middle Helladic II Greek mainland

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ABSTRACT

This thesis examines the various forms of ceramic technology being practised on the Greek mainland during the Early III to Middle Helladic II periods (henceforth the LEMH, or Late Early to Middle Helladic period, from 2200-1700 B.C.). Cross-cutting conventional chronological units, the remit of this thesis encompasses a coherent phenomenon of material culture and settlement patterning that has often been stereotyped as simple, unsophisticated and even stagnant. In order to challenge this, and to understand the range of production behaviours being practiced within these LEMH communities, I examine the ceramic assemblages from two significant LEMH settlements: Lefkandi and Asine.

I utilise a methodology that allows me to isolate specific technological attributes of the ceramics (namely fabric, forming, firing, surface treatment and decoration), in addition to petrographic and chemical analyses that ensure that the ceramics I discuss are locally produced. I then undertake a detailed analysis of the diachronic changes in manufacturing technology employed at these sites over the duration of the LEMH period. Extensive comparative assemblages from published material are then examined, allowing a wide corpus of local LEMH ceramic technologies to be identified. The results of these analyses are interpreted using a theoretical model widely informed by recent ethnoarchaeological work about (i) the 'fixedness' of certain manufacturing traits and the nature of human interaction that allow for their transmission across time and space and (ii) the socio-economic structures needed to support certain forms of ceramic production.

The interpretation of my results shows a technological divergence between communities of the central Greek and those of the southern mainland, with the former region displaying traits suggestive of specialised ceramic production, while the latter region appeared to maintain a strong tradition of household based production. This unexpected emergence of a strongly coherent regional production tradition in central Greece not only belies many suppositions about the complexity of systems of craft production during the LEMH, but may contribute to explaining the consumption of a much more homogeneous body of material culture in the central Greek region during the LEMH.
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CHAPTER 1
INTRODUCTION

Temporal and geographical scope

This thesis examines the various forms of ceramic technology being practised on the Greek mainland during the Early Helladic III to Middle Helladic II period (hereafter the LEMH, or Late Early to Middle Helladic period), approximately 2200-1700 BC (Figure 1.1). In a greater sense, though, this thesis also aims to explore some of the implications behind the techniques of making and using material culture, and the ways in which the analysis of technological systems can be used to trace the social history of, and explore the dynamics within, small-scale communities. In this context, I will also briefly explore patterns of ceramic consumption and the implications that both production and consumption patterns have for understanding the mechanisms of communal organisation and integration within LEMH communities.

While an exploration of this LEMH period is long overdue within the wider narrative of Aegean prehistory, this investigation is relevant not only to this specific time and place. In addition, I will address the more fundamental issue of developing a framework within which to interpret the socio-economic diversity of small-scale groups using their material culture. It has been estimated that throughout history over 95% of all human societies have been organised into what would be categorised by archaeologists as ‘small-scale’ groups (Carneiro 1972); however, our theoretical mechanisms for understanding these communities are limited in comparison to those for explaining the emergence of complexity and characteristics of stratified societies generally. While archaeology is concerned with long-term human history, there is an overwhelming tendency to focus on the spikes in cultural evolution (the emergence of ‘civilisation’) or at the very least, the development of increasingly complex forms of social organisation and interaction. This must be due in no small part to the very active role that material culture (most notably, of prestige goods) seems to play in aggrandising communities, and thus, the wealth of archaeological information provided by societies on the cusp of complex chiefdom/state level organisation. Yet this results in the fact that archaeology is distinctly more reserved about offering interpretations of the ‘intermediate’ and ‘transitional’ small-scale communities that, though a stable and recurring phenomenon in human history, are less amenable to archaeological interpretation due to their decidedly less complex material culture record (Bandy 2004: 331; Boehm 1993: 124).

1 Other commonly used chronological abbreviations will be: Early Helladic (EH), Middle Helladic (MH), Late Helladic (LH), Early Minoan (EM), Middle Minoan (MM) and Bronze Age (BA).
Therefore, the aims of this thesis are twofold: first, to develop a convincing method of linking ceramic technology with patterns of human socio-economic behaviour and secondly, to then use this methodology to explore the socio-economic diversity amongst LEMH communities. The recent spate of ethnoarchaeological work on the socio-economic implications of certain technologies places us in an advantageous position to make the link between technological behaviours and the assumptions that can then be made about the society in which these behaviours occurred. Thus, this thesis is not so much about the social meaning of objects, but rather about the social information that can be extracted from the techniques used to make objects and the strategies within which those objects were employed.

Within the field of Aegean prehistory, this will represent the first substantial investigation into the long-term ceramic and social history of the LEMH period, a phase that represents one of the most significant analytical lacunae in the field. Typically acting as a peripheral foil to the emergence of complexity on Crete in Early Minoan III-Middle Minoan IA and the development of the Old Palaces on Crete in Middle Minoan IB-II, the societies of the LEMH period on the Greek mainland have historically been marginalized within Aegean prehistory. These mainland communities are dominantly depicted as small-scale, materially poor, and consequently as socially underdeveloped, and relegated to the place of the Aegean Bronze Age's 'Third World' (Dickinson 1977: 15, 1982; Lambropoulou 1991: 7, 15; Rutter 2001; Wright 2001, 2004a; Zerner 1993: 39-40). In addition, being chronologically intermediate between the 'social spikes' of the EHII period generally (exemplified by the House of the Tiles at Lerna, destroyed in late EHII) and the wealth of the Shaft Graves at Mycenae (starting in MHIII), the lack of overt materialisations of incipient hierarchy during the LEMH have consigned it to a minor role in Aegean prehistory (Bennet and Galaty 1997). With the end of the EHII period considered to be '... more marked than any other subsequently seen in Greek prehistory, or any previously documented since the development of farming life' (Renfrew 1972: 116), and the Shaft Graves representative of a 'revolutionised mainland society' (Dickinson 1977: 108, 1989: 133), it is perhaps unsurprising that the LEMH has attracted a great deal less attention than either of these periods of dynamic and radical socio-cultural change.

While it is true that sites of the LEMH period appear to lack material manifestations of stratified social organisation, large-scale communal labour works, complex political administration and settlement hierarchies, the implications of this pattern have never been rigorously scrutinized. Furthermore, until recently, we have been ill-equipped to interpret the

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2 The House of Tiles, large in scale and containing numbers of sealings, and thus often hypothesised as a redistributive centre, is the most obvious example of this. In addition, other monumental buildings at Thebes, Akovitika and Tiryns are indicative of similar developments across other areas of the mainland (Wiencke 1989).
archaeological features of small-scale, non-hierarchical groups; recent ethnographic studies of material culture, in combination with archaeometric analyses of provenance and manufacture techniques, have placed us in a much more useful position to explore such societies through the patterns produced by the production and consumption of their material culture, as this thesis hopes to demonstrate.

Justifying the LEMH: a coherent period for analysis

While this LEMH period may appear to be chronologically perverse, it actually reflects a more coherent phenomenon of material culture and settlement patterning than the 'Middle Helladic' period (MHI-MHII-MHIII) proper, which was defined in ceramic terms over 80 years ago. Instead of imposing the logic of the 'Early', 'Middle' and 'Late' divisions of the Bronze Age (a system developed for use within a Cretan framework and not necessarily consistent with developments on the Greek mainland), and being constrained by chronological distinctions that do not bear strict relevance to the significant changes in patterns of cultural behaviour, I will be including the EHII period in my study, but not the MHIII phase. Let us turn briefly to the two breaks in the traditional chronology that I will be avoiding and make clearer my reasons for doing so.

The Early Helladic-Middle Helladic transition

One of the reasons why the 'Middle Helladic' period in general has been so problematic for study is that both the beginning and the end of this phase are essentially arbitrary transitions defined by changes in ceramic styles at a time when relatively few relevant sites had been investigated. While changes in ceramic typologies are often excellent means of evaluating the passage of time, when not linked specifically to other major cultural changes, ceramic phases alone do not necessarily provide a helpful framework for defining and analysing coherent phases of cultural stability and change.

This is particularly true in the case of the transition from the EH to MH period on the mainland. Based on excavations at the Corinthian sites of Korakou and Zygouries, Wace and Blegen were able to develop the first Pre-Mycenaean ceramic chronology, in which EH and MH periods could be easily distinguished from one another using the presence of different ceramic types, and were divided by a major destruction level. For example, the EH period was typified by glazed or 'Urfirinis' pottery and, following the destruction, Grey Minyan and Matt Painted ceramics heralded the beginning of the Middle Helladic period. This in turn led to the development of the 'Early', 'Middle' and 'Late' Helladic periods, drawing heavily on the tripartite system already developed on Crete and allowing for broad correspondence between the Helladic and Minoan cultural sequences (Wace and Blegen 1919).
Further confirmation of the EH and MH ceramic chronological divisions came from similar assemblages (also with associated destruction levels) found at Asea, Asine, Berbati, Eutresis and Kirrha; this combination of destruction levels and new pottery styles seemed proof that the shift from the EH to MH period was one of widespread unrest and violent destructions. Given that linguistic evidence (largely place names) had suggested the arrival (or invasion) of an Indo-European speaking population on the Greek mainland, Blegen and Haley (1928) were then able to use the EH-MH destructions as archaeological evidence for this event, known thereafter as the ‘coming of the Greeks’. Only the 1930’s excavations at Tiryns showed an EH-MH transition with no major destruction level, but this was widely ignored (Forsen 1992: 11-12).

This legacy, of a violent transition between the EH and MH periods, lasted until the excavations at Lerna in the 1950’s provided a much more detailed chronological and stratigraphic sequence, and further sub-division of the sub-phases of the EH period became possible. For the first time it became clear that certain ceramic types long associated with the beginning of the MH period and used almost exclusively to date the beginning of the MH period (for example, grey burnished pottery) actually made their first appearance in the EHIII period (Caskey 1960). Thus, the destruction level found at Lerna (which represented the burning of the House of Tiles) was dated to the transition between EHII and EHIJI, rather than the typically assumed ‘violent’ EH-MH break. Consequently, the corresponding changes in architecture and burial practices that followed were also of an EHIII date rather than heralding the beginning of the MH period, as had long been assumed (Caskey 1960: 299-302).

The chronological clarifications provided by the Lerna excavations resulted in the destruction levels at a number of other sites, including Akovitika, Ayios Dhimitrios, Ayia Marina, Ayios Stephanos, Kirrha, Kolonna, Lithares, Perachora, Phlius, Synoro, Tiryns, and Voidokhelia being re-dated to the transition between the EHII and III phases, rather than between the EH and the MH periods (Forsen 1992: 13-14). Evidence from other sites (Ayios Kosmas, Corinth and Zygouries) further substantiated this, and Caskey (1960) propounded an earlier permutation of the ‘coming of the Greeks’ scenario, citing the contemporaneous destruction of Argive sites between the EHII and EHIII periods as evidence for this. In light of this revised chronology, the fact that some sites (Eutresis and Korakou) were destroyed between the EHIII and MH periods became rationalised as a ‘second wave’ of invaders, with destruction focussed on those sites that had managed to resist the earlier invading populations (Caskey 1960: 299).

More recently, Forsen’s (1992) detailed and masterly study of the destruction levels at a wide range of well-excavated and published mainland sites has been able to clarify the situation. The results emerging from her work are clear: while individual site chronologies are
imperfect for large-scale comparisons, there is not sufficient evidence to uphold a theory of widespread contemporaneous destructions at either the EHII-III transition or the EH-MH transition, though destructions occur in both times (Forsen 1992: 255-257). Through an examination of the Helladic precedents for these cultural changes, her work has also been instrumental in disproving the possibility of large-scale population movement as a tenable explanatory model.  

Thus, it has become clear that the original grounds (destruction levels and ceramic change) for the division between the EH and MH periods is no longer valid in culturally meaningful terms. Instead, and despite the rejection of the invasion hypothesis, it has become increasingly obvious that the shift between the EHII and EHIII periods represented a fundamental transformation, with EHIII settlement patterns, architecture, ceramics and burial practices of a different character than those of the preceding EHII period. Diminished settlement numbers and site sizes, apsidal houses, new ceramic shapes and decorative treatments and burial tumuli can now be shown to have made their first appearance in the EHIII phase, rather than within the MH period, and therefore justify this EHII-III transition as that in which patterns of socio-economic, political and ideological behaviour underwent a significant crisis, though not one that need be explained by invasion. 

Though from this juncture it had become increasingly clear that the most significant cultural changes occurred between EHII and EHIII phases rather than between the EH and MH periods (Caskey 1960; Dickinson 1977: 32; Forsen 1992: 21-22; Maran 1998: 369-72; Rutter 1985: 29-35), it still remained unclear whether the EHIII and MH periods were part of the same cultural phenomenon. It was really only with Howell's (1973) reappraisal of continuity and change during the EH and MH periods that the continuity and similarity between the architecture, settlements, burial customs, pottery, stone, metal and terracotta artefacts of the EHIII and early MH period were recognised. In fact, this led Howell to suggest that the EHIII period be re-named 'Proto-Minyan' to ensure it was essentially classified with the MH during future studies (1973: 86).

The reasons for this are as follows: (i) some of the 'new' material culture types have an EHII precedent (e.g. apsidal houses); (ii) these new elements lack a uniform origin (e.g. Lefkandi I pottery has Anatolian antecedents, yet incised/impressed pottery is closely related to pottery of the Dalmatian coast); and (iii) these elements do not appear across-the-board at any site as a uniform 'package', thereby very much contradicting the likelihood that these were introduced by a migratory group (Forsen 1992; Howell 1973).

Furthermore, evidence continues to come to light suggesting that a significant environmental event occurred concurrent to this EHII-III cultural transition in the form of climatic change in the eastern Mediterranean at around 2200 BC. Resulting in a much drier prevailing climate, this is suggested by pollen, ocean sediment and geomorphological data (Burroughs 2005: 250-55; Manning 1997: 152). This is also reflected in the faunal record around sites such as Lerna where a sudden shift from swimming and marsh birds to those that live in dry conditions corresponds to the overall drying trend. The effects this might have wrought on the societies of the Aegean mainland merely underscore the necessity of placing the significant cultural break between the EHII and EHIII phases (Gejvall 1969; Manning 1997).
What Howell’s (1973) study emphasised (later re-emphasised by Carol Zemer in her 1978 study of the transitional EH-MH material at Lerna), was that compared to the changes that occur between the EHII and EHIII period, those changes that herald the beginning of the MH period (e.g. the adoption of manganese Matt Paint for pottery decoration and the first appearance of Minoanising pottery) are relatively minor. Not only did this highlight the continuity between the material culture and traditions of EHIII communities and those of the early MH period, but it also marked the beginning of a period broadly similar in cultural terms that would last until the start of the MHIII period: designated here as the LEMH. However, this scheme has never been widely adopted by scholars and study has continued to be focussed on the ‘MH’ period (often excluding the EHIII period) and the admittedly artificial boundary that imposes.5

The Shaft Grave period transition

At the other end of the MH period is the MHIII phase, which sees the beginning of the Shaft Grave period and ushers in the earliest stages of Mycenaean culture (Rutter 2001: 124). While the changes associated with the MHIII period are by no means as distinct as those between EHIII and EHII, they are equally significant in terms of the underlying social change that they represent. These include: (i) an apparent population increase and the resettlement of smaller, more marginally located sites; (ii) a dramatic change in burial customs including a rise in the deposition of material wealth and emphasis on individual prestige; (iii) the emergence of figurative art; and (iv) a rise in the importation and imitation of Minoan artefacts (including metalwork and ceramics) (Dickinson 1989; Dietz 1988, 1989).

For this reason, I propose that the MHII period define the end of the LEMH. The changes that mark the MHIII represent a fundamental departure from the small-scale, less complex societies of the LEMH as well as an equally significant departure from the somewhat ‘ascetic’ materially manifest behaviours of the LEMH period. The inclusion of the MHIII period, with its relatively rich material culture, results in the inevitable overshadowing of the LEMH archaeological record and its character becomes one of relative uniformity in comparison. Consequently, a study of specifically LEMH culture and its dynamics must use only the LEMH archaeological record to avoid throwing these small-scale, seemingly egalitarian patterns of behaviour into such low relief (when contrasted with the more archaeologically visible material culture patterns of the Shaft Grave period) that they become all but invisible.

Hence, rather than use outdated divisions to delineate the chronological foci for this investigation, I have chosen to examine a period of stable and broadly comparable culture,

5 This is also raised in the ‘Discussion’ section of Bronze Age Migrations in the Aegean (Crossland and Birchill 1973: 106-110).
unified by general similarities in material culture, political complexity and scale (Wright 2004a: 116). Rather than trying to explain a dramatic change or period of transition, this thesis is an investigation into the dynamics of production during this overall cultural phase. It is my belief that by interrogating patterns of ceramic production, consumption, technological variation and transmission it will be possible to throw much needed light on those enduring dynamics that allowed the communities of the LEMH mainland to retain their basically stable character for nearly five hundred years.

Data sources and prevailing models for explaining the LEMH

Having laid out the chronological remit for my thesis, it seems necessary to consider the ways in which this period of prehistory has been approached in the past. However, given that this period cross-cuts traditional chronological boundaries, no comprehensive studies have been undertaken. Instead, I will be discussing studies of both EHIII and general ‘MH’ material. This will be by no means a comprehensive review, but will touch on the major sources of information available as well as the main paradigms that have been used to explain the characteristics of the LEMH world. Studies of pottery, and material culture in general, will be discussed in much greater detail in Chapter 3.

The majority of excavated LEMH material is an incidental by-product of excavations focusing on investigation into another period, and gaining a comprehensive picture of any LEMH site, let alone a picture of LEMH society, is therefore a challenge. Because specific studies of either EHIII or MH material are rare, and almost exclusive to the Argolid, there is a limit to the amount of published material available. These include early studies of MH Minyan (Childe 1915; Forsdyke 1914), Matt Painted pottery and MH culture (Buck 1964, 1966) the publication of the EHIII and early MH pottery (Rutter 1995; Zerner 1978, 1986, 1988, 1993), EH and MH small finds and MH graves from Lerna (Banks 1967; Rutter 1995; Tucker-Blackburn 1970;) and a study of MH Asine (Nordquist 1987, 1990a, 1999). In addition, Rutter (1982, 1983a, 1984a) has produced a number of articles concerning EHIII and MH ceramic types that have been extremely relevant to the study of wider LEMH dynamics. The extensive publication of the EHIII and MH pottery from the site of Pevkakia Magoula in Thessaly (Christmann 1994; Maran 1992), that of Deriziotis Aloni, a small EHIII site in Messenia (Stocker 2002), the MH Orchomenos pottery (Sarri 1998) and an overview of pre-Mycenaean Thebes (Konsola 1980) are all very welcome additions that relieve the Argive-centric focus of many studies and also allow a wider discussion of the LEMH more

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6 Not included here is Dietz’s (1991) study of Argive pottery, as it is almost exclusively concerned with late MHIII and the transition to Mycenaean. The same can be said of the publication to date of the Ayios Stephanos pottery (Rutter and Rutter 1976).
generally. Additionally, comprehensive synthetic analyses of settlement and material from the Argo-Corinthia area and Elis have been made by Lambropoulou (1991) and Koumouslis (1980), respectively, though both of these focus on a larger chronological period than the LEMH. Fully published reports that include treatment of either EHIII or MH pottery exist from a large number of sites including Asea, Eutresis, Kirrha, Korakou, Prosymna, Tiryns, and Zygouries, and from the surveys in the southern Argolid (Nordquist 1995), Asea (Forsen 2003), the Berbati-Limnes area (Forsen 1996), Laconia (Cavanagh et al. 1996), Methana (Mee and Taylour 1997) and Pylos (Davis et al. 1997). Numerous preliminary reports on site and excavations also exist, though these are often not detailed enough to provide specific information about LEMH pottery.

Each of these works has provided a valuable contribution to knowledge of: (i) the variable responses of communities within each region to the changes at the end of the EHII period; (ii) the regional variability in material culture of the LEMH period; and (iii) the level of interaction between mainland communities and external groups. But the MHIII period and the changes between the LEMH and this phase remain the focal point of the majority of these analyses. A recent conference on the Middle Helladic held in Athens in March 2006 was symptomatic of this tendency; though explicitly welcoming contributions about the EHIII period, and organised with a eye towards innovatively re-interpreting EHIII and MH period behaviours, the majority of contributions tended to be about the later phases of the MH and sought explanations for the emergence of the distinctive Shaft Grave period mortuary behaviour. In general, then, patterns of material culture production, consumption and deposition in the LEMH, asides from their obvious lack of convergence upon a material vocabulary of institutionalised hierarchy are seldom explored in intrinsic detail. The integrative mechanisms by which these communities were able to maintain cohesion and stability seems to be considered largely irrelevant. As we shall now see, the two main paradigms for understanding the MH period derive from studies concerned with the origins of the Shaft Grave period phenomenon, or the underpinnings of subsequent Mycenaean palatial societies. Two main models have been proposed, the first emphasising the stasis of the LEMH and the second, the gradual development of Shaft Grave-type behaviours throughout its duration.

7 A somewhat peripheral study is that of Hielte-Stavropoulou (2004), who quite radically departs from typically Aegeo-centric models and draws heavily upon ethnographic analogy to explore the possibility of nomadism throughout the Middle Helladic mainland and southern Balkan area as an explanation for the Middle Helladic material record in general. Though this refreshingly new anthropologically-informed approach is welcome, her argument fails to be convincing due to many factors including: (i) the argument being built upon evidence collected from all periods of the Middle and Late Bronze age; (ii) the lack of any zooarchaeological evidence for pastoralist behaviour; and (iii) the wholesale application of ethnographic models with little modification or consideration of their relevance or appropriateness.
The first of these models, originally put forward by Dickinson in a book entitled *The Origins of Mycenaean Civilisation* (1977, the key concepts later revisited in 1982 and 1989), treats the LEMH as a period of cultural stagnation and poverty, the so-called 'Third World' of the Aegean Bronze Age. Little explanation for the LEMH is needed in this scenario, as the lack of discernible fortifications, 'decent' architecture, communal sanctuaries or materially manifest hierarchy (Dickinson 1982: 133-5) ostensibly precludes these LEMH communities having any organisational underpinning that requires explication. Though Dickinson (1977, 1982) considers tumulus burials to be the only evidence for possible 'big men' or 'chieftains' in the LEMH, their uneven distribution and the relatively small numbers of burials included within them is considered illustrative of the failed coalescence of LEMH leadership. In this model, it is only with the end of the Middle Helladic period (and the intensified deposition of prestigious material goods and associated social transformations) that socio-political development can be said to have occurred, due, in no small part, to the increasing influence of Minoan palaces.

The Dickinson model of rapid and drastic change in MRIII provides one of the foundations for the development of a second model by Voutsaki (1998, 2001, 2005). Once again emerging from work on the origins of the Mycenaean period, Voutsaki draws upon an analysis of mortuary data in the Argolid and Messenia to investigate the MH basis for Mycenaean behaviour. Though agreeing with Dickinson that the origins of Shaft Grave behaviour have little material basis in the mortuary record of the early MH, Voutsaki goes much further in probing the organisational principles of LEMH society, an exercise Dickinson clearly felt was unnecessary.

Departing radically from Dickinson at this point, Voutsaki questions the abject material poverty of the LEMH mainland, noting that relatively rich and/or imported goods (e.g. boars tusks, Cretan Kamares pottery and stone vessels) do appear with some frequency in settlement contexts. She interprets the non-inclusion of these materials in LEMH burials as indicative of a type of social organisation in which hierarchy and leadership need not be predicated on the acquisition or ostentatious display of high-status material goods. Therefore, she concludes, LEMH socio-political organisation was based on stable kinship structures. She argues that this type of social organisation could explain the so-called 'austerity' of MH material culture, as it played no major role in the legitimation of authority (Voutsaki 1998: 44).  

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8 In general, there remains some uncertainty about the representativeness of the LEMH archaeological record and the effect this would have on interpretations of the period. For example, if Voutsaki is correct that LEMH burials were an unsuitable place for the deposition of extravagant material objects,
Thus, in this model, the Shaft Grave period phenomenon represents a radical change not simply in deposition patterns, but in the underlying basis on which authority rested on the mainland, in a shift from kinship relations to status-driven competition. Explanations for this swift rise are sought in the influence of external groups and the integration of the mainland into Aegean gift exchange networks (Voutsaki 2001). For the present study, Voutsaki’s work has contributed two highly significant points: the first is the recognition that the changes in the depositional behaviour between the LEMH and MHIII (from household contexts to mortuary contexts, respectively) could be interpreted as meaningfully as the increase in the wealth of deposited material. The second is the suggestion that the key to understanding the LEMH lies in looking at its material culture, yet through an appraisal that avoids construing LEMH behaviours simply as small-scale versions or antecedents of their Shaft-Grave successors, and thus automatically ascribing to them the same implications of value and prestige.

However, it could be argued that the concept of kinship as an organising principle for the LEMH remains somewhat unsatisfactory or at least incomplete. This is partially due to the fact that the notion of kinship has been recognized as a highly mutable and ephemeral concept in anthropology, let alone archaeology. Therefore, identifying kinship or lineage within the archaeological record is generally considered to be extremely difficult (Allen and Richardson 1971: 51-52). Furthermore, the notion of kinship as a mode of communal organisation has been shown to be little more than titular in numerous ethnographic communities (Schneider 1984: 165-181). Though a powerful ideological notion, there is still reliance amongst these groups on further structuring principles that may be manifest in the material record, and therefore, more accessible to us archaeologically (Hayden 2001: 58-60; Lemonnier 1991). While Voutsaki’s approach has greatly empowered LEMH groups, by recognising these people as agents, rather than stagnant peripherals, we would do well to look, as Voutsaki indeed suggests, at the contexts in which we find material culture in the LEMH, and at the way these goods are produced, consumed and distributed in order to gain a better idea of what additional socio-economic structures might exist within and amongst these communities.

More recently, Voutsaki (2006) has suggested that an examination of the MH domestic economy might provide us with valuable information regarding: (i) the growth of societal complexity; and (ii) communal behaviour and organisation during this period, a proposal that is highly consonant with the approach taken within this thesis.
Gradual Evolution

In the second model, the origins of Shaft Grave mortuary behaviours, specifically the development of leadership, are sought in the archaeological record of the earlier MH period (though not, to my knowledge, within the EHIII period). Maran (1995: 70-72) and Kilian-Dirlmeier (1997) originally advanced this position, claiming continuity between MHII burial practices and those of the Shaft Grave period, and therefore argued for the emergence of elites on the mainland prior to the MHIII period. Kilian-Dirlmeier’s (1997) publication of the MHII Aegina Shaft Grave strongly advocates this position, also identifying some MHI and MHII ‘princely’ burials in the Argolid, Attica, Boeotia and Messenia as forerunners of the Shaft Grave tradition. She also emphasises the traditions of the Aegina Shaft Grave as an indigenous mainland phenomenon (see also Rutter 2001: 145). Due to the natural instability of their position, she argues, these early mainland leaders used very specific burial types9 as a means of symbolically securing their status and position; hence, this strategy went on to be institutionalised as a means of delineating leadership in the Shaft Grave period. Kilian-Dirlmeier’s (1997: 120-22) identification of a uniquely ‘mainland’ approach to competition and prestige (Minoan influence is negligible among the earliest of the examples in Messenia, for instance) is of great importance. However, there are too many chronological and evidential gaps in this argument, with only a very few early graves documented on the entire mainland, and in this sense they provide a poor case for an increasingly uniform cultural regime (Voutsaki 2005).

Wright (2001, 2004a) develops this idea further, presenting a model in which LEMH leadership is factional, and thus predicated on the ability to excel in a leadership role (as a skilled hunter or trader, for example). Success as a factional leader, he argues, could then be parlayed into an ideologically institutionalized role. In material terms, Wright (2001) argues that the existence of these factions can be traced in both settlement and burial contexts, with certain households and graves having artifacts related to the defining characteristics of the factional leader (e.g. imported pottery for a trader and hunting equipment or boar’s tusk helmet for a warrior). By the late MH/Shaft Grave period, these roles tend to coalesce into a single vocabulary of leadership representation, exemplified by the deposits of the Shaft Graves themselves. The subtlety of this model, and the explication of the concept of leadership rather than simply of the development of an elite, makes this a thought-provoking explanation for LEMH communal organisation and behaviour. The most important aspect of both these models is the belief that we should seek explanations for the organisation of

9 The criteria for identifying these are architectural elaboration, the presence of metal weapons/razors, imported drinking vessels, jewellery and hunting implements (arrowheads) (Kilian-Dirlmeier 1997: 120).
LEMH communities (contra Dickinson 1977: 12), and that LEMH material culture is capable of providing significant information about the nature of dynamic social processes at work within these communities.

Given that exploration of the LEMH mainland has been principally defined by the later dominance of Mycenaean culture and that both of these models were developed within the context of explaining the origins of leadership and hierarchy on the mainland, it is of little surprise that they are, in large part, still governed by later frameworks and retain an unconscious bias toward the ways of doing things which emerged as standardised in the later Shaft Grave period and Mycenaean world.

The first of their assumptions concerns the most commonly studied corpus of material from the LEMH period: the burials. Burials are clearly an important vehicle for social expression in the Shaft Grave and early Mycenaean periods (and in fact, are one of the most prominent types of evidence for these phases). This is generally assumed for the LEMH, but in fact, never explicitly demonstrated. Within small-scale communities of any variety, the tenuous and mutable relationships involved in intensive interaction demands constant negotiation and re-negotiation; among some groups this is expressed through burial and in other cases fails to manifest itself in the mortuary record (Bender 1990; Bandy 2004). Because there is little evidence to suggest that communities of the LEMH period fall into the former category, we must seek those material expressions of social interactions and operations in the non-mortuary sphere (Wright 2001). While this fact is acknowledged by both Voutsaki and Wright, the legacy of the Shaft Graves, in combination with the prevalence of LEMH mortuary remains, seems to be so pervasive that there is an inevitable predominance of this kind of analysis. On a more practical note, lack of grave goods means that graves can rarely be assigned to any sub-phase within the MH period; therefore, one can study the practice of inhurnation during the LEMH, but not the social processes represented by differences in a changing pattern of burial practices (Nordquist 1990b).

A second assumption is that the power and pan-Aegean influence of the Cretan polities during the Old Palace period can be retrospectively likened to that of the Cretan New Palaces. Due to the appreciable effect of the New Palace palatial institutions on the development of the mainland Mycenaean polities, there is an expectation that Minoan materials held a similar degree of significance during the LEMH, and this obliges one to take the presence of Cretan imports or their imitations as an indicator of significant mainland centres (Hiller 1993; Rutter and Zerner 1984). However, given that the political organisation and economic power of the Cretan palaces during the Old Palace period is quite poorly understood there is no justification for conflating regimes of value and influence associated with New Palace material culture with those found in the Old Palace period and hence
promoting those areas of the mainland that received Cretan material to a position of primary importance within mainland socio-political development.

A final assumption is that the Peloponnese, and specifically the Argolid, was of equal prominence during the LEMH period to its centrality in the Shaft Grave and Mycenaean period. This Argive-centric focus is further compounded by our own archaeological bias (Hielte 2004: 27), and surely related to the later high density of Mycenaean, Archaic and Classical sites located there, the subsequent intensity of archaeological investigation and the fact that three of the best stratified and horizontally exposed LEMH sites (Lerna, Asine and the Tiryns Unterburg) are located there, within ten kilometres of one another. In terms of the study of LEMH burials this is particularly apparent, given that Lerna and Asine are the only two sites with adequately large samples for analysis. As a result, patterns found within the LEMH Argolid are often assumed to be representative of patterns for the Greek mainland as a whole.

Yet one of the most fundamental principles for understanding the LEMH (and, indeed, other societies with a similar scale of organisation) must be the recognition of diversity and regional variation, and an attempt to understand and account for these phenomena (Bowser 2000; Hayden and Cannon 1982; Neupert 2000). Therefore, models extrapolated from a uni-regional perspective are likely to overlook some important regional LEMH material culture distinctions; indeed the LEMH is acknowledged to be a period of pronounced regionalism, at least in the case of ceramics (Rutter 1995: 649). Moreover, the possibility exists that the centres of importance within the LEMH world do not correspond to the regions most intensively archaeologically investigated so far. Given that, as we shall see, the majority of technologically sophisticated material culture can be assigned a central Greek (not Argive) provenance in this period, a thorough investigation of other mainland regions might show considerable divergence from the assumed LEMH stereotype of simplicity (Konsola 1981, 1985).

One of the most interesting parallels for the LEMH period, not only materially, but also interpretively, comes from the other great post-collapse phase of Aegean prehistory: the Early Iron Age (or as it is more damningly named, the Dark Age). Not only does this period share the same fate of being caught between two periods of greater complexity and material wealth (Mycenaean and Geometric), but it also sees the revival of certain material culture forms, including the apsidal houses, and cist and pithos burials, last seen in the LEMH (Snodgrass 1971: 383-386). This phenomenon, which Snodgrass describes as the re-assertion of the ‘Helladic’ character of the mainland, suggests to him that a great degree of continuity
existed despite the undoubtedly transformative institutions of the Mycenaean palaces. However, the similarity between the LEMH and the Proto-Geometric period is more likely to relate to the revival of specific forms of socio-economic organisation and ideological institutions in both these periods whose consequent material signatures are inherently similar. Regardless, comparisons between these periods highlight a more fundamental and underlying general point: their material simplicity does not mean they should automatically be tarred with the same 'cultural regression' and 'social stagnation' brush. Such treatment reveals an interpretive deficiency in our approach to understanding a frequently occurring though rarely archaeologically explored form of social organisation.

Accessing small scale groups through material culture

By far the most successful attempts at interpreting LEMH patterning and the most surprising insights into the LEMH period have derived from a close examination of material culture patterning. The first of these, by Rutter (1993: 26-29) uses chemical analyses of EHIII Argive pottery by Attas et al. (1987) to establish the existence of numerous producers and apparent small-scale exchange. This study, in combination with decorative and morphological analyses, allowed him to characterise the EHIII ceramic production tradition as one of great regional variability (particularly versus the homogeneity of the EHII system) and has been interpreted by Rutter as evidence for the emergence of a commodity-oriented system of economic organisation. Furthermore, Rutter convincingly interprets the frequent micro-regional EHIII ceramic exchanges between nearby communities as evidence for the creation and maintenance of ties between small local groups rather than the much more wide-spread cultural solidarity supported by EHII ceramic uniformity. This is illustrative of how an examination of changing production and consumption values has been able to shed light on the nature and change in systems of socio-economic organisation during the EHIII period.

A second set of insights, developed by Zerner (1993), also looks at ceramic production techniques, this time in the MH period. Through a reclassification of MH ceramics according to production parameters (rather than superficial decoratively defined ‘ware groups’) in combination with ceramic petrography and provenance studies, she is able to conclude that: (i) different regions of the mainland have radically different ceramic production techniques; and (ii) there were highly developed networks of trade and interaction between MH communities, to a degree hitherto unrecognised. Both explorations suggest that one of the best ‘bottom-up’ ways of investigating this period, and employing one of the most

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10 It is interesting to note that S. Sherratt’s (2001) idea that the Mycenaean palaces held a position of relative economic insignificance and failed to fundamentally alter the social, economic, political and ideological character of mainland societies coincides well with this notion of an underlying continuity of character to the mainland.
abundant categories of material remains, is through a close examination of pottery from a number of regions around the mainland, and a similar investigation of LEMH ceramic material culture will form the basis of this thesis.

The remit and organisation of this thesis

Taking into account the fundamental nature of the questions which need to be addressed, the scope of evidence available, and the approaches which have proved to be most productive to date, I propose to address questions of technological variation and socio-economic diversity by looking at the most prevalent category of LEMH material culture: ceramics. Not only does this provide a large corpus of material to work from, but it is also the body of material for which there is the greatest amount of comparative ethnographic data regarding the social, economic, political and ideological implications of production and consumption.

The analysis of ceramic production and technology amongst LEMH groups will help to elucidate the existence of socio-economic diversity on the mainland. It will also be necessary to consider the way in which pottery was differentially utilised across the LEMH mainland, and whether or not this is reflected in divergent consumption behaviours. It is my intention to explore what the practical implications of these behaviours might be in terms of communal structure and interaction among LEMH communities. Rather than applying the catch-all concept of ‘variation’ that is often used in reference to small-scale groups generally, and the LEMH specifically, this thesis aims to place the behaviours related to the production and consumption of ceramics within their socio-economic context.

Thanks to recent anthropological work on the elements that make up technological systems, the methodological tools needed to implement such a strategy and allow us to make links between pottery and the people are increasingly available; this further coincides with a growing body of ethnoarchaeological information about the complex relationship between people and things (Dietler and Herbich 1998, 1999; Gosselain 1998, 2001; Lemmonier 1992, 1993b). In turn, this has shown us that the way in which techniques are practiced, replicated and transmitted varies with respect to both the technique and the social organisation of a community. The recognition of this has provided archaeology with an incredibly effective tool for the detailed analysis of material culture. Therefore, great potential lies in using mundane objects and the techniques used to make them as a means of exploring the socio-economic basis of a community.

In geographical scope, I will be examining what has historically been called the ‘heartland’ of the Greek mainland, from central Greece up to the borders of Thessaly and the north-east Peloponnese (Figure 1.2). More marginal to this discussion will be the areas of the western and southern Peloponnese (Messenia, Elis and Achaea) and the Thessalian region.
proper, though they will be referred to for comparative purposes. By looking at a large amount of the mainland, this thesis will provide a comparative synthesis of pottery technology across many regions, though it would be beyond the scope of this work to explore ceramic production across the entirety of the mainland, particularly given that this period is one whose defining characteristic is regional variation.

Practically, this study will involve the primary study of two ceramic assemblages from the sites of Lefkandi and Asine, located in Euboea and the Argolid, respectively. The analyses will include macroscopic and technological examination as well as petrographic and chemical work in order to distinguish between imported and locally produced ceramics. This will then be supplemented by comparative study of those further sites that have been published in reasonable detail. The timing of such an investigation is fortunate, as a good deal of petrographic and technology-oriented research is currently being done at other sites (e.g. Argos, Ayios Stephanos, Eleusis, Lerna, Kirrha, Kolonna, and Thebes), and while these analytical programs are only published in preliminary form, they will greatly benefit the comparative analysis.

Looking at such geographically dispersed regions of the mainland will have two primary benefits: (i) it will maximise the potential for being able to distinguish local products from imports (particularly if the ceramic assemblage of each site is taken as being broadly representative of the local region); (ii) it will provide a heightened sense of the variation within a broad range of LEMH ceramic types and also increases the chance that differences in production behaviour will be more obvious, thereby creating a more clearly interpretable pattern.

The preceding discussion has set out the chronological and geographic scope of this thesis and provided a critique of the main models for understanding the LEMH period. Chapter 2 will present an archaeological appraisal of the LEMH world. Due to the fact that the LEMH is not a standard chronological period, this requires the re-evaluation of a wide range of settlement and burial data in order to extract those specifically *EHIII-MHII* patterns from the wider published data. In addition, interactions with the wider eastern and southern Aegean and Adriatic regions during the LEMH will also be considered. Following this re-examination of the archaeological data, we will return to material culture and ceramics in Chapter 3. This chapter is divided into three main sections, the first provides a detailed discussion of past theoretical approaches to the analysis of material culture; ceramic production and consumption are then considered in detail, highlighting those theoretical constructs that will be of the greatest utility within this thesis. Second, I outline the practical approach to ceramic analysis that I will employ, including those applied methods and inferential links that allow for interpretations about socio-economic structures to be developed. Lastly, I present a review of LEMH ceramics, past approaches to their interpretation and the current state of the field.
By discussing both past approaches to LEMH ceramics and the new methodology that I apply to their analysis in the same chapter, it is possible to highlight both the practical and theoretical problems with past approaches as well as illustrating how the approach developed in this thesis is well suited to the study of this ceramic material.

Chapter 4 presents the first case study of pottery from Lekfandi in Euboea, inclusive of the macroscopic, petrographic and technological analyses. This includes a discussion of general diachronic trends and their implications for the ceramic production and consumption systems at Lefkandi. Chapter 5 is a similar analysis of the LEMH ceramic material from Asine in the Argolid. Chapter 6 continues this discussion of differential regional production and consumption behaviour, looking at published LEMH sites within various regions of the mainland and clarifying the general production and consumption habits found within these sites. In conclusion, Chapter 7 will elaborate on the socio-economic implications that this production and consumption diversity might have in the context of these LEMH mainland groups and the extent to which we can use the notions of production and consumption to understand the social mechanisms integrating and defining different LEMH groups. Finally, (and returning at last to what is often taken as the point of departure!) brief consideration is given to the effects this socio-economic differentiation amongst regions of the mainland had on the development of Shaft Grave period behaviours and our wider understanding of this period in Aegean prehistory.
CHAPTER 2
EXPLORING SETTLEMENT AND BURIAL IN THE LEMH WORLD

Introduction

Having argued the relevance of new chronological boundaries (the LEMH) for my research in the previous chapter, it is necessary to review the archaeological baseline upon which all further work will be founded. This chapter provides an overview of archaeological evidence for the LEMH period (excluding pottery, which will be discussed in much greater detail in Chapters 3, 4, 5 and 6), addressing basic issues of settlement size, location and patterning and burial, as well as an appraisal of the wider Aegean world in which the mainland existed (considering the Cyclades, Crete, the western Anatolian coast and the eastern Adriatic coast). Though simple in scope, my reformulation of where key chronological boundaries should lie for a coherent historic periodisation, means that this review requires a general re-evaluation of the currently available data in order to isolate that which is truly LEMH in date, and thus, will give us a more coherent picture of this period archaeologically without the added palimpsest of the final MHIII phase.

In so doing, those patterns that actually reflect socio-economic processes during the LEMH period may be clarified. The elision of MHIII patterns of material deposition and settlement patterning with earlier MHI-II ones leads to a distortion of patterning (Dickinson 1982: 131; Wright 2004a: 121). Two examples illustrate the necessity of isolating the LEMH: the use and construction of tumuli in Messenia and settlement patterning in the Corinthia. In both instances, if one simply looks at 'the Middle Helladic' period, one assumes a uniform pattern of both activity and occupation throughout the period. However, in both these cases, only during the latest phases of the MH do the majority of tumuli get built in Messenia, and do inland sites like Kalamaki, Tsoungiza and Zygouries become re-occupied in Corinthia.¹ These are often cited as examples of the sudden and dramatic changes brought about during the early Shaft Grave period, though the implications for the processes at work in the LEMH are almost completely ignored. Is there significance in the use of only a limited number of large Messenian tumuli during the LEMH? Is it meaningful that the LEMH settlement pattern in Corinthia is almost entirely coastal? This chapter will be devoted to identifying specifically LEMH archaeological patterning and in so doing, provide a more secure database for inferences about the nature of LEMH communities.

¹ This has also been emphasised by Maran (1995: 68) regarding the genuinely misleading assertion that there is 'MH' settlement in the Nemea valley, since this is only true in the latest phase of the MH period.
On a chronological note, I will be exclusively referring to the periods EHIII, MHI and MHI, rather than to individual phases used at some sites. However, our lack of detailed chronological resolution for the LEMH period restricts me from applying a more detailed scheme of sub-phasing beyond these general divisions (Zerner 1978: 47-53). Figure 1.2 illustrates how the site specific phasing of seven of the main sites used in this thesis fits within this wider chronological scheme.

Isolating the LEMH period in the archaeological record

This type of wide comparative study is likely to encounter a number of different problems; most prominent among these is the difficulty in accurately isolating LEMH deposits. Given that this relies solely on the use of changing pottery styles as a means for dating settlements and burials (recovered through both surveys and excavations), it is worthwhile running through the main problems associated with using LEMH pottery as a chronologically sensitive indicator. Though the following chapters will discuss pottery in much greater detail, this discussion is necessary in order to explore the ways I will be addressing the difficulty of isolating LEMH material in my analysis. The two major problematic aspects of isolating the LEMH period are: (i) the ‘low visibility’ of EHIII pottery; and (ii) the high degree of regional variation in LEMH pottery styles and slow rate of change amongst canonical MH pottery types.

EHIII as a ‘low-visibility’ period

Rutter (1983c: 138-39) very cogently pointed out the fact that during certain periods, the poor relative visibility and diagnosticity of some types of pottery results in their lack of recognition during survey, and as an example, he cites the EHIII period. It should also be emphasised that this visibility issue is not limited to survey material alone, and Forsen (1992: 27) remarks that the identification of EHIII pottery even at excavated sites has been historically hampered by these difficulties. It remains highly plausible that re-study of old excavation material might yield previously unidentified EHIII pottery, and the examples of Kirrha (in which Caskey 1962: 211 recognised EIR11 material previously dated as MHI) and Nichoria (where Pullen 1993 identified EHIII material among the published MH levels) stands as testament to this.2

The reasons why EHIII pottery is so ‘invisible’ are five-fold. First, it is most recognisable from its decoration (a feature unlikely to be preserved on survey pottery), and

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2 As a further example, Forsen (1992: 194) discusses 15 sites in the Argolid; though not originally thought to have an EHIII component prior to excavation, EHIII material was found during subsequent excavation at 11 of these sites. Forsen adds that the remaining four sites could also have an EHIII component, but have been either poorly excavated or published, such that this could not be confirmed either way.
has diagnostic shape features that may easily be confused with MH types (for example the eroded everted rim and strap handles of EHIII tankards could be mistaken for MH kantharoi or shoulder-handled bowls). Second, until the recent publication of the Lerna IV assemblage (Rutter 1995), there was no detailed publication of a substantial and well-stratified EHIII deposit, and therefore a general lacuna in our knowledge of the typical shapes, surface treatments and decoration associated with EHIII pottery. Third, though initially recognised by Caskey (1960), but more recently and explicitly spelled out by Rutter (1983a), the existence of prototypes for canonical MH pottery types (e.g. EHIII fine grey burnished for MH Grey Minyan) means that without close investigation, pottery that was once automatically considered to date to the MH period may actually be EHIII. Fourth, EHIII is also a period of short duration in absolute terms, lasting only approximately 150-200 years, which will result in a much more limited amount of pottery being deposited in comparison with periods of greater length. Lastly, the apparent regional variability that exists within EHIII pottery types, as a detailed study of EHIII Deriziotis Aloni in Messenia illustrates (Stocker 2002), as well as the possibility that EHII traditions may have survived for longer periods in some areas (Howell 1973: 82; Sampson 1985), results in our inability to anticipate what an EHIII ceramic tradition may look like in any specific region.

In fact, it is often only from the presence of a limited range of well-known EHIII ceramic traditions or shapes (e.g: Light-on-Dark/Dark-on-Light pattern painted wares and ouzo cups) that the period is positively identified; given that Rutter (1984: footnote 15) has noted that the pattern-painted class of pottery made up less than 10% of the weight and count from the excavations at Tsoungiza, there is no reason to assume that this class of ceramics necessarily forms a large component of an EHIII assemblage. If these ceramic types are neither produced at nor imported onto a site, particularly in a region in which we lack knowledge about the local EHIII ceramic traditions, only through excellent stratigraphic contexts can EHIII settlement phases, burials or other activities be recognised. The combination of these factors therefore suggests that the limited evidence for EHIII activity found in survey and excavation cannot always be taken as an accurate reflection of how limited activity genuinely was, but should also be seen as a function of the low recognisability of EHIII material within the archaeological record. This naturally has serious implications for the recognition of LEMH activity, and will be discussed in further detail in the next section.

3 For example, the lack of a regional painted pottery tradition in the southern Peloponnese (most notably in Laconia) may account for the near total absence of identified EHIII material in that region (Cavanagh et al. 1996).
High degree of regional variation

The high degree of regional variation in pottery types is an equally valid problem for the MH period as it is for the EHIII. While the MH pottery does not suffer from the same visibility problems, and has even been dubbed a 'high visibility' period by Rutter (1983c: 138-39), due presumably to the easily recognisable and highly durable grey pottery that is so characteristic of this period, it is still not one that is easily sub-divided chronologically. Because of this, attempts have been made to take two of the most typical and widely-appearing MH pottery types (Grey Minyan and Matt Painted) and use these as an index for chronological development (see Dickinson 1977: figure 2 for his 'Proto-Minyan' to 'Mature Minyan' classification system and Buck 1964 for the chronological development of Matt Painted pottery). Given that Grey Minyan is also one of the main indices for identifying MH occupation and activity (Buck 1964: 278-83; Fossey 1988: 23), this type of system would be of great utility. However, what has been overlooked is the amount of regional variation that can occur even within these canonical ceramic types (Rutter 1995: 648; Zerner 1993). For example, 'local' Grey Minyan pottery from Euboea seems to exhibit some of the features typically associated with 'classical' or 'mature' Minyan at an earlier chronological phase than the 'local' Grey Minyan found elsewhere (e.g. carinated shapes, elaborate rim types and rim handled cups) (Howell 1966: 91).

This has resulted in the differences in shape and/or decoration within two superficially similar (but potentially very different) ceramic traditions being assumed to represent chronological changes across the mainland as a whole. Yet these changes may have no more than local significance. It is this lack of attention to local/regional ceramic traditions and developments that has hampered our ability to develop more fine-grained chronologies for the MH period in the absence of absolute dating of local sequences, and resulted in the very hazy chronologies that exist at present. This very real regional variability has often been obscured by the use of classification systems that promoted the use of overly homogenised ware groups rather than expressing the nature of local/regional ceramic traditions. If greater attention is given to local ceramic traditions and their chronological developments, we can begin to define periods within the MH with much greater assurance. This has been done at Lerna, for example, by Zerner (1978), who has defined a series of traits marking out the transitional EHIII-MH phase at Lerna (e.g. incised rims of grey burnished pottery, the adoption of bichrome matt-paint) and is now more successfully being applied to the Argolid as a whole (e.g. Nordquist 1995).

In addition, the fact that these canonical groups (Grey Minyan and Matt Painted) carry on into the Late Helladic period can also make identification of the early MH period
difficult (Furumark 1941: 215, Davis 1979). In general, though, the increased prevalence of certain ceramic types within the overall ceramic assemblage (rather than simply of specific features of vessels) are often indicative of the late MH period. For the majority of the Peloponnese, Boeotia and Euboea the following trends appear only in the last phase of the MH period, if not later: polychrome painted decoration, an increase in the amount of Yellow Minyan (relative to Grey Minyan) and the appearance of smaller stemmed goblets/cups (Davis 1979). This once again underscores the need to understand a great deal more about local pottery sequences.

Methodology: explanation and justification

Given the problems outlined above, there is often difficulty in disaggregating patterns of material deposition in the LEMH period from that of the later MH period. This is particularly true when working from published material that varies greatly in terms of the amount of detail provided. Given that it is (perhaps unsurprisingly?) rare for any further chronological breakdown to be given in many preliminary archaeological reports beyond that of simply ‘Middle Helladic’, almost all determinations of a more specific date for any site, burial or occupation layer must be made on the basis of an examination of the pottery. Given that a great deal of the pottery is not illustrated, sometimes this has to be done on the descriptions alone, and the following is a discussion of the criteria that have been used to identify sites likely to have an occupational phase dating to the LEMH period.

Using the Gazetteer of Aegean Civilisation (Hope Simpson and Dickinson 1979), the publication of nine intensive surveys, six extensive surveys, and reports of recent investigation in Archaeologikon Deltion (AD), Bulletin de correspondance hellénique (BCH) and Archaeological Reports (AR), I was able to compile a preliminary database of sites at which EHIII/MH material had been reported (see Appendix 1). Erring on the side of caution, those sites at which material is dated either to ‘late’ MH, contains a queried MH component or is dated to MH-LH (implying an MHIII date, see Wright 2004b: 119) were not included within the analysis. In the majority of the cases, it was then necessary to return to the primary report in order to determine if the material was EHIII in date and/or whether the MH component reported could be ascribed to an early phase of the MH period. Often, only a limited amount of this pottery would be described or illustrated and therefore a decision had to be reached based only on a limited amount of information. Factors such as a large amount

\footnote{As Furumark (1941: 215) goes so far as to say, ‘it is difficult to decide whether a vase should be classified as MH I or II as the characteristic style of the early MH phase is still in use in Mycenaean times.’}

\footnote{References regarding settlement and occupation patterns are all included in Appendix 1.}
of Yellow Minyan, predominantly curvilinear Matt Painted designs or a high percentage of polychrome Matt Painted pottery were considered indicative of a later MH date.

Earlier MH material was evaluated with reference to many of the categories defined by Zerner for the early MH period at Lerna, though the degree of regional variation amongst early MH pottery was compensated for by closer examination of the early MH levels from any excavated and published sites within a region (e.g. Kirrha for Phokis and Asea for Arcadia). \(^6\) This attention to regional ceramic differentiation is based on the collation of many ceramic features that appear to be chronologically sensitive from a wide range of LEMH sites, including ones with periodic occupation (e.g. Asea) from which one can see pottery characteristics associated with defined chronological periods (Rutter 2004). Figure 2.1 lists many of the most chronologically sensitive ceramic characteristics from Lerna, Kirrha, Asea and Kolonna and those features that appear contemporaneously at all sites are used as the best chronological indicators; this also was intended to be a less Argolid-specific model, and therefore, hopefully one that can be applied with more assurance to the mainland in general.

For the reasons discussed above regarding the 'low visibility' of the EHIII period, the absence of EHIII material at a site does not necessarily preclude it from being considered as an LEMH site. Due to low visibility, sites tested in only limited trial excavations, excavations with very limited publication, extensive surveys and surveys with no rigorous collection strategy, sites at which early MH phases are identified, even without explicit evidence of EHIII occupation proper, will often be considered to have enough potential continuity of occupation to classify them as 'LEMH'. Alternatively, if only EHIII pottery is present, with no evidence of any early MH occupation, a site is not included as an LEMH site proper (though a number of sites exist like this in the Argolid and Corinthia and will be discussed in their own right).

Therefore, those sites that yielded EHIII pottery and pottery that was definitively early MH, or was very likely to be early MH in date were assigned category 1 (definite) LEMH status. Those sites at which there was possible EHIII pottery and material likely to be early MH were given category 2 (probable) LEMH status, whereas those sites in which there was no EHIII material and probable early MH material were considered category 3 (possible) LEMH sites (see Figure 2.2 for a distribution map of these sites). Sites assigned a category 4 (doubtful) status included those at which early MH material could not be confirmed (due to lack of publication or diagnostic features) but where there was no evidence to suggest only a late MH occupation. Those sites considered to definitely not be LEMH in date (category 5)

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\(^6\) Having physically examined pottery from three regions of the mainland (the Argolid, Boeotia and Euboea), I had a clearer understanding of regional variation at least within these three areas. In many cases, however, primary evaluation was impossible and therefore entries within the database include the terms 'probable' or 'possible'.

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were those that had only EHIII material and late MH material, or those sites at which only late MH material was present.

In the following section, I will be examining the general settlement patterns within the main regions being considered in this thesis: Attica, Euboea, Boeotia, Phokis, Lokris and the north-eastern Peloponnese, including also other areas of the Peloponnese (Arcadia, Elis, Achaia, Laconia, and Messenia) which have been widely investigated and provide complementary information that can enhance the overall picture of settlement and demography on the mainland. Following that, I will briefly examine burial and mortuary patterns during the LEMH period and finally, connections between the mainland and other areas of the eastern and southern Aegean and the western Adriatic coast; these additional forms of archaeological evidence will enhance the picture we have of overall LEMH period behaviours.

Settlement and scale

Developing as clear a picture as possible of LEMH settlement patterning is critical in a number of respects. Our knowledge of human populations and their distributions form the basis from which so many other archaeological characteristics are extrapolated (Renfrew 1972: Chapter 14; Osbourne 2004; Whitelaw 2000). Concepts of scale dramatically affect the adoption and uptake of technologies and material culture types by producers and consumers, respectively and are therefore critical to investigations in upcoming chapters regarding the social context of ceramic production and innovation during the LEMH period (Broodbank 2004: 61; Shennan 2001). In addition, the location of sites, their size and their relationship to one another may prove illuminating as a means of evaluating settlement nucleation, site hierarchy and potentially, a site’s socio-economic position. Lastly, given the fact that the decline in settlement numbers has become one of the most emblematic pieces of evidence for the inferred cultural decline during the LEMH period, this is a chance to explore how homogenous this settlement decline phenomenon was inter-regionally, and to see whether nucleation of settlement could present a valid explanatory model for this drop in site numbers over certain regions of the mainland. As Snodgrass (1971: 367) has suggested for the Early Iron Age, the decline in the quality of material culture in a period like this could be understood as a breakdown of a centralised authority rather than necessarily implying a general debility in the overall society; therefore, it is of the utmost importance to ascertain whether the so-called LEMH decline (Dickinson 1977: 38) was also a demographic one.

The notion of 'decline' has become firmly entrenched in our understanding of the LEMH period, yet is actually a point of view derived from a geographically limited number of sources. Of 10 intensive surveys that have been carried out in the Aegean since 1965, only
three were in central Greece (and restricted to Boeotia and Attica); in addition, the publication of these has been patchy and the dating of prehistoric sites extremely generalised (Rutter 2001: 135). Instead, the detailed data derived from the north-eastern Peloponnese (which has played host to four intensive surveys in the last twenty years) has often been considered to be typical for the entire mainland. The results of the Argolid Exploration Project are illustrative of this: 33 EHII sites, ranging in size from 5 hectares to 25 sites below 0.2 hectares were found, compared with 3 EHIII and 3 MH sites, whose maximum size was 1.8 hectares. (Jameson et al. 1994: 543). This trend seemed to correspond well with an overall model of site destructions and abandonments and inferred population decrease, and has typically been a significant factor in interpreting the overall decline considered typical of the LEMH period (Forsen 1992: 157; Renfrew 1972: 226-240).

However, Bintliff (1977: 131-134) long ago made the reasonable point that numbers of sites themselves are unhelpful in understanding settlement patterns, and these patterns could be linked to cycles of dispersal and nucleation rather than simply abandonment. This has been further developed by Whitelaw (2000) who argues that both regional and site-specific patterns must be explored in order to analyse realistically settlement patterning and the reality of site nucleation in the archaeological record. While many areas across the mainland have received an uneven amount of investigation, and have been examined using very different methods (e.g. intensive, extensive and topographical survey), the very nature of LEMH settlement, in which the majority of the smaller EHII farmsteads and hamlets appear to have been abandoned, places us in a potentially advantageous position. Because it appears that very small settlements, which are essentially archaeologically invisible without intensive survey, are not prominent features of the settlement landscape in the LEMH period, then there exists a much higher probability that a large proportion of LEMH sites have been recognised. Furthermore, the distribution of LEMH sites from areas where intensive survey has been carried out, may provide one of the most accurate reflections of past human settlement behaviour, much more so than for other periods which exhibit a settlement pattern consisting of numerous dispersed small settlements (like the EHII period). For example, of six of the intensive surveys on the mainland since 1980 (the Argolid Exploration Project, the Asea

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7 Results from these surveys (The Cambridge Boeotia project, the Stanford Skourta Plain survey and the Oropos Survey) give mixed indications of possible settlement patterns, though within the publications, chronological details are lacking as are full descriptions and/or illustrations of ceramic finds. For example, the Boeotia survey found the most 'definitely' identified MH sites of any prehistoric period (9 MH sites vs. 3 EH), though it is difficult to determine if these are LEMH or later MH sites (Bintliff 1985; Bintliff and Snodgrass 1985); other surveys are equally limiting in the detail of information they provide regarding prehistoric periods.

8 The validity of this point for the MH period has been questioned, with particular reference to the north-eastern Peloponnesian survey data, as none of the sites that survive into the LEMH period appear to increase dramatically in size. However, there may be sites elsewhere (e.g. Thebes) for which this argument may be valid (Dickinson 1977: 97; Symenogleou 1985: 35).
Valley survey, the Berbati-Limnes survey, the Laconia survey, the Methana survey, the Nemea Valley Archaeological Project, the Oropos survey and the Pylos Regional Archaeological Project), only c. 8 sites of EHIII or MH date have been newly discovered, compared to approximately 40 new EHII sites discovered by the Laconia survey project alone. Therefore, while there remain areas from which information is scanty, for regions that have been subject to intensive survey, settlement patterns for the LEMH period are probably some of the most accurate presently known for prehistory.

However, due to gaps in the data (particularly due to the lack of fine chronological resolution mentioned above), settlement patterning will have to be discussed in much more generalised terms, discussing mostly the distribution of sites, with questions of site hierarchy, site densities within the landscape and evidence of nucleation restricted to those cases where the information is available. For the sake of comprehensiveness, though, the most thoroughly excavated and published sites in each region will be briefly examined in order to enhance our understanding of site sizes, populations and internal organisation.

**Messenia** (Figure 2.3)

Messenia, the south-western region of the Peloponnese, is one of the most agriculturally fertile areas of the mainland, with three main areas well-suited for settlement running west to east: the first, running from the north coast (between Kyparissia to the upper Pamisos river), the second from the southern part of the west coast (near Pylos) and the third on the eastern side of the Messenian Gulf near the Kalamata plain. Having been subject to a great deal of archaeological scrutiny (from three major survey projects, the extensive Swedish Messenia Expedition, the University of Minnesota Messenia project and the intensive Pylos Regional Archaeological Project), it should be possible to attain a high level of resolution regarding LEMH settlement patterns. This is of particular importance as Messenia is historically one of the only regions in which there is a reported increase in sites of the Middle Helladic period.

Of a reported 44 find-spots with MH material (for sources, see Appendix 1), an estimated 28 of these come into use for the first time in the late MH (MHIII) period. Thus, of the reported find-spots of MH material, only 14 settlements in Messenia can be considered to have definite, probable or possible LEMH occupation. Of these 14 settlements, I will only consider the six sites that have definite evidence for LEMH occupation: Gargaliani: Ordhines, Gargaliani: Kanolos, Ano Englianos (Pylos), Nichoria, Korifason: Beylerbey and Valta: Kastraki, a pattern that perhaps relates to a local settlement strategy in which each valley supports a single settlement. These sites have a relatively even distribution along the coastal plain east of the Navarino bay. Only Nichoria overlooks the Messenian Gulf, and is quite isolated from the apparent concentration of settlement along the western shore of the Messenian peninsula.
Of these six sites, only two have been excavated: Ano Englianos and Nichoria. Though very little of the EH-MH material was reported in the published Pylos excavation reports, recent re-analyses of the pre-palatial Pylos material are able to provide information on the LEMH history of the site. For the EHIII period, Stocker and Davis (2006) suggest that two to three small sites may have occupied the Englianos ridge, coalescing into a larger site in the MH period. Though the PRAP survey estimates the size of the site prior to the palace (in the MHIII-LHI period) at c. 5.5 hectares, this figure may be slightly smaller in the earlier period of the MH. At Nichoria, occupation over 3 hectares can be estimated, though only two examples of LEMH architecture have been exposed: Unit V-1 and Unit II-8. Unit V-1, dating to transitional EHIII-MHI levels, was closely associated with two hearth structures, and therefore may represent a production area rather than a domestic dwelling (Howell 1992).

**Laconia (Figure 2.3)**

Laconia, taking up the south-eastern part of the Peloponnese and bounded on both the east and west by mountain ranges (the Taygetos and Panatos, respectively) sees the majority of LEMH settlement within the large Eurotas Valley (encompassing the Skala and Sparta plains) and along the well-sheltered coast of the Gulf of Laconia. This region has been the subject of both extensive survey in the 1960’s (Waterhouse and Hope Simpson 1960, 1961) and intensive survey in the 1990’s. Though MH sites are relatively abundant, they prove to be almost entirely founded in the later MH period (of the 21 sites found in the intensive Laconia survey, 13 are definitely later MH, and three are clearly LEMH) (for sources, see Appendix 1). This early MH paucity is further borne out by the presence of only a single sherd (at the Amyklaion) of EHIII material found on either survey. Recently, Banou’s (1999) survey and publication of EH sites in Laconia has identified two EHIII sites. These two sites, Skoura: Ayios Georgios and Skoura: Vouno Panagias, documented the first occurrence of Dark-on-Light and Light-on-Dark pattern painted EHIII pottery to so far be recognised in Laconia. A third EHIII site was also identified at Macrovouni: Vardies, though the identification of a plastic decorated pithos sherd as EHIII is questionable, and is therefore not secure enough to demonstrate LEMH occupation. However, it is unclear if these sites continue into the MH period.

Therefore, the LEMH period is once again a great deal more elusive in this area than the relatively widespread presence of ‘MH’ occupation would suggest. Only a single site, the Amyklaion, provides enough EHIII and ample early MH material to represent certain occupation in the LEMH period, though seven other sites (Ayios Stephanos, Geraki,

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* Rutter (1995: 639) states that while specific types of plastic decoration can be as good an indicator of EHIII date as pattern-painted decoration, this is true only on certain vessel types and specifically not pithoi.
Paizoulia, Asteri, Ayios Ioannis, Aphidna and Vaphio: Palaiopyrgi) have pottery that appears to be from the earliest phases of the MH period. Six other sites have possible early MII occupation, though the lack of an EHIII component (presumably related to the fundamental problem of the identification of EHIII among the local Laconian pottery) does not allow one to identify them as having definite LEMH occupation at this time. Five of the definite and probable LEMH sites cluster around the Laconian Gulf, and the other three are located 10-15 km inland, though with so few sites it may be premature to comment on settlement patterning in general. The earliest material from the Menelaion, though one of the largest MH sites in Laconia, dates from the MHII period, and recent work at Kouphovouno has revealed a substantial MH cemetery, though nothing found at this site suggests anything earlier than an MHII presence (Cavanagh et. al. 2006).

One can estimate site size only for Ayios Stephanos, where LEMH material was found in trenches A, G, B, D and trial trench VI (that in turn only represented tests over a small portion of the site), and prehistoric material reported over an area of c. 200 x 150 m, making a size of between 2-2.5 hectares not unreasonable (Taylour 1972). During the course of the excavation, rectangular houses were found, plus a single apsidal house uncovered in the earliest MH levels. Geraki, though currently under intensive excavation, has almost no architectural remains of the early MH period due to later rebuilding (Crouwel 2006).

*Elis and Achaea* (Figure 2.4)

The prehistory of Achaia and Elis, located along the north- and central-western coast of the Peloponnese respectively, has not been the subject of great scrutiny and though the Minnesota Messenia Expedition (which included parts of southern Elis), Papadopoulos' 1978 survey of Mycenaean Achaia and Koumouzelis' (1980) brief overview of prehistoric sites (as an appendix to her thesis) provide a general overview of settlement from the Early to Late Bronze Ages, no intensive and methodologically rigorous survey has been undertaken in these areas. The Achaian landscape offers a limited number of settlement choices, with only a small area of arable land along the coast and a series of mountain networks perpendicular to the shore creating a number of inland valley systems. Though these areas are given greater attention in later prehistory, in the context of increased interaction between the Aegean and the central and western Mediterranean, a greater understanding of settlement for the earlier phases could address (i) the existence of contact between the Adriatic coast and central Mediterranean from an early period and (ii) the importance of the Corinthian Gulf as a conduit between the western Peloponnese and central Greece.

In Achaia, only one site, Teichos Dymaion, has conclusive material evidence for continuous occupation throughout the LEMH period, though three other sites are very likely to have also been occupied in this period: Aigion, Katarraktis: Drakotray and Katarraktis:
Pyrgaki, though no EHIII material has been found at any of these. Little more can be said regarding these sites, as they are mentioned only briefly in publication; for example, though brief reports from both Teichos Dymaion and Aigion mention a large amount of LEMH pottery (including close parallels from Tiryns and Orchomenos), the lack of any further publication makes any estimates of the size of either site currently impossible (Mastrokostas 1965: 128-9).

The region of Elis on the central western coast of the Peloponnese, has a similar topography to Achaia, with settlement focussed around the slightly inland Alpheios and Penios river valleys. Only three sites in this region demonstrate probable occupation throughout most of the LEMH: Olympia (the Altis), Olympia (the New Museum site) and Kato Samikon; best investigated are the two Olympia sites (for sources, see Appendix 1). Although within five hundred metres of one another, the types of EHIII pottery found at the two suggest that there may have been a shift in occupation between the two areas during the duration of the EHIII period. Specifically, the lack of more developed MH ceramic types at the New Museum site may indicate that occupation ended there earlier in the MH period than that of the Altis site (Koumouzelis 1980, Rutter 1982). Three other sites lack EHIII pottery, though they may possibly have MHI and II material: Ayios Andreas: Pheia, Makrysia and Ayios Dhimitrios: Lepreon. The other ten reported MH sites (including two tumulus complexes) from Elis are demonstrated only to have late MH material.

At the Altis, houses 2, 3, 5 and 6 represent the EHIII-MHI occupation and houses 1, 4 and 7 appear to represent MHII settlement, indicating a minimum extent of approximately 2 hectares for the majority of the LEMH period. At the New Museum site, houses IV and V date to this period, though a general site size estimate is more difficult to make. If, however, the two settlements were considered as a single site for the period that they were simultaneously occupied (possibly late EHIII-MHI), this would suggest a size of upwards of 8-10 hectares. The built structures revealed by these excavations are both the rectangular and apsidal forms well-known from this period, though the apsidal houses appear only to have been in use during the EHIII-MHI phases.

The low numbers of definite LEMH settlements in these areas make any generalised statement speculative. However, there are certain indications that these regions were much less marginal to the mainland and the wider pan-Aegean context than previously assumed. Though this will be discussed in greater detail in the following chapters, the similarities between certain forms of EHIII pottery from this region and central Greece – particularly the one-handled bowl, a shape more common in Boeotia than in the north-eastern Peloponnese (Rutter 1995: 649) – are prominent enough to re-assess the degree and nature of contact hitherto assumed.
Arcadia (Figure 2.4)

Arcadia, the central-eastern sector of the Peloponnese, is highly mountainous, and settlement has therefore been characterised by small-scale sites located within the valley systems. Within this highly fragmented landscape, natural conduits exist which are as significant and effective as many sea-routes; the site of Asea is an excellent example of this, located at one of the main mountain passes between the north-eastern Peloponnese and Laconia and therefore effectively positioned along one of the few direct routes from the northern to the southern Peloponnese.

An extensive survey carried out by Howell (1970) in eastern Arcadia, and more recently an intensive survey of the Asea valley system in southern Arcadia (Forsen 2003) have suggested that there was an overall decrease in settlement numbers in this region during the LEMH period; the Megalopolis survey reported no EHIII or MH sites at all (Lloyd et al. 1985). Overall, five sites probably have LEMH occupation: Stadion: Ayios Constantinos (on the north-central Tegea Plain), Pheneos (in northern Arcadia), Pikernis (on the Mantinea plain), Asea (on the southern edge of the Tripolis plain) and Levidhion Panayia (on the northern Caphyae Plain) (for sources, see Appendix 1).

The patterns found in the Asea valley survey, based on the only rigorous application of intensive survey methodology, act as a microcosm for understanding the region as a whole. Only two new potential LEMH sites were located (Ayios Nikolaos and Ayios Athanasios), and the only definite LEMH presence came from the site of Asea. At the two newly discovered sites, the limited evidence for EHIII (a single piece of pottery at one and a possible shaft-hole hammer axe at the other) and the lack of explicitly early MH pottery, means that these sites are not considered to constitute definite LEMH occupation. This pattern, of very sparse EHIII remains, plus a poorly represented early MH period, are typical throughout Arcadia. For example, although 20 MH sites are reported in the Gazetteer of Aegean Civilisation, this translates into only 4 clear instances of LEMH occupation.10

Even within this small sample, there appear to be certain discernible trends with regard to settlement nucleation and abandonment. For example, at Asea, both survey and excavation indicate that the site became the single nucleated centre for the valley during the early MH period, increasing in size to c. 4.3 hectares from c. 3 hectares in EHIII. Furthermore, excavations (Holmberg 1944) indicate that it may have been abandoned in the middle of the MH period (towards the end of the LEMH period). Two other Arcadian LEMH sites, Levidion Panayia and Stadion: Ayios Constantinos, estimated to be approximately the

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10 Notably, in the case of both the eastern Arcadia and Asea valley survey, the scholars responsible for the analysis and publication of the EHIII and MH ceramic material both had extensive experience with identifying the pottery of these periods (Forsen 1992, 1996; Howell 1966, 1969, 1970). This meant that the pottery was often assigned to a specific chronological phase within these periods.
same size as Asea were each also the nucleated centre of a valley/plain, and show evidence for a similar abandonment at the end of MHII.

Built structures from this region include both typical rectangular and a single relatively large apsidal building from Asea (Holmberg 1944: 12-20), and within the deep MH deposits (with a reported seven MH building phases) at Pheneus, apsidal houses were also found (Howell 1970). Nearly identical in construction to those at Asea, these consisted of 2-3 stone foundation courses with an upper mud-brick superstructure, though there is apparently some evidence for the use of wood construction in the earliest MH levels (Howell 1970: 111-12). Lastly, of some importance is the discovery of an EHII-MHI metallurgical kiln at Pikernis, one of the very few built structures related to craft production from this period (Howell 1970: 86-7).

North-east Peloponnese (Figure 2.5)
Moving to the west, this area of the mainland has been the most intensively surveyed and widely excavated, and it should be possible to gain a more accurate and nuanced picture of settlement distribution in the north-eastern Peloponnese. Comprising the Corinthia, Argolid and Methana peninsula, three major gulfs (the Corinthian, Argive and Saronic) surround this region, and a single narrow land-route provides access to the Peloponnese along the Corinthian corridor. In this area, the Argive plain provides the greatest expanse of arable land, with a series of smaller inland valleys in the Corinthia. In the Argolid, 18 sites have definite evidence for LEMH occupation: Argos, Asine, Berbati, Dendra, Epidaurus, Fourni, Hermione, Iria, Kandia, Kephalaria, Kephalaria Magoula, Krenai, Kranidi, Lerna, Megalochochio, Midea, Mycenae and Tiryns (for sources, see Appendix 1). The southern Argolid peninsula is broken up with smaller arable valleys, while the steep and rocky topography of the Methana peninsula creates a much more marginal subsistence zone.

The high number of definite sites in this region is undoubtedly due to the large number of excavations that have taken place in the Argolid and the well-documented character of LEMH pottery in this area. Apsidal buildings are found in EHIII contexts at Lerna and Tiryns (and possibly Kandia), though they are found at Lerna only in the earlier MH phase. Only 2 sites have been designated as having possible LEMH occupation (Epidaurus and Galata: Troizen); the site of Prosymna is not included here because while occupied in the EHIII period, it was abandoned late in EHIII and not re-occupied until the MHIII phase; similar patterns occur nearby in the Nemea and Kleonai valleys.

Only four of these sites were located solely through survey. The remaining 14 have been partially excavated; however, excavation has taken place almost exclusively to elucidate the periods prior or subsequent to the LEMH occupation and for this reason many excavated sites only yield a minimal amount of information about their LEMH occupation. The three
most extensively investigated LEMH sites in the Argolid are Lerna, Asine and Tiryns; the size of the former two fall well within a 1.5-2 hectare range while the extent of the Tiryns LEMH settlement appears larger, covering up to 4-6 hectares. At Mycenae, the LEMH occupation levels, though widely destroyed by later construction also extend over an expansive area, indicating a size of c. 3-5 hectares. Though located under the modern city of Argos, LEMH deposits have been revealed in numerous rescue excavations and could mirror the vastness of Thebes in Boeotia, with a conservative size estimate of 10-12 hectares. This size includes only the ‘Quartier Sud’ area and the thin strip at the base of the Larissa which appear to comprise the extent of the specifically MH-I-II occupation, although it has been suggested that these two areas may represent distinct and independent occupations (Touchais 1998).

The Southern Argolid Exploration Project revealed two new LEMH sites (Kranidi Bay and F5 Fourni Focus) and confirmed the existence of a third (Hermione). These sites range in size from 0.9 to 1.8 hectares. While these three sites are by no means large enough to represent nucleated settlements encompassing the entire populations of the 28 sites that were abandoned towards the end of EHII, the sites that survive into the LEMH are the larger, primate centres of the EHII period. Only a single definite LEMH site, at Megalochorio, was found by the Methana peninsula survey, and while the site itself was known previously, the presence of a single EHIII sherd and early MH material was a new discovery.

North of the Argive plain, the smaller inland valleys of Nemea and Kleonai are almost entirely abandoned following the EHIII period; while occupation does continue at the sites of Zygouries and Tsoungiza for some part of EHIII, these sites are not considered to be a significant part of the LEMH settlement landscape due to their abandonment during the entire early MH period. This is in contrast to the results of the Berbati survey in which no EHIII material was found, though at the site of Berbati itself, a significant amount of early MH pottery was the only evidence of the early MH period in the survey area (Forsen 1996; Lindblom 2006). Eight sites in Corinthia and the Megarid continue to be occupied during the LEMH. Seven of these: Aetopetra, Arapiza, Ayios Gerasimos, Cheliotomylos, Gonia, Korakou and Vougliameni (on the opposite coast of the Perachora peninsula) all cluster very tightly within a 15 kilometres of one another and all lie within c. 3-5 km of the coast itself. Only a single site, Phlius, is located inland, approximately 10 km from the Corinthian Gulf. Along the Megarid, to the east of the Corinthia, only Kato Alepochorion has evidence of EHIII occupation, and it appears that this site and Megara are the only settlements likely to have been occupied throughout the LEMH period; yet given the lack of intensive survey in

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11 Granted, it is unlikely that all 28 of these EHII sites were occupied simultaneously, and hence while there is almost certainly a definite drop in population, there is no indication that it was as dramatic as the simultaneous abandonment of nearly 30 sites would indicate (Whitelaw 2000).
this region, this may not be surprising. These sites are all relatively similar in size, ranging between circa 0.5 and 1.5 hectares, and are almost exclusively concentrated on the small areas of arable coastal land; this clustering of sites along the Corinthian Gulf coast has been noted for other periods of occupation (Morgan 1999: 347-67). At Korakou, excavated remains include an apsidal house as well as rectangular houses (from the eastern part of the excavation) though LEMH remains were recovered in soundings in all areas of the site (Lambropoulou 1991).

There is clearly significant settlement disruption during the late EHIII, eliminating the vast majority of the small-sites (farmsteads and hamlets) that had been so typical of that period. Therefore, those settlements that continue into the LEMH period in the northeast Peloponnese tend to be the larger sites within an area, but do not strictly fall into the 1-2 hectare nucleated village model suggested for the LEMH (Dickinson 1977; Nordquist 1987: 24). Thanks to the intensity of excavation and survey in the north-east Peloponnese, a wide range of LEMH site sizes can be observed, from small, village sites of 1.5-2 hectares to the upper end of the spectrum with sites like Tiryns and Argos covering c. 6-10 hectares; this plainly illustrates the different scales upon which communities of the Argolid, particularly in the Argive plain, are operating.

Finally, it is necessary to mention the site of Kolonna on Aegina, located in the centre of the Saronic Gulf and often treated as part of the mainland in discussions of the MH period. Occupied continuously throughout the LEMH period, Kolonna has historically been singled out as the site with the most sophisticated material culture record of the LEMH period, so much so that it has even been argued that Aegina could be considered the first Aegean state outside Crete (Niemeier 1995). Though real evidence to support such a claim does not exist, the presence of an increasingly complex fortification system in place from EHIII, a great deal of imitation Minoan pottery from the beginning of the MH period, imported Cycladic and Minoan goods from the MH II period, an MH II potter's workshop and unique finds such as a figuratively decorated cylinder seal made from local clay and a lion bone distinguish Kolonna from other LEMH sites (Gauss and Smetana 2006). Furthermore, a Gold Mica pottery fabric, used to create an extremely wide range of both coarse and fine vessels, that appears at almost every LEMH and at numerous later MH sites, and has been identified as originating on Aegina (Rutter 2001: figure 12; Zerner 1978, 1993).

This combination of site complexity and relatively large-scale ceramic production suggest that Kolonna occupied a unique position of economic power in the sphere of the LEMH mainland. In terms of size, the fortified centre of the town is no more than 1.5 hectares, yet the extent of the surrounding settlement has never been documented, nor is there information regarding other LEMH settlements on Aegina. For the purposes of this discussion, Kolonna will not be included among LEMH sites, as it often is for reasons of
proximity to the mainland. However, in important behavioural terms, Kolonna does not resemble any mainland site during the LEMH period, and as suggested by both Kilian-Dirlmeier (1997) and Broodbank (2000a: 353) is much closer in type to Cycladic mercantile trading sites like Ayia Irini. Therefore, while the impact that Kolonna may have had upon LEMH communities will be addressed, considering Kolonna a mainland site seems inaccurate given its emergence as an early prototype for the trade-oriented, ambitious and Minoanised Cycladic island centres.

Attica (Figure 2.5)
Attica is separated from Boeotia to the north by Mount Parnes, and three other ranges effectively divide the region into a series of plains: the Attic and Mesogeion appear historically to be the most well-populated. An extremely limited amount of survey has taken place here, and subsequently the settlement landscape (at least for prehistory) is poorly understood. Two intensive, non-collection survey projects (the Oropos Survey Project and the Stanford Skourta Plain Survey) have taken place here, yet both focus their investigation on the north-eastern and central border between Attica and Boeotia, and therefore prehistoric central and southern Attica remain largely unexamined.

Generally, the LEMH settlement pattern in Attica recalls that of the north-eastern Peloponnesse: there appears to be a massive reduction in site numbers during the LEMH period, with only 4 sites that exhibit definite continuous LEMH occupation: Athens, Limani, Eleusis and Brauron. These four sites have both EHIII occupation and early MH material. Three other sites (Ayios Kosmas, Thorikos and Pagai) in Attica have evidence of EHIII occupation alongside some MH material, yet it is unclear if this is continuous occupation into the early MH period, or is a resettlement in the late MH, as appears to have occurred at sites like Marathon, Kaki Thalassa and Kiapha Thiti (for sources, see Appendix 1).

The data from the two surveys confirms this pattern of significant settlement decrease, with the Oropos survey reporting no new EHIII or MH settlements within the surveyed territory (Cosmopoulos 2001). In Oropia, only a single site, Petrakhos, exhibits signs of continuous LEMH occupation and while it is claimed that an increase in size of Petrakhos to 3.3 hectares in the LEMH period is an indication of nucleation, this site is certainly not large enough to account for the nucleation of all the EHII sites in Oropia (Cosmopoulos 2001: 72). The Skourta Plain Survey also documents a settlement collapse following EHII, with only a single probable LEMH site in this region located at Magouleza.

12 The results of this survey are problematic for a number of different reasons. First, no EHIII material was identified by this survey, even though the survey area encompassed a site (Petrakhos) at which two independent sources (Hope-Simpson and Dickinson [1979] and French [1972]) report EHIII material. Secondly, in discussions of the low number of MH sites in Oropia, the author claims the MH as a period of 'low visibility' (Cosmopoulos 2001: footnote 210, contra Rutter 1983c).
However, given the limited coverage afforded to Attica in general, it may be premature to generalise about the nature of LEMH settlement patterning from this limited amount of information.

**Euboea (Figure 2.6)**

Euboea, lying off the eastern shore of Attica and Bocotia, is the second largest island in the Aegean (after Crete), though it is separated from the mainland by less than 100 meters at the narrowest point of the Euripos Strait. Euboea’s proximity to the mainland has meant that it is particularly well placed as an interface zone between Euboea and the Boeotian mainland as well as between the northern and southern Aegean. Hence, the development of coastal nodal sites along the Euripos Strait between Euboea and the mainland must have enabled communities situated there to alternately control or restrict participation in communication and transportation. Furthermore, the lack of coastal accessibility on the eastern side of the island (there is presently only a single port, Kymi, on the rocky eastern coast of Euboea) would have further enhanced the importance of the west coast communities.

The potentially critical position of Euboea with regard to circum-Aegean routes is also suggested by the rise of sites like Lefkandi at both the end of the third millennium and the beginning of the 11th century BC, at which time the Euripos Strait was a crucial transportation route between centres of metal sources (Nakou 1997a: 645; Sherratt 1993); though there is no current evidence for the exploitation of these metal sources during the LEMH period, Euboean west coast settlements were still well situated to take advantage of their position in terms of maritime traffic and control.

This advantageous position is also true for many other Euboean sites in the Iron Age, when the powerful mercantile city-states of Eretria and Chalkis successfully established trading colonies in the northern Aegean, Italy and Sicily as early as the 8th century B.C, an achievement often attributed to their profitable geographical position and the maritime links of the island, in combination with its highly productive agricultural plains (particularly the central Lelantine and northern Hystiaia) (Jacobsen 1969).

The benefits of Euboea’s geographical location and agricultural fertility were equally well exploited by the prehistoric populations of the island, and the extent of the EHII site of Manika (located in the same area of Euboea as Eretria, Chalkis and Lefkandi, and far and

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13 The Euripos strait is supposed to have opened between 5,000 and 6,000 years ago (Higgins and Higgins 1996: 84-85), which means Euboea could have been linked to the mainland in the LEMH period. Regardless, the isthmus route that this would create would likely have provided a similarly attractive and efficacious means of transportation and intersection.
away the largest EHII site in the Aegean if the estimated settlement extent of 50-80 hectares is correct) may be testament to this (Sampson 1986).

Archaeological surface investigations of Euboean prehistoric settlements have been limited, with two of the primary sources of information published in the early 1950's and 1966, respectively (Theochares 1952, 1953; Sackett et al. 1966); other, small-scale surveys have been conducted by Sampson (1980, 1985) but the results have only been mentioned tangentially within other publications. These surveys have been critical in locating LEMH sites, but of these, only nine have been excavated (many preliminarily); thus, precise dating and estimates of site size are rarely clear. An exception to this is the intensively surveyed Karystos bay area of southern Euboea (Keller 1985; Keller and Wallace 1987). The Canadian Karystia Project, which aimed to clarify the prehistoric-historic settlement history of the Karystos bay area, located a large number of prehistoric sites (the majority of these belonging to the Final Neolithic or early EH period), including a large MH settlement (Ayios Nikolaos) to the northeast of Karystos, representing a period that hitherto had been virtually unattested in this area.

Material of the EH period, generally, is the most abundant in Euboea, though material of the EHIII period is relatively scarce. From the Theochares (1952, 1953) and Sackett et al. (1966) surveys, the only unambiguous evidence of EHIII occupation comes from Yialtra, Lefkandi and Manika (Sackett et al. 1966: 87-89; Sampson 1981; Theochares 1957), though EHIII material has more recently been found at the sites of (Kavkala) Politika, Chalkida and Avlonari (Sampson 1980: 224, 1985: 336), as well as during excavations at Classical Eretria, Eretria Magoula and possibly at (Aidiphsos) Koumbi (Ducrey 1985; Krause 1982; Müller 1985; Sampson 1983: 14; Sapouna-Sakellarakis 1987).

The picture from the Middle Helladic period is slightly clearer, with settlement being found on all the large plains of Euboea, although with a decided bias towards the western coast (Howell 1966: 90). A total of 26 sites have been reported as having an MH component (Keller 1985; Sackett et al. 1966: 90; Theochares 1952, 1953), though further clarification of this number is needed to disaggregate LEMH sites from those sites that represent only late MH occupation. Of these 26 sites originally designated as MH, 18 can clearly be shown to have substantial early MH occupation. It should also be noted that all but two (Aidiphsos Koumbi and Ayios Nikolaos) showed signs of occupation in the EHII period, and ten of the

14 Howell (1966) noted an exception to this in the Karystos plain in southern Euboea; however, the Canadian Karystia Project has now located a large (possibly nucleated) MH settlement at Ayios Nikolaos (Keller 1985; Keller and Wallace 1987).

15 In the case of Sackett et al. (1966), in some instances a 'site' actually represents a number of surface findings located in close proximity to one another, and reported as a single site. The reported scattering of material, and the resulting lack of definition within and between these findspots justifies such a combination; however, this places prohibitions on estimating the sizes of these sites. As an example of this, see sites 30 and 31 Psakhna: Ayios Ilias and Psakhna: Pirkos, in Sackett et al. (1966: 54-55).
sites have conclusive evidence for EHIII occupation as well. This suggests that many of these sites were continuously occupied (Sampson 1980: 227). This is not to suggest that these 18 sites represent the total amount of settlement during the LEMH period on Euboea, though it is likely that these represent a substantial number of the larger sites of that period on the island.

Very general patterns exist, with LEMH settlements located in each of the major agricultural areas of the island: Koumbi and Oreoi on the Histiaia plain, Rovies and Limni near the Kerinthos plain, Politika, Psakhna and Manika on the Psakhna plain, Chalkida and Lefkandi on the Lelantine plain, Eretria, Eretria Magoula and Amarynthos on the Eretrian plain, Aliveri in the southern coastal valley, Avlonari in the broad coastal valley near Kyme, Nea Styra on the smaller plain of Styra and Ayios Nikolaos on the Karystos plain. However, it is undeniably the most central, accessible and agriculturally rich area of Euboea (approximately from Politika to Eretria) that is most heavily populated, with three major populations resident in each of the three large coastal plains (Sampson 1980: 227).

None of these sites has been sufficiently excavated to produce an extensive horizontal exposure of an LEMH site, but remnant surface material and the extent of excavated remains allows us to approximate the size of a number of these sites. At Lefkandi, LEMH material was found in all the trial trenches on the Xeropolis mound (400 x 120 m), and surface material of the same period was found as far as the south-east promontory and upper south and eastern slopes of the Toumba (Sackett et al. 1966). It seems unlikely that this represents a single settlement (particularly in light of the embayments that would likely have surrounded both sides of the Xeropolis hill in the LEMH period); therefore, a conservative estimate of the size of the Xeropolis site is in the range of 4-5 ha, though it is possible it was considerably larger if occupation extended beyond the boundaries of the mound itself. At Eretria, excavations have produced LEMH material from a number of sondages within the modern town (including a rectangular built structure dated to the early MH period) and early-late MH material from the acropolis, suggesting a site size comparable, if not larger, to that at Lefkandi. Lastly, at Amarynthos, LEMH surface material was found scattered across the entirety of the Palaiochora hill, and along the western and eastern slopes; excavations indicate a size of approximately 2-3 hectares (Sapouna-Sakellaraki 1987).

Only a few LEMH built structures have been uncovered in excavations in Euboea, and consequently, little can be said about architecture or internal site organisation at any of these sites. In north-west Euboea, only at Aidiphsos Koumbi has an early MH structure been uncovered (Sampson 1983: 141, 1997: 175-76). In the central and most densely inhabited part of the island, fragmentary architectural remains of this period have been found at Chalkida (Sampson 1980: 270). MH walls have also been reported at Manika, including the fortification wall found on the promontory, though the evidence on which this date is based has never been clarified (Theocharis 1957). More recent test trenches have revealed part of a
possible apsidal house (Sampson 1980; Sapouna-Sakellaraki 1987: 101-270). The limited exposure in test trenches at Lefkandi also revealed a possible apsidal wall and a thick plaster floor, and excavations at Classical Eretria in the Vouratsas plot have exposed specifically LEMH material associated with a storeroom still containing a 15cm thick deposit of carbonised grain. Both rectangular and apsidal structures have been found, though no monumental architecture has been revealed (Ducrey 1985).

**Boeotia-Phokis-Locris (Figure 2.6 and 2.7)**

This region is essentially the heart of central Greece, with the Euboean Gulf as its north-east boundary and the Corinthian Gulf at the south-west. Broken up by a series of mountain ranges that tend to isolate both the western coast from the central plains (e.g. Mt. Helikon on the south-west coast), only in a small area of the eastern coast (facing the Euboean Gulf near Dhramesi), is the land topographically conducive to coastal settlement. A series of fertile agricultural valleys run through the centre of Boeotia, including the southern Theban plain around Lake Kopais, bounded in the south by Mount Parnes and in the north by a range consisting of the Khlonion, Profitias Elias, Ptoion and Ktipias mountains. These plains are highly segmented due to topography and range in size from the largest at 345 sq km (surrounding Lake Kopais) to the more marginal Dhavleia plain at the base of Mt. Parnassos measuring only 36 sq km. Phokis and Locris (to the west and north-east of Boeotia, respectively), occupy similar, if slightly more topographically segregated terrain, though in both these regions sheltered coastal areas exist that provide a suitable settlement landscape (eg: the Kirrha area in Phokis and the Mitrou area in Locris).

In a greater sense, these three regions occupy a critical position between the Peloponnese and Euboea or, effectively, between both north and south and east and west and constitute the two primary overland routes out of the southern Aegean basin (from the Corinthian Gulf to the Adriatic and from the Euboean Gulf to the north-western Aegean). This combination of a productive subsistence territory and central communication route is likely to have important implications for settlement history within this area. In fact, this combination of traits can be seen in microcosm in the so-called Phokis-Doris ‘corridor’, running from the fertile Sperchios valley off the Malian Gulf (the north-west edge of the Euripos Gulf) in the north-east to the Corinthian Gulf in the south. This north-south transect of land is flanked by mountains on either side, creating one of the shortest natural and most easily passable routes for overland transport between northern and southern Greece. Recently the subject of an intensive survey, it has been maintained that the Phokis-Doris route (and arguably, others like it in Boeotia) is one that not only unifies adjacent regions but also results in the creation of core areas at the northern and southern end of this ‘corridor’ (Szemler 1991: 63). Other recent investigations in this area include three extensive surveys of central Boeotia,
Opoutian Locris and Phokis (Fossey 1988, 1990, 1986) and an intensive survey of central Boeotia (the Cambridge-Bradford Boeotia project).

In contrast to evidence from other areas of the mainland, the intensive Cambridge-Bradford Boeotia survey has recorded an increase in sites from the EH to MH periods, including nine previously unknown MH sites. Unfortunately, the prehistoric pottery from the survey is almost entirely unpublished and no sub-phases of the MH are mentioned in preliminary reports, so it is currently impossible to clarify the implications of this survey in terms of settlement patterns for LEMH Boeotia. On the other hand, this survey does provide some confirmation of a pattern that has been noted before: settlement appears stable, or may even increase in Boeotia during the MH period, contrary to patterns seen on the Peloponnese (Rutter 1995: 695).

In Boeotia, 17 sites have evidence for definite LEMH occupation, with the number increasing to 22 if probable LEMH sites are included (for sources, see Appendix 1). EHIII remains have been found at Ayios Thomas, Chaironeia, Dramesi, Drosia, Eleon, Eutresis, Haliartos, Kalami, Khlembotsari, Khostia, Lithares, Onchestos, Orchomenos, Petrakhos, Petrakhos (Sohoria), Schimitari, Stroviki, Tanagra, Thebes and Thespiai; only at two of these sites does occupation not continue into the MH period. EHIII material is probably present at Askra, Livadhostro and Pyrgos Magoula though a lack of publication makes this impossible to determine definitively (for sources, see Appendix 2.1). At the EHIII sites, early MH material has also been identified, though due to the fact that well-stratified excavation sequences are rare and consequently so is our knowledge of LEMH Boeotian pottery, not all of them necessarily represent continuous occupation. The site of Eutresis, for example, is considered to have a gap between the end of EHIII and early MHIII, but the presence of two Phylakopi I type duck vases as well as an MMIA barbotine cup rim suggests there may also have been an earlier MH component that is not recognised in the local pottery assemblage (or has since been discarded) (Rutter and Zerner 1984: 82, n. IIB5). It is of some note, moreover, that all but three of these sites (Askra, Ayios Ioannis and Petrakhos) were also occupied in the EHII period.

In Locris, only two new MH sites were located through survey: Smixi and Mitrou, though Mitrou appears to be the only site at which LEMH occupation is attested while the majority of the Smixi material seems to belong to the later MH period. In Phokis, five new MH sites were found by the Phokis-Doris survey, only two of which have material from the earlier MH period. Within the two regions, then, EHIII material appears at Medeon, Kirrha,

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16 Following my study of the material retained from the Goldman (1931) excavation, it became apparent that it had been classified solely according to ware-based categories (e.g. Grey Minyan, Yellow Minyan and Matt Painted); it is possible, then, that material that did not fall into these categories was discarded and may have represented unrecognised, earlier MH material.
Atalandi, Ayia Marina, Dhema, Elateia, Melidoni, Mitrou and Rhakes, and possibly at Agnandi and Lilaia. Early MH material is found at all these sites, as well as at Panagia and Rakhita, where no EHIII material has thus far been recovered; however, the site of Panagia was found during survey and material from Rakhita is only briefly mentioned in publication and therefore both may potentially yield EHIII material in the future. All of these sites, with the exception of Rakhita (Phokis), Atalandi and Melidoni (Locris) and Akras, Ayios Ioannis and Petrakhos (Boeotia) were also occupied during the EHII period. This remarkable continuity of settlement, in combination with the apparent stability in settlement numbers (noted by Forsen 1992: figure 7; Rutter 2001) demonstrates the comparatively limited effect the late EHII settlement disruptions and destructions had within these regions in comparison to other areas of the mainland like the Argolid and Laconia.

At a general level, settlement within this region appears to be heavily influenced by geographic and topographic features. The highest settlement density occurs in Boeotia around Lake Kopais, which (before its drainage in 1886) would have had seasonally fluctuating water levels; it is also plausible that alluvial silting (created by yearly flooding) would have provided high quality agricultural land in the zone around Lake Kopais. The sites ringing the lake and in the lacustrine region to the south-east of Lake Kopais are often spaced c. 5km from one another, while the largest LEMH site in Boeotia, Thebes, appears to command a large agricultural catchment of c. 5-10 km in all directions. Outside of this relatively well-settled central Boeotian zone, sites are often located at points that are strategically located in terms of over land communication routes (e.g. the cross-Phokis route linking Medeon, Chaironeia and Skala Atalandi or the cross-Boeotian route linking Livadostro, Eutresis, Thebes, Hypaton, Platanaki and Lithosoros).

A number of sites within these regions have undergone extensive investigation, and of these, Thebes is one of the most noteworthy. Though located under a modern city and relatively inaccessible except for small-scale rescue work, Thebes has been increasingly recognised as a centre of particular importance with a conservative estimate of its LEMH settlement extent at approximately 8-10 hectares, increasing to 12 hectares in the late MH and early LH. This includes an EHIII house complex of 23 x 10 meters, 18 find spots of MH architecture, 19 of MH remains and 18 burial locations (Demakopoulou and Konsola 1975; Konsola 1981; Symenogelou 1982: figure 2.2).17

Though this appears to be by far the largest site in the region, estimates can be made for Eutresis and Kirrha; unfortunately, the information is inadequate to make estimates about the LEMH size of Dramesi, Orchomenos and Medeon. In the first excavations at Eutresis,

17 It is not simply its size that makes Thebes stand out, but also the relative wealth of finds associated with both the EHIII and early MH periods, including the only metal hoard known from the EHIII period; this will be discussed in greater detail below.
EHIII remains were noted in House H, T and Bldg O, while the earliest MH material appeared over a wider area (Houses C, X, A, M, S and Area R and Q). Up to three apsidal houses were exposed in the early MH levels, and material of this period seems to be concentrated in the northern area of the site. This suggests an approximate size of c. 3.5-4 hectares for LEMH Eutresis. Though variable, these sites tend towards a size of 2 to 6 ha, with some substantially larger than the estimated 1-2 hectare village usually associated with settlements of the LEMH period (Nordquist 1987: 24).

**LEMH settlement patterns**

The most basic results of this survey of settlement patterning can be summed up as follows: sites are not evenly distributed throughout the mainland, with three discernible clusters of settlement appearing on the western Messenian coast, in the Argolid and south of Lake Kopais in Boeotia; admittedly, these are the regions that have been most intensively surveyed and it is possible that further archaeological exploration of other regions would further enhance the current pattern of LEMH occupation. In Laconia and along the Corinthian Gulf there is a definite bias towards settlement along the coastline, as along the western coast of Euboea. On the whole, sites are spaced between 5-10 km from one another, though exceptions to this can be found in the isolated settlements of Achaea and the central Peloponnese where sites tend to be closer to one another (see Figure 2.2). In addition, the necessity of isolating specifically LEMH settlements is also demonstrated in Figure 2.8, where the distribution of definite, probable and likely LEMH sites is contrasted with all reported EHIII and MH sites (including those of the MHIII period).

Though hampered by the extremely uneven pattern of investigation, this exploration of LEMH settlement has been able to demonstrate that the mainland during this period was by no means a coherent unit with regard to settlement sizes, distributions and patterns of nucleation. Furthermore, it raises three important issues, the implications of which must be considered in greater detail. These are: (i) site numbers and nucleation; (ii) site size and population; and (iii) site location and interaction. In this section the patterns seen in different areas across the mainland will be explored, followed by a discussion of what this might mean in terms of the socio-economic organisation of LEMH communities and their interaction with surrounding groups.

Overall, across the mainland during the LEMH period, there is a distinct decline in settlement numbers following the EHIII period; in every region, except possibly Boeotia, there are fewer LEMH sites than there are EHIII sites, and in general the LEMH sites are not of sufficient size simply to represent the nucleation of the previous settlement within a region. However, rather than this representing the 'collapse' of EHIII society, the more nuanced
emerging picture denotes a shift in character rather than simply a decline. The example of the southern Argolid, for instance, shows that the majority of abandoned EHII sites are very small (c. 25 under 0.2 hectares) rural farmsteads and hamlets (Runnels et al 1995). A partial explanation for the loss of these settlements into the LEMH period must relate to the lack of sustainability of these very small settlements in light of the compromised social, economic or environmental conditions that heralded the LEMH period (Renfrew 1972: 116; Forsen 1993: 241-7). This is confirmed by the fact that the EHII-III shift does not appear as catastrophic in those areas where settlements focused in lowland arable areas (e.g. Bocotia), rather than those regions, typified by settlements in the Argolid, in which EHII sites were found to expand widely into marginal landscapes (Fossey 1988: 459-463; Whitelaw 2000). In addition, the more rapid rate of settlement recovery seen in areas of the Peloponnese such as Messenia, for example, may also relate to the relatively limited number of EHII settlements that had expanded into marginal regions, in favour of larger, stable settlements focussed around productive agricultural land that continued to be occupied into the LEMH period (Zavadil 2006).

However, it still remains unclear what factors ensured the continuation of a site into the LEMH period, or its new occupation within this phase. It seems likely, given the location of many LEMH sites, that this success was predicated upon access to a rich and extensive catchment of arable land and, possibly even more importantly, reliable water resources. An interesting clue towards what makes an LEMH site successful comes from those settlements abandoned towards the end of the EHIII period (e.g. Prosymna, Zygouries, Tsoungiza, Thorikos, Tanagra, Raphina and Ayios Thomas). While these sites do not share any single trait that might explain the reasons behind their abandonment, the possibility of an increasingly dry climate during the LEMH period (as suggested in Chapter 1, footnote 4), in combination with their relative isolation and hence overall need to be both agriculturally and socially self-sufficient, might have contributed to their desertion early in the LEMH period. Alternatively, if one looks at those sites newly founded in the LEMH period (e.g. Sohoria, Skala Atalandi, Rakitha, Ayios Ioannis, Chaireneia, Melidoni, Korifasion:Beylerbey and Ano Englianos), these all occupy stream fed valley locations with ample arable land at a reasonable distance (5-10 kilometres) from the closest neighbouring communities. Therefore, some of these factors may have contributed to the success of LEMH sites, which tend to represent the larger sites within an area, and could be seen as ‘primate centres’ – a site that becomes the primary/sole settlement focus of a defined area (e.g. a valley or a defined section of coastline); three excellent examples include the Mastos in the Berbati valley, Asea in the Asea valley and Magouleza in the Skourta plain. Therefore, while this may not represent nucleation as a process, the settlement landscape of the LEMH period could definitely be described as nucleated.
As mentioned above, these sites have an overwhelming tendency to be evenly spaced within the landscape, with sites rarely closer than 2-5 kilometres from one another. A few areas, such as southern Laconia, coastal Corinthia, and the Argolid show a tendency for a tighter spacing of sites; the implications of this in terms of inter- and intra-site interaction will be discussed in detail later. In areas such as Achaia, where only a single definite LEMH site is known (Teichos Dymaion), this is located in the single most agriculturally and locationally advantageous position: at the access point to the Corinthian Gulf and along the only large coastal strip of fertile land. Indeed, a common factor for many LEMH settlements is location at the conjunction of arable land with (if not directly on) the coast; this may be due in part to the better drainage and more accessible water available near coastal locations. In Laconia, both Asteri and Ayios Stephanos are in a good position to exploit the arable land skirting the coast of the Laconian Gulf and Athens in Attica is similarly well-placed close to the Saronic Gulf in the centre of the Attic plain. In Boeotia and Locris, Drachmani and Skala Atalanti (respectively) combine these two locational traits, while on Euboea, Psakhna, Lefkandi and Aliveri are in particularly advantageous positions (as well as having access to the largest amount of arable land), though all the sites along the western coast of Euboea are well situated to allow exploitation of the fertile plains to the east whilst accessing the coastal channel of the Euripos Strait. Of these two, Lefkandi is also closely connected to a second major route besides that of the Euripos Strait: the overland Theban-Boeotian route, located just across the Euripos Gulf in Boeotia. However, this is not the case for Thebes and Argos, two of the largest known LEMH sites, so these factors are clearly not of sole importance for the success of an LEMH community.

Turning now to (ii), the differential size of these LEMH sites provides an indication of a demographic order of magnitude. It is one of the only ways we have of approximating the scale of human settlement and getting a clearer picture of LEMH demography, a factor that will have serious implications for the nature of internal organisation at a site (see Figure 2.9 for a comparison of LEMH site sizes). House densities from five sites (Lerna, Eutresis, Asea, Pevkakia and Olympia) were examined (Figure 2.10). Making a conservative estimate of the number of houses contemporaneously in use during a limited chronological phase, and assuming a nuclear family of c. 4-5 people in each house, densities of approximately 200-250 people per hectare can be estimated for each site. While there are problems with this type of extrapolation based on such a limited amount of data, the convergence upon the c. 200-250 people per hectare figure is well within a range given by others for Bronze Age population estimates (Broodbank 2000; McDonald and Rapp 1972; Renfrew 1972; Whitelaw 2001a).

18 Of these two, Lefkandi is also closely connected to a second major route besides that of the Euripos Strait: the overland Theban-Boeotian route, located just across the Euripos Gulf in Boeotia.
19 This is based on an estimate of 10 sq m per person. While there are problems such a cross cultural density (Whitelaw 2001b), the majority of LEMH houses under analysis were 35-50 sq/m and though there were some much larger exceptions (e.g. House P at Asea, whose total interior floor area is estimated at 124 sq m), the typical house size corresponded closely to the estimated size for a 4-5 person nuclear family.
This would imply that sites in the 1.5-2 hectare range probably housed between 300-400 people, those sites within the 3-6 hectare range (such as Tiryns and Lefkandi would have 600-1200 people) and the largest 6-10 hectare sites (like Thebes and Argos) populations of upwards of 1200-2000 people. Both of the latter sites may therefore be considered to have crossed critical population thresholds within which it is possible to maintain a basic egalitarian structure, estimated at between 300-350 people (Chagnon 1975: 103; Forge 1972; Kosse 1990, 1994). This assessment of site size and population may require a re-evaluation of whether the majority of LEMH sites warrant their classification as simple and small ‘village’ communities (Dickinson 1977).

An examination of the population density of the mainland also helps to clarify the nature of human interaction and settlement patterning during the LEMH. The Argolid provides the most extensively explored area from which to make a rough estimate. Within the c. 40 x 40 km area of the Argive plain, there are 12 probable LEMH sites; if one assumes a population at each site of 500-600 people (this average population may seem slightly high, but it must take into account the variability of site sizes in the Argolid), then this works out to a figure of 3.5-4 people per sq/km, a figure that seems consonant with other normative estimates for a subsistence farming population (Broodbank 2000a; Forge 1972; Robb and van Hove 2003). A very similar figure is achieved if one looks at the southern Argolid (c. 225 sq. km) with the three known probable LEMH sites (Hermioni, A6 and F5). With good estimates of site size provided by the survey data, an approximate population for the southern Argolid is 740-950, and this results in a population density of 3.3-4.2 people per sq/km. Therefore, if one can extrapolate this figure to other regions of the LEMH mainland, it becomes obvious that while there may be a diversity of site sizes, the LEMH landscape is not a densely settled one and thus retains a dispersed village character if not strictly ‘village’ size settlements.

Finally, let us consider (iii), the location of LEMH sites, a critical factor in inter-site and inter-regional interaction. Though there is an obvious tendency towards coastal location, placement on strategic overland routes must also be considered in the light of the location of some LEMH sites. This has already been briefly discussed in connection with the overland Phokis-Doris corridor (linking the Malian and Corinthian Gulfs), and a closer examination of other LEMH settlement patterns shows a decided correspondence to overland passages: e.g. (i) the cross-Phokis route linking Medeon, Chaironeia and Skala Atalanti; (ii) the cross-Boeotian route linking Livadostro, Eutresis, Thebes, Eleon and Drosia (and possibly even Lefkandi right across the Euripos Gulf); and (iii) the route bypassing Aegina and the Saronic Gulf linking the cluster of sites at the western end of the Corinthian Gulf and Mycenae, Argos and Lerna. The superficial homogeneity of LEMH material culture and practice has long suggested the existence of a wide network of communication between regions of the mainland; yet, it appears that the channels along which information and material are moving
may not be entirely intuitive and linear. For example, while Kolonna is obviously playing a significant role in the linkages between numerous coastal sites around the eastern mainland, other areas (like Boeotia and Elis) may also be closely linked to each other through the internal waterways surrounding the Peloponnese (in this case, the Corinthian Gulf). While it would be incorrect to claim that these sites were situated there purely as a function of geography, the combination of strategic location, arable land and hydraulic resources might go some way to explain the continuation of certain EIIII sites into the LEMH period.

From this general discussion, there are two important dimensions to LEMH settlement character that must be given consideration with regard to the effect these have on the basic social, economic and political structures in place within these communities. Firstly, in light of the essentially nucleated character of LEMH settlement, communities across the mainland will be relatively independent and self-sufficient from one another. This is by no means a densely populated landscape, with the majority of communities located 5 to 10 kilometres from their closest neighbour. The nucleated settlement pattern of LEMH groups means that socio-political life within that group is characterised by intensive daily interaction and face-to-face negotiation, with integration of community members requiring constant social mediation (Kolb and Snead 1997; Johnson and Earle 1987: 320-1). It seems highly probable that for both the replication of social identity and economic sustainability, the community must be one of the most important units within LEMH society, though a number of mechanisms from inter-household or factional competition to supra-family alliance and integration building may be employed in order to maintain the socio-political status quo (Kolb and Snead 1997: 61).

The nature of those social mediations, moreover, would be heavily dependent upon the second key dimension of LEMH settlement: site size and corresponding population. In this case, the demographic size of a community raises two issues: endogamous self-sufficiency and communal integration. Some sites at the smaller end of the spectrum (1.5-2 hectares) fall just within the range for endogamous self-sufficiency, and therefore fluctuations in the population might necessitate the cultivation of close ties with communities in a similar position, in order to ensure the possibility of inter-marriage (for a recent discussion of this, see Broodbank 2000a: 88).

As suggested above, populations of LEMH sites may have ranged from 200 to 1200 people, illustrating the fact that not all of these communities were so uniformly small that their ability to maintain a socially sustainable population (particularly with no obvious manifestations of leadership) is easily explicable. In fact, those sites within the higher range of population levels undeniably had mechanisms to mitigate the inevitable social ruptures that would take place within a community in which such a high level of daily social interaction was occurring (Freedman 1975; Oliver 1955; Rappaport 1968). The fact that big populations
do not seem to have any perceptible effect on the egalitarian façade within almost all LEMH communities (e.g. differentiated residences, evidence of clear hierarchical offices) or result in the fissioning of communities (as is evident from the potentially nucleated character of LEMH settlement) is a sign of the success of these integrative institutions amongst the larger LEMH communities. The reluctance of LEMH groups to either fission (one of the most predominant mechanisms for dealing with social stress amongst small-scale groups), or develop actively aggrandising leaders, denotes the presence of successful high-level integrative mechanisms (Bandy 2004: 322). Most interestingly, these mechanisms of social integration do not take the form of ritual or ideological elaboration well attested in other non-ranked societies (Adler 1989; Adler and Wilshusen 1990; Kujit 1996; Kujit and Goring-Morris 2002), nor do they exhibit the typical manifestations of emergent social and political stratification that define the MHIII period (Voutsaki 2001; see Lesure and Blake 2002 for similar examples from Mesoamerica).

Furthermore, the nature of this internal stability would also deeply affect interactions and relationships with the surrounding communities. In practical terms, the distance between LEMH communities lessens the probability of casual interaction and increases the likelihood that interaction and relations between groups (whether socially, economically or ideologically oriented) were likely to be of a much more formalised variety.

The nature of those socio-political internal structures that allowed LEMH societies to maintain economic and social cohesion is outside the remit of this thesis, but the general concepts raised here of community size, communal integration and degree of intra-community affiliation will be considered within the context of diverse ceramic production and consumption behaviours. It should be possible to utilise the information about the nature of ceramic production and consumption at a site to gauge one aspect of the general character of socio-economic organisation, whether integrative or exclusive in nature, between various LEMH communities (see Chapters 3 and 7 for a more thorough discussion).

**Burial and mortuary record**

Turning away from settlement patterning, one of the only other major types of archaeological evidence for human activity in the LEMH period is burial. While I have already provided a critical appraisal of the problems associated with examining LEMH society through burial data (see Chapter 1), it is worth exploring whether the identification of specifically LEMH burials might reveal some patterns particular to the LEMH period. Given that the MHIII period represents the beginning of the Shaft Grave period and – as the latter name suggests – is laden with a new vocabulary of burial and mortuary practices, it becomes critical to
separate these from LEMH phenomena if one is to understand what patterns in burial practice in the earlier MH phase can tell us about LEMH society.

Naturally, the same difficulties and problems of dating settlements to the LEMH period equally apply to dating burials, and this is further compounded by the fact that many of the burials do not contain any datable material. Furthermore, given that lack of grave goods is often thought to be a feature of early MH burials, a grave may be dated to the earlier MH period on the sole criterion that it contains nothing but an inhumation (Nordquist 1990b). Because of this, only a few sites that have been extensively excavated are able to provide us with a substantial enough sample of reasonably well-dated burials, primarily Lerna and Asine. It should be noted that there are very few burials securely dated to the EHIII period, and for this discussion, graves of the MHI and II periods compose the majority of the sample.

**General burial types**

On the whole, burial customs of this period could be characterised as simple, with the majority of burials occurring singly in pits, cists or pithoi, with no evidence of regional preference or variation (see Figure 2.11 for examples of common LEMH burial types). Intramural burial is purported to be popular in the LEMH period, though more detailed analyses have allowed a clarification of this issue. While it appears that some burials were made under or between occupied houses, some of these ‘intramural’ burials may have occurred before an area became used for settlement and/or burial may have taken place after an area had been abandoned. In this case, the term intramural may more accurately reflect the practice of burying the dead in close proximity to the living settlement (Nordquist 1990b; Milka 2006). However, determining which of these scenarios was the case is often impossible due to subsequent building activity, though genuine intramural burial (internment below a space in contemporaneous use for habitation) appears to be most almost exclusively practiced with infants and children (Cavanagh and Mee 1998: 24). Burials in areas directly adjacent to a settlement (so as to seem nearly intramural) should be differentiated from formal extramural cemeteries, which form discrete and independent areas away from the settlement proper. Burials adjacent to the settlement are attested at Asine and Argos and possibly at Kirrha and Pevkakia as well (Cavanagh and Mee 1998: 23; Dietz 1991: figure 84; Nordquist 1987: 95). It is very likely that other LEMH burials were dispersed in clusters throughout the site in this fashion (such as at Athens, Thebes, Tiryns and Orchomenos), but lack of stratigraphic clarity and limited horizontal exposure at certain sites make such an assertion difficult to make with absolute certainty (Cavanagh and Mee 1998: 25).

True extramural cemeteries are also found, though the dates of the material found within these are almost exclusively MHIII or later; this includes the three largest examples, Mycenae, Prosymna and Thorikos (Cavanagh and Mee 1998: 25). Though it is possible that
some of the graves in the Prehistoric Cemetery at Mycenae were in use during the LEMH, the settlements at both Prosymna and Thorikos are almost certainly only re-occupied in the MHIII period, and therefore a late MH date for these extramural cemeteries is most likely. At Argos, there is some evidence that the necropolis southeast of the Aspis may contain a few tumulus burials from the LEMH (MHI-II) period, as does the East Cemetery at Asine (Dietz 1991: 283, 291). Overwhelmingly, though, the most intensive period of both inhumation and material deposition in true extramural cemeteries is the last phase of the MH period (Cavanaugh and Mee 1998; Wright 2001).

A final type of burial, the tumulus, is a low earthen mound, sometimes elaborated with retaining stones or slabs and often containing multiple burials in a variety of grave types (from pits and cists to pithoi, sometimes with added architectural elaboration); this burial form contains very few inhumations relative to its size and represents the most monumental and labour-intensive type of burial facility from the LEMH period. Though there is a distinct concentration of these grave types in the western Peloponnese, early examples are also found in central Greece (at Drachmani, Aphidna and possibly Vrana) as well as in the Argolid (at Argos and Asine) and will be discussed in greater detail below. Though used (in a limited manner) at both Argos and Asine from the beginning of the MH period, it is known from the very end of EHIII (and therefore one of the features often argued as evidence of an invading population). Three of these first four tumuli seem to serve a more ritual than explicitly burial purpose: at Lerna (covering the burnt House of the Tiles), at Thebes (connected to the Kadmeia area) and at the Altis in Olympia (Forsen 1992: 232). The first tumuli burials of definite LEMH date are found at the New Museum (Olympia) site, containing an apparent cremation inside a pithos with some well-dated early EHIII pottery in the foundation of the tumulus itself (Forsen 1992: 88-89). It is claimed that eight other tumuli may date to early in the MH period, and these include the tumuli found at Papoulia, Voidokoilia, Peristeria and Ellinika in Messenia, Mirali in Achaia, Athens and Aphidna in Attica and Elateia in Phokis (Müller 1989). In terms of finds, by far the richest of these are a complex of three tumuli, dating to MHI, which have recently been excavated at Ellinika (ancient Thouria). These contained the burials of three individuals (a man, a woman and a child), with the female burial containing the richest grave goods, including 40 ceramic vessels and 4 bronze pendants in the shape of a double axe (Rambauch 2004).

Forsen (1992: 232-41) distinguishes between ritual and burial tumuli, with the former category comprising: (i) the early EHIII tumulus at the Altis in Olympia (ii) the EHIII tumulus covering the burnt remains of the House of Tiles at Lerna and (iii) the EHII-III tumulus covering part of the Kadmeia area in Thebes. These will only be discussed briefly as they are almost entirely early and do appear to serve a more ritualised than burial function.

The majority of tumuli seem to have been constructed and used in the MHIII/LHI period, and are therefore outside the remit of this investigation.
The next section will be a investigation of the three most comprehensively excavated and published LEMH cemeteries from Lerna, Asine and Argos, with information about burials at additional sites appearing in the following section.

**Lerna, Asine and Argos**

Among the reasonably securely dated LEMH burials at Lerna, it has been shown that infant burials represent the earliest phase of the MH while adult burials do not even begin until the middle of Lerna phase V (circa MHII) (Zerner 1990: 23). Both the EHIIL burials and early MH burials are uniformly simple, with the majority of the graves being child burials in coarse fabric jars. During the earlier LEMH period, very few graves show architectural elaboration and it is not until the MHIII period that built cist tombs become common. Even in the less elaborated tombs of the LEMH there are some graves with goods, which are almost entirely (if not exclusively) composed of ceramic drinking and pouring vessels, including some imported Aeginetan and Cycladic pieces. Items produced solely for use as grave goods (e.g. miniature ceramic vessels) do not begin to appear until the final part of the MH period (in connection with the built cist tombs), another indication that a very clear change in patterns of burial behaviour is beginning to emerge in the MHIII period that must be viewed as separate from the LEMH mortuary pattern. No extramural area of burial at Lerna has so far been identified, yet there do appear to be discrete and separate burial areas within the site (Angel 1971; Wright 2001).

One of the most extensive samples of MH graves comes from Asine, and has been subject to frequent analysis (Georgousopoulou 2004; Nordquist 1987, 1990, 1999). Examples of all types of MH graves are found there from the beginning of the period: stone cists, clay-brick cists, semi-cists, pits and pithos burials, with each type ranging widely in terms of labour investment and elaboration (Nordquist 1987: 128-36). In the Lower Town, only a few burials can be dated securely to the LEMH period, though by looking at those burials in contexts (i) definitely dated to the early MH period like the burials below House Pre-D and/or (ii) from or around Houses T, S and A (the most securely dated early MH levels from Asine), it may be possible to isolate a group of LEMH graves. Within this area, circa 26 graves can tentatively be assigned to within the LEMH period. These are primarily pit graves (or stone-lined pits), contain equal numbers of children/infants and adults, and only four of these contained grave goods. One of these graves, 98, is considered one of the richest of the LEMH period, containing a female adult with a locally made jug, a spindle whorl, a pair of bronze earrings, an awl and goat/sheep bones.

Few LEMH graves are found within other areas of the site, though a single adult male (grave 107) is located on the Acropolis and contains two ceramic vessels, an arrowhead and a razor, and the third - grave 70 in tumulus Γ- was an infant buried with some 15 ceramic
vessels in the eastern Cemetery. Thus, there is no clear-cut correlation between grave types, goods, areas of the sites or the age and sex of the dead (Nordquist 1987: 23, 103), though the use of the extramural cemetery areas (the Acropolis and the east Cemetery, which do not come into common use until the MHIII period) during the LEMH for relatively rich burials may relate to a much earlier form of status- or identity-driven differentiation than previously inferred. It seems likely that, as has been suggested (Georgosopoulou 2004), spatial differentiation of burials may have been a significant aspect of negotiation of identity and the demarcation of kin-based landholdings; however, the concept of clearly prestige status-driven mortuary behaviour seems to largely absent at Asine in the LEMH.

At Argos, burials at both the tumulus cemetery south-east of the Aspis and below the south-eastern edge of the Larissa date to the LEMH. However, LEMH settlement does not occur on the Aspis, and therefore these few early MH burials can only be described as an extramural cemetery for the earlier Quartier Sud settlement (approximately one km to the south and dated to the MHI-II periods). In the Quartier Sud settlement, the burials are inter-mixed with habitation remains, and could represent either intramural or discrete burial areas within a settlement (Müller 1985). Thus, there are two co-existing burial traditions at MHI-II Argos, and the spatial element to burial differentiation that may have been present at Asine may be even more prominent at Argos.

Other sites
Further examination of burials from sites outside the north-eastern Peloponnesse sheds little light on large-scale patterning. Though sites like Kirrha and Ayios Stephanos have a rich MH burial record, few of these are clearly LEMH in date and limited exposure at these sites hampers attempts to further understand spatial differentiation of burial practices. The wide exposure at Eutresis revealed 22 graves that date to the ‘MH’ period, though lack of grave-goods within all but three of these graves (3, 6, and 24) makes any closer dating impossible (Goldman 1931: 221-224). The majority of the graves were pits, though cists and pithos burials were also represented; all of the graves tended to be located within the area of the settlement though their stratigraphic position makes it clear these were not intramural burials proper (Goldman 1931: 224). Though grave goods are admittedly scarce in all LEMH burials, it is interesting that Goldman notes, and seemingly correctly, that Eutresis, Orchomenos, and other areas of Greece where the Minyan ceramic tradition is dominant tend to have even fewer burial goods than those areas in which the Matt Painted pottery tradition is common (the Argolid and Peloponnesse) (Goldman 1931: 224).

22 Two other graves, 15 and 18, are also MH, but their stratigraphic position is such that these can be dated to the later part of the MH period and therefore are not included in this discussion.
The very end of the LEMH period sees some of the most elaborate burials thus far known on the mainland: these include a robbed but architecturally elaborate two room built structure at Lefkandi (Sapouna-Sakellarakiou 1995), the so-called Warrior Grave at Kolonna on Aegina, which contained a male with weapons (obsidian arrowheads, a long sword and a spear), personal ornaments (a boar's tusk helmet, razor and gold diadem), and both local and imported pottery, and the grave on the Tamiskou plot at Thebes, containing a similar range of material (Cavanaugh and Mee 1998). Kilian-Dirlmeier (1997) links these graves with other, slightly later graves, like those at Dramesi, Thorikos and Marathon, as examples of an emergent elite 'warrior' type burial. While this may be an early foreshadowing of Shaft-Grave behaviour, it seems interesting that such graves are (i) in central Greece (including Attica) or Aegina rather than in the Argolid (oft considered the heart of the Shaft-Grave phenomenon) and (ii) do not contain a large amount of high value (and particularly imported) prestige goods, but may relate to a much more mainland-oriented 'Great Man ideology' (as suggested by Wright 2001). Therefore, rather than simply foreshadowing the burial practices of the Shaft Graves at Mycenae, per se, this burial behaviour could be much more of a mainland (or Aeginetan) burial type, and the material manifestation of a specifically LEMH way of behaving (Rutter 1993: 145).

General Discussion of LEMH burial

Though burials are a frequent component of LEMH period sites, these do no prove to be a fruitful arena for investigation into the traditions of LEMH communal organisation or socio-economic structure. Due in no small part to the lack of grave goods (and the lack of a fine ceramic chronology with which to date those grave goods that do exist), this means that the picture of LEMH mortuary practices is a very static one, and is unable to shed much light on the dynamics of LEMH groups. The general argument has been that the static nature of LEMH society and its simplicity and poverty are well reflected in its burial record (Dickinson 1977: 33-4). The evidence presented in this chapter, however, challenges this notion that LEMH communities were all so static, so small or so simple that their communal structures and organisation could exist without some form of manifestation. In this sense, it accords well with Voutsaki's (2001) argument that while burial may not have been an acceptable arena for the expression of LEMH relationships and affiliations, this does not mean these social dynamics should not be sought elsewhere.

In a similar vein, Wolpert (2004) has argued that the Shaft Graves can be viewed as the eventual outcome and material manifestation of long-term status negotiations and identity constructions that were present throughout the LEMH, though not manifest in the burial sphere. Like Voutsaki, he suggests that it is this shift away from above-ground social
negotiations that are the hallmark of the Shaft Grave period, and he goes on to propose that looking for manifestations of prestige and identity within LEMH burials is generally useless. Such a notion is corroborated by the fact that (from our current state of knowledge) LEMH burials show no recognisably consistent patterns indicative of elite identity, prestige competition or any other indication of stable leadership or administrative office. How can one interpret a burial as an expression of elite competition when the very concept of ‘elite’ may not have been appropriate, and did not have a homogenous material expression? While there are burials of the LEMH period that are relatively rich (especially the MHI Ellinika and Elateia tumuli), there is no evidence for the continued acquisition of wealth among these groups, and they probably represent a successful individual, rather than an emergent elite class.

A more likely proposition has been that of interpreting LEMH burials as relating to kinship or lineal groups (Georgosopoulou 2005), yet this seems no more an explanation than an organising principle and still fails to explain the lack of consistent patterns regarding material deposition and grave expenditure. With our current state of knowledge, LEMH burials neither lend themselves to interpretation based on long-term developmental trajectories nor present a coherent static pattern within a site or between sites. Is there no discernible correlation between aspects of mortuary practices and status, age and sex because these types of differentiations do not exist within LEMH communities or is it due to the fact that the burial sphere is an inappropriate forum in which to air these negotiations? While this has been a summary of some aspects of LEMH burial, this thesis is primarily concerned with the production and consumption of material culture, and from this brief review, it has become clear that this is almost exclusively relegated to activities occurring above ground, making the interpretation of LEMH burials only of the most peripheral utility within the remit of this thesis.

The Wider Aegean context: Crete, Anatolia and the Dalmatian coast

Having begun to establish a picture of settlement and burial on the mainland during the LEMH period, it is critical to also consider the impact that the wider context of the Aegean world may have had upon these communities; thereby recognising those areas that may have been exerting influence upon the social and economic practices of the mainland. Though the mainland in the LEMH is often considered the backward cousin of its Aegean counterparts, contacts between the mainland and surrounding areas have begun to be more systematically documented (see Maran 1998; Rutter and Zerner 1984; Zerner 1993). In addition, these external contacts — and the variable ways in which mainland communities adapted to this
contact through modification, emulation or even resistance – may shed light on the internal social organisation and socio-economic dynamics within these communities.

Let us begin by looking at the area of the eastern and southern Aegean. On Crete, the first palatial centres emerged at this time and, arguably, with it, a true economic, political and even ideological core area for the first time in the Aegean. While evidence is patchy for the EMIII-MMIA period on Crete, due in no small part to the destruction of pre-palatial levels at some of the most relevant sites caused by later rebuilding, this late pre-palatial phase was one not only one of state formation but also of potentially increased overseas contact (Watrous 1994: 729-36, 1998: 21, 2005).

In terms of the implications this may have for the LEMH period, there is clearly an expansive Minoan presence throughout the southern Aegean from early in this phase, as well as one that is resolute and directional in terms of the external contacts it makes (potentially motivated by raw material acquisition). The manner in which this Minoan influence is felt seems dictated by the Cretans themselves, and not those with whom they interact (as is the case of the Cyclades which appear to be effectively bypassed during the late Early Bronze and early Middle Bronze Age periods), is an indication of the ambitious nature of these early Cretan elites (Broodbank 2000a: 356-61). It seems unlikely that the political situation on Crete was either politically or economically stable during the Proto-palatial phase, and the preponderance of foreign artefacts and raw materials (such as ivory, stone vases, and stone palettes found in MMI-II burials) in apparently non-palatial contexts leads to speculation about the potentially competitive nature of trade and foreign interaction (Branigan 1989; Watrous 1998). It seems highly plausible that this type of acquisition-oriented trade may better reflect the intensifying competition between Cretan peer polities during this period than the more formalised and institutionalised appearance it takes on in the Neo-palatial period (Branigan 1989).

Though this may be seen as overstating the position of Crete and the influence of the palatial centres on the mainland at this early a date, by the MMIB-II period, certain areas (Kythera, Aegina or the Cyclades) were being affected by the Cretan core, and therefore whether through an island filter or through primary contact, mainland groups must have been somewhat aware of developments on Crete. Therefore, though of potentially varying intensity all over the mainland, the development of palatial states, and possibly more significantly of a competitive peer-polity economy, on Crete would have been felt by the majority of coastal mainland groups; the diversity of mainland responses to this increasing Cretan influence will be examined in Chapter 7.

While it is not until MMIB (early MHII in mainland terms) that palatial centres were fully developed at Knossos, Phaistos and Mallia, the need for raw materials (like metals, for example) and prestige materials was likely to have begun earlier than this, and the MM I-Ill
period is seen as one of rapid Cretan expansion into the eastern Mediterranean mercantile scene, with evidence of Minoan pottery at Ugarit, Byblos and in Egypt (Watrous 1998: 20). Moreover, it appears that this expansion was entirely stimulated by Cretan needs; Watrous (1998: 22) even claims the total absence of Egyptian royal and private gifts is likely to reflect the relative unimportance of Crete to Egypt (and other eastern Mediterranean states) at this time, further underscoring the Minoan initiative behind this expansion.

To explore the nature of expanding Minoan interests more fully it is necessary to also look at activities within the Aegean islands during this period. A major gap exists in Cycladic prehistory during the EBIII period, in which no stratified archaeological assemblage has been identified thus far. Whether this lacuna represents a true abandonment of settlement or simply a gap in the archaeological record (or in our ability to recognise ECIII material due to the possible continuation of ECII ceramic traditions) is hotly debated; at certain sites like Ayia Irini on Kea for example, this gap appears to represent a genuine abandonment of the settlement, though at other sites closer examination of stratigraphy combined with a clearer picture of ECIII ceramic traditions may eventually lead to the resolution of this gap (Broodbank 2000a: 331-33; MacGillivray and Barber 1980; Rutter 1984a).

Regardless of this, settlements at the major nucleated sites of Ayia Irini on Kea, Phylakopi on Melos and Akrotiri on Thera are (re)-occupied in MCI (late MCI-early MCII at Ayia Irini); these contain imported Minoan pottery and a very limited amount of locally imitated Minoan pottery. Therefore, we may already consider these islands to be closely connected to the expanding influence of Crete (Broodbank 2000a: 350).  

In a unique case, the site of Kastri on Kythera shows evidence of a Minoan presence from the EMII-III period, with the expansion of Kastri and the earliest appearance of Minoan-type farmsteads on the island by the MMI period (Blackman 2001: 20, 2002: 16). On Aegina, at the site of Kolonna, only a limited amount of material can be dated to MMIA (a few cup rims and a loom weight), though by MMIB-II (early MHII) a large quantity of Minoan pottery, imitation Minoan pottery and a Minoan seal were found on the island. Further evidence from the recent excavations suggests possible resident Cretans from as early as the MMIB period, with good indications that a Cretan potter may have been resident at Kolonna from this time (Gauss 2005, 2006).

On the mainland itself, Minoan MMIA pottery has been found at Asine, Athens, Ayios Stephanos, Eutresis and Lerna with a Minoan style stone figurine and loom weight also found at Lerna in this period (Rutter and Zerner 1982: 81-82). By MHII, Minoan material

21 One of the best pieces of evidence for the degree to which areas of the mainland (and also the Cyclades) are in contact with Crete comes from the amount of imported Minoan pottery as well as the presence of local imitations of this pottery type (commonly known as Minoanising or Lustrous Decorated). However, this will be discussed in detail in the next chapter and therefore will only be briefly mentioned here.
appears at many of the same sites as in the preceding phase: Lerna, Asine, and Ayios Stephanos, and a limited quantity of MMIB-II material has also been identified at Argos, Mycenae, Iolkos and Pevkakia. These finds consist mainly of pottery, though stone vase fragments have also been found at Mycenae, Argos and Lerna, an object has been found at Ayios Stephanos with a Linear A inscription, and loom-weights and stone amulets of Minoan type were also found at Lerna (Janko 1982; Rutter and Zerner 1982: 82).

However, one cannot look only to the south to understand the complex and dynamic world in which the LEMH mainland existed. Evidence has long existed for contact between the Aegean (particularly the northern Cyclades and the eastern mainland) and the western Anatolian coast. The most obvious of these links comes in the form of the (sometimes wheel-made) late EHII ceramic types dubbed the ‘Kastri group’ in the Cyclades and the ‘Lefkandi I’ group on the mainland (see Chapter 6 for a more detailed discussion), which are almost identical to western Anatolian proto-types, the sudden appearance of the potter’s wheel on the Greek mainland and the presence of EHII type sauceboats at Troy is seen as a legacy of this contact (see Rutter 1983a: 349-50). While this has often been taken as an indication of Anatolian invaders (e.g. Doumas 1996) (a claim for which there is no additional material evidence, see Chapter 1, footnote 3), contact between Anatolian coastal groups and those in the northern Cyclades/eastern mainland is undeniable (French 1968: 172). It has also been argued that the technological knowledge for making grey-burnished pottery originated in western Anatolia and was transmitted to the Greek mainland in EHII-III, resulting in the Grey Minyan pottery proto-type, Fine Grey Burnished pottery (French 1966: 109; Howell 1973; Rutter 1983: 349), and finds of early MH ceramics on Lesbos may be evidence of this contact (Davis 2001: 85).

It is also possible that the transmission of ceramic stylistic (and potentially technological) information continues well into the LEMH period, though this time from west to east. The remarkable similarity in shapes (and manufacturing techniques) of pottery found in Troy VI (c. MHII) to types of Minyan pottery produced on the Greek mainland contemporaneously may be a testament to this continued interaction and information exchange (Howell 1973; French 1972; Pavuk 2006). Links between the mainland and Anatolia are also evident in the metal-working traditions that began in EHII and continue through the LEMH period. These include the ‘shoe-slot’ spearhead and Type I and III knives (Tripathi 1988: 119), though the most interesting and informative evidence is surely that of the tanged dagger, in which the presence of certain morphological features (particularly the hidden hafting system) suggests direct technological transmission rather than just reproduction (Nakou 1995: 15). This continued technological transmission between the mainland and Anatolia is fascinating in that it does not seem to create a great deal of material
exchange, as such, but represents a potentially information-rich history of cultural contact and exchange.

Contact with the Adriatic coast (namely the Četina culture) and areas of the Greek mainland also seems to have taken place in evidence during the EHII and III periods. Two particular types of cultural traditions occurring on the mainland (concentrated in the western Peloponnese) from the EHIII period (tumuli and finely incised/impressed pottery) are suggestive of links between the western Ionian coast of the mainland and the Dalmatian coast. Such links have long been discussed in the context of the ‘invasion’ hypothesis and thus have hindered less diffusionist interpretation of these links. Recent work by Maran (1987, 1998), has re-evaluated these inter-relations in a new light, illustrating the similarities of Četina culture pottery with incised/impressed ware and the tumuli found along the Albanian coast with those found in western and central Greece. Though Forsen (1992: 219) questions these links due to an apparent lack of both incised/impressed pottery and tumuli along the Albanian coast between these two cultural regions, archaeological work in this area over the past 10 years has filled in this geographical lacuna (Della Casa 1995: 573), thereby strengthening Maran’s case that both of these cultural traditions find their origin in long-standing contacts between western Greece and the Adriatic coast.

Maran’s meticulous study of the EHII-III transition provides a convincing explanation for what has long been suspected: that Adriatic coast societies were in active contact with the communities of western Greece, and though his conclusion that population movement may have occurred between the Adriatic coast and the decimated landscape of transitional EHIII-III Achaia and Elis is not definite, contact between these two cultural groups can no longer be denied. In this respect, the western Peloponnese may even plausibly be considered more closely linked with an Adriatic system than with the Greek mainland (see Maran 1998: figure 71a), as the sea-borne interaction along this coast must have made contact more accessible between coastal and inland Peloponnesian communities. The conduit of the Corinthian Gulf— and the number of LEMH sites along it— may have even pushed this contact to more central areas of the mainland.

The links between the Adriatic coastal communities, southern Italy and even Malta during this period are also well-attested, and the possibility of links between western Greece and southern Italy are no longer so far-fetched (Rambach 2006). Though speculative, the appearance of early MH pottery (Grey Minyan) at Pelikata on Ithaca need not necessarily be an indication of the movement of LEMH peoples, but could reflect their contact with more mobile trading communities (Howell 1973: 89). Perhaps it is just as instructive to look at the western distribution of MH pottery, in order to consider where certain lines of trade/exchange and contact were occurring? It is possible that this route also provided some (likely secondary) trade contacts with temperate Europe. Though little evidence of this exists, rare
examples like an EHIII import (a shaft-hole axe from the Thebes hoard) appears to be of Bulgarian/Rumanian origin (Maran 1989: 129-36).

Conclusions

This chapter has provided a critical review of the main characteristics of the LEMH archaeological record. In turn, this provides a way to ground LEMH sites and their inhabitants in an appropriate geographical, scalar and Aegean-wide context. The first exploration of the LEMH record was through settlement patterning, and an exploration of site numbers, locations and sizes. This analysis was able to clarify our understanding of the settlement pattern for the LEMH period by removing irrelevant later MH sites but also revealed some interesting observations: (i) challenging the assumption that all LEMH sites were small villages; (ii) confirming the elimination of small farmsteads after the EHII collapse; (iii) exploring site populations and regional demographies, and establishing a scalar basis for this research; and (iv) examining the location of LEMH sites in terms of both connectivity and sustainability. The second body of data considered, the burial record, provided fewer original observations. Given the amount of work that has been done on MH burial patterns, our current inability to provide an adequate model for the earlier phase of the period is surprising, but is limited by a framework of interpretation based on the teleological expectations that this behaviour should prefigure Shaft Grave patterns, as well as the sheer dearth of information.

Lastly, the world surrounding the mainland was given consideration, as the isolation of the mainland communities during this phase is no longer something that can be taken for granted. With Crete the predominant archaeological focus in the Aegean at this time, connections with and influences from other regions (the Adriatic coast, western Anatolia) are often overlooked. Recent scholarship has not only confirmed some of these external links but has further clarified the relationship between Crete and the rest of the Aegean in this Pre- and Proto-Palatial phase. Overall though, two points stand out: (i) regions of the mainland have potentially varied sets of external contacts whose effect on those regions may differ significantly and (ii) contact with Crete need no longer be seen as the sole vector for long-distance exchange between mainland communities and their contemporaries elsewhere in the Aegean.
CHAPTER 3
THEORY AND METHODOLOGY

Introduction

This chapter will serve three main purposes. The first of these is to develop a way to infer information about the social and economic organisation of a community through an examination of the way pottery is made and used. Focussing specifically on the way in which prevailing technological and production-oriented approaches to material culture have been used to answer archaeological questions, I will isolate those fundamental theoretical principles which I think are critical if we are to progress from considering attributes of pottery to the social context in which that pottery was produced and used. Though this first section will be a general discussion of the way material culture has been used to forge links between the material and social realms (and the varying success of these approaches), I will primarily be drawing attention to those theoretical perspectives and methodological tools that are relevant to addressing my particular research questions. While at a basic level, those questions are about evaluating the nature of ceramic production and patterns of consumption at different LEMH sites, this chapter will also explore what the social implications of these systems might be, the extent to which these systems affect the socio-economic homogeneity and organisation of a group and thus, the way in which systems of ceramic production and consumption may be a valid way to explore differentiation between LEMH communities. Practically, this requires an examination of both the middle-range inferences linking attributes of an object and the way it was produced, an assessment of the organisation of production, and the effects production systems have on other sub-systems at work within a community. Additionally, by examining the consumption of material culture, techniques and knowledge within and between communities, an approach can be developed with which to identify shared patterns of material behaviour amongst LEMH communities, rather than simply talk about the 'variability' between them. While the theoretical and methodological approach detailed herein represents one tailor-made to the questions that I wish to address, it is one that I hope might have wider applicability when approaching the ceramic production and technology of other small-scale communities. Therefore, although we will briefly look at the ways in which material culture has historically been interpreted, primary attention will go to those explanatory approaches that have fundamentally changed our perceptions of material culture and have impacted the ways in which we build links between attributes of the material record and the socio-political and economic mechanisms that generated those attributes (David and Kramer 2001) (see Figure 3.1 for a schematic representation of the theoretical approaches this chapter will cover).
Secondly, I will detail the precise methodology I will be using to gather and record ceramic data, the theoretical links and ethnographic models that I will be using to interpret that data, and how the insights from the ceramic record of the LEMII period can be used as a new tool to define and interpret the socio-economic dynamics of LEMH communities.

Thirdly, and finally, I will discuss the ways in which ceramics have been used in the past to explore the nature of LEMH society. This will provide a basis for subsequent discussions as well as exploring the extent to which ceramics have been able to shed light onto the modes of production or consumption choices within LEMH groups. By highlighting the state of current ceramic research, it is my hope that the relevance and applicability of the approach advocated herein will become apparent.

**Explanations of material culture variation**¹

The principal reason why material culture is of any use to archaeologists is because it exhibits significant physical, functional and technological variation with regard to time and space. Hence, the majority of material culture studies are concerned with explaining that variation, and this review serves to highlight two common explanatory paradigms that have been explored: the study of artefact variation as a means of delineating cultural, social and political groups and the study of artefact variation as a means of assessing complexity. My goal, rather than correlating specific types of artefact variation with specific cultural groups or social phenomena is to tease out how and what aspects of human behaviour are represented by this variation, thus allowing me to develop a methodology for exploring what artefact variation can mean in small-scale communities.

**Variation as chronology and typology**

The first dedicated studies of artefacts, during the early 20th century, used material culture variation generally (and often variation in pottery styles, specifically) to identify cultural groups in time and space (Dunnell 1982; Trigger 1989). Typologies of material culture forms could be used as a mechanism for chronological classification, and frequently re-occurring artefact groups could be equated with cultural groups. This was based on the underlying supposition that material culture, as a product of human society, would act as a direct

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¹ In writing this chapter, I had great difficulty in discussing these different theoretical approaches to the production and consumption of material culture as a clear, developmental trajectory. Because this represents a synthesis of the developments within numerous different theoretical schools (often within different countries), it makes sense that developments did not occur in uninterrupted chronological succession. Therefore, I have chosen to organise this chapter thematically, and while care will be taken to emphasise the date of certain theoretical developments, it should be clear that these were often occurring simultaneously.
reflection of changes occurring within that community (Grieder 1975: 850-1). Before this link became problematised, it was presumed that homologous similarities between material culture types were evidence for cultural diffusion and migration; hence objects could be employed as cultural markers and a link was simply and clearly delineated between people and things (e.g. Gladwin and Gladwin's [1935] Red-on-buff culture; the 'Beaker Culture', etc).

Where does variation lie?

However, with the advent of processual archaeology and the recognition of the complex and often obscure role the production and consumption of artefacts played in human relationships, material culture could no longer be used to directly infer non-material phenomena (Binford 1962). To counter this, generalisations (founded on empirical observations) about human behaviour were sought; in this way, the archaeological patterning of material culture could be interpreted not as evidence of different cultural groups, but of specific and universally interpretable patterns of human behaviour. Implicit within this search for a 'middle-range theory' was the recognition of objects as meaningful reflections of human behaviour. The practical effect of this was that questions about artefact variation shifted from a culturally historically oriented 'how were artefacts different' to 'why were they different', encapsulating the much greater emphasis on explanation rather than description that characterised the processual movement. The major methodological implication of this was that the artefact had to be broken down into those attributes that played roles of differential significance in the articulation of non-material meaning, in an attempt to understand better the relationship between how human behaviour and social context influenced the form of material culture.

Typified by Binford's (1962: 219) distinction of the technomic (primarily relating to functional demands), socio-technic (concerned with the articulation of social groups) and ideo-technic (relating to ideological or symbolic concerns) aspects of an artefact, material culture could be considered a repository of different types of information, the most obvious distinction being between those attributes of an object that 'did something', and those that did not. Eventually, this resulted in the attributes of artefacts being divided along three separate lines: style, function and technology (Braun 1983; Bronitsky 1986; Plog 1980). With function and technology representing the utilitarian and physically constrained aspects of material culture, the term 'style' then became synonymous with the intentional, and by implication, the socially meaningful and most informative aspect of material culture. While

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2 One major exception to this is V.G. Childe whose growing realisation of the difficulty in linking changes in material culture with changes in human behaviour led him to pursue a much more economically oriented approach to understanding material culture; this will be discussed in further detail in the following section.
the isolation of 'formal variability' as the key to understanding the socially informative aspects of material culture gave rise to an artificial division of an object into its form and its decoration, this principle, that not all aspects of an artefact are equally significant with regard to understanding non-material phenomena,\(^3\) was sound, and is one that would re-occur frequently in material culture studies.

**What does variation mean?**

This concept, that material attributes contain differentially important degrees of information, was profound, and within Anglo-American archaeology, created a divisive approach towards the analysis of material culture. This approach consisted of research into decorative (or non-functional) variation to explore social, economic or ideological facets of culture alongside (though seldom overlapping with) investigations into functional variation as a result of practical needs and environmental and technological circumscription (Arnold 1978, 1985; Skibo 1992). Up until this point, the major debate in the study of material culture had been which characteristics of an artefact held social meaning; suddenly, the focus of investigation shifted to what variations in those characteristics meant, and three divergent schools of interpretation arose.

The first of these schools advocated an approach predicated on the notion that the function of style\(^4\) was 'active', and played a significant role in the communication of many social messages, ranging from personal identity and status differentiation, boundary maintenance and network affiliation (Hodder 1979; Wobst 1977: 327-28; Wiessner 1984, 1989). The concept of active style has had an immense impact in archaeology, due to the underlying notion that, in effect, artefact variability was clearly meaningful to those people who made and used artefacts, and by correctly interpreting what that meaning was, we could have a direct insight into the social organisation, political affiliations and group identity of past communities; in short, often exactly the kind of social and cultural information that archaeology wished to obtain. Problematically, this was a theoretical case of putting the cart before the horse insofar as while these heavily anthropological studies had been able to demonstrate that material culture could communicate meaning, without living informants

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\(^3\) This is cogently summarised by Barth (1969: 14), who claims that “[in material culture] ... one cannot predict from first principles which [cultural] features will be emphasised and made organisationally relevant by the actors.”

\(^4\) Style, is, in this case referring in general to the surface embellishment of an object and thus the aspect of material culture that is unconstrained by functional requirements and considered to be the most socially informative (Rice 1987: 245). Within the following discussion, a number of terms are frequently used and therefore need to be defined briefly here. For my purposes, technique relates directly to the way something is done, and therefore is a description of an action being performed. The term ‘technology’ is used when a group of specific techniques are consistently used together. Though style is often used in the same way I am using the term technique, I will make it clear if this is the case; otherwise, style will only be used in reference to the way something appears.
from which to gather this data, the theoretical tools to access this meaning archaeologically were undeveloped. Regardless of the fact that there was no middle-range theory that was able to illustrate in what way material culture was communicating this information, nor widespread generalisations that would allow for the cross-cultural application of specific interpretive analogies, the notion of material culture as a medium of communication, affiliation, boundary maintenance, etc., was widely applied to archaeological data, with decorative motifs on a pot often assumed to represent factional groups and ethnic groups (Bowser 2000; Cordell and Plog 1979: 407).

The second approach was defined as ‘isochrestic’ style, in which choices made during the production of an artefact (between variants that were functionally equivalent) reflected the social tradition in which the artefact was made (Sackett 1977; 1982), and therefore could be used to identify communities of similar people. A third approach, quite similar to that of isochrestic style, was the concept of technological style (see Lechtman 1977). While technological style was similarly concerned with teasing out the underlying meaning of artefact variability, it represented a radical shift in the conceptualisation of artefacts insofar as it suggested that the divide between function and style was arbitrary. The key concept of technological style was that rather than focus on a single aspect of an artefact, every aspect of the way an artefact had been produced was as informative about the social context of its producers as its appearance. In turn, then, the production techniques within a community (and the fact that they were ‘embedded’ within the social, political, economic and ideological milieu) should act as a reflection of deep, ideological social structures within that community. While this assumption is questionable, the idea that technology is deeply embedded within other sub-systems of culture, and could potentially be informative about them was highly significant. Furthermore, it required the development of a new methodology by which to analyse material culture, taking into account the chain of operations that produced an object, from the acquisition of raw materials to its eventual use and deposition (henceforth known as the chaîne opératoire) (e.g. Lechtman 1977; Lemonnier 1986, 1992: 66; Pfaffenberger 1992; Schiffer and Skibo 1997) Thus, the many choices made in the creation of an artefact were afforded the same significance as the eventual appearance of an artefact, and techniques became a means of characterising the community in which this technology was embedded.

Of fundamental importance for my research was the realisation, by both the ‘isochrestic’ and ‘technological’ style schools, that different production decisions were driving a great deal of artefact variation, and therefore in order to explain variation, the reason behind production differences had to be addressed. Therefore, the act of production became

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5 In this case, the term style may refer to both the way something is done (what I would call technique) as well as the eventual appearance of an artefact.
the mechanism by which to investigate how the artefact was created in the social world. Both of these approaches aimed to build a bridge between specific features of an artefact and the social conditions that generated those features, though with disparate goals in mind (to identify social groups and to identify underlying cultural structures, respectively). However, the technological/isochrestic style notion that techniques are heavily influenced by the social circumstances of the producers is one of the most important underlying theoretical principles upon which this chapter is founded.

**Critiques of these approaches**

Though these theoretical schools do lack a well-defined middle-range theory, the more fundamental criticism is related to their overall goals. The underlying principle behind these studies is their identification of material culture variation with a specific cultural phenomenon such as ethnicity, lineage or community, for example.\(^6\) However, this correlation has been extremely elusive and tenuous for the simple reason that these cultural categories are proving (in both anthropology and archaeology) to be mutable, ephemeral and situational concepts at best, and at worst, inaccessible and nonexistent (Jones 1997: 13; Schneider 1984). Unsurprisingly, then, identifying the material correlates of a potentially illusory concept are likely to be unsuccessful. While this is surely a function of the fact that anthropology, the discipline from which much of archaeological analogy has been drawn has historically focused on these types of abstract units, recent trends in anthropology suggest a movement away from the classification of people into discrete units, as the concept may be intellectually useful but may actually obscure the more complex ‘contingent interrelations’ that actually characterise human societies (Shennan 1989: 13; Trigger 1996: 277; Welsch and Terrell 1998). The fundamental problem with the ‘style’ approach, therefore, has been the attempt to use material culture to identify categories and concepts that have no material basis; this may be one of the most significant contributing factors to our inability to build middle-range theories for this kind of investigation. This is by no means a novel concept, and as early as 1930, Childe (1930: 240-7) was doubtful of the archaeological correlation between material culture and ethnicity, and indeed, whether ethnicity was even an appropriate phenomenon for archaeological investigation.

\(^6\) Or, as MacEachern says (2001: 79) “... the delineation of ancient human groups with categories analogous to those seen in the world today”.

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Explanations for production differences

The other dominant paradigm for explaining material culture variation over the past thirty years has been to assess social, political and economic complexity through craft production, the underlying assumption being that there should be a positive correlation between production specialisation and socio-economic and/or political complexity. The significance of craft production has long been recognised as critical to understanding the economic underpinnings of society (Childe 1950; Peregrine 1991; Renfrew 1979; Underhill et al. 1998), and investigations have generally concentrated on the role craft production may have played in the emergence of social complexity and/or the development of elites (Brumfiel and Earle 1987; Tosi 1984:22). Though crude correlates have long been assumed to exist between aspects of production and certain levels of socio-political complexity (e.g. the potter’s wheel as an index of complex economic organisation), these had never been rigorously investigated. This explanatory paradigm was the first to try and establish concrete and widespread connections between features of the material record and certain forms of socio- and politico-economic organisation. The following section, then, concentrates on the work that has been done to build a middle-range theory between variation in material culture, different socio-economic modes of production and degrees of social complexity.

Production as a marker of complexity
The conceptual basis for this theoretical paradigm was simple: the socio-economic and political context in which an object was produced could consistently be associated with certain artefact attributes. Due to the material constraints placed on production techniques, it was assumed that it should be possible to find widespread and cross-cultural regularities between the way objects were made and the socio-economic contexts in which they were produced, and finally, to equate certain modes of production with levels of cultural complexity. However, this was methodologically complex, requiring careful study of how specific technological, decorative and morphological features of the artefacts could be interpreted as the archaeological signatures of specific modes of production organisation (Peacock 1977; van der Leeuw 1991) (Figure 3.2). Conceptually, technical attributes (gleaned both from traces left on the artefact itself and the evidence provided by workshop areas) were used to make certain descriptive inferences (assessing such intangible concepts as ‘skill’ and ‘labour investment’) about the nature of the producers. In turn, the presence of a certain combination of these technical indices would be used to assess the scale, intensity and organisation of the producers, thus providing a notional category into which the mode of production could be classified (Figure 3.3).
As is clear from Figures 3.2 and 3.3, there were rarely one-to-one correlations between specific technical attributes, abstract concepts and modes of production. As in ‘style’ paradigms, idealised categories (modes of production) had been created that bore little relationship to production processes, and were therefore unlikely to be recognisable archaeologically. Additionally, there proved to be a weak correlation between specific modes of production and political centralisation or social complexity, even though a large number of studies were undertaken to explore this connection in numerous contexts, including the emergence of the early state (Brumfiel 1998; Feinman 1999) and incipient chiefdoms (Arnold and Munns 1994).

Production differences and producer specialisation

The problem remained that while production differences clearly existed, these could not be linked to those abstract features considered most significant by archaeologists (such as social complexity and political centralisation). The factors driving production could not be approached at this generalising a level, and thus required a much more detailed examination of the social, political and economic conditions that artefact production was contingent upon. One of the key concepts to emerge from this was that of producer specialisation. This represented a means of breaking down the notion of production into units that directly related artefact characteristics to modes of human behaviour (e.g. skill acquisition, learning patterns) rather than the abstract and idealised modes of production (Costin 1991; Pool 1992; Rice 1981, 1984; Hagstrum 1985, 1986). 7

The first example of this, by Rice (1981), used the presence of diversity and the increasing convergence upon a visually standardised product to infer specialisation. Using concepts like ‘richness’ and ‘evenness’ (taken from ecological studies), to measure the numbers of clay types, surface treatments and decorations being used within ceramic classes, she identified specialisation as a function of the increasing limitations placed upon both the makers and consumers of pottery and the increasing skill of potters in terms of being able to meet those requirements (Rice 1981). Three variables were used to assess the degree of specialisation of a producer and hence, the likely mode of production associated with that level of specialisation: the skill of the producer, the intensity or scale upon which production takes place and the attachment or independence of the producer to a market. However, these proved very difficult to assess, particularly in an archaeological context where there was no primary evidence for production (e.g. a workshop).

7 From this point onwards, I will be discussing the ways that these questions have been looked at using ceramics specifically.
8 Richness refers to the number of types within a ceramic assemblage, and evenness to the number of varieties within each type.
Another approach focussed on deducing the skill level of the producer from the mechanical and morphological standardisation of the vessel (Bencco 1988; Blackman et al. 1993; Stark 1999). Though many of the principles upon which these assumptions were based had a logical foundation (e.g. the size and shape of a vessel would only become standardised when the action used to produce it had been repeated so often that the producer must be considered a specialist), there was little exploration of why these principles were true.\(^9\) Problematically, the same degree of morphological and mechanical standardisation appears in the handmade products of household level producers and apparent full-time ‘specialists’, thus throwing into question to what extent standardisation reflects specialisation (Stark 1995, 1999). This lack of correlation between standardisation and specialisation also carries over into other facets of ceramic production, such as clay selection, in which there does not appear to be any definitive interrelationships between fabric standardisation and specialisation (Arnold 2000: 370-2).

Labour investment was also explored as a means of assessing specialisation, most notably in the form of the quantitatively determined ‘production step index’ (Feinman et al. 1981); this technical parameter also failed to be of explanatory value as there was no evidence whether specialisation necessarily favoured an increase or decrease in labour input. An example of this is the case of the Wanka, in which increasing labour investment was favoured among specialists in contrast to the case of predynastic Egypt where the advent of specialisation is linked to a notable decrease in labour investment (Costin and Hagstrum 1995; Wengrow 2001).

One of the most successful examples of correlating craft specialisation with a non-material behaviour was by Clark and Parry (1991) in which they explored the relationship between craft specialisation, social complexity and political centralisation using approximately 150 ethnographic case studies. Though no simple relationship existed between any of these factors, a few relationships proved cross culturally to have statistical significance. Of these, the most notable was that the production of highly labour intensive goods (or ‘hyper-specialised’ items as they dub them) are statistically more likely to be produced within groups for whom differentiation and status were maintained through the display and consumption of sumptuary goods. Conversely, labour efficient specialisation was most common in societies in which there are institutionalised offices that did not rely on material as a form of prestige display (Clark and Parry 1991: 338-40).

\(^9\) Naturally, within archaeology, such a principle was of limited use due to the fact that the premise (of increasing standardisation being linked to the skill and repetition of a producer) was based on the products of a single potter; due to the nature of archaeological material, and the long periods of time that are typically dealt with, principles relating to a single individual’s work are of limited usefulness.
Interestingly, this link between the role of artefacts within society and certain modes of craft specialisation has since been corroborated by complementary archaeological case studies. For example, the work of Stark (1995: 212) amongst the Kalinga potters revealed that specialisation within a utilitarian goods market was unrelated to economic stratification, a finding entirely in line with Clark and Parry's suggestion that the nature of specialisation is highly dependent on the role material culture consumption played in social differentiation. Thus, it appears that correlations between specialisation and the nature of production are contextually contingent upon the wider role of material culture within that community.

**Empirical observations: the key to later inferences**

While many of the wider inferences made about production within the craft specialisation/complexity paradigm are questionable, the ethnographic foundation for many first principles of deduction, such as standardisation being related to the repetition of a task rather than its practice by a specialist (Stark 1995) were the direct result of these studies. Thus, the ethnoarchaeological work associated with this approach has been able to provide insights about (i) the practical way in which production systems work in communities; (ii) how different modes of production can situationally be associated with different types of cultural, economic and environmental contexts; and (iii) how the attributes of an artefact can mark the technological tradition in which it was produced (David and Kramer 2001:140). Hence, the practical implications of specific production traditions and, in turn, a great many of the ethnographic observations upon which my methodological inferences are based are derived from studies that were developed specifically for their application within the theoretical framework discussed above (e.g. Arnold 1980, 1981, 1985; Arnold et al. 1991; Neff et al. 1988).

By basing inferences analogically on these founding ethnoarchaeological observations, rather than upon the later assumptions that have been built on these principles, several analyses of archaeological material have been able to reveal the contingent social and economic relationships associated with a particular form of production. Two of the most successful examples of this have illustrated how the judicious application of ethnographic analogy concerning pottery and bead manufacture methods, respectively, allowed for the duration of production to be assessed; by combining this with an estimated scale of consumption, both the number of producers could be judged as well as the intensity with

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10 Due to the fact that many assumptions made about craft specialisation are predicated on the notion that it frequently emerges within a prestige-good oriented system (Gero 1983; Stark 1998b: 73-74), it is of particular relevance to my research agenda that consideration is given to the concept of specialisation outside of a complex system. This notion, of specialisation occurring outside of a complex system, highlights the fact that other reasons relating to the wider context of material usage within a community could be closely connected to the adoption of craft specialisation.
which they worked (Roux 2003b; Whitelaw 2001b). Hence, the significance of production systems within the Mycenaean palaces and the early Harrappan culture can be placed within a contextual scale, and the commensurate requirements for the support of these systems can be assessed (e.g. the need, or lack of need, for elite sponsorship) (Roux 2003a, 2003b; Whitelaw 2001b).

**Production variation as a reflection of social relationships**

Concurrent with the theoretical developments reviewed above, relevant ethnoarchaeological documentation continued to be generated. Beyond trying to recognise empirical regularities of human behaviour, there was a move towards attempting to explain why these regularities occurred. Thus, ethnoarchaeological studies began to ask questions that cross-cut specific political, economic, social and ideological situations and whose universal applicability lay in their foundation in human psychology, cognition and developmental skills rather than culturally-based specifics. Unexpectedly, as a discipline that had so often provided cautionary tales against cross-cultural generalisation, ethnoarchaeologists were beginning to address some of the questions that could lead to the development of a middle range theory (Kramer and David 2001: 140).

A great deal of this work has been done in conjunction with the concept of 'technological style', including the methodological development of the 'chaîne opératoire' or behavioural chain analysis (Lemonnier 1986; 1992; 1993; Schiffer 1983; van der Leeuw 1977, 1991, 1993), in which an artefact could be examined and analysed by reconstructing the process by which it was made and used (Figure 3.4). By having reconstructed all the mechanical stages that go into the production of an artefact, it then became possible to consider the necessary preconditions that must exist for those stages to have been completed, the accompanying decisions made by producers and in addition, to consider the social relations that would have been involved in those processes.

**The differential significance of techniques**

By considering artefact production as a series of techniques predicated on learned behaviour, variation in material culture stems from the social environment in which those techniques were learnt. Hence, learning environment has come to be seen as a critical factor in determining how certain techniques will be differentially affected by transmission over time and space (e.g. Dietler and Herbich 1994, 1998, 1999; Gosselain 1998, 1999, 2000). While the elements of this concept have been suggested in the past (namely that different parts of an artefact hold different types of information), the suggestion that techniques have different degrees of stability and significance was meaningful. Rice (1984: 240) had originally made
the observation that not all aspects of a pottery-producing system are equally susceptible to change, and yet by considering the way in which socio-technical aggregates (as Gosselain calls the many different human and material elements that come together in a pottery-making system) are contingent upon variables like social strictures, motor-skills and cognition, it became possible to determine which techniques are most stable and which are most likely to change (Dietler and Herbich 1998: 245; Gosselain 1998, 2000: 191-3; see also Hill 1979). What makes this a particularly important realisation for archaeological research is that changes within those particularly stable features imply a discontinuity in other systems related to the replication of a technological traditions, such as patterns of learning and communal organisation and types and degrees of interaction between groups (Roux 1999: 159). This concept has been used to great effect in ethnoarchaeology, in which the dissemination of micro-technological features has been able to trace the geographical distribution of production traditions (e.g. Mahias 1993: especially table 5.2)

The differential transmission of techniques
The second major point that came from this work was that the way these traits were horizontally and vertically transmitted is a window into the socio-economic basis of the groups in question (see Figure 3.5). Given that “... transmission through time and space requires specific modes of interaction by individuals” (Gosselain 2000:194), it should be possible to investigate what these specific modes of interaction are or, indeed, were. What makes this different from pure ethnographic analogies is that, to some extent, these are mechanisms that are determined by the way people learn and interact. For example, clay processing traditions are often related not only to learning traditions (and the appropriateness of clay for the production of a vessel), but also the community in which you live (Livingstone-Smith 2000); therefore, clay-processing is a ‘medium’ trait, often relatively stable yet can be adapted if the potter moves or clay sources run out. On the other hand, the ‘roughing out’ stage of the forming technique, handle attachment method and rim thickness are all the most difficult to learn in terms of physical action and ingrained habits and thus are by far the most stable over time and unlikely to change during the life of a potter (Gosselain 1998, 2000: 192-3; London 1991). Miller (1985: 35-6, 200-203) made a similar observation regarding the relationship between forming technique and caste, although his interpretation leans more to the ideological and social constraints than to the strict and limited learning environment imposed by the caste system. These traits, due to their stability, are often present within a bonded group (the unit in which the behaviour was learnt), and can therefore be traced diachronically by examining the continuity and spread of stable traits. To take another example, due to their relatively high fuel costs, firing techniques are most often related to
community-wide and regional traditions, and are often highly visible collaborative events and are therefore subject to changes in relation to shifts in group practice.

Lastly, the use of certain decorative motifs (and the tools to make decoration) has been shown to be one of the least stable and most frequently changing techniques related to pottery production (Gelbert 1999: 217; Gosselain 1998, 2000: 191). Not only are decorative patterns the most likely to change due to the lack of both technological and economic danger in innovating in this arena, but decorative motifs are also a frequently and easily disseminated feature requiring no more than ephemeral contact for their spread to occur. Independent confirmation of the mutability of decoration comes from a variety of sources, including observations by Graves (1985) who found little decorative similarity amongst family groups of potters, DeBoer (1991) who found this to be the arena in which the most experimentation occurred, and Dietrich and Herbich (1994) and Hodder (1979, 1982) who noticed the spread of decorative motifs across significant boundaries. In a similar fashion, the differences in ceramic decoration used by the Mafa and Sirak people (on the Nigeria-Cameroon border) have often been used as evidence of their 'separateness', though in fact these two groups share beliefs, ritual practices and for all intents and purposes would consider themselves part of a closely related group (Kramer and David 2001: 211). Even those scholars working from an evolutionary perspective (Neiman 1995; Shennan and Wilkinson 2001), have propounded the view that ceramic decorative variation is more likely to be related to neutral drift and interaction factors than any more meaningful socio-political or ideological criteria. Interestingly, Longacre (1999) did find that the more formal an apprenticeship, the greater the stylistic reproduction, confirming the concept that the stability of a technique is, to a great extent, influenced by how deeply ingrained the process of learning was.

These general findings have been further substantiated by two similar studies, the first of which has shown that those changes least resistant to change are those that require collaboration (such as clay extraction, processing, temper addition and fuel gathering); because these are often done with others, changes are much more likely to occur (Gelbert 1999: 222). The second study confirms shaping to be the most resistant part of the ceramic production process due to the fact that this involves the long-term acquisition of specific motor skills through apprenticeship, and the difficulty in attaining a certain level of expertise secures this as the most stable production technique (Wallaert-Petre 1999: 186). In retrospect, Hayden and Cannon's (1982) work regarding material variability as a function of learning environment and interaction is also closely linked to this. Their observations about the way in which the nature of learning environment corresponds to the uniformity of material culture

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11 However, Hodder (1979) argued that this was due to the fact that decoration was very susceptible to changes wrought by socio-economic stress, rather than recognising it as a factor of interaction phenomena.
produced (e.g. a specialist learning environment tends to produce the most homogenous products) foreshadow the principle discussed here; they only lack the information about the salience of certain techniques (Hayden and Cannon 1982: 359).

**Socio-economic differentiation and the requirements of techniques**

In order to determine what the socio-economic implications behind certain traditions within a community are, it is necessary to turn to the work of Roux (1989, 1999, 1999, 2003a, 2003b) and others who have studied the ‘trans-cultural’ regularities imposed on production techniques due to material restraints, motor skill and human cognitive ability, and hence, the impact of these regularities on the socio-economic organisation of specific forms of craft production. This work is of specific relevance to those techniques (such as forming) that fall within Gosselain’s category of most stable techniques due to the fact that the other techniques associated with pottery production (such as clay processing, firing and surface treatment) have been shown to be highly susceptible to non-uniform principles (social pressures, environmental changes, etc).

In the case of wheel-making of pottery, for instance, the fundamental traits of the technique (such as the success of one operation determining the next and the mastery of the technique requiring specific motor skills to be developed), require certain necessary social relationships, not least a ten-year apprenticeship to take place, before the technique can be performed as an expert (Roux and Corbetta 1989: 161-2).¹² This duration may seem excessive, but in pre-industrial societies not only would learning conditions be vastly different from comparable ones in the modern world, but learning would encompass not simply the mastery of shaping pottery, but also of complementary activities such as maintaining wheel-motion and speed. In addition, our current concepts of learning to use the potter’s wheel encompass different parameters (and investments of time) than learning to use this technique as a means to a viable economic livelihood in which successful and varied execution of numerous forms is needed.

Therefore, two factors become of the greatest significance when trying to interpret the socio-economic impact of certain production techniques: (i) the level of skill and time needed to master a technique and (ii) the social (and other) relationships that are necessary for the learning, replication and transmission of the technique to occur. By identifying and characterising technical activities on the basis of the knowledge, skill and the social relationships their transmission demands, the nature of the technological system (the composite of information from all the techniques used to make an object) can be evaluated in

¹² A similar argument has been made for the production of Levallois stone tools, a development in lithic technology that could surely be considered commensurate in importance with the wheel for ceramic technology (Schlanger 1996).
these terms. However, unlike the concept of 'mode of production' (which takes into account only the economic and political context of a technological system), this categorisation of technical systems is based on (i) organisation of production in terms of knowledge distribution (being equal between all members of a community or unbalanced) and (ii) the demands placed on the other sub-systems of a community to ensure that the technological system can be transmitted and replicated (Roux 1990:150, Roux and Matarrasso 1999). This creates a spectrum of production organisation ranging from intensive, dependent and highly skilled workshops to simple, self-sufficient and autonomous households. Therefore, a distinction between modes of craft production is made according to the investment of time, knowledge and the degree of communal resources that are needed to underwrite the production system (Figure 3.6).

This discussion has been a review of the major theoretical approaches used in the past to explain material culture variation. For the large part, material culture and specifically the production of material culture have been used as a mechanism to (i) differentiate groups and (ii) judge levels of socio-cultural complexity. While this review has been critical of the ways in which society and material culture can be linked, the large corpus of ethnoarchaeological observations that have been generated by this research will form a substantial basis for many of the archaeological inferences made within this thesis. Recent work in the study of artefact production has contributed additional explicit theoretical links between the techniques used to produce an artefact and the way in which those techniques are informative about group membership, interaction and the socio-economic relationships that the technique requires. This combination of practical empirical ethnographic observations and the theoretical links between the nature of production techniques and the implications for the wider social system will form the basis for my analysis of ceramic production in the LEMH world.

The logics of consumption

Though the significance and social implications of the production of material culture are the foundation of this thesis and the majority of approaches to ceramics specifically highlight production as the primary means of deriving information about society, the consumption of the objects being produced also requires consideration (Berthoud and Sabelli 1979). While the subject of consumption is a vast one, and holistic consideration of this would be beyond the scope of this thesis, it would be neglecting a very important arena of information if the consumption of material culture were to be overlooked entirely. Therefore, while this will be by no means a comprehensive treatment of the subject, let us briefly consider the way that the consumption of material culture can be utilised as a reflection of certain social strategies.
Due to the limitations posed by the archaeological record of the LEMH period, we are only able to ask certain questions of the data. Far and away the best analyses of material culture consumption within archaeological contexts have been done at sites that have good spatial exposure and a high degree of chronological resolution, thus allowing for analysis into the intra-site patterns created by human consumption choices to be performed within a delimited chronological period. Given that analysis of this type is simply not an option for any of the LEMH sites I will be considering, it is necessary to consider the aggregate consumption practices at a site (amenable to analysis of a presence/absence variety), rather than distinguishing between different consumption practices or strategies within a group.

**Consumption as aggrandisement**

Historically, archaeological and anthropological studies of consumption have tended to focus on the way control over certain types of material culture can be used to confer status, legitimate hierarchy and institutionalise inequality within a group, or the way exchange of goods can perform similar functions between groups (Earle 1982, 1987; Smith 1999; Trubitt 2003). This basic concept, that the differential ability to acquire and consume certain materials can create inequalities (whether rare natural mineral resources or subsistence surplus), has been used to explain the emergence of complexity on many different scales (Renfrew 1972; Gilman 1981; Gledhill et al. 1988). Because this type of competitive consumption often leaves the most visible and impressive manifestations in the archaeological record (as in the case of the Shaft Graves, for instance), when this is absent, the concept of consumption as an explanatory mechanism is often relegated to a minor position. However, in order to learn about consumption in small-scale groups without institutionalised leadership, which are unlikely to engage in such sumptuary displays (Allen 1984), we must turn to recent anthropological work on what exactly the consumption of material culture can tell us about a community.

The main thrust of these investigations has been the exploration of the underlying behaviours and social relationships that allow artefact consumption to become a mechanism for accumulating power (Berthoud and Sabelli 1979: 748). Ethnographic investigations turned largely to small-scale, non-hierarchically organised groups in which hierarchy was not an institutionalised practice in order to examine what social practices had the potential to give rise to inequality, and what role material culture played within these practices (Godelier 1988; Godelier and Strathern 1991; Strathern 1971). While the emergence of hierarchy is not the

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13 See Whitelaw (1983, 2001b) for examples examining ceramic consumption in a pre-palatial Cretan village and a Mycenaean palace, respectively. Other excellent examples include an analysis of activity areas and room functions at a Minoan palace (Tsipopoulou 2006) and Hayden (1997) in which the consumption of fish in the Pacific Northwest coastal communities is linked to social differentiation and hierarchy.
aim of my investigation, these studies reveal a great deal about the logics behind material culture consumption within a group, and it is from this perspective that I wish to look at the concept of LEMH consumption logics and practices. This is not in the hope of finding explicable patterns of materially manifest complexity, but rather in identifying the role that material culture plays in the centralisation and stability of such communities. Therefore, rather than interpreting the meaning of consumption behaviours, I intend to examine the nature of these practices to characterise the logics that provide the foundations of LEMH social reproduction.

Two main avenues of investigation have been used to explore the uses of material culture within non-hierarchically organised communities. The first examines modes of communal consumption behaviour and the second links leadership forms to different types of consumption. The first of these approaches focuses on the notion of feasting, a form of behaviour that is centred around the consumption of goods, and the way in which this type of social interaction serves to establish, conceal and secure certain social relationships. Hayden (1995, 2001) particularly, has been instrumental in determining how exactly the act of feasting can lead to the formulations of certain social relationships. By identifying three different types of feasts (minimally distinctive, promotional/alliance and competitive), a very wide number of social, economic and political relationships can be promoted, replicated and transmitted through the course of communal consumption (Hayden 2001: 58-60). Though a wide number of archaeological correlates are suggested for the identification of feasting behaviour (Hayden 1995: 23-8, Hayden 2001: table 2.1), the potential for archaeologically distinguishing between these admittedly very different acts of consumption are limited. While these investigations of feasting have moved beyond the notion of consumption as competition, addressing very explicitly how these ‘commensal politics’ work (e.g. through the creation of obligation, to mobilise labour, etc.) or indeed what the underlying socio-political purpose was (e.g. the reinforcement of kin relations, the legitimation of asymmetrical power relations), the equifinality of these acts in the archaeological record limits their archaeological applicability (Dietler 2001: 80-89; Hayden 2001).

**Equivalence versus non-equivalence**

The second approach to deciphering the nature of consumption behaviours derives from the study of non-institutionalised forms of leadership and the different mechanisms by which power is acquired by individuals within these groups. These leadership types include figures such as the Centre Man, an individual who is particularly skilled at mediating inter-community problems, a Man of Renown, who may acquire prestige through travelling and interacting with other groups, a Great Man whose surplus of livestock and agricultural land may enable him to organise feasting or a Big Man whose inherited office need only be...
sustained through the maintenance of unevenly distributed material wealth (Clark and Blake 1996; Helms 1988; Strathern 1971; Godelier 1988). Though this has led to particular modes of consumption being studied as an archaeological correlate for a specific form of social organisation (e.g. a community where competitive consumption is the primary means of social reproduction is a chiefdom) (Liep 1991: 32), anthropological studies of the economic underpinnings of modes of consumptive behaviour have allowed a fundamental distinction between types of consumption behaviour to be made.

Essentially, the differences between these kinds of groups lies in the extent to which social relations are founded on particular, formalised types of material consumption (Strathern 1991: 2). Godelier (1991: 276) defines this as a difference within consumption logics, with the notion of equivalence at one end of the spectrum (in which the material goods of equivalent value are exchanged and consumed within and between groups, and thus, cannot lead to inequalities arising) and non-equivalence at the other end (in which debts and obligation are created through the exchange and consumption of things of unequal value); this distinguishes whether consumption is underwritten by the desire to create unequal relationships versus maintaining stable/fixed social relations; in essence, then, all communal behaviours and in turn material manifestations of those behaviours are about integration or differentiation (Hayden 1995; Potter 2000a, 2000b; Potter and Perry 1997). Hence, this proposes a way to classify societies based on a fundamental difference in the manner in which social relationships are reproduced using material culture, and in many ways will determine the way material culture is used within communities (Godelier 1991: 280; Thomas 1991: 78; Strathern 1991: 1). Within archaeology, this distinction is particularly useful, as the contrast between material culture being used in association with social practice versus material culture playing an institutionalised role within that social structure should have a discernible material signature.

It is only through close examination of what changes along this spectrum would entail that one can begin to determine some of the material implications of this distinction (Lemonnier 1993: 130). Certain generalising rules tend to govern the patterns and general overall appearance of material culture in communities with different consumption logics, and in which material culture is used for different means. Within a community in which social relationships are stable (which could mean anything from an egalitarian group to a chiefdom with inherited offices) one tends to see conservatism in material culture due to the fact that (i) material culture is not being used as a medium of competition or (ii) material culture is being used to perpetuate/legitimate the known bases of power, and thus relies on grounded, established symbols amongst which there is little room for experimentation in the set power structures (Clark and Blake 1996: 276). Thus, due to equivalent material culture consumption characterised by not being convertible into power, material culture plays a wholly integrative
role in reaffirming social cohesion; this can be contrasted to non-equivalent consumption in which material culture becomes one of the prime mechanisms by which to accrue influence and obligation (see Figure 3.7 for other contrasting features of equivalent versus non-equivalent consumption patterns).

It is these middle-ground communities (with few institutionalised offices) in which the consumption of material culture may be the most confusing to interpret, as the lack of an established power base, or indeed any established sources of legitimacy (Hayden 1995: 80; Lesure 1999: 23-4; Wolpert 2004: 129; Wright 2001: 80) means that the consumption of material goods is an extremely heterogeneous practice and patterns of consumption may look "neither egalitarian or ranked" (Clark and Blake 1996: 276). Furthermore, the early stages of a shift between an 'equivalence' and 'non-equivalence' logic is likely to be accompanied by an increase in the conspicuous consumption of (i) materials that can be easily obtained and (ii) materials that can be used to attract followers; thus the focus of this type of consumption is often on the heterogeneous accumulation and usage of a wide variety of utilitarian goods (Clark and Blake 1994). As this competitive aggrandisement becomes more widely practiced, and material culture consumption becomes a more formalised medium for social negotiation within a community, this results in the need to converge upon an increasingly defined set of materials, and this often means materials that are less widely accessible to members of the group in general. In addition to this, the 'prestige' of a material must be widely understood in order to have efficacy as a means of acquiring status; thus, this may result in the reproduction of high value vessels in a more utilitarian medium, such as skeuomorphing metal vessels in ceramics (Wright 2004a: 77).

**Discerning consumption logics through material culture**

The material distinction between different consumption logics cannot be made solely through examination of the artefact itself, but necessitates an exploration of three separate contexts: the depositional, associational and physical nature of the consumed material (Dietler 2001: 90). Therefore, I will be attempting to distinguish at a general level between a competitive/aggrandising oriented (non-equivalent) consumption logic and an integrative (equivalent) consumption logic. Thus, if consumption is a reflection of dynamic activities and processes taking place within a community, then the study of different consumption logics should indicate whether an integrative or competitive ethos is at work within a community (Adler and Wilshuesen 1990: 135). While the act of consumption is by no means a homogenous phenomenon across a community, the nature of the archaeological record limits the extent to which we can access internal variability, and thus I will be focusing on defining the overall consumption logic being practiced within a community. Though admittedly reductionist in some respects, this allows for all the available information from an
archaeological context to be used, and rather than trying to tease out the internal modes of consumption being played out over long periods of time within a fragmentary material record, it should be possible to classify the dominant long-term logics of consumption being practiced at a site, and likewise, to pick up on any shifts within the overall consumption practices within a community (Costin and Earle 1989: 691).

Combining information about what something is, the context in which it is deposited and what its usage is, are ways of bypassing the need to understand the meaning of the material object in emic terms and allowing us to judge its role in materialist terms. The biggest stumbling block to this approach, though, is trying to understand the regimes of value associated with certain material goods, because it is useless to try and understand the consumption logic of community if it is unclear what general value is placed on certain material objects. While one can try and extrapolate this from the contexts of deposits (i.e. things that are found in burials may be more valuable than things that are not), this is hampered by archaeological recovery biases and imposed value systems. A retrojective approach, however, is based on the premise that once hereditary inequality is apparent in the archaeological record of a community, the material referents within this system will be codified and reified examples of those materials used in the aggrandising past of the community (Clark and Blake 1996: 276-278). Thus, if we look forwards for this kind of clear archaeological expression of formalised consumption logics (for the LEMH world, this would be the Shaft graves) those now established and formalised vocabularies of prestige would give us a great deal of insight into the materials of value in aggrandisement during the LEMH period (Wright 2001; Wolpert 2004: 129).

Simultaneous consideration of production and consumption choices

By exploring the ways that we can link both production and consumption to social relationships within communities, it is possible to (i) analyse these communities by assessing similarities and differences in terms of their production organisation and consumption logics and (ii) use the degree of similarity between communities (particularly with respect to shared production techniques) to assess the level of interaction between them. In order to address (i), let us turn to the concept of grid and group, first proposed by Douglas (1979, 1982: 3) as an alternate way of classifying communities that was not contingent on mutable socio-cultural constructs and informant-defined conceptions. This works by isolating the two basic axes that represent the major dimensions of sociality: group, which refers to the degree of integration between an individual and a community and grid, which refers to the limitations and proscriptions placed on individuals. This recognises a range of different types of social organisation related to the different potential combinations of grid and group features within
the community. The examples used by Douglas identify four basic types of groups: low grid/low group represents a very individualistic society in which there are neither individual proscriptions on actions, nor is one particularly integrated into any wider network; high grid and low group means that there are many prohibitions on individual behaviour but without many of the benefits afforded by commensurate group membership; high grid and high group is considered typical of very hierarchical societies, in which there are mechanisms of control over individual behaviour in combination with a strong concept of inclusion within a wider group; finally, low grid and high group results in an environment in which external boundaries are clear (as group membership is the key focal point), though all other positions and relationships within the community are negotiable (see Figure 3.8a).

There have been attempts to link these different social environments with forms of social organisation: for example Big Men are often linked to low grid/low group, a dictatorship with an oppressed lower class with high grid/low group, whereas chiefs are considered to be typical of high grid/high group (see Figure 3.8c) (Ostrander 1982: 18). The other two examples shown in Figure 3.8b and 3.8d, respectively, illustrate the application of the grid/group concept to the political and ideological nature of warring states in classical China (5th century BC to the 2nd century AD) and to the cosmological organisation of socially stable communities.

**Grid/group as a measure of community integration**

As reviewed in Chapter 2, the mechanisms by which LEMH communities remained cohesive without any evidence of hierarchical inequality are unknown, and while this thesis is not concerned with exploring these issues in detail, a brief exploration of degrees of LEMH integration as seen through the diversity of production and consumption behaviours will be addressed in Chapter 7. Using the concept of grid/group for this analysis of LEMH communities will provide a means of conceptualising and expressing socio-economic similarities and differences between communities, within a multi-dimensional framework from which to explore specific social, economic and political characteristics present within that community. In general, we can distinguish between two common types of integrative mechanisms, high-level and low-level, the former emphasising cohesion at a community-wide level and tending to occur in groups of more than 250 individuals (Adler and Wilshuesen 1990: figure 1). High-level integrative facilities often take the form of large communal buildings or grounds (Adler and Wilshuesen 1990: 134-5) within which to house community-wide integrative activities. On the other hand, low-level integration, "serves to integrate only a small portion of a community" (Adler 1990: 135), and thus would not necessitate the development of a village-wide notion of communality, nor any of the associated material paraphernalia for doing so.
Using a system of classification based on the degree of integration present within a community would eliminate the need to talk about ‘chiefdoms’, ‘factions’ or any other category, but instead allows classification to be based on the social environment of individuals (Ostrander 1982: 14). Douglas’ model has been widely applied to a variety of different questions, with the concepts of grid and group being adapted to the specific research question at hand. With particular reference to the questions I would like to address, I suggest replacing the grid/group axes with the degree of differentiation suggested by the traits of production, and with scalar stress/population (a reflection of the need for integrative mechanisms). In this model, the consumption logic of a community would then show which level of integration was being employed. This method could then be used to classify the material environment of different groups, represented by different types of material culture patterning (i.e. the archaeological record).

By placing on one axis the socio-economic mode of production (i.e. what degree the producers are specialised and the degree of separation between ceramic producers and consumers) and on the other population (the degree to which the communal integration is placed under stress) could allow one to assess the degree of socio-political integration and the way this is reflected in the consumption logics of a community (see Figure 3.9). This will allow LEMH groups to be classified according to a continuum of social behaviours and relationships that can be evaluated materially. Instead of slotting LEMH groups into a place on an evolutionary scale of social complexity, this creates a matrix within which groups can be characterised according to scale and materiality. This should enable us to use the diversity of production organisation and the variability of consumption behaviours to assess the degree and nature of integration within LEMH communities.

**Social fields as a measure of intra-community interaction**

In order to explore the second issue, the level of interaction between communities, let us turn to another anthropological concept that is of particular applicability within archaeology: the social field. Essentially, the social field refers to a group of social relationships and aggregates, created through interaction occurring on numerous different levels and with varying degrees of intensity (Lesser 1952: 137). Because the social field is rarely a closed system, it allows us to investigate multiple types of interaction (whether direct or indirect) between groups, which should be reflected in material culture patterning. This means we are not forced to correlate material patterns with specific social scenarios, but through the concept of the social field can explore the distributions of imported material culture, of techniques or of decorative similarities and correlate these to specific types of social interactions. This allows us to divide up the concept of trade, transmission and interaction through a number of (potentially intersecting) social fields. Using the concept of the social field in conjunction
with the information about the transmission of techniques relating to the intensity of interaction, it should be possible to isolate exchange fields (containing communities who trade material goods), interaction fields (in which ephemeral contact may have occurred), consumption fields (in which the logics of consumption between different communities is the same) and transmission fields (in which the level of technological similarity suggests population exchanges). Because ethnoarchaeological work has come to show that no single cultural, ethnic, socio-economic or environmental parameter can adequately explain why material culture is made the way it is or the patterning of its distribution, (Livingstone-Smith 2000:36), examining these different fields, and through identification of significant overlap, may allow us to understand regional dynamics and social networks.

This allows one to explore the variability between communities who, though they may superficially share material culture types and basic social organisation, are by no means comparable. This is of particular interest when considering communities on the threshold of institutionalised inequality, in which identifying the subtle differential socio-economic and political mechanisms within groups may be of significant explanatory value in understanding the long-term trajectories of those communities.

Finally, one must consider these questions of socio-economic organisation and communal integration within the context of scale as addressed in Chapter 2. Given that the scale at which activities occur has a substantial effect on the learning, transmission and indoctrination of knowledge, it is absolutely crucial to couch these analyses within an appropriate scalar context (Blanton et al. 1996: 68; Hayden and Cannon 1982).

Methodological stages

My methodology for analysing LEMH pottery is essentially straightforward, and the following section will cover the practical means of implementing it as well as the inferential links that I will be then be using to further interpret LEMH ceramic assemblages. It involves a threefold process. The first stage is to identify a set of ceramic technological attributes that are of utility in reconstructing the socio-economic structure of a local production system. These attributes must then be recorded in a precise and detailed way that will allow inter-site comparisons to be made and diachronic changes to be recognised; this recording system must also enable information to be recovered from even the most fragmentary material. Lastly, that data will be interpreted within the inferential framework laid out above and further elaborated upon below. While the methodology I propose to follow is specific to ceramics and the present discussion will be ceramic specific, it could be adapted in principle to looking at other forms of material culture. The following four features have been isolated as reflective of the significant pottery production techniques: fabric, manufacture, surface treatment/decoration.
and firing. In addition, these are features for which we have the greatest amount of ethnoarchaeological information regarding the way these techniques are practiced and transmitted.

**Fabric**

The first, and arguably, most important task is to define fabric (e.g. clay paste, texture, colour, inclusion type, shape and frequency), thereby creating macroscopic fabric groups that relate to specific production traditions/raw material resources and allow products that are compatible with the local geology and those that are clearly imports to be distinguished from one another. These macroscopic groups will then be sampled and examined petrographically to (i) verify the reality of these macroscopically identified fabric groups; (ii) identify the major mineralogical components of each fabric group in order to determine their compatibility with local geologies or to suggest their non-local origin; and (iii) explore variation within these fabric groups stemming from production decisions. Given the difficulty in archaeologically discriminating between a scenario in which a number of potters are working at a single site (and exploiting slightly different raw materials) versus pottery being traded within a localised region, the term 'local' will refer to production within a small-scale, localised area rather than at a site-specific level. However, with regard to our understanding of a production tradition, examination on a regional level should not obscure the general level of homogeneity or heterogeneity that exists within that production tradition. It is only when considering inter-community consumption (and hence movement of ceramic vessels) that we will have to address the question of locality versus sub-regional vessel movement more specifically.

The fabric-based classification of a ceramic assemblage is useful beyond questions simply of general provenance, and allows primary archaeological questions about production decisions and technological traditions to also be addressed. Though clay procurement and processing strategies have long been used as the basis for making assumptions about the mode of production (Bishop et al. 1982:32-60) or considered to be an environmentally and functionally constrained aspect of the pottery-making process (Arnold 1985; Braun 1983: 112; Schiffer and Skibo 1987, 1997), more recent research has been informative about the social dimensions of raw material prospection and processing. As the social significance of production techniques and traditions began to be more widely considered, it threw into question the assumption that had been made that the functional properties and requirements of clay determined its exploitation, and it was soon demonstrated that the importance of other, more socially-oriented factors (such as learning and tradition) may be more influential features within clay processing than environmental factors (Day 2004: 131). On the other hand, the exploitation of clay resources consistently appears to be determined by geographical
proximity; typically, the range of resource exploitation is limited to within one or two kilometres of the production site (Arnold 1985: 35-60).

Furthermore, the way that clay is processed (e.g. the addition of temper, purification, sieving, etc.) is determined for the most part by the source from which potting was learned, rather than simply on functional terms (Livingstone Smith 2000: 36-8). While potters are able to change the sources of clay that they use, the way that they have been taught to process that clay into an acceptable form for potting is a relatively fixed and resistant trait (Day 2004: 131,139; Gosselain 1995: 90-1). It is unclear whether this resistance to change in the context of clay processing techniques is due to the importance of certain clay properties with regard to subsequent stages (Day 2004:132) or to the fact that the context in which this behaviour is learnt determines the degree to which it is a stable tradition (Gosselain 1994, 1999). Hence, the continuity of clay processing decisions is one that can be used to delineate a specific production tradition; this has even been demonstrated in archaeological contexts, in which clay recipes can be shown to have a continuity of upwards of two thousand years (Day 2004: 110; Day et al. 1998; Wilson and Day 1994) This notion has been of utility in identifying the movement of potters in the Aegean Bronze Age (e.g. Cretan potters relocating to Kythera), who continued to utilise Cretan clay recipes and processing techniques despite the fact that they exploited new local clay resources (Kiriatzi 2003: 129). Thus, in summary, the replication of a specific clay recipe over time is a good indication of the transmission of a production tradition, and the inferences that one could draw from an examination of the fabrics are as follows: (i) the use of many different local clay recipes at a site is indicative of how many clay processing traditions existed, and consequently, the minimum number of potters likely to be operating, at a site and (ii) changes in clay processing are likely to relate to the introduction of new technological traditions to a site.

**Forming**

The second feature that I will be recording in detail is method of manufacture. This requires a number of distinctions to be made between different types of manufacturing techniques. The most basic distinction is between hand-made and wheel-made pots, and is of particular significance due to the fact that the use of rotative kinetic energy (RKE) to shape the walls of the vessel represents a cognitive/behavioural shift in terms of developing specific perceptual motor-skills, and therefore the two manufacturing techniques have distinct techno-economic implications (Courty and Roux 1995: 1; Roux 2003a: 15-16; Roux and Courty 1998: 748).

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14 This is also of particular relevance to the identification of 'local' ceramic products. If potters do not tend to exploit clay resources beyond a certain radius of the location of production and sites are widely spaced from one another, then this may mean that certain clay resources could be more accurately correlated to site-specific production.
Within the ‘wheel-made’ category, however, there are a number of further distinctions between manufacturing techniques that must be made. Given that this is a particularly important distinction to make, due to the implications behind specific forming techniques, a brief discussion of the nature of wheel and proto-wheel use is needed. Research into the development of the wheel in the Indus Valley, the southern Levant (Roux 2003a, 2004; Roux and Corbetta 1987; Roux and Courty 1998) and on Crete (Knappett 1999, 2004) has indirectly resulted in a large body of ethnographic and experimental information being generated to understand the mechanisms by which this craft technique develops. What has emerged from these studies is: firstly, there are a number of proto wheel-fashioning methods that can be distinguished from one another on the basis of traces left on the artefact, secondly, the change from producing hand-made to wheel-made vessels requires a major cognitive shift, reflecting not only the acquisition of irregular gestures (as opposed to the ‘everyday’, domestic gestures needed for hand-building pottery), but also in terms of the completion of a wheel-made object being predicated on the success of the preceding stages (as opposed to a hand-made vessel where mistakes can often be ‘corrected’ at a later stage) (Roux and Courty 1998: 749; Roux and Corbetta 1987: 7, 67-70, table 4) and thirdly, the techno-economic implications of wheel-use are related to the length of apprenticeship needed to master the motor-skill and cognitive complexities associated with this technique (e.g. symmetrical/combined bilateral movement).

Addressing the first issue, there appear to be several different ‘intermediary’ forms of wheel-fashioning that are often employed before the development of the ‘fast’ wheel occurs. These are techniques that utilise coiling methods to form the basic shape of a vessel that is then shaped (to varying degrees) using RKE. Given that it was unclear, prior to my study, whether the manufacturing techniques at use in LEMH period would represent these types of proto wheel-fashioning or wheel-throwing proper, it was necessary to consider the options in greater detail. In order to distinguish between wheel-making and combination wheel-fashioning techniques, certain macroscopic features must be examined, and those defined by Arnold and Bourriau (1993) such as deep, even and parallel rilling will be used to distinguish wheel-throwing proper. Many proto wheel-fashioning techniques show similar morphological features to wheel-thrown pottery and it is necessary to take great care to distinguish between these products (the presence of features such as breaks between unsmoothed coils may be useful in distinguishing these from one another). Four different varieties of wheel-fashioned pottery have been identified by Roux and Courty (1998: 748-50, see also Knappett 1999a, 2004) (Figure 3.10). While Roux and Courty provide a wide range of macroscopic and fabric microstructures that can be used to distinguish between the use of these different techniques (Figure 3.11), unfortunately, two of these four wheel-fashioning methods involve the complete obliteration of the manufacturing marks, making it very difficult to discern between
the four techniques (see Figure 3.12 and 3.13). While every effort will be made to distinguish between wheel-made and wheel/RKE fashioning this is often a problematic distinction to make although when there is enough evidence, the forming technique used will be clarified with as much specificity as possible (e.g. RKE 1-4 to designate the different RKE forming techniques). However, given the fragmentary nature of the material I will be analysing, when this level of specificity cannot be achieved, I have made a more generalised scheme for distinguishing between four different manufacture techniques. These are (i) wheel-throwing proper (ii) wheel/RKE fashioning (in which it is impossible to discern between true wheel-throwing or the employment of RKE techniques 3 and 4 which involve major forming, joining and thinning operations taking place on the wheel) (iii) wheel/RKE finishing and (iv) hand building (see Figure 3.14 for the differences between these four categories). Equally importantly, though, it is necessary to distinguish between manufacturing traces that could be confused with wheel/RKE forming and those that are wheel/RKE finishing techniques for hand-built vessels (e.g. rim wiping, resulting in a rilling effect). Thus, the three major distinctions that should be possible to make are between those vessels whose body is formed by shaping on the wheel (wheel-made and wheel/RKE fashioned), those vessels that were finished using some type of rotative kinetic energy (wheel/RKE finished), and those vessels that were entirely hand-produced (Figure 3.15).

I will also evaluate the second issue, the cognitive shift represented by adoption of the potter's wheel by judging the changing level, intensity and skill with which this technique is utilised over time by local potters. This requires that one consider both the diversity, shape complexity and size of wheel/RKE-fashioned vessel forms, the number of pots produced and the morphological standardisation of the product; this also allows for an estimate of the number of potters likely to be needed to satisfy the needs of a community (Roux 1990: 147-8).

Additionally, it should be possible to qualitatively assess the degree to which the manufacturing techniques have been integrated into the production traditions of a site. Given that the use of the wheel also imposes limitations on other aspects of the manufacturing process, such as the clay the potter can use (often a well-sieved, finer clay body is needed as it is more malleable on the wheel and comfortable for the potter). These knock-on effects may not be noticeable in the early stages of wheel use when, for example, only a narrow range of small vessel types may be produced. However, as the wheel becomes a permanent fixture in the production process, it may be possible to recognise commensurate changes in other facets of the ceramic production system (such as a narrower range of pastes being used) (van der

15 Though Roux and Corbetta (1989: 72-90) also provide a quantitative way of judging the stage of apprenticeship through aspects of vessel morphology, this requires a large corpus of whole vessels, and therefore cannot be used on the fragmentary material I am analysing.
Leeuw 1993: 272-299). It has also been noted that the adoption of the wheel often occurs alongside other technological innovations within other material classes, such as the lathe in woodworking and the use of the drill in metalworking (Almagro-Gorbea and Fontes 1997).

Finally, the practical effects of this technique on the socio-economic organisation of production are of primary importance. As discussed above, the nature of both wheel-use and hand-building require the investment of different levels of time, knowledge and apprenticeship, and, the adoption of the wheel indicates a new degree of technical specialisation (Kiriatzi et al. 1997; Roux 1990: 142-3, 2004: 21) (see Figure 3.16). The wheel is a technology that presupposes specialisation, and this has often led to the assumption that a complex politico-economic system would be needed to underwrite such division of labour (Knappett 1999a: 111-12). However, the association of certain techniques with specific forms of socio-economic organisation has been questioned, and that we should therefore re-examine our assumptions.

While the link between politico-economic complexity and specialisation may be tenuous, the wheel as a technique does appear to represent enough of a learning requirement that it is extremely unlikely that every domestic unit within a community would use it, and – at least in the modern world – there are no known examples of wheel-thrown ceramics being produced on a household level (Peroni 1989: 136; Roux 1990: 146-147). Though this cannot be equated with economic specialisation, per se, within an otherwise undifferentiated community this kind of division of labour could threaten the homogeneity of the group because it encourages the differential possession of knowledge and its transmission, leading to the creation of social identities within a group that were previously unknown (Whitelaw et al. 1997: 275). Furthermore, this activity will be undertaken “... to the detriment of other economic activities” (Roux 1990: 147), and underscores the fact that the potter would become increasingly reliant on other members of the community for subsistence, while at the same time the potter could also be a source upon which the community came to rely more intensively. Thus, the archaeological inferences that one can make from close study of the manufacturing process are twofold. Firstly, within a community, one can begin to infer the level of technical specialisation, and consequently, the implications that this investment in pottery production might have on dynamics within a community. Secondly, the nature of the forming technique is one of the most resistant to change and therefore tracing the spread of a particular forming technique should be informative about the nature of interaction occurring between groups and the intensity of socio-economic contacts (Livingstone-Smith 2000: 38,

16 An excellent non-ceramic example of this comes from prehistoric Europe, in which techniques for mass-producing armour and weaponry were being employed; this was surprising, not least because the groups practicing these techniques were those with a very limited amount of evidence of socio-political complexity, and it has been assumed that only a certain level of socio-economic complexity would support mass production (Steinburg 1977).
Gosselain 1998, 2000: 208-9). Overall, forming techniques can be used as a means of accessing information about both intra-community and inter-community integration and interaction.

**Surface Treatment and Decoration**

Two other main characteristics I will be exploring are surface treatment and decoration. Unlike manufacturing technique and clay processing, these are highly conscious decisions that affect the visual appearance of the finished pot and are subject to changes caused by interaction, experimentation and random drift. Therefore, because these techniques are “... technically malleable, easily transmissible and theoretically expected to fluctuate through time and be widely distributed through space” (Gosselain 2000: 196), they are also of limited utility in evaluating or characterising local technological traditions. However, the study of surface treatment and decoration is of importance in two respects to the present study: first, in order that the information I gather can be used comparatively, if other ceramic assemblages are principally classified using a ware-based or decorative-based system, it is necessary that I also have this information about the pottery to allow for comparison. Secondly, as was discussed in a previous section, the decorative similarities of pottery can be highly informative about interaction between groups. While this is by no means a reliable way of identifying ethnic groups, political alliances, etc. (as has been suggested in past archaeological work, for example, amongst the ‘active style’ school of material culture theory), it can help us evaluate the degree to which groups were interacting. This must take into account the degree to which the idea or the actual execution of the decoration is similar, and therefore, whether the similarity in decoration/surface treatment is related to the decoration having been simply copied or imitated versus the acquisition of similar techniques to replicate a certain design or surface treatment (Wedde 1997). Given that general decorative motifs tend to diffuse easily among social networks, the spread of these motifs can be of great utility in delineating interaction networks (Gosselain 2000: 200). However, the syntax and grammar behind the use of design motifs is less malleable or susceptible to change, and therefore may be a more fruitful way to explore decoration as a marker of specific learning-based traditions (Hardin 1970; Washburn 1978).

In order to be able to differentiate between surface treatments based on technique rather than visual appearance alone, distinctions between slipping, burnishing and polishing, have to be well defined (Figure 3.17). Experimental work was done to replicate certain surface treatments on differentially tempered clays, and has resulted in a distinction being made between burnished and polished surfaces (e.g. the difference between a hard edge tool being used to mark, often in shiny striations, a leather hard surface versus a soft cloth being used to produce a shiny finish on leather-hard clay). Therefore, the definitions of surface
appearance that I will be using are based on the technique used (this allows differentiation between a burnish and a polish, two surface treatments that may leave superficially similar surfaces, but are made using fundamentally different techniques). In addition, colour of decoration and surface was also noted as this contributes to the overall appearance of the vessel and may be useful in determining firing atmosphere. In terms of decoration, motifs and techniques were noted down, thereby allowing one to divide those types of pottery that have a superficially similar appearance and those that share technical similarities (e.g. those painted vessels that use iron-based rather than manganese paints).

The way in which these surface treatment and decoration can help to reconstruct the socio-economic basis of production is questionable, though it has been argued that increased decorative investment (the time and skill needed to produce a certain decorative effect) is indicative of a mode of production attached to an elite whereas increasing efficiency of production is the hallmark of independent specialisation (Costin and Earle 1989; Costin and Hagstrum 1995; Feinman et al. 1981). However, the link between these concepts remains tenuous, and ultimately, decoration and surface treatment remain poor criteria from which to develop inferences about the socio-economic context of production.

**Firing**

The final technique of relevance is the firing of a vessel. This technique has been shown to be susceptible to (potentially) conscious change due to the fact that firing is often collaborative between numerous pottery producing groups (in many cases due to the cost of fuels) (Gosselain 1992, 1998, 2000; Livingstone Smith 2001). Due to this, many individuals provide input about the way in which to fire a kiln, and this dynamic interaction results in changes occurring at a more frequent rate than in an activity undertaken independently. Due to this propensity for change, then, firing techniques are not a particularly good marker of technological traditions and continuity. However, while there is no clear relationships between specific firing practices and the organisation of production, it should be possible to assess (to some extent) the skill of the potter and the nature of the installation in which firing took place. The relative skill of the potter in achieving and maintaining a specific atmosphere, temperature and desired effect (i.e. the colour of the exterior of the pot) may be indicative of the knowledge and technical specialisation of the potter, and a wider assessment of the labour and material requirements for firing (e.g. kiln, fuel, etc.) may prove informative about the wider socio-economic implications of firing in general within a community. Given that kilns are by no means a more economically efficient practice than open firings, the development

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17 Kilns are much less fuel-efficient, and though they tend to minimally reduce the firing losses, this may be offset by the labour costs associated with kiln construction and extra fuel acquisition (Rice 1987: 162).
of kiln technology often relates more closely to the production of an object with a specific visual appearance, rather than to reasons of economic efficiency.

In turn, the degree to which firing practices have been integrated within the wider production tradition may be informative about the coherence of a technological tradition. For example, coarse fabric vessels are much more resistant to rapid temperature change due to their overall porosity, and hence are much better suited to open firings in which temperature change occurs with extreme rapidity. However, fine-grained ceramics often cannot withstand these abrupt temperature changes and therefore are much better suited to kiln firing in which the rate of temperature change can be more precisely controlled (Rice 1987: 90-93, 104-5). Thus, changes in firing techniques may correspond to other shifts within a system of ceramic production and this may be a way in which to understand the overall integration of a ceramic production tradition.

Four categories have been isolated that are directly related to the firing conditions and atmosphere: these are 'oxidised', 'reduced', 'oxidised (incomplete)' and 'reduced (incomplete)' (Figure 3.18). Division into these categories is based on both the firing cores and surface appearance of the pottery as well as the evenness of colour (Rice 1987: 156, 345; Rye 1981: 121). A particularly uniform colour is indicative of the fuel and pottery being separated during the firing process; in the case of reduced pottery, a light grey colour (as opposed to black) can only be produced in a very narrow range of atmospheric conditions (Vitelli 1994: 143) In addition, other characteristics of pottery can also be seen as a reflection of the control exercised by the potter over the firing atmosphere, such as the ability to produce a particular decorative appearance. This is most notable in terms of creating certain decorative effects, such as dark-on-light and light-on-dark painted pottery, though this is as dependent upon the chemical composition of the paint as the firing atmosphere. For example, manganese paints will turn dark during firing regardless of the firing atmosphere (Farnsworth and Simmons 1963: 389), whereas iron oxide based paints will fire red in an oxidising, low temperature atmosphere but will be dark (purple-brown-black) if a three-stage (oxidation, reduction, oxidation) firing is achieved (Noll et al. 1975; Vitelli 1993: 8-9). This is another way to judge the temperature, atmosphere and control that the potters had over the firing.

Lastly, a number of other features can also be used to judge the firing temperature of the pottery; these include: (i) the presence of burnish or polish, created by the compaction of the illitic components in the clay, and only maintained if the clay body is fired below a temperature of 900°C (Kilikoglou 1994: 72-73); (ii) the presence of crystalline calcite within the clay body, indicating a firing temperature between 650 and 900°C (the temperature at which calcite tends to lose its crystalline structure); (iii) the presence or absence of sintering or vitrification of the clay body which occurs at temperatures of c. 900°C; (iv) the presence of carbon cores that tends to indicate a firing temperature of or below 650-750°C (Rice 1989:
Though these criteria are not a comprehensive evaluation of firing atmosphere and temperatures, they do allow for an evaluation of the general level of control over the firing conditions, and the level of knowledge, skill and familiarity possessed by the potter.

Having thus established criteria for systematically recording techniques and exploring a range of inferential links between those techniques and levels of production specialisation, socio-economic organisation and inter-community interaction it should be possible to begin to explore the nature of LEMH period production and communal organisation. This must be couched in terms of the techniques they were using that might indicate a certain level of specialisation, the way those techniques change over time and what the techniques can tell us about the number of producers within a community. We can also explore the level of interaction taking place between different communities or regions through a synchronic examination of technological variation, transmission and imitation. For example, by contrasting zones in which forming techniques are shared versus zones of superficial imitation, where only decorative characteristics are imitated, it should be possible to delineate zones of interaction which reflect different degrees and processes of connectivity.

This methodology has highlighted those techniques of ceramic manufacturing systems in which temporal changes in, and spatial differences between, techniques are most likely to relate changes within the production system of a community and significant technological differences between communities. While no inferential methodology will ever be able to define absolutely the social and organisational changes in a community that occur alongside changes in a system of production, evaluating the resources, labour mobilisation, specialisation and transmission of knowledge associated with specific techniques can allow inferences to be made about the sub-systems and structures within a community that are most likely to be affected by these production traditions.

**Past approaches to LEMH ceramics**

*Typologies and classification: the problem with wares*

Having explored the ways in which ceramics can potentially be used to explore social, economic and political questions, it seems appropriate to return to the LEMH mainland and ask how pottery has been used in the past as a tool for deriving information about the period and its people. In examining the questions that have already been asked about LEMH pottery,

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18 Though discussed in detail in Chapter 2, I must reiterate the qualifications upon which the dating of the pottery lies and the difficulty of separating out phases within the LEMH period. Given that, with the exception of Howell (1973), no one has ever discussed the LEMH period as a conceptual unit, this means that while the EHIII period is often discussed separately, the instances where the MH period has been sub-divided into MH I, II and III phases are sporadic, and thus much of my discussion of LEMH ceramics is based on my own divisions using the criteria laid out in Chapter 2.
this should highlight not only the information we have available to start the present investigation, but should also classify the ways in which some of the questions that I will be asking have already been approached from a different paradigmatic angle. Pottery has been far and away the dominant class of material evidence by which to define and explore this period. First, I will review the main ceramic types that are associated with the EHIII and early MH periods, and address the different ways that LEMH pottery has been divided and classified. Second, we will turn to explore the ways that pottery has been used to address questions of LEMH organisation, complexity and interaction.

The two common pottery types of the MH period are Grey Minyan and Matt Painted (originally Mattmalerei). Grey Minyan was first named by Schliemann during excavations at Mycenae (1878) and Orchomenos (1881) and is classically defined as being of very fine clay, wheel-made, polished and evenly fired in reducing conditions (Blegen 1921; Childe 1915; Forsdyke 1914; Zerner 1978: 135) Only during the 1950's excavations at Lerna, and their provision of a good stratigraphic EHIII-MH sequence, did it became clear that there was an EHIII predecessor to Grey Minyan: Fine Grey Burnished pottery (Howell 1973; Rutter 1983: 349). Matt Painted, a dark-on-light painted style of pottery often consisting of large, closed vessels, also appears to be derived from the pattern-painted pottery of the EHIII period (Buck 1964; Graziadio 1982; Rutter 1984a). Thus, these par excellence examples of MH pottery should be more widely considered to be typical of the LEMH period (see Figure 3.19 for examples of typical LEMH pottery types).

These two pottery classes typify the classification system based on the concept of decorative ‘ware’, groups of pottery categorised together because they share a similar basic visual appearance. This ware-based system has typically dominated LEMH pottery classification schemes. The first comprehensive system for dividing up MH ceramics was proposed by Blegen (1921), and consisted of four main classes of ceramic types with a number of sub-divisions as follows: Minyan (divided into True Grey or northern Minyan,

19 However, it should be made clear that there are some differences between EHIII and early MH pottery, and the first of these is with regard to shape. For example, the EHIII tankard and ouzo cup do not continue into the MH period, though in the case of the tankard, it might be possible to envisage its development into the MH kantharos. The second major difference is in the use of matt-paint to decorate vessels. Often assumed to be manganese-based paint due to its dull colour and consistent dark-purplish firing colour, the universality of the shift to the use of manganese-based paint throughout the mainland is questionable. Overwhelmingly, though, there are more similarities than differences between EHIII and early MH pottery, and those elements that do change between these chronological periods are related to the more mutable aspects of pottery production and are therefore indicative of small-scale changes. More significant is the departure the EHIII assemblage made from the typical EHII types such as the handleless saucer and sauceboat.

20 This is significantly different from Rice's (1976) definition of a ware-based classification system relating to production. In her scheme, pottery was categorised in the same group if it had the same fabric type and technological features, with decoration being of much less significance. Thus, Rice's concept of a 'ware' group is very close to the technological groups I will define here, but the term ware will not be used given its appropriation by those referring almost exclusively to surface treatment and decoration.
Argive Minyan and Yellow Minyan), Matt Painted (divided into Coarse and Fine varieties), Mainland wares corresponding to the Middle Minoan period (generally also referred to as Lustrous Decorated or Minoanising pottery; decoratively, if not fabric-wise these refer to at least two different styles, see Zerner 1978: 160), and finally, Coarse Domestic pottery. Though these divisions were extremely useful in creating recognisable and grossly datable ceramic groups for the post-EHII mainland, the later uses of these nomenclatures rarely take into account those original criteria, including presumed area of production, fabric and surface treatment, that Blegen intended.

The systems of EHIII and early MH pottery classification that came after Blegen, such as those by Goldman (1931), Buck (1964), French (1972), Dietz (1991) and Rutter (1995) have all used surface treatment as the primary feature to create ware groups (see Figure 3.20 for selected examples of these classification systems), with other criteria, such as fabric, being used only to distinguish between the textures within certain ware groups. The uniformity imposed by this system has admittedly created a system of ceramic classification that can (with varying degrees of success) be applied to the wide geographic area of the LEMH mainland and has been the basis for making chronological comparisons between sites. However, the use of this ware-based categorisation system as the primary means of typologically dividing pottery in the majority of LEMH publications has imposed a seeming uniformity to the LEMH ceramic record that simply does not exist (Stocker 2003: 360; Zerner 1986: 58-73) and is of little usefulness for addressing the questions about ceramic production posed in this thesis.

While these over-arching typologies may be necessary in the early stages of archaeological investigation into a poorly known period or region, this type of pottery classification eventually serves to obscure significant variations and has made anything but the most superficial comparisons between LEMH sites from published data all but impossible. We end up with ceramic types that are related to the way they look rather the way or the place where they were made. Exemplifying this problem is Grey Minyan (GM), in which a highly varied range of criteria – broader than those originally designated by Blegen – are now being used to specify something by the name of Minyan. Generally, these rely on a pot having a dark grey/brown/black burnished or polished surface, with limited consideration given to other factors like fabric or manufacture technique. Therefore, while many different types of pottery tend to be grouped under the name ‘Grey Minyan’, identical ceramic types (in terms of form, fabric and manufacture technique) have been placed in entirely different classes due

21 Even though the term Lustrous Decorated refers to a specific fabric group, I will attempt to specify whether the specific pottery I am discussing refers to one with ‘Minoanising’ decoration or one with the more linear ‘mainland’ type decoration as I believe this may be illustrative of different patterns of consumption.
to relatively minor differences like firing atmosphere (for example, Yellow Minyan or Lefkandi II 'plain ware', which appear identical to Grey Minyan with the exception of colour but is not categorised under the same general class) (Howell 1968: 9; Zerner 1993).

Thus, GM has become a widely used catch-all category of LEMH pottery, a development that has obviously limited its usefulness for discerning patterns of past behaviour for the simple reason that such a homogenising classification scheme has made discerning local products from publications nearly impossible. Consequently, with only such information to hand, any widespread comparison of local production traditions could not be addressed. For example, in the Nichoria site report, a class of pottery is dubbed Minyan, even though it apparently bears no resemblance to NE Peloponnesian or central Greek 'Minyan' in fabric, manufacture or surface treatment. The somewhat misleading application of the term is even admitted by Howell (1992: 43), though he retains the name 'Minyan' for describing a class of (admittedly dark-faced and burnished) pottery that bears little resemblance to Minyan found elsewhere. The retention and application of such terms may be one of the reasons why over one hundred years after its original classification, the production locations of GM are still unknown. Equally problematically, this lack of clarity also compromises our ability to distinguish between local and imported products, making it difficult to gauge the consumption patterns at a site beyond the most superficial aesthetic evaluations.

More recently, pioneering work by Zerner (1978, 1993) has advocated an entirely different way of classifying transitional EH-MH and MH ceramics, based on her study of the pottery from the site of Lerna. Zerner's work broke down many of the rigid and over-generalised ware groups and was critical in identifying ceramic fabrics that could then be loosely associated with production locales (namely, Quartz Mica Dark Burnished with the Argolid, Lustrous Decorated with the southern Peloponnese and Gold Mica with Aegina). This allowed Zerner to then sub-divide these fabric groups into 'decorative traditions' that corresponded to surface treatment groups, and often occur in a number of ceramic pastes. A similar concept, but based on techno-stylistic zones, had been explored by French (1973: figure 7.1) dividing the mainland into Peloponnesian, Euboean and Boeotian/Phocian ceramic regions.

By recognising that similar looking vessels were being produced in different fabrics and using different techniques in certain areas, it becomes possible to distinguish the main classes of imported and locally produced pottery; in so doing, variations in the assemblage stemming from import/consumption choices could be differentiated from those relating to

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22 Though historically assumed to have been produced in the southern Peloponnesse (at Ayios Stephanos, for instance) or on Kythera, Kiriatsi's (2006) recent re-evaluation of petrographic, technological and decorative data from Lustrous Decorated pottery suggests a production location at Lerna (Kiriatsi 2006). This will be discussed in more detail in Chapter 6.
local production decisions. Furthermore, the identification of imports from other regions then helped to define what the core of other local assemblages should look like, and consequently, a method of classification relating to production groups was proposed for characterising LEMH ceramics. This system of classification was able to demonstrate a hitherto unknown level of trade and interaction on the mainland (Zerner 1993: 50-51). This has been borne out by the chemical analysis (NAA) of MH ceramics from central Greece, in which ΔIB type Matt Painted beaked jugs show such close chemical compositions as to suggest their manufacture in the same workshops and yet appear widely distributed throughout central and northern Greece (Mommsen et al. 1996: 6).

Even more recently, a large-scale programme of analyses has been undertaken to systematically identify macroscopically and petrographically defined fabrics that could be used as a means of isolating regional ceramic traditions and fabrics. So far, preliminary reports of this combined macroscopic/petrographic approach have been published for Lerna (Whitbread 2001), the Aspis, Argos (Kilikoglou et al. 2003), Eleusis (Faber et al. 1999), as well as an overview of work being undertaken at Ayios Stephanos, Aegina, Kirha and Orchomenos (Whitbread et al. 2002). What has emerged from these studies is that the common ware types of the MH (Minyan, Dark Burnished, Lustrous Decorated) have diverse enough petrographic signatures to suggest their having been produced using a number of different clay bodies (and, therefore, presumably at a number of different locations). Grey Minyan was produced in a number of different clays (calcareous, non-calcareous and some containing bauxite); Dark Burnished is also produced in calcareous and non-calcareous clays, though it appears to have a generally more uniform textural composition. Lustrous Decorated, though apparently produced from different clay bodies, has a surprising regularity of inclusion type (well-sorted sand). All of these wares also seem to have been locally produced on Aegina, which has a very distinctive petrographic signature (Kilikoglou et al. 2003: 133-4; Whitbread et al. 2002: 123-124). Therefore, it seems likely that there were a number of sizeable pottery production centres during the LEMH period, suggested by the uniform chemical composition of some central Greek ceramics, and by the fabric, morphological and decorative uniformity of Aeginetan and Lustrous Decorated pots (Maran 1992: 179-214; Nordquist 1995: 205-206). However, this does not preclude the possibility that smaller-scale local production occurred alongside these larger systems of pottery production and distribution, particularly as the analytical programmes have, to date, focused on samples from larger communities.

This type of fabric- and technology- based approach to LEMH ceramics has provided the best insights into the dynamics of LEMH communities, allowing one to examine local production traditions and their spread as well as assessing the consumption and importation practices within a community. However, two major problems still exist with implementing
this approach. Firstly, the lack of full publication (of the Lerna material, particularly) has resulted in other scholars only using this system of classification to a limited extent. In addition they continue to treat presence of a certain ceramic type as evidence of its local production (Kilikoglou et al. 2003). For example, the presence of two wheel-made Fine Grey Burnished vessels at EHIII Lerna, are taken as an indication of local use of the wheel, though within Zerner’s scheme, this class of fine grained pottery is associated more heavily with a central Greek provenance than a local, Argive one (Rutter 1995; Zerner 1993: 47-8). In fact, not only from the point of view of fabric, but also from a technological one (given the specific social preconditions for the adoption of the wheel and the fact that continuous and/or increasing wheel use is not attested at MH Lerna), the likelihood that these vessels are locally made seems low. Furthermore, the other wheel-made products found in EHIII Lerna are equally ambiguous as local products, including Fine Burnished non-grey (presumably the oxidised equivalent to Fine Grey Burnished) and Light-on-Dark decorated (a decorative treatment associated most convincingly with central Greek products (Rutter 1982: 73-4, 1983: 336). Though Rutter (1983a: 351) recognised the possibility that these vessels are imports, he argues against such a scenario, citing the inconceivability of all EHIII Fine Grey Burnished pottery being the product of a single production centre. However, recent petrographic work on the MH version of this pottery type (Grey Minyan) has shown that there may be a number of production centres, but none of them need necessarily be Lerna.23

The second problem of implementation is that even when a fabric-based system of classification was used, the fabric sub-divisions continued to be applied within the constraints of the surface/decoration-based ware categories. This means that it is often impossible to look at a published site report and understand the range of vessels, techniques and decorative motifs being produced in a single fabric (and, possibly by a single producer at that site), as well as whether this fabric is local at a regional level and therefore, the native local production and consumption practices. While Zerner’s system has been enormously successful in drawing to our attention the number of producers within LEMH pottery traditions and the degree to which regional interaction can be traced using these criteria, there still remains a great deal to be done in terms of (i) tracing what production traditions look like at different sites and (ii) using the spread of certain technological characteristics to inform us about interaction beyond that simply of the material exchanged as the vessels themselves.

23 Rutter (1983: footnote 70) also mentions that NAA analysis of a single fine grey wheel-made bowl from Lerna was chemically compatible with having been produced locally (Attas 1982: 49), though this single example is questionable due to use of trace elements alone to characterise local chemical signatures (see a similar argument regarding Attas’ [1982: 133] attribution of two Minoanising sherds to a local Lernean provenance, and the problematic nature of this based on the exclusion of calcium concentrations, in Whitbread 2002: 124).
By way of illustration, consider briefly, the contrasting distributions of Aeginetan pottery and Matt Painted (MP) pottery (Figure 3.21). Due to the distinctiveness of Aeginetan fabrics (biotite often being visible on the surface), this is one of the few categories of LEMH pottery that has been widely classified on the basis of fabric, and consequently, production location. On the other hand, MP is a superficial designation based on manganese painted linear decoration. When one contrasts distribution with that of Aeginetan, a pottery type correlated to a specific production location, much more coherent pattern of distribution emerge for the latter. The spread of Aeginetan pottery actually refers to a pattern created by exchange, rather than the distribution of a decorative treatment, the latter most likely relating to the variable interaction of communities based on geographical proximity (Gosselain 1998, 2000: 191).

If we integrate additional technological information (about forming and firing, for example) with fabric information of the kind detailed by Zerner, it may be possible to develop technological classes by which to categorise LEMH vessels. Figure 3.20 details an example of this, looking at concordances between three different existing systems of LEMH pottery classification, and a fourth based on what I have tentatively identified as technologically distinct classes of LEMH ceramics (based not just on fabric but other technological features such as firing and manufacturing techniques). This approach will open up two opportunities: (i) the large-scale producers and specialised workshops of MH pottery production should become apparent, and not be obscured by other local household industry and (ii) regions in which similar technological traditions prevail should become identifiable even if production occurred at a number of different sites within such regions.

Elsewhere within the field of Aegean prehistory, ceramic specialists have been using an integrated fabric- and technology-based approach to great benefit (Day et al. 1998; Kriatzi et al. 1997; Knappett 1999a, 1999b; Whitelaw et al. 1997). The development of pottery studies on Crete has shown that the use of local fabric- and technology-based classifications for pottery do not preclude ceramics being correlated with wider regional chronological horizons. The Cretan example has illustrated that even after the long-term employment of ware-based pottery typologies, new provenance and technology based classificatory systems can be employed that allow a much greater understanding of local and regional production and consumption patterns to be achieved (Whitelaw 1983).

The manner in which LEMH pottery has historically been classified means that the types of questions I would like to pose cannot be answered through a straightforward

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24 As early as 1910, Dawkins and Droop noted that Minyan "... technically, is one of the best of the prehistoric wares; artistically its merits are humble" (1910: 17), already suggesting that a close examination of the techniques used to make certain LEMH pottery types may be a profitable avenue for investigation.
investigation of LEMH ceramics as they are currently classified, and requires both the primary re-examination of LEMH ceramic material and the re-interpretation of published material into categories that relate to production and manufacturing choices rather than visual appearance.

**Addressing origins**

Having briefly examined the difficulties inherent in the way that LEMH pottery has been classified, let us review the way that pottery has been used as a tool for understanding the socio-economic, political and ideological dynamics of LEMH groups. Originally, investigations into LEMH pottery types were largely concerned with determining the 'origin' of many LEMH pottery types, particularly Grey Minyan. Given that its appearance seemed to coincide with a time of (assumed) widespread destructions (see Chapter 1), plus the introduction of a new repertoire of ceramic shapes and surface treatments, Grey Minyan became one of the most concrete pieces of evidence for the appearance of the so-called 'coming of the Greeks' (Blegen and Haley 1928; Doumas 1996; Hood 1986). In this sense, LEMH pottery became a tool through which to trace the ancestry of these invading populations (Childe 1915; Forsdyke 1914).

Minyan pottery, the most recognisable and widespread LEMH ceramic type, was thought to have an Anatolian origin due to its similarities with the material Schliemann had excavated at Troy (Childe 1915; Forsdyke 1914: 145). Central European and north Balkan origins for its makers have also been argued (Fuchs 1937: 95-144; Persson 1938: 433-34), but this is often based on a wider range of non-ceramic evidence. The Anatolian origin of Minyan pottery was raised again with the recognition of the late EHII Lefkandi I/Kastri group assemblage that morphologically and technologically showed a great deal of similarity to western Anatolian types. While the western Anatolian influence on the Lefkandi I/Kastri group material has been convincingly argued (French 1968; Mellink 1986; Rutter 1979), any direct link between Anatolian pottery and LEMH pottery groups is less apparent, with no evidence existing for EHIII and MH Fine Grey Burnished pottery having an Anatolian origin (Crossland 1973: 12; contra Mellaart 1958).

More recently, Rutter’s (1979, 1982, 1983, 1995) research on the origins of EHIII ceramic traditions (most notably that of Fine Grey Burnished and pattern painted pottery) have begun to address fundamental questions about the way in which LEMH pottery came to look the way it did. His argument (Rutter 1979) that EHIII ceramic traditions, particularly in

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25 Though, interestingly, while Childe (1915: 207) does not deem this to be sufficient evidence of an invading population, he does note that there is a strong Anatolian influence visible in the material culture of Euboea and the northern Aegean, a conclusion that will often be reiterated about the EHIII-III period (Nakou 1995; Rutter 1979).
the northern Peloponnese, are the result of the fusion of EH II mainland traditions and the new, incoming influence of the Lefkandi I/Kastri group assemblage and central Greek ceramic traditions, has been widely accepted. However, this explanation remains a largely descriptive one, rather than one that takes into account the transmission of knowledge and the changes in production techniques and consumption demands that this shift in pottery types and techniques implies. Though incredibly thorough (and surely in large part correct) the specific technological and stylistic attributes that are differentially adopted in order to form this 'hybridised' pottery type are not explored in great detail. This is partially due to the lack of detail available about local pottery traditions (due, in no small part to the ware-based typologies which define the LEMH ceramic sequence), but there has been also little attempt to unpack what elements/techniques of ceramic traditions were incorporated into this new hybridised product, and given that the emulation of the visual appearance of a pot has fundamentally different implications to the adoption of a forming technique, this would seem to be an essential place to start such an investigation. While Rutter's analyses of EHIII ceramic traditions have addressed numerous questions about the nature of interaction and the development of exchange networks within this earliest part of the LEMH period, one of the most profound statements about the LEMH world gleaned from ceramics comes from a consideration of the EHII-III shift. Comparing the ceramic repertoires of EHII and III, Rutter has argued that during the EHIII period, specialised ceramic goods first appear. Unlike the pottery of the EHII period, these EHIII ceramics might not appear to be as homogeneous, but this might constitute a shift away from exchange, oriented around enhancing social cohesion (in EHIII) to economic, commodity-based trading (in EHIII) (Rutter 1993: 27-29).

Another significant contribution to LEMH pottery studies, and to our conception of LEMH communities in general, comes from Nordquist (1987, 1995a) who raises practical, ethnographically informed questions about the politico-economic nature of LEMH communities from the evidence of ceramic production. She has suggested that multiple modes of production were likely to co-exist simultaneously on the mainland (1995: 202-7), though for the majority of the LEMH period the Peloponnesian material seems to indicate nothing above basic household level production; indeed, she considers the Peloponnesian shift to wheel-use as occurring only when palatial demand for the pottery developed (Nordquist 1995: 207).

**Thinking about consumption in the LEMH**

Lastly, study of the consumption of pottery during the LEMH period has been taken as a means of exploring complexity, social organisation and interaction. However, the general paucity and overall poverty of material goods (almost exclusively pottery) within the LEMH has curtailed the depth of these investigations.
Consumption during the LEMH has essentially been approached from three angles. Firstly, investigations of domestic deposits to delineate forms of social organisation and interaction within LEMH communities, such as the pairing of drinking vessels within houses at Asine and Tsoungiza, suggesting small-scale household level domestic interactions playing a primary role in social cohesion (Nordquist 1987, 1999; Rutter 1993: 27-29). Secondly, the examination of vessels within burial deposits has been employed to gauge potential regimes of value and expressions of status (including archaeologically invisible metal vessels being represented by ceramic skeuomorphs) (Nakou 1997b; Voutsaki 1988; Wright 2004; Wolpert 2004). Thirdly, the consumption of imported vessels at a site has been interpreted as a sign of large-scale interactions and mainland-wide networks. Regarding this final point, we have a severe information deficit with regard to the origin of many LEMH ceramic products. While there exist excellent studies from the EHII mainland (Attas et al. 1987), EMII (Whitelaw 1983) and MMII Crete (Knapett 1999b) illustrating how provenance studies have revealed complex inter- and intra-regional networks of exchange and consumption, no such information is yet available for the LEMH mainland, and the continued use of ware-based ceramic typologies makes this information unattainable from even recent published reports.

Moreover, there are two major hindrances to studies of LEMH consumption at both the site-wide and regional level. At a site-wide level, too few LEMH sites have been sufficiently horizontally exposed to provide any kind of meaningful pattern among domestic units; in addition, the patchy nature of rescue excavations means that only windows into either households or burials are revealed (e.g. at Thebes and Argos, specifically), meaning that in order to compare consumption patterns at a site, it is necessary to compare domestic and mortuary behaviour. Until we have a greater amount of available data, the simple site-level approach that I have suggested above, in which the overall nature of the assemblage is evaluated to determine the overarching consumption logic of a site, will be necessary to allow these obstacles to be overcome.

**Conclusion**

At the end of this review, it becomes clear that we are in a good position to address the questions posed at the beginning of this chapter with regard to LEMH pottery. The recent increasing focus on identifying regionally local products on the LEMH mainland, combined with the development of theoretical perspectives about the nature of ceramic production and technology, gives us a chance to use this integrated methodology to explore the socio-economic dynamics of small-scale communities. By establishing what the differences between regional ceramic production traditions and patterns of pottery consumption are on
the LEMH mainland, we have a chance to explore and contrast the socio-economic basis for production between communities and the different roles that ceramic material culture played in maintaining or renegotiating the operational structure of a community. Furthermore, by tracing technique similarities between regional production systems, we can begin to gauge, with a much greater degree of accuracy, the level of interaction occurring between groups; this can be contrasted with other types of interaction, as indicated by decorative similarities between material culture types and as suggested by the patterning of imported material. We can then combine these three dimensions of materiality (production, consumption and interaction) to begin to comprehend the levels of socio-economic diversity and degrees of integration present within LEMH communities.
CHAPTER 4
LEFKANDI IN EUBOEA

The location and extent of the site

The site of Lefkandi is located in the centre of Euboea's western coast, a location that offers immediate access to the wider Aegean via the conduit of the Euripos Strait (which narrows to only 80 metres at neighbouring Chalkis) and the northern and southern Euboean Gulf. The site is also situated on the eastern edge of the Lelantine plain, attested as one of the most agriculturally productive areas in classical Greece (Popham and Sackett 1968).

As reviewed in Chapter 2, the prehistoric geography of this central Greek area is somewhat under-explored, though a preliminary extensive survey of Euboea has indicated that Lefkandi was one of the major sites of the LEMH period (along with Manika, Eretria, Amarynthos, Nea Styra and Ayios Nikolaos in the south), probably covering about 4-5 hectares at a conservative estimate (Sackett et al. 1966: 60-61). However, one cannot look only at Euboean sites to understand the role that Lefkandi's nodal position must have played in terms of interaction between communities. The proximity of Lefkandi to the mainland (particularly along the trans-Boeotian routes mentioned in Chapter 2), and the relative ease with which the Euboean Gulf could have been traversed at this point, means that Euboea cannot be considered as a discrete entity. Therefore, the central Greek region, and particularly those sites on the opposite mainland coast to Lefkandi (particularly Petrakhos and Dramesi) must be afforded equal significance when contextualising this site.

Archaeologically, the site of Lefkandi is defined by two primary foci: the Iron Age cemetery area (containing the Toumba building), located in the north-western area of the modern town, and the Xeropolis mound, located about 500 m. to the east. During the 1966 survey, LEMH material was found at Toumba, Xeropolis and along the promontory running south-east from Xeropolis (Sackett et al. 1966: 61), suggesting a wide focus of activity during this period; however, the focus of this investigation is on the material recovered from Xeropolis (Figure 4.1).

The Xeropolis site is a high mound measuring approximately 400 metres by 120 metres, with sea cliffs on the southern edge of the site and two small bays to the east and west. In antiquity, the eastern bay would likely have extended further inland, creating a port or harbour location for the site.
Excavations at Lefkandi and previous scholarship

In 1964 to 1966, excavations were carried out under the auspices of the British School at Athens. Though the excavations were originally intended to investigate the later Mycenaean, Proto-Geometric and Geometric occupation of the site, the abundance of earlier prehistoric material (Early and Middle Helladic) found in trenches widely dispersed across the mound, provided cause to excavate a deep sounding (Trench CC) on the north-eastern edge of Xeropolis. In addition, substantial amounts of prehistoric material were found in Trial X (north-central) and Trench B (south-west) (Figure 4.2).

Trench CC descended to a depth of over 8 metres before hitting bedrock; the depth necessitated the original dimensions of the trench to be narrowed from 5 metres to almost half that size (see Figure 4.3). Though very little horizontal exposure was achieved in the deep sounding, stratigraphic and occasional architectural indications allowed for the prehistoric material to be divided into six main phases. With the exception of a brief preliminary report, however, none of the earlier prehistoric material or stratigraphy has been published (Howell in Popham and Sackett 1968: 2-12). Almost no other work has been published on the prehistoric material, with the exception of 36 samples of Lefkandi pottery included in the petrographic analysis of central Euboean ceramics undertaken by the Fitch Laboratory (Day 1986). Notwithstanding this lack of publication, the stratified sequence from Lefkandi has been considered instrumental in establishing (i) a stratigraphic sequence of the Greek mainland ceramics between EHII and MHIII and (ii) the development of MH ceramic groups.

Furthermore, the unusual nature of the earliest material (late EHII) from the deep sounding ensured that Lefkandi was to achieve a position of importance within academic discourse on Aegean prehistory. The appearance, during the later part of the EHII period, of new ceramic types at Cycladic and eastern mainland sites (which have been eponymously named for the sites at which they were originally identified: the ‘Lefkandi I’ assemblage on the mainland and the ‘Kastri group’ in the Cyclades) has ensured the significance of Lefkandi (Renfrew 1972: 103-5; Rutter 1979: 1-6). These ceramic types (almost exclusively vessels for serving food and drink) are western Anatolian and eastern Aegean in origin; the appearance of this pottery has often been equated with an intrusive population and the destructions that occurred at many sites at the end of EHII (Doumas 1988; French 1966; Rutter 1979). Yet

1 The date of the Lefkandi I and Kastri group assemblage has long been debated, though it cannot be discussed in the scope of this thesis. Summaries are found in Rutter (1979, 1995: 647), Manning (1995: 52-56, 1997: 147-150) and Sotirakopoulou (1993), and a date of late EHII now seems generally accepted. The numerous correlations that can be made between the Lefkandi I phase and the late EH II, and the occurrence of many typical ‘Lefkandi I’ shapes in EH II or EC II contexts seem convincing evidence of this. Also, given that Lefkandi II levels show strong correlations with early Lerna IV (the presence of a single ouzo cup - one of the earliest Lerna IV shapes, shoulder handled bowls, Dark-on-
given the piecemeal adoption of a limited number of Lefkandi I/Kastri Group shapes at various sites, the small percentage of an assemblage that these vessels compose, and the lack of other associated foreign material culture, this invasion hypothesis can generally be dismissed (see Broodbank 2000a: 309-314, for the this argument in the Cyclades).

The introduction of these new shapes, however, is also accompanied by the introduction of a new type of manufacturing technique: the potter’s wheel. The plate, the Lefkandi I group shape that is most commonly wheel-made, appears at only a limited number of Greek mainland (Lefkandi, Manika and Pevkakia, as well as Ayia Irini on the island of Keos), and it has been suggested that Lefkandi is the only known site where wheel-made pottery appears to be produced locally (Wilson 1999: Table 3.3). For instance, the pink-buff wheel-made plates that appear at Ayia Irini III on Keos, are considered ‘Euboean’ imports (Wilson 1999: 99-103). This will be given further consideration in Chapter 6.

Though strictly outside the chronological remit of this thesis, the introduction of this ‘Lefkandi I’ assemblage bears heavily on the technology and ceramic manufacturing traditions of the succeeding phase in all areas of the mainland. For example, some elements of the form and decoration of EHIII ceramics are often viewed as alien to the earlier Peloponnnesian ceramic traditions and are thought to reflect the hybridisation and modification of the Lefkandi I group with the local traditions (Rutter 1982: 348). Given that Rutter (1983a; 348) goes on to plausibly suggest that the technology of early Peloponnnesian LEMH pottery seems to have come from central Greece, it seems of critical importance to trace the development and transmission of these technologies. As discussed in Chapter 3, the implications of the adoption and uptake of the new technologies represented by the Lefkandi I assemblage have never been fully explored. For this reason, the techniques behind the Lefkandi I/Kastri group are vital to understanding the development and transmission of early LEMH ceramic production traditions.

Therefore, a full technological study of the Lefkandi material can provide critical information about the adoption, uptake and transmission of new techniques that are fundamental to understanding the development of ceramic traditions amongst the communities of the Greek mainland in the LEMH period.

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Light painted wares, Fine Grey Burnished wares and knobbed coarse wares) it is logical to assume that Lefkandi I represents a period preceding early Lerna IV: late EHII.

2 Though this will be discussed in greater detail below, the wheel-made shallow bowls I have observed at Lefkandi occur in a fabric that – due to the frequency with which it occurs – is very likely to be from a local clay source. Furthermore, the ‘fine pink buff’, as Wilson describes the fabric of the wheel-made plates at Ayia Irini, suggests compatibility with this commonly used ‘local’ Lefkandi clay.
Stratigraphy and phasing

The lack of thorough publication has meant that in order to re-study the Lefkandi pottery, I had to establish a relative stratigraphy and chronology for the earlier prehistoric phasing of the site. In the Lefkandi preliminary report (Popham and Sackett 1968: 5-8), five phases correlating broadly to the LEMH period were identified, and briefly related to changes found in the ceramic assemblage. From this limited report, these preliminary phases have since been correlated to the stratigraphy of numerous other sites and have been assigned a place in both absolute and relative chronologies. However, the validity of these associations (given the minimal amount of published material and the new information that has been published since the Lefkandi preliminary report) is questionable, and it was necessary to begin my analysis by re-establishing a generalised phasing system for the site.

The Lefkandi pottery assemblage is currently boxed according to excavation unit, and while some of these units had been assigned to a phase, many had not. This meant that I had to use the original excavation notebooks to create a concordance between excavation units and stratigraphic levels; this then allowed the majority of the pottery (98.6%) to be assigned to a specific stratigraphic level, whereas before only a more general excavation unit had been recorded.

Secondly, I created a stratigraphic matrix in which the levels from Trench CC (the deep sounding) and the two subsequent extensions of the deep sounding were correlated with one another. In order to establish phases, diagnostic chronological features of the pottery repertoire were selected from my database and inserted into the matrix (Figure 4.4). From this, it was possible to create chronological divisions within the sequence of levels and relate these to divisions within Aegean relative and absolute chronology more generally. Using these distinctive ceramic-chronological correlations as a guideline, I was able to establish 5 preliminary phase groups, which correspond to ceramic developments occurring at other sites on the Greek mainland, and broadly overlap with the phases proposed in the published preliminary report (Figure 4.5).

It was then possible to check the effectiveness of this phasing scheme by consulting the appearance of certain ceramic attributes at other sites and seeing if the occurrence of these was roughly chronologically compatible with their appearance at Lefkandi. For example, the use of 'rod' handles on grey burnished pottery is given a date of EHIII or early MH at Nichoria (Howell 1992: 47) and of early MHI at Orchomenos (Stocker 2002: 363). The two examples of these types of handles at Lefkandi, are found in my Phases 2 and 3 (dated to EHIII, or to transitional EHIII-MH) and thereby correlating closely with both the Nichoria and Orchomenos dates. Another example comes from two vessel fragments that appear to be
imports from the Argolid. Parallels with Lema IV:2 and IV:3 date these imports to middle and late EHIII, and these appear in my Lefkandi phases 2 and 2-3, once again independently confirming the phasing system.

**Integrity of the assemblage**

From an initial examination of the Lefkandi material, it became clear that the assemblage had been heavily selected and many sherds discarded. I was able to identify five intact contexts, and these were used to assess the suitability of the remainder of the retained Lefkandi assemblage for this type of quantitative analysis. As there is no record (which I have been able to access) of the sampling and discard strategy used by the original excavators, it was necessary to investigate whether my sample was reasonably representative before analysis could proceed. For 2 of the 5 phases I have identified, the 5 separate contexts in which all the sherds appear to have been retained were: Trench B (Phase 1), Trench CC, levels 72 and 73 (both Phase 4) and Trench CC, level 67 and Trench D, level 5 (both Phase 5). From this, it was possible to compare the percentages of certain traits (anticipating the type of analyses to be undertaken) between selected and fully retained levels (Figures 4.6, 4.7 and 4.8). It appears clear from this comparison that the heavily selected levels produce data (with regard to the ceramic attributes that I am interested in investigating) highly comparable to the fully retained levels. For example, in the two fully retained assemblages from Phase 4, the fully retained levels are comprised of even higher levels of fine Buff Plain fabric pottery (circa 90% and 95%) than in the selected assemblage, where Buff Plain makes up 85% of the assemblage; a similar pattern is seen in the Phase 5 fully retained versus selected levels. This provides a welcome confirmation that the unusual pattern of high proportions of fine ware pottery is not simply a function of later discard patterns. Very close levels of correlation were also seen between the fully retained and selected assemblages with regard to the other technological features recorded; thus, this seems to provide corroboration that it should be possible to interpret the patterns found in the pottery of the discarded levels with assurance as representative of the original patterning within the assemblage. The pottery was then recorded in a bulk processing manner (including weights and counts of all sherds within a single context). This was followed by the recording of 10 technological details of all the feature sherds (rims, bases, handles and any decorated sherds); there were 3535 in total (3431 of which can be assigned with security to a stratigraphic context) (for full details, see Appendix 2).
Fabric

Initially through macroscopic study of the full assemblage, 9 major fabric groups were identified and served as the basis for the programme of petrographic sampling. These were: Buff Plain (BP), Buff Plain Coarse (BPC), Buff Sandy (BS) and, Buff Schist (BSch), Dense Mica Schist (DMS) Quartz Sandy (QS), Gold Mica Sandy (GMS), Gold Mica (GM) and Gold Mica Coarse (GMC); three minor fabric groups appeared in Phases 1 and 2, but appeared in such small quantities that they were not petrographically sampled: Quartzite (QU), Lime Temper (LT) and Coarse 3 (C3). A thirteenth group of outlier fabrics (OUT) is an amalgamation of disparate and easily distinguishable fabrics likely to be imports (Figure 4.9). Macroscopic similarities observed between the Buff Sandy (BS), Buff Plain (BP), Buff Plain Coarse (BPC) and Buff Schist (BSch) fabric groups indicate a likelihood that these are actually four textural varieties of a single fabric group. Though this issue will be explored in much greater detail through the petrographic analysis (in the following section) a preliminary examination of the local geology indicates that there are three primary types of geologic zones in the region of Lefkandi; schist, limestone and alluvial sediments, suggesting that the BP, BPC, BS, BSch, DMS and QS fabrics are compatible with having been produced locally.

Petrographic Analysis

One hundred and sixteen samples were taken for petrographic analysis and observed under a polarising microscope (see Figure 4.10 for pictures of petrographic groups). The rationale behind the sampling was to explore (i) the validity of the macroscopically defined fabric groups; (ii) the compatibility of these fabric groups with the local geology, thereby assessing the likelihood of these ceramics having been locally manufactured; (iii) any variation within these fabric groups, particularly over time; and (iv) whether it was possible to trace the general provenance of those macroscopic fabric groups that stylistically and fabric-wise appeared to be imported to Lefkandi.

In total, nine petrographic classes (one with five sub-groups) were recognised among the 116 samples, and while a general description of each of these fabric groups is given below, a detailed description of each sample can be found in Appendix 3. The correlation between the macroscopic and petrographic groups will be discussed in the following section (see Figures 4.11 and 4.12).

(1) Dense Mica Schist

Groundmass of sub-angular monocrystalline quartz and mica lathes. Frequent medium/large sub-rounded polycrystalline quartz and medium sub-angular crystalline
calcite (dolomite). Dominant large sub-rounded biotite-muscovite-schist and rare pyroxenes (diopside), amphiboles and olivine.

(2) Quartz-chert
Groundmass of sub-angular monocrystalline quartz, feldspars and mica lathes. Common medium/large sub-rounded polycrystalline limestone and rare crystalline calcite (dolomite). Dominant large/very large polycrystalline quartz/chert (some with mica and/or calcite), few small/medium sub-angular monocrystalline quartz and few iron opaques.

(3) Calcareous mica-schist
a. Schist/Phyllite
Calcareous clay with semi-coarse groundmass of small angular monocrystalline quartz (often undulating) and mica. Void filled calcite and large, amorphous polycrystalline limestone. Few medium angular monocrystalline quartz, medium sub-rounded muscovite-schist and phyllitic material. Frequent large sub-rounded polycrystalline quartz/chert.

b. Mica-schist
Dense calcareous clay with groundmass of monocrystalline quartz grains, mica lathes and polycrystalline limestone. Very few medium rounded to sub-rounded polycrystalline limestone, large sub-rounded polycrystalline quartz and medium sub-angular monocrystalline quartz. Frequent large sub-rounded muscovite schist and rare free muscovite. Very rare feldspars, epidote-amphibolite, olivine and crystalline calcite.

c. Medium fine calcareous
Well evolved calcareous groundmass with sub-angular monocrystalline quartz and mica lathes. Very few small, well-sorted monocrystalline quartz, medium sub-rounded polycrystalline quartz/chert and rounded/amorphous polycrystalline limestone (as well as some void-filling calcite). Very rare small mudstone and mica-schist fragments and free mica.

d. Fine dense:
Well evolved calcareous dense ground mass with well-sorted frequent rounded/sub-rounded monocrystalline quartz grains, mica lathes and iron opaques. Rare sub-angular monocrystalline quartz, medium rounded polycrystalline limestone and free mica. Very rare sub-angular to sub-rounded feldspars.
e. Fine calcareous:
Well evolved calcareous groundmass with sub-angular monocrystalline quartz and mica lathes. Rare sub-angular monocrystalline quartz, medium rounded polycrystalline limestone and free mica. Very rare sub-angular to sub-rounded feldspars.

(4) Quartz/mica veined rock:
Highly calcareous clay with a groundmass of polycrystalline limestone and sub-angular monocrystalline quartz. Frequent small/medium rounded polycrystalline limestone and rare medium crystalline calcite (dolomite?). Very few medium, sub-rounded polycrystalline quartz/chert and iron opaques. Few sub-angular chert with green discoloration and medium/large angular/sub-angular rock fragments with veins of iron rich material. Biotite. Very rare dark glassy rounded igneous rocks with olivine and mudstone (often with quartz).

(5) Meta-igneous rock:
Groundmass of poorly evolved mono- and polycrystalline quartz, mica and polycrystalline limestone. Frequent small/medium polycrystalline limestone grains, few angular monocrystalline quartz, medium rounded/sub-rounded polycrystalline quartz/chert and large sub-rounded meta-igneous rocks with feldspar lathes, olivine, staurolite and biotite. Very rare free olivine.

(6) Igneous rock:
Groundmass of iron opaques, sub-rounded monocrystalline quartz, feldspars and mica. Few amorphous polycrystalline limestone, medium sub-angular chert (some with greenish discoloration), igneous rock containing feldspars (sanidine) and chert in and iron-rich matrix and frequent large rounded mudstone. Rare free feldspars and olivine.

(7) Angular feldspars/biotite:
Common small/medium angular monocrystalline quartz, dominant angular feldspars and biotite. Few sub-rounded to rounded dark, glassy rock fragments with plagioclase and biotite inclusions (andesite?) and very few sub-rounded polycrystalline quartz and polycrystalline limestone.
(8) Angular feldspars/mica:
Dominant small/medium angular monocrystalline quartz, frequent angular feldspars (both plagioclase and microcline), biotite and muscovite. Very few sub-rounded polycrystalline quartz, polycrystalline limestone and rare free muscovite.

(9) Medium fine biotite:
Fine dense calcareous clay with few small angular monocrystalline quartz, feldspars and biotite. Rare medium, rounded dark glassy rock with feldspar and biotite lathes (andesite?), rounded polycrystalline limestone and often with microfossils.

These petrographic groups relate closely to the recognised macroscopic groups (see Figure 4.11 for specific correlations and Figure 4.12 for general correlations between macroscopic and petrographic groups). The only exception to this is the recognition of two closely linked petrographic groups (the Meta-igneous rock and Igneous rock) that were not at all apparent in the macroscopic divisions. Even after re-examination of these in hand sample, no clear macroscopic indications that these were visually different from the Buff Schist/Dense Mica Schist macroscopic groups could be detected.

With the exception of this, the Dense mica schist petrographic group corresponds to the macroscopic group of the same name (DMS), the Mica-schist petrographic sub-group to the Buff Schist (BSch) macroscopic group, the medium Fine calcareous petrographic sub-groups to the Buff Sandy (BS) macroscopic group, the fine calcareous/dense petrographic sub-group to the Buff Plain (BP) macroscopic group, the Angular feldspars/biotite petrographic group to the Gold Mica Coarse (GMC) macroscopic group, the Medium fine biotite petrographic group to the Gold Mica (GM) macroscopic group and the Angular feldspars/mica petrographic group to the Gold Mica Sandy (GMS) macroscopic group. For this reason, I suggest the retention of the original macroscopic names in the subsequent diachronic analysis and all further discussions.

The predominant group amongst the petrographic samples, that of the Calcareous mica schist group (and its associated 5 sub-groups), shares an overwhelming similarity in terms of clay type and inclusion suite, with the essential differences between the five sub-groups being textural rather than compositional. Among this class, the texture of the Mica-schist sub-group (namely, a fine clay body with well-sorted sub-angular mica-schist inclusions) is the only one that appears to have had deliberate temper added. The nature of the mineralogical and clay inclusions are compatible with the Carboniferous shales, phyllites and metamorphic rocks inland from Lefkandi, and it is very likely that all members of this class are local products. These share a number of similarities with Day's (1986) local fine wares,
medium fine local (Group C) and Grey Minyan fabrics, all of which he assigns to a local provenance.

The next three classes, the Quartz/mica veined rock, Igneous rock and Meta-igneous rock share a number of underlying similarities to the clay body used in the calcareous mica-schist class, and while the rock inclusions may derive from a local source, these are most likely to represent a slight difference in clay exploitation from the Calcareous mica-schist group. The presence of metamorphosed igneous material in this group may relate to the ophiolitic series of rocks north of Xeropolis, including the possible serpentine in the Quartz/mica veined rock class, though it is possible that the material found in these samples came from another source. 3

The two much less calcareous fabrics, the Dense-mica schist and the Quartz/chert are likely to be derived from a different, and possibly non-Lelantine, clay source, though nothing about the composition would require an origin outside of Euboea. The Dense-mica schist group shows similarities with Day's (1986) Group E, for which he concludes that a local provenance is not excluded.

The Angular feldspars/biotite fabric appears to correlate closely with Day's (1986) Volcanic Group 2, and is therefore most likely to be a product of Aegina (as originally considered following macroscopic inspection). The Medium fine biotite class appears to be a more refined version of the Angular feldspars/biotite (with less quartz and microfossils), and is likely to share the same provenance, Aegina. Though compositionally similar, slight textural differences and the consistent presence of muscovite and biotite in the Angular feldspars/mica class suggest a different origin, potentially in the Cyclades.

One further set of analyses was performed, due to the fact that the BP fabrics (Fine calcareous/dense sub-groups) were so fine-grained that petrographic analysis was only of limited use in their classification. Fourteen samples of this class were subjected to bulk chemical analysis by X-ray fluorescence. The results showed these samples to have a remarkable degree of chemical homogeneity, particularly in light of the fact that they came from five phases of occupation at Lefkandi. Furthermore, when compared to Jones' 1986 chemical analysis of Lefkandi clays, there is a distinct chemical similarity between those clays and the BP class, thus suggesting that this BP fabric has a local origin (Figure 4.13).

The implications of the petrographic analysis are relatively straightforward: (i) in this case, macroscopic fabric categories were able to distinguish between pottery likely to have been produced from different clay sources; (ii) the calcareous mica-schist class (and its sub-groups) are almost indisputably local, though with a wider range of textural sub-variations than macroscopic examination was able to delineate; (iii) the following classes: Igneous,

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3 This information is derived from the 1:50,000 IGME geological maps of Eretria (1975 sheet).
Meta-igneous, Veined rock, Dense mica-schist and Quartz/chert are not incompatible with a local provenance but are likely to represent a number of different clay procurement tradition; and (iv) frequent import groups appear to derive from Aegina and possibly the Cyclades.

**Diachronic changes in fabric composition**

During Phase 1, seven of the nine major macroscopic fabric classes are represented, the only exceptions being the Gold Mica Coarse fabric (identified as a coarse Aeginetan imported type) and the Buff Plain Coarse (a variant of the Buff Plain used for thicker-walled vessels). Though the Buff Plain fabric comprises 46% of the assemblage, a number of other fabric groups are well-represented, including 28% of the BSch fabric and 8% of the DMS fabric (Figures 4.14 and 4.15). A number of other medium-coarse fabrics are present (Lime Temper, Quartzite, Quartz Sandy and Coarse 3: c. 3% of total), including about 4% of ‘outliers’ that are presumed to be imported (due not only to their unique paste, but often associated with atypical shape/decorative attributes).

This pattern changes slightly in Phases 2 and 2-3, in which the proportion of the BSch fabric drops to 7.6% and 4.8%, respectively. The most dramatic change is the increase in QS (from 1.2% in Phase 1 to 22.3% in Phase 2 and 33.8% in Phase 2-3) at the expense of other medium-coarse fabrics. This fabric type appears most commonly as a low collared jar. Throughout Phases 2 and 2-3, the proportion of BP is reasonably stable, comprising approximately 46% of the assemblage and the number of fine GM (Aeginetan?) imports drops from 3% to 1.5%. In Phase 3, a further major change occurs: BP increases to make up 80.9% of the assemblage with a consequent reduction in all other fabric groups, including imports. By Phase 4, BP composes 85% of the entire assemblage. The only other fabric groups in which there is an increase are BPC (a slightly coarser version of BP used almost exclusively for thick walled, closed vessels), C4 (possibly Aeginetan coarse fabric) which appears for the first time in Phase 4, comprising 2.3% of the assemblage and OUT (also presumed imports) which makes up only 2.9% of the material.

The general trends in fabric groups over time are clear: well-levigated fabric is increasingly being used; the biggest shift takes place in Phase 3 when c. 80% of the ceramic assemblage is made from fine, well levigated clay. This may be related to the introduction of new clay processing techniques, or the exploitation of a less contaminated clay source. Another, slightly more subtle change, occurs in Phases 2 and 2-3 with the increase of a medium-coarse fabric (QS) that rapidly becomes dominant at the expense of the much more varied coarse fabrics used in Phase 1. This reduces the number of fabrics being used in

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4 This could be partially related to the sudden drop in the number of shallow bowls being produced, as these are widely produced in the BSF fabric during Phase 1. However the general decrease in number of fabrics indicates a wider trend towards fewer fabric types in general.
During this phase, BP (fine fabric) and QS (medium-coarse fabric) account for c. 70-80% of the total ceramic fabrics. In Phase 3, BP becomes by far the dominant fabric and the relative amount of QS drops significantly (to only 10.5%); this coincides with a huge increase in the number of jars being made in BP (from 13.5% in Phase 2-3 to 52.5% in Phase 3). Phase 4 sees a further slight increase in the use of BP, with a large reduction in the amount of pottery made in other fabrics and this continues into Phase 5. Also notably, a new coarse fabric is introduced in Phase 4 (GMC); this has tentatively been identified as Aeginetan coarse ware and appears in some quantity (2.3%). Almost identical figures continue into Phase 5, with the BP continuing to comprise over 85% of the assemblage, and only the QS fabric class making up more than 3% of the rest of the assemblage.

Petrographically, this picture is confirmed, with the subtle petrographic variants seen in the calcareous mica-schist group diminishing over time, as either a single clay source appears to dominate the production tradition at Xeropolis, a more standardised approach to clay preparation becomes wide-spread or other local regional products cease to be consumed with as much frequency on the site.

Diachronic changes in manufacturing techniques

Though in Chapter 3, I discussed the various distinctions between different forms of intermediary RKE assisted wheel-forming, in general, it only seemed possible to distinguish between wheel-thrown or sophisticated RKE/wheel-fashioned vessels, wheel/RKE finished vessels and handmade types. Therefore, in general, I will be using these three descriptive terms (wheel/RKE formed, wheel/RKE fashioned and handmade), though where it is possible to make distinctions between specific manufacturing techniques, this will be elaborated.

During Phase 1, the majority of all ceramics were handmade (presumably coiled) (see Figure 4.16 for example of possible coil-join on vessel wall). Only 8.1% of the pottery showed signs of being fashioned on the wheel (Figure 4.17). As opposed to another class of vessel that I will discuss below, the deep, even rilling seen on the interior of these vessels seems to indicate either wheel-throwing proper or a sophisticated variant of the RKE forming technique (see Figure 4.18 for examples of these marks). These vessels were limited to certain forms: shallow bowls (or plates), two-handled ‘bell’ cups and tankards. Another 8.7% of the pottery appears to have been wheel-finished, due to the less even rilling formations and the lack of depth of these marks. Furthermore, these vessels had other diagnostic marks.

5 While I cannot absolutely rule out the possibility that these are vessels fashioned on the wheel after having been coil built (or built using some other hand-forming technique), the lack of marks associated with intermediary RKE forming techniques known from Crete at this time (Knappett 1999a, 2004), such as relic coils and diagonal scraping marks, tend to suggest that RKE manufacture is not one of the manufacturing techniques being employed at Lefkandi.
associated with early wheel finishing, such as wheel-finished rims with the rest of the vessel seemingly handmade and shaving/paring of excessive clay to thin the body walls of the vessel (see Figure 4.19 for examples of these marks). Phases 2 and 2-3 exhibit similar patterns, though the number of vessels that show definite wheel/RKE formed marks increases to 20-21%. This coincides with a marked increase in both the number of types and sizes of vessels that appear to have been wheel/RKE formed (Figures 4.20, 4.21, 4.22), including a greater proportion of large, closed vessels (such as jars) and thinner walled vessels. By Phases 3 and 4, wheel/RKE formed vessels constitute c. 46% of all the pottery, with this rising to just over 50% by Phase 5. Over the course of Phases 3, 4 and 5, the forming traces left on the pottery are most compatible with the primary wheel formation of pottery, such as the presence of a central spiral on the base interior (a sign of centring on a rotation device), and a dense, homogenous microfabric. This characteristic fabric texture, which has an absence of fissuration and lack of structural discontinuity, has been associated with wheel forming rather than wheel finishing (Courty and Roux 1995; Roux and Courty 1998: figure 5). This suggests that even if RKE finishing techniques were in use during Phases 1 and 2, they are becoming less prevalent in these later phases of LEMH Lefkandi.

Lastly, there exists a definite correlation between wheel/RKE formed vessels and BP fabric; in Phase 1, 86.7% of wheel/RKE formed vessels are in BP, by Phase 3 this has risen to 98%, due to the general increase in both numbers of vessel types produced on the wheel and number of vessels produced in the BP fabric. This is likely to be related to the need for clay to be finer textured, softer and wetter in order to be effectively drawn up on a wheel (Rice 1987: 128); therefore, the intensification in the use of BP fabric can be directly related to the increasing use of the wheel for manufacture.

Overall, two ceramic manufacturing traditions can be traced during Phases 1-5 at Lefkandi: handmade and wheel/RKE forming. The appearance of wheel/RKE forming in Phase 1 at Lefkandi is admittedly a new development at a broader Aegean level; however in Phases 1 through 2-3 this manufacturing technique remains in an early developmental stage, with many vessels only showing signs of partial wheel use (such as wheel-finished rims combined with shaved walls). As the use of the wheel increases in general, so does the skill with which it is used and not only does the proportion of vessels made on the wheel increase, but so does the proportion of larger and fine-walled vessels (Figures 4.20, 4.21 and 4.22): 18% of wheel/RKE formed vessels were thin-walled in Phase 1 compared to 23% of wheel/RKE formed vessels in Phase 4, thus pointing to an increase in the proficiency with which the wheel was being used.

**Diachronic changes in surface treatment and decoration**
Red-brown slipping and burnishing is one of the most popular surface treatments of Phase I (and indeed of the 'Lefkandi I' assemblage everywhere: see Rutter 1979: 15-16 and 1983a: 348), comprising 34.5% of the assemblage (Figure 4.23). Scored vessels and wiped vessels also form a major part of the assemblage, comprising 23.5% and 20.6% of the total, respectively. The majority of the scored and wiped vessels are medium to coarse types, whilst of the BP pottery, over 60% is slipped and burnished. Phases 2 and 2-3 do not deviate from this pattern a great deal: slipped and burnished vessels decrease slightly and scored vessels decrease markedly. The only noticeable increases in types of surface treatment are the large rise in polished vessels (from 1.5% in Phase 1 to 11.7% in Phase 2) and burnished vessels. Both of these seem closely related to specific shape-surface treatment correlations, namely between BP everted rim bowls and polishing, and QS low collar jars and burnishing. Most notably, when the QS low collar jar loses popularity (in Phase 3), the occurrence of burnishing also drops from 25.5% to 3.3%.

In Phases 3 and 4 the two main types of surface treatment used are wiping and polishing, which account for 80.5% and 82.1% of the ceramics in these phases, and this trend continues into Phase 5. In Phases 4 and 5, light slips become slightly more prominent (comprising 8% and 11% of the assemblage, respectively), and these are primarily used to create a light background on which pattern-painted decoration appears. Painted decoration increases slowly through the phases, ranging from between 6% to 12% in Phases 2 and 3, with only a slight change in Phases 4 and 5 when painted decoration increases from approximately 6% to 9% of all pottery. In general, painted decoration is most common on closed shapes (jars and jugs); in Phases 4 and 5, 72-74% of painted decoration occurs on local closed vessels of this type (Figure 4.24).

In general, then, there is a high degree of correlation between vessel types, fabrics, techniques and surface treatments and the BSch scored bowls and QS low collar burnished jars are both examples of this. In addition, over 60% of polished vessels are BP wheel-made bowls/cups. It therefore appears that surface treatment may be considered a significant technological feature in terms of its close correlation with fabric, shape and manufacture.

Potter's marks are also present on the Lefkandi pottery, occurring almost exclusively in Phase 1, though there are two examples from each of Phases 2 and 3 and a single example from Phase 4 (Figure 4.25). These pre-firing marks occur most regularly on shallow bowls, and much less frequently on jars; of the 19 examples from Phase 1, 10 occur on shallow bowls.

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6 This directly relates to the disappearance of the shallow BSch bowl, on which scoring was most common.

7 This is an interesting result, given my previous assessment of decoration/surface treatment as a much more superficial/transferable characteristic (Gosselin 1998, 2000: 191). Potentially, though, the significance of a surface treatment should be judged with regard to its level of integration within a technological system (e.g. its correlation with fabric, shape and manufacture technique).
bowls (9 of which are in BSch fabric). Though numerous hypotheses have been put forth to explain potter's marks in general, the most likely scenario relates to their significance either denoting something to the producers or disseminators of the marked vessels (Lindblom 2001: 19). While there is by no means a large enough corpus of marks at Lefkandi for a detailed analysis, their appearance almost exclusively in Phase 1 is surprising. However, since these occur almost exclusively on shallow bowls of a certain fabric group, two major possibilities could explain their presence: (i) the marks are used to distinguish the work of different potters, particularly if fired together in a communal kiln (Bedaux 1988: 379; Donnan 1971: 464); or (ii) the marks are an identification of a particular potter/workshop to those distributors or customers who will be receiving the pot, and given the earlier reference to 'Euboean' imported shallow bowls at Ayia Irini, this is not entirely implausible (Wilson 1999: 99).

**Diachronic changes in firing conditions**

In terms of the firing conditions of Lefkandi ceramics, a few obvious trends can be discerned (Figure 4.26). The first concerns the prominence of incompletely oxidised pottery in Phases 1, 2 and 2-3 (comprising 54%, 53% and 50% of the assemblage of each period, respectively). Fully oxidised pottery makes up 41% of the assemblage in Phase 1, with c. 5% being fully reduced; there is no incompletely reduced pottery in either Phase 1 or 2 (and only 0.6% in Phase 3). Arnold and Bourriaud (1993: 105) have noted that achieving a completely oxidising or unoxidising firing atmosphere is particularly challenging (though, if achieved, an oxidising atmosphere is the more common); therefore, the attainment of such firing conditions should be taken to denote a reasonable amount of firing control, even in Phase 1.

Once again, it is in Phase 3 that the most obvious changes begin to take place: for the first time reduced pottery comprises a major portion of the ceramic assemblage (40%), with 32.5% oxidised pottery, 25.3% incompletely oxidised and the remaining 1.3% is incompletely reduced. Phases 4 and 5 represent the periods in which the greatest control of firing conditions seems to have been acquired, particularly in achieving reduced pottery, with c. 40% and 46% of the pottery fired in this manner over these periods, respectively. Furthermore, the burnish or polish characteristic of this grey pottery is created by the compaction of the illitic components in the clay; these are destroyed at a relatively low temperature (between 700 and 900°C), and therefore the maintenance of this type of surface treatment is also dependent on close control over the firing temperature (Kilikoglou 1994: 72-73). Due to the limited parameters within which a completely reduced and polished vessel could be produced, this reinforces the conclusions that an increasing sophistication in firing techniques and knowledge was attained through time (Rye 1981: 100).
Additionally, one can look to the painted pottery for evidence of the level of firing control. While it is typically assumed that manganese-based paint was commonly in use for MH painted pottery (the common Matt Paint of the period), the fact that the majority of painted local Lefkandi pottery is not matt in finish and often mottled red/brown/black, indicates that it was produced using an iron-rich paint (rather than a manganese paint which consistently turns dark regardless of firing conditions). The use of an iron-rich paint requires reduction and re-oxidation in order to achieve a dark paint on a light-coloured background, and thus, a greater control over kiln temperature and atmosphere to guarantee the desired affect (Noll et al. 1975). The increase in painted pottery (all of which is of the dark-on-light variety) during Phases 4 and 5 may be a reflection of the increasing control over kiln temperature and atmosphere.

At present, no experimental work (e.g. re-firing experiments) has been undertaken to determine the possible firing temperatures of the Lefkandi pottery, though the presence of crystalline calcite (possibly dolomitic) and polycrystalline calcite (often deteriorating) in all of the petrographic groups, save the Angular feldspars/biotite, which are almost definitely imports to the site, indicate a firing temperature between 650 and 900°C. Though the temperature at which calcite breaks down is still debated, a likely firing temperature range of 700-750°C can be suggested for the majority of the Lefkandi Phase 3, 4 and 5 pottery as this would be compatible with the retention of a surface sheen, the lack of sintering or vitrification of the clay body and a general lack of carbon cores which tend to burn out around 650-750°C (Rice 1987: 97-98).

Physical traces left upon the pots may give some indication of the installation in which the pots were fired. The large number of fully and evenly oxidised pots in Phase 1, combined with the lack of firing clouding and smudging, indicates that a kiln structure (possibly pit or updraft) was used in firing. Given both the lack of segregation between fuel and pots in an open firing, and the comparatively limited of control over atmospheric conditions when compared to a kiln firing, it is unlikely that such firing outcomes could have been achieved using an open firing. Furthermore, in a number of Phase 1 shallow bowls (particularly the BP and BSc examples), sooting and smudging tend to occur quite evenly on the exterior rim, as if the vessels were stacked during firing with only the exterior rim exposed to carbon deposition.

There is a clear increase in the proportion of fully oxidised and fully reduced vessels in Phase 3. The firing cores of these vessels are consistently grey or black throughout or have a double core, suggestive of a continuous reducing atmosphere, or an incompletely oxidising atmosphere, followed by a reducing atmosphere (when cooling). Regardless of the exact firing process, this type of atmospheric manipulation requires sophisticated control over the
internal temperature within the firing installation and the knowledgeable and timely addition of fuel. This is particularly well illustrated by the few examples of light-on-dark painted pottery that require an oxidising, reducing and then re-oxidising atmosphere to achieve a light coloured decoration on a dark background.

**Diachronic changes in morphology and shape**

Given that the majority of the ceramic material was highly fragmentary (approximately 85% of the sherds have a maximum dimension of less than 8cm.), distinguishing between different shape classes was not always possible. Instead, I developed a system of hierarchical classification (based largely on rim types, handle placement and wall thickness) that allowed even very small sherds to be catalogued and given a preliminary shape class, with finer classifications possible for fragments including more features (see Figures 4.27 and 4.28). The most commonly represented classes are small open shapes (typically rounded, everted rim bowls and cups), though a full range of all household pottery types are represented, further corroborating the fact that the material from the deep-sounding is a typical and representative domestic assemblage.

Changes in shape are less amenable to quantification due to the fragmentary nature of the assemblage and the difficulty in definitively distinguishing between similar shapes (eg: shoulder handled bowls and kantharoi). It is therefore necessary to look at this from a qualitative point of view, giving consideration to the introduction of new vessel types and the nature of these new vessel types.

Phase 1 sees the combination of typical late EHII ceramics with high numbers of 'Lefkandi I' shapes; in general, there are a great deal fewer Helladic elements (sauceboats and saucers in particular) than one would typically find at a mainland or Cycladic site. For example, at Ayia Irini III, which has the most comparable group of Lefkandi I/Kastri group pottery, this group makes up c. 13% of the pottery, while typical EHII Helladic elements such as sauceboats, saucers, pans and frying pans comprise c. 16.8% (Wilson 1999: table 3.2). At Lefkandi itself, the Lefkandi I/Kastri group shapes comprise at least 56% (or 52% in the fully retained pottery of Trench B) of the assemblage and only 1% sauceboats/saucers are found in Phase 1. The remainder of Phase 1 shapes appear to be deep bowls and hole-mouth or collar necked jars.

An interesting point comes to light when one considers the most popular new shape at both these sites, namely the shallow bowl (making up 20.1% of the assemblage at Ayia Irini and 40.4% at Lefkandi). At Lefkandi, the shallow bowl is used in place of many traditional Helladic forms (e.g. saucers) that remain in use at Ayia Irini. In addition, the popularity of the
shallow bowl at Lefkandi may have related to the rapidity with which it could have been produced on the wheel (of the wheelmade shapes in Phase 1, 70% are shallow bowls). 8

The greatest change in vessel repertoire occurs in Phase 2, with the introduction of the round everted rim bowl, the low collar jar (essentially a large, coarse variant of the everted rim bowl), the ouzo cup and the EHIII tankard, at the expense of the extremely popular Phase 1 shallow bowl (which comprises 40.4% of the entire assemblage in Phase 1 and only 17% in Phase 2). Like other sites on the mainland, traditionally popular EHII shapes like the sauceboat and saucer are not found after Phase 1.

The only changes that occur after Phase 2 are the introduction of the hemispherical bowl and rim handled cup in Phase 2-3, the increasing carination of cups and bowls in Phases 3 and 4, and in Phase 5, the introduction and increasing frequency of the stemmed bowl (Howell 1968: 9). The rim-handled cup, introduced in Phase 2-3, is a quite unusual shape which has few parallels at other LEMH sites. One of the few parallels is at Pevkakia, where it appears in the middle of the MH1 period (Maran 1992: plate 38 no. 5). Looking at Figure 4.29, it becomes clear that the prevalent shapes found from Phase 2 onwards are derived from one another and are part of the same ‘manufacture grammar’. This means that in terms of motor habits, all of the vessels that appear after Phase 2 are part of an existing template for pottery shapes, and new vessel types originate through additions to, or manipulations of, a familiar shape.

In terms of vessels sizes and proportions, there appears to be a bimodal distribution of open shapes, with two bowl types (with rim diameters of 10 and 18-22) and cooking pot varieties (with rim diameters of 10 and 22 cm). There is also a surprisingly high bowl to jar ratio, at nearly 2:1 throughout phase 2-5.

Diachronic changes in imported material

In terms of imported fabrics, there appears to be a slight decrease over time in both the GM fabric (4.4% in Phase 1, but then remaining stable at c. 1.5% in Phases 2-3, 3, 4 and 5) and the OUT class (4.4% in Phase 1, falling to 2.9% by Phase 4) (Figure 4.14 and 4.15). However, the amount of imported pottery is not the only notable thing; and the nature of these vessels also deserves consideration. Between Phases 1 and 3, 58%-66% of the imported vessels are jars. Other imports include bowls and rare shapes such as pyxides, askoi and flasks. In Phase 4, the quantity of jars among the imports decreases (to 40%), and bowls make up a much larger proportion of the imported ceramic repertoire.

8 At Ayia Irini, only 0.1% of all the pottery is wheelmade and these are all shallow bowls; furthermore, all are thought to be Euboean imports (Wilson 1999).
This decrease in imports over time includes a drop in the amount of Aeginetan pottery, which formed a reasonably significant component of the assemblage in Phase 1. Though GMC fabric (a presumed Aeginetan coarse ware import, confirmed by petrography to have a volcanic origin) makes its first appearance in Phase 4, this could coincide with the increased maritime trade of the period due to advances in boat technology and the subsequent possibility of transporting large, coarse vessels over greater distances (Broodbank 2000a: 345-46). One of the most noticeable trends is the nature of the imported vessels. Up until Phase 4, given that a high percentage of all imports are jars, this raises the question of whether the nature of this exchange may have been driven by a less socially-oriented motivation and instead more geared towards trade for the contents of the pottery.

Implications of technological changes

The identifiable changes in the technological system at Lefkandi from the EHII to the LEMH period are as follows. Increasingly, pottery is made from fine clays (at the expense of a range of clay mixtures popular during Phase 1), the wheel is used more often for a wider range of vessel shapes, and firing tends to have occurred under more controlled conditions. How, then, can these changes in individual techniques be related to the nature of technological change and the degree to which this can be related to changes within the pottery producing and consuming system at Lefkandi? Furthermore, what might be the social/organisational structures within a community that are most likely to be affected by this changing production orientation?

In terms of fabric, the rise in BP can be associated with the increasing skill of the potters (both on and off the wheel), as essentially untempered material is more difficult to work with, particularly in the construction of large shapes (though, as stressed earlier, this is a preferable material for use on the wheel once the requisite skills have been attained). For example, in Phases 2 and 2-3, while QS low collar jars appear as the dominant coarse pottery type, these jars are all but replaced by jars in the BP fabric. Another implication of the fabric shift is the change in clay processing techniques that must have taken place. It has been observed that clay processing (the addition of temper, purification, etc.) even in a place with essentially identical material resources is determined for the most part by the source from which potting was learned (Livingstone Smith 2000: 37). At Lefkandi, this seems indicative of a reduced number of potters, a reduced number of sources of potting knowledge or an increasingly selective constraining pressure on the way pottery was made (Rice 1981: 222).

As explored in Chapter 3, ethnoarchaeological studies have demonstrated the ability of a potter to change clay sources, but not the way they were taught to process that clay into...
an acceptable material for potting (Day 2004: 131,139; Gosselain 1998: 90-1). From this perspective, the petrographic analyses have been informative beyond simply clarifying those products compatible with local production. Even though the dominant petrographic group (Calcareous mica-schist and its numerous sub-groups) are all compositionally homogeneous enough to have derived from a single clay source, it is the textural differences that distinguish them as different fabrics in the early Lefkandi phases. It is this textural differentiation that disappears over time, confirming the impression that a single *clay processing tradition* (and therefore, by implication, a single technological tradition) was gaining dominance. Given that this trait is relatively fixed and resistant to change, the cessation of several local clay recipes may suggest a similar eclipse of other local technological traditions.

In terms of changes in manufacturing technique, the fact that forming techniques in general have been shown to be among the traits most resistant to change (Gosselain 1998) means that this topic deserves special consideration. Furthermore, given that at LEMH Lefkandi we also see the introduction and growing dominance of a *new* forming technique (wheel-making) whose appearance elsewhere is most often associated with the intensification of economic production, the centralisation of political power and the emergence of socio-cultural complexity, this requires special attention. It has been observed that the technique of wheel-making pottery is particularly challenging, and cannot be mastered by all members of a community in the same way as other forming techniques (Courty and Roux 1995: 17). If the observations from Roux’s ethnographic work on the potter’s wheel are taken as the basis for generalisation, the use of the wheel has genuine implications for the social context in which it emerged, in terms of the presence of craft (even if potentially part-time) specialists. At Lefkandi, we can trace the development of the use of the wheel, not simply in terms of increasing skill (e.g. the increasing ability to make large, closed vessels) but also in terms of the other changes that are occurring in other aspects of the technological system in order to accommodate the use of the wheel (e.g. the use of fine clays and the increase in carinated shapes closely linked with a heavier reliance on the wheel) (Balfet 1984: 175-9). This, combined with the dramatic increase in low investment surface treatments (namely wiping and polishing), point towards an increasingly efficient system of production.

Knappett (1999a: 104) suggests that on the Greek mainland during the LEMH, the wheel is not clearly demonstrated to be in continuous use; yet this investigation shows that this is not necessarily the case at Lefkandi (and possibly not at other central Greek sites). On Crete (for example), the potter’s wheel develops in the context of the mobilisation and emergence of centralised political power, the growth of inequality and the need for efficient high-value production of material goods, just as would be predicted by models of craft specialisation. Its propagation during the LEMH at Lefkandi may require re-evaluation of the
universality of these correlations in a wider Aegean context.

Commensurate changes also occur in terms of firing technology, though whether this represents a greater understanding of the means by which to control atmospheric conditions inside a kiln, or actually represents new kiln technology, is unclear. The increase in Phase 3, when approximately 70% of the pottery is completely and evenly fired, or in Phases 4 and 5 when iron-based paint becomes more commonly used to create dark-on-light painted pottery, may be indicative of this shift. Ethnographic observations of comparative firing techniques (open firing, pit kilns and updraft kilns) have shown that firing atmospheric is most controlled in a kiln, but this also results in an overall decrease in firing losses. Fuel efficiency is also often associated with kilns, but this may actually be nominal; rather more fuel may be required during a kiln firing, but it becomes more efficient if there are consistently fewer firing losses. However, efficiency may not be the key as to why certain firing techniques are adopted, particularly if production intensity is not the driving force behind innovation. As suggested by Pool (2000), kiln firing allows for greater control over the speed of temperature increase and degree of control over firing temperature. This is not to be equated with efficiency, necessarily, but is of particular importance for the firing of fine grained ceramics, because the thermal expansion potential of non-tempered ceramics is negligible. Therefore, the fact that the firing technologies from Lefkandi show an increase in control of firing conditions through time indicates an adaptation with particular advantages for the production of high-quality, fine-grained and evenly coloured ceramics.

The development of a specialised technological field

These changes within the system of ceramic production at Lefkandi are indications not of intensification but rather the growing specialisation of a system of ceramic production. Figure 4.30 shows the quantification of the elements I have isolated as most significant to the development of a specialised system of ceramic production: the use of finely levigated clay, the use of the wheel for manufacturing, control over firing atmosphere and simplification of surface treatment. This rising homogenisation of the Lefkandi ceramic assemblage is well illustrated by Figure 4.31, which shows the dominance of the BP wheel-made bowl at the expense of bowls deriving from different production traditions. This increasing homogenisation of techniques has been shown to occur most commonly within a specialist-learning environment (Hayden and Cannon 1982: 331), thus corroborating the inference of an increasingly specialised technological system at Lefkandi through time.

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9 For example, open firings are extremely variable with losses ranging anywhere from 0-100% depending on conditions. For pit firings, losses tend to be around 25-50% and for updraft kilns, 12-20% (Rice 1987: 173).
Even more important, though, is the feedback and integration that seems to exist between elements of this production system and are indicative of the development of a specific technological system, and the growing dominance of this particular potting tradition through time. Moreover, this increasingly specialised ceramic production system would require an investment in the training of a potter, with a lengthy apprenticeship period, and can also be characterised as an increasingly labour efficient arrangement (the use of the wheel, the lack of decorative elaboration). The introduction of formal apprenticeships that doubtless would have had to accompany this specialised pottery production system may also account for the lack of uptake of new decorative motifs within the Lefkandi pottery repertoire; a higher degree of formal stylistic reproduction is argued to coincide with the introduction of sanctioned learning forms of technological transmission (Longacre 1999). While it was shown in Chapter 3 that different aspects of the production of an object are a function of different degrees of learning, adoption and scales of identity, what we are witnessing at Lefkandi is the coherence of a single system that is increasingly self-reinforcing and interdependent upon other socio-economic sub-systems of the community (for example, in Figure 3.6, this system would be located at the right end of the spectrum). Estimates of the number of days needed to produce the full corpus of wheel/RKE formed vessels at Lefkandi (having conservatively extrapolated the number of vessels in use at the whole site), would mean that by phases 4 and 5, at least one or two full-time (350 days per year) potter(s) would be needed (Roux 2003a) (see Figure 4.32 for full calculations), thus suggesting that some members of the Lefkandi community would have differentiated roles and compromising strict household autonomy within the community. Given that at Lefkandi in the LEMH period the population has been estimated at c. 800-1000 people (Chapter 2), the size of the site suggests that a complex socio-political structure was in place to maintain the cohesion of such a large community. As with other LEMH sites, there is no evidence of materially-sanctioned hierarchical offices, and it seems highly unlikely that at a site this size, the specialised ceramic production system was the only arena in which distinct or differentiated roles existed.

The logics of consumption at Lefkandi

Having focussed largely on changes in technology and production at Lefkandi, these are inextricably linked to (either resulting from or stimulated by) changes in the nature of consumption. To an overwhelmingly degree, the increasing technological homogeneity of Lefkandi pottery is mirrored by the increasing visual homogeneity of ceramics consumed within the Lefkandi community (Figure 4.33). For example, as already mentioned, very simple polished surfaces are the most common surface treatment amongst the pottery. Though
in Phases 4 and 5 there is a small overall increase in the amount of incised and painted pottery, this decoration is employed in an extremely limited fashion; incised linear decoration appears 85-86% of the time on the shoulder of BP, small, open shapes (cups, bowls and kantharoi), and painted decoration is employed 60-70% of the time on BP closed vessels in linear motifs (often just banding). Unlike other sites (particularly in the Peloponnese), the motifs used at Lefkandi show very little diachronic development throughout Phases 2-5, relying on a limited repertoire of linear and geometric motifs. This homogeneity also has more subtle, less overt manifestations such as those observed in the petrographic analysis. For example, the identification of a small number of possibly non-local fabrics, e.g. the Igneous and Meta-igneous classes (all dating from Phase 4) that were macroscopically indistinguishable from local products, seem to indicate that even those ceramics imported from outside of Lekfandi had to adhere to this preference for visually homogeneous products (for a similar argument regarding the visual homogeneity of EHII ceramics, see Rutter 1993).

Though speculative, these changes must surely represent a shift in the use of ceramic material culture at Lefkandi, and a redefinition of the role that ceramics could play within the social sphere. With an increasingly visually undifferentiated and standardised body of ceramic material being produced and utilised at Lefkandi, there is little to support the notion of visually distinct types of pottery playing a role in the assertion of status, affiliation, identity or aggrandisement during the LEMH period. This corresponds well to Clark and Parry's (1991: 319-23) observation that labour efficient specialisation (as demonstrated to be occurring at Lefkandi) is most common in societies where social negotiation is not dependent on material culture as a form of prestige display. Thus, if ceramic material culture does not appear to be playing a role in internal competition, was it being employed to promote stable alliance-driven relationships within the Lefkandi community? As suggested in Chapter 3, the material signature of this type of consumption logic would involve the use of objects that are employed for integrative purposes, but also which would have grounded, established referents and thus would leave little room for experimentation and variation. This accords well with the stability of Lefkandi ceramic consumption patterns, as well as with the nature of much of the Lefkandi pottery. In phases 3-5, between 67% and 73% of the assemblage is comprised of open shapes which tend to be bowls, goblets and basins whose size appear to emphasise communal social and drinking activity rather than individual consumption. Due to both the relatively large size of the Lefkandi community and the presence of differentiated offices (e.g. specialised producers), the need for integrative mechanisms would be higher within the Lefkandi community than among other smaller and less differentiated communities. Therefore, there would be a great necessity to frequently employ integrative and alliance building behaviours in order to maintain group structure without the development of
hierarchical offices. Hence, the mode of ceramic consumption behaviour and overall consumption logic at Lefkandi is most likely to be one that emphasises communal cohesion and aggregation.

This may bear some relation to the apparent lack of inter-regional influence upon the LEMH ceramic record at Lefkandi. This is true regarding the number of imports (and their decrease in the later stages of the LEMH period) at Lefkandi, but also with relation to the influence of other mainland pottery traditions on the ceramics of Lefkandi. For example, the decorative traditions at Lefkandi, which should be one of the best reflections of inter-regional contacts, due to the ease with which decorative motifs can be replicated without any transmission of skill or knowledge, shows little sign of having been influenced by the Matt Painted pottery traditions common in the Argolid or Peloponnese.

Based on Howell's (1968) preliminary report on the Lefkandi pottery, Rutter (1985:33) commented that Minoan (and to a lesser extent, Cycladic) influence at Lefkandi is nominal during the early MH period, and that this is due to the general isolation of mainland sites north of the Peloponnese. Yet this type of explanation seems symptomatic of the biases inherent in the explanations of patterns of LEMH ceramic production and consumption. Consider, as a comparison, the case of Kastri on Kythera, a site that, though in close geographical proximity to the mainland, produces pottery that is ‘Minoan’ both stylistically and technologically. Furthermore, while a class of ‘Minoanising’ pottery, thought to originate either on Kythera (or from itinerant Kytheran potters located at the mainland site of Ayios Stephanos or even Lerna) appears widely at southern mainland sites from the beginning of the MH period, only a single example of mainland pottery has been found in the excavations at Kastri before the MM/MH III period (Coldstream and Huxley 1972; Zerner 1978; Kiriatzi 2006). In this case, the lack of mainland pottery found at Kastri could be interpreted as a conscious decision to refrain from the importation or adoption of ‘Helladic’ pottery styles, rather than the isolation of the community at Kastri. It seems that while Kytherans could get mainland pottery, their decision not to do so requires explanation. Could the situation at Lefkandi be analogous to this? At Lefkandi as well, there appear to be conscious decisions made with regard to types of imported pottery. For example, though Aeginetan pottery is found from Phase 1 at Lefkandi, only very specific types have so far been found there. Closed jars and coarse cooking pots are relatively common, as are red slipped and burnished inturned rim bowls; however, conspicuously absent are the typical Aeginetan Matt Painted open and closed vessels very well attested from other LEMH sites (Zerner 1993). Furthermore, Lustrous Decorated pottery is also notably missing from the LEMH Lefkandi material, though found elsewhere on the mainland in large quantities from the beginning of the MH period (Zerner 1978, 1993).
Given that pottery made in what now can be shown to be a stylistic and technological tradition which develops in a region that includes Lefkandi (i.e. Buff plain oxidised and reduced pottery, or Red and Grey Minyan to use the ware based terminologies) is found widely distributed across the mainland, then perhaps this should be interpreted as a strong and unified cultural region. In this context, the lack of Minoanising (and other imported ceramic) material could therefore be interpreted as a deliberate resistance to a foreign material culture style? The inhabitants (and most notably the potters of Lefkandi) were clearly innovative, having not only been one of the few sites to adopt Lefkandi I group material but then also being one of the very few sites to employ the primary new technology associated with its Anatolian area of origin (the use of the wheel). Like the potters of Kastri, were the potters of Lefkandi instrumental in both developing a technological system and setting and adhering to a regional consumption style? Overall, the production system and consumption logic at Lefkandi point towards a system of strong community cohesion and self-sufficiency. This may manifest itself in part as resistance to Cretan and southern mainland influences, but the positive influence of the local technological and stylistic field developed at Lefkandi and surely other sites is visible throughout the central Greek region.
CHAPTER 5
ASINE IN THE ARGOLID

The location and extent of the site

For my second case study, I will be looking at material from the site of Asine located in the Argolid. As discussed in some detail in Chapters 1 and 2, the Argolid is one of the most intensively investigated regions in Greece and has often been assumed to be a microcosm for patterns of behaviour throughout the LEMH period. For this reason, it is of particular interest to look at the patterns of ceramic production and consumption at an Argive site in comparison with those found at a central Greek one in the previous chapter in order to determine whether this view of the Argolid is tenable. As previously discussed, settlement patterning in the Argolid fulfils the stereotypical expectation during the LEMH: there is a clear drop in the number of sites, with a widespread occurrence of site abandonment at the beginning of the LEMH. For example, the intensive survey of the southern Argolid recorded approximately 30 EHIII sites, but for the LEMH period only 3 sites (A6, E9 and F5) show convincing and robust evidence for EHIII and early MH occupation (Nordquist 1995). A slightly different type of settlement abandonment seems to be documented in the Corinthia, with sites located in the inland valleys (Tsoungiza and Zygouries) suffering abandonment at the end of EHIII and not re-occupied until MHIII (Wright 2004b).

In the area around Asine—generally spaced about 4-5 km from one another—there are a number of sites of varying size. Most comparable in size and location is Lerna, located directly across the Gulf of Argos. Moving north, a number of larger sites present themselves around and on the plain: Tiryns, Mycenae and Argos (the former two ranging from between 3 to 6 hectares, with the latter up to possibly 12 hectares in size), plus the sites of Midea, Berbati and Kephaliari where definite LEMH occupation is attested, though the extent of these sites cannot be estimated given the present state of information.¹

The site of Asine is located on the eastern side of the Gulf of Argos near the village of modern-day Asine. The main area of the site is that of the ‘Kastraki’ knoll (measuring 350 m by 140 m), but during certain periods, the site appears also to have encompassed the Barbouna and Karmaniola areas to the northwest and east of the Kastraki hill, respectively. The seaward side of the Kastraki hill is so steep as to be inaccessible; however, the northwestern side (facing the Barbouna hill) slopes gently towards a rocky summit, and this is where the majority of all prehistoric settlement has been found. The only semi-sheltered harbour exists between the

¹ For example, at Midea, Trench L has produced definite evidence for LEMH occupation including Dark Burnished, Grey Minyan and Matt Painted pottery. However, the occurrence of this pottery only in a single trench thus far, coupled with the lack of information regarding the surface extent of this type of pottery, makes an estimation of site size impossible (Fischer 1992).
sloping northwest side of the Kastraki hill and the Barbouna hill, in which a 100-200 meter long cove occurs (Figure 5.1).

A coastal plain exists between the Barbouna hill and the Drepanon hill located approximately 2000 meters to the east; palaeogeographical reconstruction suggests that marsh and wetland conditions prevailed here in the Neolithic, but due to landscape instability during the Early Bronze Age, this marshy area was apparently filled in by erosion and a fertile soil lens was able to form on top of this Early Bronze Age alluvial deposit (Zangger 1994: 224, 234); this apparently mirrors the situation at neighbouring Lerna and Tiryns (Zangger 1993: 69-82). Like both these sites, Asine is clearly strategically located in terms of both coastal access and arable land.

**Excavations at Asine and previous scholarship**

The site was originally excavated in 1922-1930 under the initiative of the Swedish Crown Prince Gustaf Adolf and represented Sweden’s largest excavation in Greece up until that point. The work was directed by Axel Persson and Otto Frödin and focused on two areas: the Kastraki hill (the top of which is called the Acropolis) and the gentle north-western slope known as the Lower Town); the Barbouna Area was not excavated until the 1970's. These earlier excavations covered an area of c. 2 ha, and demonstrated an essentially continuous occupation (though with serious fluctuation in density and type of settlement) from the Neolithic period onwards.

Material from the 1922-1930 excavations makes up the corpus of my second case study; a large proportion of the ceramic material from the 1926 season was exchanged with the Greek government (in return for Swedish prehistoric stone tools and weapons) and is currently housed in Uppsala, Sweden, at an Uppsala University facility. Subsequent excavations have taken place at Asine under the auspices of the Swedish School intermittently from 1970-1987, investigating the Karmaniola sector (east of the Kastraki hill) as well as excavation of the Barbouna hill and its slopes (where two major Middle to Late Bronze Age and late Geometric extra-mural cemeteries are located).

The timely publication of the 1922-1930 excavations in the *Asine I* volume (Frödin et al.1938) provided one of the most complete sources of information of two poorly investigated periods in Aegean prehistory, namely the Middle Helladic and early Iron Ages. Given the wide horizontal exposure and stratigraphic depth achieved at Asine, this site remains one of the most comprehensive sources of information about Argive coastal site history in the Middle Helladic period (Rutter 2001: 130).

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2 This is part of the Institution för antikens kultur och samhällsliv of Uppsala Universitet collection.
More recently, this has been further enhanced by the synthesis, analysis and re-publication of the substantial Middle Helladic material from Asine in two volumes. For my purposes, only Gullog Nordquist’s (1987) monograph *Asine: A Middle Helladic Village in the Argolid* and a string of other publications relevant to the LEMH (Nordquist 1985, 1990b, 1995a) will be discussed. Nordquist’s study examines the settlement, architecture, subsistence and material culture of Asine during the Middle Helladic period, with numerous references to EHIII material. Though Nordquist (1987) utilises ceramic evidence for a number of her arguments (most significantly the section on trade and interaction at MH Asine), by no means is her work exclusively focused on pottery. Therefore, primary re-study of this material was necessary in order to gain a holistic picture of the EHIII and early MH ceramic fabrics and technological character of pottery at Asine. However, Nordquist’s re-study and clarification of the excavation notebooks and associated stratigraphic documentation has been invaluable in terms of my ability to create a generalised phasing for LEMH ceramic groups. The following section explains how I identified stratigraphic units that corresponded to late Early to middle Middle Helladic deposits, and thus created a corpus of LEMH ceramics on which to carry out my study.

**Stratigraphy and phasing: isolating LEMH deposits from the 1926 excavations**

The 1926 material formed the basis of my Asine study, and while it only makes up a limited amount of the material excavated from Asine, the nature of the sample makes it incomparably useful. The 1926 pottery from Asine was not selectively discarded during excavation, or after transport to Uppsala, and is entirely complete (including coarse wares and body sherds). Therefore, the integrity of this assemblage is unassailable, and any patterns in the technological attributes of this pottery should bear direct relevance to ancient human production decisions unmediated by modern recovery selection decisions.

The purpose of this study was to provide another LEMH sample with which to study diachronic variation in both fabric and technology; it was therefore of the highest priority to isolate relevant and closed LEMH deposits, even though the Asine excavations are slightly stratigraphically problematic in this respect.

While Middle Helladic remains are found over a wide area of the site (most notably the Lower Town, Terraces II, III and IV, the Pre-Myceanean Terrace, the Polygonal Wall Terrace and the Barbouna Area: see Figure 5.2 for a plan of the Lower Town), an attempt to distinguish the occurrence of specifically LEMH remains is more challenging due to two

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3 Dietz’s 1991 work, *The Argolid at the Transition to the Mycenaean Age*, utilises the later Middle Helladic (almost exclusively MHIII-LHI) material – primarily from the Barbouna cemeteries – to discuss the transition to the Shaft Grave period, and is therefore outside the remit of my investigation.
factors: (i) the long-term settlement at Asine has resulted in multiple inhumations, building events and soil erosion, which has consequently led to frequent multi-period contamination; (ii) our current inability to finely date many types of LEMH pottery, such that it is often difficult to specify a particular date for a deposit if chronologically sensitive ceramic indicators are not present.

I decided to restrict my investigation to areas, architecture, or other deposits that Nordquist (1987: 47-54) had identified as belonging to the LEMH period. However, the phasing of these deposits could then be further amended using a range of chronologically sensitive ceramic attributes identified by Rutter (1995: 468-475, 592-594) and Zerner (1978: 135-169) for the EHIII and early MH material at Lerna, respectively.

The material from the Lower Town and Terrace III included the most extensive EHII architecture (House R and House S on Terrace III), EHIII deposits (the area below House T and Bothros 11 on Terrace III) and MHI-II deposits (House T on Terrace III and House A in the Lower Town). The contexts within House T and House A are probably the best stratified and relatively closed deposits for this period, though even among these deposits, some mixed material is inevitable (see Figure 5.3 for plans of these houses). The material from the Barbouna area (to the northwest of the Acropolis) was not investigated, but this area will be briefly discussed later with regard to the results of its more recent excavation (1970-1972).

The stratigraphic problems and difficulty in isolating deposits of limited temporal duration were most apparent when attempting to locate late EHII deposits (though not strictly within the LEMH remit, these deposits would both provide comparative material for Phase I at Lefkandi and a background to changes taking place in the EHIII period). The best purported EHII contexts were meant to occur on Terrace III within House R (the House S deposits, also of later EHII date, were too shallow and fragmentary), though recent re-assessment of the late EHII chronology and stratigraphy at Asine throws this into question (Pullen 1987).

In Pullen's re-examination of the Asine material, only three excavation squares within House R contained pure EHII material, while the remaining 15 squares were primarily disturbed EHII deposits of questionable chronological homogeneity with large amounts of later material (Pullen 1987:540). Given that House R appears to have been constructed in three phases, and was disturbed by a large number of intrusive graves (Pullen 1987: 540, table 1), both EHIII and MH material is found in the lower levels of almost all the House R squares.

Given the difficulty in stratigraphically defining EHII deposits, I chose to use a second criterion for dating these deposits. Within the deposits excavated from the northern edge of Terrace III (within and surrounding House R), I assigned to Phase I (EHII) those deposits that contained a large proportion of EHII diagnostic type sherds (e.g. ring bases from saucers,
sauceboats and impressed hearths). Incidentally, it was in one of these deposits (in House R, room III) that preliminary identification has been made of a Lefkandi I/Kastri group (late EHII) jug spout (see Figure 5.4). While the layers of this earliest phase are consistently contaminated by ceramic elements of the MH period (such as Aeginetan coarse ware and sand-tempered Lustrous Decorated pottery considered by Zerner [1978: 159] to be a feature of the transitional Lerna IV-V phase, if not slightly later), deposits can be identified that have a large proportion of late EHII material. However, these are the most tentatively dated and phased layers, and will not typically be included within my analyses.

Less contaminated levels seem to exist for the EHIII-MHII periods, and I have established a single phase 2 that corresponds roughly to EHIII and transitional/mixed EHIII-MHI deposits. For the most part, Phase 2 pottery comes from Bothros 11 within House T and House T itself; it has occasionally been necessary to use the chronologically indicative ceramic traits delineated in both the Lerna IV (Rutter 1995) and transitional Lerna IV-V (Zerner 1978) publications to phase a deposit with more specificity than the stratigraphy is able to provide. Therefore, the reason for the slight chronological fuzziness of my Phase 2 is not due to lack of chronologically indicative ceramic features, but rather due to the mixed nature of the Asine deposits in general.

The later material from MHI, transitional MHI-MHII and MHII (my Phases 3, 4 and 5, respectively) was relatively easy to distinguish, as well-preserved architecture exists dating from these periods (House T on Terrace III and House A in the Lower Town) (Nordquist 1987: 72-76). Consequently, in association with this architecture are some of the best closed (and by association, uncontaminated) Asine deposits of this period, and these have quite exhaustively been linked to the MHI through MHII phases at Lerna (Nordquist 1987: 72-76) (see Figure 5.5 for a summary of Asine phasing).

**The Barbouna material**

Material from the Barbouna area was not included in this study for two reasons: first, the majority of the material is of MHIII date and secondly, the main excavated area on the Barbouna hill is that of a cemetery which is unlikely to provide as wide and varied a ceramic

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4 For ease of reference, I will be referring to these different chronological periods as Phases 1-5. Figure 5.5 shows the correlation between different chronological periods, stratigraphic units and these phases.

5 Based upon stratigraphy and location of deposits, I originally divided this phase into two separate periods. However, these two phases were amalgamated into a single phase for the following reason: many of these deposits were a mix of chronologically diagnostic EHIII and transitional EHIII-MHI elements (e.g. AS 5127 which contained both an EHIII streaky slipped jar sherd and a transitional EHIII-MHI grey burnished sherd with an incised line along the interior rim); these could not be separated without splitting deposits and therefore were merged into a single phase. On a practical note, these two phases were also combined due to the fact that creating two phases resulted in a very small absolute number of sherds for each phase and correspondingly, the analyses of these phases were easily skewed due to small absolute numbers.
record as would be required for my study (Nordquist 1987: 85). While some earlier MH material from this area appears to exist, the lack of vertical excavation in this region means that the status of the area during the LEMH is unclear (Nordquist 1985).

Of note, though, are the results from the more recent excavations of 1970-1972 in which trial trenches were dug to a level that has brought to light EHIII and earlier MH material, in the central trench and trenches F, B and D (Fossey 1978; Backe-Forsberg 1978). The material presented in the publication⁶ is suggestive of a ceramic repertoire in the Barbouna area similar to that of the lower Town and terraces at Asine, though much more fragmentary in nature. In ceramic terms, this includes a limited number of examples of EHIII painted pottery⁷, incised herringbone coarse ware⁸, Grey Minyan⁹, Matt Painted pottery¹⁰ and even an imported Lustrous Decorated style piece.¹¹

Though this material was not investigated during this primary analysis, two significant points justify this brief discussion. Firstly, it helps to delimit the edges of the LEMH settlement at Asine, for while occupation clearly occurred here, the apparently fragmentary and limited nature of the material suggest that it was near the periphery of the site during this period (Fossey 1978: 18). Secondly, a second excavation area with similar pottery types provides corroboration for the representative nature of the patterns detected in the Lower Town sample.

Fabric

Macroscopic description of fabrics

Macroscopic examination of the Asine material revealed 9 fabric types (Figure 5.6) (for full catalogue of feature sherds, see Appendix 4). However, there existed a wide range of textural variation within each fabric with regard to inclusion size, sorting, roundness and frequency. While this variation is not significant enough to warrant their division into different fabric groups, these variations within fabrics were much more prominent than between those fabrics identified at Lefkandi. It seems clear, at least on a macroscopic level, that within each fabric type, similar clay sources (given the overall similarity observed in clay and inclusion type) are

⁶ Much of this pottery (as noted by Backe-Forsberg 1978: 54, 55), is found in mixed contexts with later material (MHIII and Mycenaean), and therefore does not fall strictly into the LEMH remit. Given the continuity of many early MH pottery shapes and styles into these later periods (for example, Grey Minyan), it is therefore likely that some of this sample is actually later in date and this could explain a few of the decorative, morphological and manufacturing differences noted between this pottery and that of the Lower Town (e.g. the higher occurrence of wheel-made pottery). This is further indicated by the presence of MHIII Polychrome Decorated included in the catalogue: Backe-Forsberg 1978: Catalogue number: 58)

⁷ Fossey 1978: Catalogue numbers: 7, 8, 46, 84, 276.

⁸ Fossey 1978: Catalogue number: 129.

⁹ Backe-Forsberg 1978: Catalogue numbers: 4-5, 17, 36-40 and 64


¹¹ Backe-Forsberg 1978: Catalogue number: 47
being used, but the variation seen within these classes may represent markedly different clay processing techniques or differences in clay source micro-location due to the large amount of variability within a seemingly compositionally discrete group of fabrics.

The first of these fabrics is the Mudstone-tempered group (MS1), which is often very slightly micaceous with a decidedly silty texture, and preponderant poorly sorted red-brown angular and platy mudstone inclusions. Variation often occurs in the frequency and size of the platy inclusions (some often appear darker), as well as in the size and frequency of calcite particles. The second Mudstone tempered fabric (MS2) resembles the MS1 class in terms of clay composition (slightly micaceous with a very predominant silty and sandy texture) and has a similar variety of inclusions as the MS class. These range from small red/brown/dark mudstone inclusions, small quartz grains and lime particles; the most noticeable difference within this class is the smaller size and relatively well-sorted nature of the inclusions in the MS2 class. The MS1 class appears to be a coarser variant of the MS2 class, and the predominance of jars and pithoi in the MS1 class, may serve to substantiate this argument.

A common variant of the MS2 fabric (which appears much more dense and red in colour) is most often used for black and dark burnished vessels, and possibly some combination of the surface treatment and firing used to achieve the dark burnished surface of these vessels contributes to the variable appearance of the fabric. However, the MS2 fabrics were not further divided because of the essential similarity in both clay texture and inclusions; at a macroscopic level, creating any further divisions would have been inaccurate based on observable characteristics. This fabric bears a close resemblance to the macroscopic descriptions of Dark Tempered fabric at Lerna by Zerner (1986: 60-61).

The Siltstone tempered fabric class (SS) has a finer light-yellow coloured clay matrix with both rounded and platy inclusions (either a mud- or a silt-stone) ranging in colour from reddish to dark brown/black to nearly black. White to yellow particles, presumably calcite or deteriorating limestone, also occur quite commonly.

The Coarse fabric class (COA) is made up of dense clay with rare very large grains, mostly semi-rounded quartz and rock fragments and some smaller dark platy angular fragments. Two other fabric types made up of well-levigated fabrics should also be mentioned, but due to the fineness of the clay, it is difficult to say whether these all belong to the same fabric group or should also be named as a fabric 'class'. The first is the buff group (BG), composed of orange to buff coloured fine, relatively well-levigated clays with some lime inclusions and rare quartz/sand grains (see similarity with Zerner's Grainy GM fabric) (Zerner 1986: 62-63). The other group is composed of fine white (FW) clays with occasional small, rounded dark grains.

There are three other common fabrics that occur among the Asine material, and their homogeneity suggests these represent ceramics produced from the same clay sources within a
standardised clay processing tradition. The first of these is the Gold Mica fabric (GM) with a semi-fine, sandy and quartz rich clay with slightly angular red chert, blue/grey platy particles plus occasional plates of gold biotite on the surface; descriptively, my GM fabric is indistinguishable from the Gold Mica fabric identified at Lerna (Zerner 1986: 64-65). The second true ‘fabric’ is the Gold Mica Coarse (GMC), which is composed of a somewhat dense fabric with rounded quartz inclusions, gold mica grains/sheets and a crystalline/highly micaceous appearance at the break. On occasion, red, blue or grey particles (ranging from semi-rounded to platy) are sometimes visible both in the break and on the surface. This fabric (and shapes within this fabric group) are identical to the Coarse Micaceous fabric identified by Zerner at Lerna (1978: 189-90), and through petrographic work, provenance at this time can be tentatively ascribed to Aegina for both gold mica fabrics (Zerner 1986: 65).

The third of these fabrics is the Sand tempered (SAN), which is composed of a light coloured, semi-fine clay with even, well-sorted and often rounded red, dark and white inclusions, that, due to the even and well-rounded nature of these particles, I have tentatively identified as sand particles. Once again, this fabric bears a great deal of macroscopic similarity to a fabric identified at Lerna as well as sharing the same characteristic surface treatment (Zerner’s medium and coarse Lustrous Decorated fabric) (Zerner 1986: 66-67). SAN, therefore, represents the fabric group associated with the Lustrous Decorated pottery tradition and while the provenance of this pottery type remains unknown, the similarities to Crete in terms of technological practices (both forming and fabric preparation) make this a particularly interesting imported pottery type (Kiriatzi 2003).

Petrographic analyses
In order to explore further the validity of these macroscopic fabric groups, petrographic analysis was carried out on 46 samples. Individual descriptions of each of these samples can be found in Appendix 5, with this section acting as a summary of: (i) the compositional and mineralogical range of the sampled fabrics; (ii) their compatibility with the local geology; and (iii) any correlation between fabric and ceramic typology (e.g. shape, surface treatment, etc.). Some ‘outlier’ classes were also sampled, but the goal of the sampling regime was not to explore the entire range of fabric types among the Asine material, but rather to investigate the variation within what appeared to be the locally manufactured fabrics. It should also be noted that the samples taken cover ceramics produced over a long period of time, and therefore variation within fabric groups may be related to temporal changes in technological traditions.

Five overall fabric classes were recognised petrographically, though two of these classes can be further divided into sub-groups based on subtle textural and compositional differences; below are brief descriptions of the significant characteristics of each fabric class (see Figure 5.7 for photomicrographs of petrographic groups).
(1) Predominant quartz:

a. Medium fine

This is a medium fine-grained, calcareous clay with iron opaques, mica lathes, rounded polycrystalline limestone and shell remnants/microfossils appearing frequently in the clay body. Small monocrystalline quartz grains and few larger angular quartz fragments (both mono- and polycrystalline) are the predominant inclusion type along with few crystalline calcite fragments. Poorly sorted sandstones/litharenites also appear rarely alongside very rare examples of feldspars.

b. Siltstone

Essentially, this is an almost identical clay body to the medium fine, including the same mix of iron opaques, mica lathes, polycrystalline limestone, rare feldspars and shell fragments. Similarly, small monocrystalline quartz are predominant, with rare rounded chert grains, poorly sorted sandstone/litharenites and occasional crystalline calcite; however, in this sub-group large sub-angular to sub-rounded siltstone fragments are very common.

c. Sandstone

This sub-group also has a similar clay body with mica lathes, very rare feldspars and shell fragments. Small monocrystalline quartz fragments also predominate, but in this case the only other prominent inclusion type is poorly sorted sandstone/litharenite often with iron-rich cement material.

(2) Quartz/chert/siltstone:

This fabric class has predominant small-medium angular monocrystalline quartz and frequent large angular to sub-rounded polycrystalline quartz. Large sub-angular to sub-rounded siltstone is the second most prominent inclusion type, followed by small and medium sub-rounded to sub-angular chert fragments.

(3) Mudstone:

This fabric class is composed of dense fine grained clays with few small monocrystalline quartz inclusions and very rare larger quartz inclusions. The primary inclusion type is a very fine-grained mudstone (sometimes this is radiolarian), and, rarely rounded sandstone grains as well.

(4) Fine sand:

This is a very fine clay with very few voids and is slightly calcareous, with infrequent rounded grains of polycrystalline limestone. Includes common small sub-angular to sub-rounded grains of mono- and polycrystalline quartz, bimodal distribution of chert (small, rounded grains and slightly larger semi-angular
fragments), and rounded to sub-rounded sandstone (composed of quartz/mica with an iron oxide rich cement). Also present are very infrequent sub-rounded silt/mudstone, with only one example having this occurring frequently (AS 14). The size and nature of the inclusions within the very fine clay body suggest that this aplastic material may have been deliberately added as a temper.

(5) Volcanic/Igneous:

Medium-coarse

This is a medium coarse calcareous clay with few voids. Generally, less abundant quartz (particularly of the small, rounded monocristalline variety) with more common large angular to sub-angular mono- and polycristalline quartz appear. There are frequent angular feldspars (both microcline and plagioclase), common rounded grains of polycristalline limestone, common sub-angular dark glassy rock fragments (andesite?) containing amphibole/olivine/feldspar/quartz lathes, and rare biotite lathes and amphibole.

Medium-fine

The difference between this and the medium-coarse variety is essentially one of texture and inclusion frequency.

The first of these petrographic classes, predominant quartz, encompasses both the MS1 and MS2 macroscopic classes, and while it can be further sub-divided petrographically into three sub-groups, these variations are subtle on a microscopic level, and were therefore, unsurprisingly, neither recognised nor reproducible in macroscopic classification (see Figure 5.8 for specific correlations and Figure 5.9 for more generalised correlations between the macro- and microscopic groups). Compositinally, the similarity between these three subgroups (particularly the use of a calcareous clay body with mica lathes, feldspars and microfossils/shell fragments) suggests that these all derive from a very similar (if not single) clay source, with the variation in inclusion type and size (e.g. the presence of siltstone or sandstone) most likely to relate to micro-variation in clay recipes or processing treatments.

Due to the petrographic similarity between the MS1 and MS2 classes, for the purposes of the quantitative analysis, these will be combined under a single heading; the possibility of the MS1 class being a coarser variant of the MS2 class was originally raised in the previous section. The impact of these petrographic sub-groups on the interpretation of local production traditions at Asine will be addressed in a forthcoming section.

The second petrographic class, quartz/chert/siltstone, correlates directly with the macroscopic COA group; while this fabric class shared a similar rock and mineral suite to the
predominant quartz petrographic group, the angularity of the quartz and the presence of siltstone and chert made it petrographically distinctive.

The third petrographic group, mudstone, correlates almost directly with the macroscopic SS group, though two samples macroscopically identified as SS appear to be possible outliers. This class, due to the fine clay matrix and typically angular inclusions, is one of the few fabric classes that appears to have been intentionally tempered; though this group does not differ significantly in terms of composition from the previous two, the character of the clay and the angularity of the inclusions seem to be more compatible with fabrics macroscopically observed at Lerna and described petrographically by Whitbread (2001).

The final two petrographic groups, volcanic and fine sand, are closely linked to the macroscopic groups GM/GMC and SAN, which were not only visually distinctive in terms of fabrics, but also tended to have forms and decorative attributes that marked them out as potential imports. This is further borne out by the identification of volcanic and igneous elements, namely the presence of angular zoned feldspars, both microcline and plagioclase, pleochroic amphiboles, biotite and glassy volcanic rock, as a sure sign of its foreign provenance. Macroscopic examination of this fabric suggested a compatibility with descriptions of Aeginetan gold micaceous pottery (both the medium and coarse variety), and the presence of biotite in several of the thin sections further confirms this identification.

While the volcanic group is geologically very distinct from the local products, and therefore clearly from an external source, the fine sand class is not geologically incompatible with local manufacture. However, its distinct appearance and tempering technique (unlike the much more variable local Asine pottery) suggest a production tradition dissimilar to that of the local Asine pottery (for a similar opinion regarding the Lerna material, see Whitbread 2001: 372 and the Argos material, see Kilikoglou et al. 2003: 135), and suggesting it was imported to the site. This fine sand fabric shows great compositional and textural similarities to the Sand-mudstone siltstone calcareous fabric identified by Whitbread (2001: 377), corresponding to Lustrous Decorated pottery among the Lerna V material, the Lustrous Decorated fabric from the Aspis, Argos (Kilikoglou et al. 2003: 135) and the sand-tempered fabric identified on Kythera (Kiriatzi 2003: 125). Therefore, while the fine sand/SAN pottery may have been produced locally (within the Argolid), it differs significantly enough in terms of certain manufacturing features such as clay processing, surface treatment and vessel form to classify it as a distinct technological tradition.

With the exception of the volcanic/igneous fabric class, all the materials found within the pottery could be locally sourced in the vicinity of Asine. However, the overall geologic similarity of the wider region around Asine (a bedrock of Paleocene-Maastrichtian flysch, Triassic-Dogger carbonates and Upper Cretaceous limestone extends for 5 km on both the
eastern and western sides of the Argive plain) suggests that ceramics produced within this region as a whole would share an underlying compositional similarity. This is confirmed by the remarkable similarities between the ceramics from the site of Lerna (10 km to the west) and much of the sampled Asine material. For example, for the Lerna IV and V ceramics, the 'local' clays were '... sandy calcareous with varying percentages of chert, limestone and calcareous sand/siltstones', mirroring the results of this petrographic analysis (Vaughan et al. 1995: 708; Whitbread 2001: 377). Therefore the term 'local' cannot be used to define a single production centre, but rather refers to a compatibility with a regional production tradition within the northern Argolid. However, while the first two petrographic groups (predominant quartz and quartz/chert/siltstone) seem likely to represent local production at Asine, the third (mudstone) could easily represent a product of a nearby Argive centre, possibly Lerna given the macro- and microscopic similarities between this and Lerna fabrics.

Only 3 of the samples (AS 4, 17 and 21) could not be placed in these petrographic classes, though there is nothing distinct about the macroscopic appearance of these samples. While nothing about their composition would suggest a foreign provenance, subtle variations in their composition within the typical 'local' suite of inclusions (e.g. a combination of chert, siltstone, sandstone and a calcareous, micaceous clay) suggest that a further number of local sub-classes may exist that were not well represented in the samples. Therefore, it appears that the petrographic analysis reflects a similar situation to that noted for the macroscopic classes: a wide range of micro-variation exists within the 'local' fabric groups.

**Diachronic changes in fabric composition**

As has been discussed above, there are some problems with the integrity of my phase 1; therefore given that this was recorded simply as a contrasting assemblage for Lefkandi and actually bears no relevance to patterns of LEMH ceramic technologies, will not be discussed in detail. In Phase 2, the dominant fabric in use is that of MS, with over 50% of all Asine pottery being made from this fabric. Other significant fabric types include the SS group (nearly 14% of the assemblage), the COA fabric (c. 18% of the assemblage) and the BG (c. 6.5% of the assemblage). GM, GMC and SAN all appear in relatively small proportions (c. 4%, 2.5% and 1.5%, respectively) with various other outlier fabrics making up only 0.5% of the assemblage during Phase 2. The FW fabric group does not begin to appear until Phase 4 (Figure 5.10).

In Phase 3, there are very few changes in the overall fabric composition of the assemblage, with the amount of MS declining slightly (forming 48% of the assemblage), and an

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12 This information comes from the 1:50,000 IGME geological maps of Nafplio (1970 sheet) and Argos (1970 sheet).

13 This is hardly surprising given the sampling strategy, in which only those frequently occurring macroscopic fabric groups were investigated; this precluded the sampling of rare and 'outlier' groups.
increase in both the BG class (to nearly 10% of the assemblage and the SAN fabric (from c. 1.5% of the assemblage to nearly 7% in Phase 3). Similar patterns exist for Phase 4, but by Phase 5, the BG and SAN fabrics together make up nearly 20% of the assemblage, with other fabrics like the FW (making up 3% of the assemblage by Phase 5) and the GM and GMC fabrics making up between 6.5 to 8.5% of the assemblage from Phases 2 through 5.

In terms of fabric, there is an overall pattern of stability through the five centuries of the LEMH period. Though there are fluctuations by fabric from phase to phase, these do not appear to have constancy as trends (often reversing in the next phase), and therefore are unlikely to have any greater significance than drift and variation. There is an exception in two cases: both the BG and SAN fabrics show a marked and continuous increase through the phases.

Qualitatively speaking, there are few notable fabric-shape correlations, with both the MS and SS fabric classes used to make a wide range of both open and closed shapes (from bowls and cups to jars); furthermore, the COA class is not only used for cooking pots/jars, but petrographic analysis identified a dark burnished bowl in this fabric class (due to the surface treatment on these vessels, this is macroscopically unclear), suggesting a more comprehensive production tradition than was originally assumed. Therefore, it appears that individually within each of the fabric groups likely to have been produced locally at Asine (the MS1, 2 and COA groups) and those likely to have been produced nearby at another Argive centre (the SS group) a full range of eating, serving and storage pottery was being produced (Figure 5.11).

**Diachronic changes in manufacturing techniques**

Of the manufacturing techniques identified in Chapter 3 there is evidence for four techniques at Asine (wheel-thrown proper, wheel/RKE formed, wheel/RKE finished and handmade). There is only a single example within the entire assemblage of a definitively wheel-thrown (as opposed to a wheel/RKE formed piece), and this is of an outlier fabric and in an unusual shape, so must be considered an import, or possibly an intrusive element from later levels and therefore not strictly relevant to local LEMH manufacturing techniques.

From Phase 2 to Phase 5, there is little substantial change discernible in the spectrum of manufacturing techniques in use at Asine, with handmade products dominating the assemblage (comprising between approximately 93% to 96% of the assemblage during these phases) (Figure 5.12). Wheel-finished pieces are clear from the marks on the rims of sherds, with no corresponding marks found on the bases of vessels. Furthermore, there is little evidence for wheel/RKE finishing on the body or base section of vessels, thus suggesting these vessels were not formed in any part on the wheel (Figure 5.13).
There is a small increase in wheel/RKE finished products from phases 2 to 5 (making up 1.5% of the pottery in Phase 2 and 5.5% in Phase 5), though there is not a commensurate rise in the number of wheel/RKE formed products during these phases. The wheel/RKE formed ceramics continually make up between 5% to 7% of the total local pottery, with no discernible increase occurring over time. Furthermore, the fabric groups among which these wheel/RKE formed products occur are most often produced are non-local or uncertain, like the BG (Figure 5.14).

The fabric group in which the most wheel/RKE formed products consistently occur is the BG group. This fabric group has a parallel at Lerna in the fine-grained group, but given the fine nature of the clay, petrographic analysis is of little use in classifying this fabric any further (Whitbread 2001: 371). As Zerner claims, this fabric type is equally likely to be either a local or imported product (bearing strong similarities to central Greek fabrics) (Zerner 1986: 62), and this complicates matters regarding its inclusion in the local fabric groups when performing analyses regarding local manufacture traditions.

For the sake of argument, even if the BG fabric class were included in the 'local' fabrics, the effect is negligible. Though this causes a slight increase in the percentage of locally wheel/RKE formed products, these still remain an unequivocal minority, never comprising more than 7.5% of the assemblage. While the pattern of a slight increase over time amongst wheel/RKE finished products persists (from c. 2% in Phase 2 to c. 5% in Phase 5), this remains unaffected if the BG fabric class is considered local and included within this category because the vast majority of wheel/RKE finished vessels occur in the MS2 fabric class.

**Diachronic changes in surface treatment and decoration**

Eight surface treatments occur commonly on the Asine pottery: wiping, scoring, polishing, burnishing, light slipped, dark slipped, light slipped and burnished, and dark slipped and burnished (Figure 5.15). The most common surface treatment throughout all five phases is wiping, making up between 38% to 55% of the pottery; the next most common surface treatments are dark slipped and burnished followed by light slipped. Both of these surface treatments retain their popularity over time, but only the dark slipped and burnished category shows a slight increase, from c. 12% in Phase 2 to c. 14.5% in Phase 5. In contrast, while light slipping of vessels continues to be the third most common form of surface treatment, the percentage of vessels treated in this manner drops from c. 19% in Phase 2 to c. 9% in Phase 5. Burnished, light slipped and burnished and dark slipped categories show some decrease, though these surface treatments continue to be used through Phase 5, though not with as much frequency as in Phases 2 and 3.
Scored vessels seem to disappear in Phase 5, but given that these were a very nominal component of the assemblage throughout all earlier phases, the significance of this may be negligible. Diachronically, the only significant pattern is the greater increase in wiped surfaces; this negatively affects all other surface treatment categories with the exception of the dark slipped and burnished class, which increases slightly from Phases 2 to 5.

With regard to decoration, (Figure 5.16) one overwhelming trend is clear: the amount of painted pottery increases from c. 14% in Phase 2 to c. 25% in Phase 5, with a decline in the amount of pottery decorated with plastic decoration occurring in Phase 2 to Phase 5 (from c.6% to c. 2%, respectively), though this increase in painted pottery is not necessarily at the expense of the plastic decorated pottery. In fact, the increase in painted pottery coincides, and appears to be driving, an increase in the amount of decorated pottery overall, though other decorative techniques such as incising and impressing appear consistently throughout the phases and are neither positively nor negatively affected by this increase in painted pottery and decorated pottery in general. There is no clear correlation between surface treatment and shape, nor decoration and shape, with decorative treatments like incising and painting being applied to open and closed vessels alike.

Diachronic changes in firing conditions

With regard to firing conditions among local pottery types at Asine, there are no clear diachronic patterns (Figure 5.17). Oxidised, incompletely oxidised, reduced and incompletely reduced pottery appear within all the phases at Asine, with incompletely oxidised pottery the best represented throughout all phases (comprising c. 50% of the assemblage in Phases 2 and 3 and dropping to 41% in Phase 5). Pottery fired in fully oxidising conditions remains the second most common type for all phases at Asine (comprising c. 32% of the pottery in Phases 2, 4 and 5). Incompletely reduced pottery is the next most common group, with reduced pottery being the least commonly occurring. The only notable change in firing conditions is an increase in reduced (whether fully or incompletely) pottery: this is a minor increase, though, representing a change from 21% (completely or incompletely) reduced pottery in Phase 2 to 25% in Phase 5.

Additionally, one can look to the painted pottery for evidence of the level of firing control. Unlike the case of Lefkandi, matt-paint (presumably manganese based) was used almost exclusively for painted decoration, thus requiring very little firing control in order to produce a dark-on-light painted pattern. During the EHIII phase of the LEMH, dark-on-light mottled (and thus, presumably iron-rich) paint was used infrequently, yet the motting of colour and the often streaky finish of this paint illustrate an incomplete control over the necessary
reduction and re-oxidation needed to achieve a dark paint on a light-coloured background using iron rich paints (Noll et al. 1975).

Insofar as firing conditions correlate with other attributes of the pottery, there appears to be a relationship between reduction firing and the BG fabric group (Figure 5.18); in each phase, the majority of reduced vessels are in the BG fabric group (from 48% in Phase 2 to 68% in Phase 5); given that the BG fabric group only ever makes up c. 10% of the entire assemblage (in Phase 5), the dominance of the BG within the reduced firing category is quite remarkable.

Amongst the local fabrics, a firing distinction can be made between the MS class and the COA/SS classes; the presence of crystalline calcite in the MS class suggests that the firing temperatures of this pottery did not exceed 750 °C. While the presence of polycrystalline limestone in the two other classes indicates a firing temperature of less than 850°C, the presence of crystalline calcite is unique to the MS class and may indicate a notable divergence in firing techniques between these fabric classes.

**Diachronic changes in morphology and shape**

As at Lefkandi, shape is a particularly difficult aspect of the Asine pottery assemblage to quantify. All of the standard EHIII and early MH shapes are found, and in this manner, shapes at Asine (unsurprisingly) closely resemble those at neighbouring Lerna. However, given the stratigraphic problems discussed previously, it is difficult to discuss with assurance the disappearance of vessel types as these are often found in later levels (presumably as intrusive kick-ups).

Between Phases 2 and 5, only three new shapes are introduced into the Asine repertoire: the angular (or carinated) bowl/cup, the stemmed bowl and the globular cup. The first two of these shapes are variants on a pre-existing shape. The globular cup, however, seems to have no obvious antecedent and occurs only in BG, SAN and FW fabrics, and may therefore be considered an imported shape (or alternatively, an imitation of an imported shape). There are few other discernible correlations between shape and fabric, with the majority of standard bowl, cup and jar shapes produced in the full range of fabrics (Figure 5.11). The angular bowl and cup are first seen in the latter half of Phase 2 (this is identical to Lerna where these shapes make their first appearance in the transitional Lerna IV-V phase), and the stemmed bowl appears for the first time in Phase 4. There do not appear to be formalised sizes or rim diameters for the Asine vessel shapes, with both open and closed vessels appearing in a wide range of sizes.
Diachronic changes in imported material

Trends among the presumed import fabrics are intriguing (Figure 5.19). In general, the proportion of presumed Aeginetan material remains stable over time comprising 6.5-7.5% of the assemblage in Phases 2-4, and rising slightly to 8.5% in Phase 5. Other presumed import fabrics (the SAN, BG and FW classes) all show marked increases over time; in combination these represent 17.7%, 23.4% and 22.7% of the assemblage in Phases 3, 4 and 5, respectively. With regard to vessel shapes of imported material, the GM and GMC fabrics appear in a wide variety of shapes, and from Phase 4, it seems that a full corpus of both open and closed shapes in this fabric appear at Asine (Nordquist 1987: 49 seems to confirm this). In the SAN fabric, jars are predominant; in Phase 3, however, open shapes like cups and goblets begin to appear more frequently, though the range of shapes in the SAN fabric does not approach the GM and GMC fabrics in terms of comprehensiveness.

The FW and BG classes produce almost no evidence of closed shapes: in the FW class there are only two possible jar identifications and in the BG there are six closed shapes identified, though some of these are tentative and are more likely to represent other, small closed shapes like pyxides (four of these six examples are also decoratively painted in an style somewhat atypical of the main painted pottery repertoire). The main shapes produced in the BG and FW fabric classes are the everted rim bowls/cup or globular cup. Therefore, a wide range of eating, serving and storage vessels appear to be imported to Asine during the LEMH period, with the majority (and widest range) of vessels deriving from Aegina.

Implications of technological stasis

The lack of quantifiable diachronic patterning within the Asine material is the first and most significant pattern to be noted in this analysis, and highlights the lack of development within the production techniques in use at Asine. How, then, can the trends (or, indeed, non-trends) in the production of pottery at Asine be explained?

The principal characteristic of the Asine fabrics is that within a limited range of clay and temper resources, they incorporate a great deal of macroscopic and petrographic variation. However, these variations are not compositionally significant enough to reflect a wide range of raw material sources. Due to the overall compositional similarities between the MS1 and MS2 fabric classes (and the further four petrographic sub-groups found within these macroscopic classes) these are taken to be fabrics local to Asine. Within this range of local fabrics, the presence of multiple petrographically distinctive groups persisting through time is likely to
relate to the continued exploitation of a number of geographically proximate but subtly different clay resources by the different Asine producers.

Turning to the diachronic representation of fabrics, there is no substantial increase or decrease in any potentially local fabric type; while the MS fabric consistently makes up the largest proportion of the pottery, this fabric does not become more dominant as time progresses (if anything, there is a slight decline in the amount of MS2 used over time). In Phase 2 there are seven fabrics in common use (common use defined as being over 2% of the assemblage), and between eight and nine fabrics are in common use in Phases 3, 4 and 5 (see Figure 5.20). This corresponds to a stable number of surface and decorative treatments, but this will be discussed in detail later. Rather than any single fabric group becoming more frequently used, the number of fabric groups in use remains stable and increases slightly (though this ‘increase’ is due to the introduction and increasingly regular appearance of imported fabric types). This is confirmed by the petrographic analysis in which each of the petrographic sub-groups are represented throughout Phases 2-5.14

Among those fabrics likely to be local to the northern Argolid (MS, SS and COA), a variety of shapes was produced in each of the fabrics (including both serving and storage vessels); furthermore, throughout Phases 2 through 5, the number of distinct shapes produced in each fabric remains almost unchanged. This seems to substantiate further the stability of each fabric group, and the apparent continuity of production within each of these fabric traditions (Figure 5.20, also see Figure 5.11).

While clay and fabric composition are one of the most definitely delimited attributes of pottery production in terms of resource availability, choice within fabric composition has also been shown in equal part to reflect the choices of producers and the replication of a specific learned behaviour relating to resource procurement and raw material processing (Arnold 2000: 362-68; Neupert 2000: 250-51). On a broad level, if fabric composition and texture can be seen as a reflection of learnt behaviour within a pottery producing population, then the continued use of a range of fabric groups over time should relate to a number of stable competing or complementary pottery production traditions within the region.

This is further substantiated if one looks within each fabric class at the number of morphological and decorative attributes being used within each of these production traditions over time (Figures 5.22-5.24).15 There are 3-5 rim types, handle forms and surface treatments in use within every macroscopic fabric group. Given that petrographic analysis has shown the presence of further sub-groups within each of these fabric groups, it might be possible to

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14 This is particularly telling as many of these sub-groups are macroscopically invisible; hence, the sampling strategy was unable to take their presence into account and their appearance within all phases of the Asine samples is testament to their longevity and stability through time.

15 Given the petrographic similarity between the MS1 and the MS2 classes, these have been considered as a single fabric tradition for this analysis.
imagine each of these fabric sub-groups, morphological features and decorative treatments relating to different Asine producers or production traditions.

With the possible exception of the SS fabric class (where there is a slight reduction in the number of rim, handle and decorative types employed by Phases 4 and 5) (Figure 5.24), there is almost no change within each fabric group with regard to the number of morphological and decorative features employed over time. The consistency and the retention of so many morphological and decorative attributes serves to underscore the likelihood of a relatively large number of producers (possibly within a number of households) working within Asine. As has been suggested by other studies (Rice 1991: 268; Stark et al. 2000: 324), there appears to be a relationship between increasing homogeneity in numerous attributes of pottery (including notably fabric composition, vessel morphology and decoration) and increasing specialisation of production. However, what we appear to be witnessing at Asine is the inverse of this type of pattern; a number of long-lived production traditions are evident from the beginning of the LEMH, and within each fabric type, a wide range of morphological forms and surface and decorative treatments are utilised and maintained through time.

This pattern is further corroborated in the manufacturing patterns of Asine pottery. The limited employment of the wheel at Asine, though not unusual in the context of the Argolid during the LEMH (see Chapter 6), should be considered in more detail. Even though evidence of wheel-use exists from Phase 2, the majority of all wheel/RKE formed products occur in fabric classes that could potentially be imported, and while wheel/RKE formed products do occur in extremely small numbers in the MS2 fabric, the overall picture suggests that wheel/RKE use was by no means popular at Asine. This presence of very few local wheel/RKE formed products is in fact rather confusing for wheel/RKE use is not a technique that is typically sporadically employed. Requiring rigorous time and teaching investment, proficiency in wheel/RKE use is much more difficult to acquire than any other manufacturing techniques, and can therefore often be quantitatively traced in its development. Thus, I would argue that those local ceramics identified as wheel/RKE formed (there are only 6 of these throughout the phases) have been mis-identified and should be considered wheel/RKE finished instead. One additional point adds weight to this argument, and that is the clear diachronic increase amongst the local fabrics in the wheel/RKE finished category. Within this category, the vessels tend to have characteristics associated with early rotational manufacture: a tendency to be thick-walled, signs of shaving to thin the body of the vessel and often wheel finished necks and rims (though

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16 Arguments against this type of correlation emphasise the greater complexity of the issue (Arnold 2000; 358-359), citing ethnographic examples where elite control and specialisation of pottery production have led to increased diversity in clay recipes due to resource circumscription. While this is undoubtedly true, I would argue that in the case of Asine, we are still talking about a relatively small-scale community (c. 2 ha) without apparent elite offices, and therefore, these types of ethnographic models probably have little relevance.
the remainder of the body may not have evidence of being produced/finished on the wheel). This increase in wheel/RKE finished vessels, in a formative and basic fashion, is a pattern likely to occur within a community where the technological tradition of wheel/RKE use is being newly introduced, and thus represents a formative period of experimentation with an unfamiliar technological tradition.17

A further problem exists in explaining the manufacturing traditions at Asine: this relates to the BG fabric, and whether or not this is indeed a local product. Within the BG fabric, wheel/RKE use occurs quite commonly, though only in a limited group of vessel shapes (small open shapes like cups and bowls). Furthermore, the high percentage of this pottery that is completely reduced (another technique not commonly in use among the local fabric classes) further distinguishes this group. This is almost an identical situation to that at Lerna, where no local ceramics that are clearly wheel-made appear among the early MH material (Zerner 1993: 42), though NAA analysis of EHIII fine reduced (and sometimes wheel-made pottery) has shown this group to be of a local fabric (Rutter 1983a). Consistently, at both Lerna and Asine, fine fabrics (which are often wheel-made and completely reduced) arise as question marks within the assemblage. I think two possible explanations can be offered for this category of fine, grey and often wheel/RKE formed ceramics. The first would be that this BG fabric class represents an import, which is not outside the realms of possibility (BG makes up between 9-10% of the assemblage at most, with another fabric likely to have been imported, the SAN, also comprising 9% of the assemblage at its peak). However, given the local provenance ascribed to this fine reduced group through NAA analysis at Lerna, the possibility exists that at Asine the BG and its wheel-made and reduced products could also be local. In this case, the second proposition is that itinerant potters from a centre of production at which wheel/RKE use and reduction firing of pottery were an established technological practice (possibly in central Greece), came to both Asine and Lerna sporadically and produced vessels in the technological tradition of their home (as suggested by Rutter [1983a]).18

Two recent research investigations substantiate the suggestion that itinerant potters were active in the Aegean Middle and Late Bronze age, and that they utilised and imported their own technological traditions, adhering to ‘known’ technological practices. Material evidence of such a model exists in the form of a wheel/tournette, found at Kolonna (Aegina) and made out of ‘Minoanising’ sand tempered fabric, presumably by Minoan potters who were not simply bringing with them very specific manufacture and paste traditions, but actually

17 Nordquist (1987: 48) also suggests that middle MH pottery at Asine may have been ‘wheel finished’.
18 Adding feasibility to this scenario is the BG fabric itself: no such fine, well-levigated fabric exists in the local Asine fabric repertoire, and the introduction of such a fabric warrants exploration. If itinerant craftspeople were visiting both Lerna and Asine, the BG fabric could represent a clay type specifically processed according to their clay production traditions and for their needs (such as wheel-making), in which a well-levigated fabric is particularly preferred.

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making the technological kit necessary for the implementation of these specific manufacturing traditions (Gauss 2005). The similarity of specific aspects of morphology and decoration on LMI pithoi found across Crete is also suggestive of the presence of itinerant potters (Christakis 2005: 9-10, 73). In addition, Day’s ethnographic study of Cretan twentieth century pottery-making systems documents the building of local kilns by itinerant potters rather than using local kilns already in place (Day 2004: 119).

Furthermore, if one imagines that the exposure of the local Asine potters to both of these techniques had only been through the presence of itinerant potters, then the slightly experimental and sporadic nature with which both wheel/RKE use and reduced firing were employed at Asine might be explicable. Discussing grey (reduced), burnished pottery from Lerna, Zerner claims ‘... the style (of Grey Minyan) was certainly used by potters in the Argolid’ (1993: 43 emphasis added). In the case of both Asine and Lerna, it might be conceivable to suggest that only those technical elements like surface polish/burnish and incomplete reduction firing techniques were achieved regularly in the latter part of the LEMH. As proposed in Chapter 3, the adoption of these kinds of technical attributes, of the ‘superficial’ through ‘intermediate’ types that can be learned and replicated through indirect contact or simple observation, respectively, are those most likely to be transmitted through sporadic contact, like the model of itinerant craftspeople herein proposed.

Returning to our summary of the technological attributes of Asine pottery, the local pottery does not seem to indicate any particular diachronic changes in firing conditions. Rather, the dominance of incompletely oxidised pottery suggests that a great deal of the firing was not particularly well controlled, though the increase in incompletely reduced vessels may be illustrative of experimentation and attempts to create reducing firing conditions. This should be related to the suggestion proposed above, with experimentation occurring to replicate the grey firing colour of completely reduced vessels. This possible experimentation with more sophisticated firing techniques is also concurrent with a slight increase in the number of fully oxidised vessels (particularly white slipped) varieties, and may indicate a rudimentary control over this more easily achieved firing atmosphere.

There is little indication provided by the pottery as to the type of firing installation, though the presence of a single completely oxidised pithos rim suggests that large, well-fired vessels did exist and therefore a built structure of significant size seems likely (though, perhaps, as is evident from ethnography, a structure was built for the communal firing of large vessels, with regular pottery fired in individual structures) (Day 2004).

In terms of decoration, the pottery at Asine follows along almost identical lines to those occurring at the same time at Lerna and other Argive sites, with the utilisation of EHIII pattern-painted and MH Matt Painted traditions. There is some evidence of a transitional painting technique between these two traditions; for example in Phase 2, very slightly lustrous and dark
'near-matt' painted decoration occurs (Frödin et al. 1938: 218, 229, for examples of a similar phenomenon), and therefore it seems likely that this shift was ongoing and continuous throughout the EHIII period (Buck 1964: 298). Also during Phase 2, streaky washes or slips (like the extremely popular EHIII solidly painted class at Lerna and the Smear ware cited from other EHIII sites) were common, suggesting a familiarity with the decorative styles of the surrounding sites and regions. Pattern painted pottery was also fairly common at Asine, in both Dark-on-Light and Light-on-Dark varieties. The motifs employed at this time were entirely linear, including stripes and cross-hatched triangles or rectangles (similar to motif VIIC in Rutter 1995: 548-549). At the end of Phase 2, Polychrome Matt Painted designs first appear (this also occurs at Lerna, see Zerner 1978: 155-56), mostly in thick bands and concentric triangles.

Matt-painted decoration increasingly becomes one of the most popular decorative treatments (though red-brown, slightly shiny paint still appears rarely on vessels until Phase 4), and over time, there is an increase in the variety of decorative motifs employed. In Phase 3, the parallel stripe is very prominent; many vessels also have zig-zag triangles under the rim, concentric circles and painted X's on the base of vessels (motifs 3a/5, 97/98 and 100/101 respectively from Buck 1964). Matt-painted lines on the rim interior also appear for the first time, possibly imitating the incised decoration that is popular at this period for everted rim bowls. In Phases 4 and 5, these motifs continue to be employed, and concentric triangles are also used (Buck 1964: motif 42a/44), with some cross-hatched linear panels also appearing; furthermore, the execution of the design is often finer (thinner lines and more even dark-purplish colour) than in the preceding phases.

The establishment and maintenance of a number of diverse traditions at Asine suggests the contemporary existence of a number of producers. However, no aspect of production at Asine gives an indication that any of these production traditions are technologically sophisticated enough to require an input of time, learning or skill requiring the differentiation of labour (Nordquist 1987: 108). This analysis of the Asine pottery therefore accords with Nordquist's (1987: 109) assessment of production more generally at Asine, in which there is no evidence for industry beyond that which could be produced at the domestic/semi-specialised level (see Figure 3.6, in which Asine production organisation would fall between household and semi-specialised). Within a village the size of Asine, estimated as 1.5-2 hectares in the LEMH and thus with a population of circa 225-300 people and perhaps 37-50 households, there is evidence for the existence of at least five possible different ceramic production systems (this is based on the number of petrographic fabric groups found amongst the local macroscopic groups). Therefore, the organisation of ceramic production need not have operated beyond the scale of a domestic craft to supply the entire Asine population (Nordquist 1987: 24).
The logics of consumption at Asine

Turning to consumption choices at Asine, the diversity of ceramic types must bear some relevance to the choices of consumers and the social role pottery played within the community. At Asine, as has been noted above, there does not appear to be any convergence upon a site-wide ceramic technological tradition; this is also true concerning the lack of any single dominant visual style. In neither production nor consumption terms is there a move towards standardisation. Substantial variation existed not only in terms of the surface treatments applied to vessels, but also in their combination with a wide variety of decorative treatments and shapes (Figure 5.25).

Furthermore, the range of decoration, surface treatments and shapes seen at Asine indicates close contact with a wide number of sites and regions. Therefore it would seem that consumption choices at Asine were not driven solely by a clearly established set of preferences within the site, but correspond to changes and affiliations that lie beyond the borders of the community. The changes seen in decorative preference are consistent with developments over a wide area of the mainland and in the Cyclades (Buck 1964: 289-291), and the adoption of these painted motifs at Asine seems indicative of interactions within this area of the Peloponnese, or at the very least, of the local adoption and emulation of products imported into Asine.

This comprehensive and variable consumption tradition is also reflected in the types of imported pottery found at Asine (see Figure 5.19). Looking at the nature of ceramic importation at Asine, we must revisit the possibility (raised in the previous section) some of the variation within in the MS and COA classes is related to production at nearby sites and represent the results of an intensive system of micro-regional exchange among Argive sites. This is far from an unusual suggestion in the light of NAA analyses that showed EHIII painted pottery from Korakou and Lerna to be the products of at least 4 different sites (Asine, Tiryns, Zygouries and Corinth) (Attas et al. 1987; Rutter 1993). The frequency with which pottery tends to move around the Argolid is also exemplified by analyses of MH coarse material from the Argos Aspis (Kilikoglou et al. 2003: 133).

While the results of analyses within this chapter have identified only a single macroscopic and petrographic group (the SS group) likely to represent the product of another Argive site, it is very possible that other products of Argive sites are commonly occurring within the Asine assemblage but are so macroscopically indistinct from the local assemblage as to be invisible. While it is necessary to keep in mind the likelihood of these short-distance exchanges between Asine and other sites in the Argolid, the relatively small amounts of this pottery identified through chemical analysis at other Argive sites makes me confident that the presence of such imports at Asine would not heavily distort the picture of local production
presented here. However, the significance of this sort of exchange for the nature of ceramic consumption at Asine cannot be overlooked, due to the social phenomenon it is likely to reflect. The frequent exchange of ceramics, and specifically of tablewares (particularly of types that are likely to have been visually distinctive for the consumers) is associated with two types of behaviour. The first is that of an economically oriented trade in ceramics (Rutter 1993), while the second, and more likely scenario for the LEMH, is one associated with frequent feasting events and large-scale regional gathering and interaction (Marshall and Maas 1997: 227; Rosman and Rubel 1981: 179).

Regardless, those products definitely imported to Asine continued to increase in proportion throughout the MH period, and by the late MH period, Nordquist (1987: table 5.3) has estimated that some 20% of all ceramics at Asine are imported (with 80% of those imports coming from Aegina). During the LEMH period the proportion of imported ceramics increases over time, with types such as the SAN fabric (the Minoanising group) pottery comprising up to 9% of the assemblage by Phase 5.19 Aeginetan pottery appears to make up a reasonably consistent component of the assemblage from Phases 3 to 5 (c. 7%), with OUT imports (some of these undoubtedly Cycladic, with a sandy, gold micaceous fabric) a much smaller percentage of the possible imports (c. 1.5%). In addition, in Phase 3, four possible Cretan (as opposed to Minoanising) imports can be identified, with two more appearing in Phase 5. This documents that contact and exchange with external groups are by no means wanting; in fact, the high percentage of SAN fabric (Minoanising) pottery and the presence of some true Cretan imports suggest a close connection with the source of this pottery or a concentrated effort towards the acquisition of this ceramic type.

What repercussions might this stylistic diversity and wide practice of importation (both regionally and intra-regionally) have for the nature of material culture consumption at Asine? The production sphere at Asine, as noted above, seems to be oriented around household level production; this seems to be equally true of the consumption of pottery. The finds of pairs of ceramic drinking vessels (for a set of host and guest, apparently), may give us a window into the role that ceramics may have played in the LEMH community (Nordquist 1987: 108), and this seems to indicate a much greater emphasis on a household based notion of communality and interaction. Furthermore, the diversity with which ceramics were consumed at Asine seems to indicate that the acquisition, emulation and production of visibly distinct classes of ceramics was both an important and acceptable medium of household expression.20 The fact that many different types of pottery were being produced and imported to Asine suggests the existence of

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19 A similar proportion (c. 8%) of the assemblage at Argos in the MHI-II phase is also comprised of Lustrous Decorated pottery (Kilikoglou et al. 2003: pl XXVIia).

20 I use the term household here, but the likelihood that other types of affiliation such as kinship groups, lineage ties or even factional alliances were also being expressed in patterns of ceramic consumption behaviours are equally probable.
an active consumer market for these conspicuous markers of diverse affiliations and origins. Furthermore, given the relatively small size of Asine, the importance of extra-community relationships for both demographic and agricultural sustainability may have been paramount; thus, the emphasis on ties beyond the community as a whole may be explicable, as would the emphasis on intra-community interaction and events. Though this manifestation of household differentiation does not appear to have a formalised material vocabulary, the differential access of Asine households to certain materials has already been noted by Nordquist (1987: 108), and the concept of unformalised differentiation between households has also been raised by Voutsaki (2001) with regard to the household assemblages of other Argive sites. Thus, it seems likely that a much more competitively oriented form of social behaviour (occurring on either a household, lineage, kinship or factional basis) was occurring at Asine in comparison to the much more communally-oriented phenomenon observed at Lefkandi.
CHAPTER 6
REGIONAL AND SITE COMPARISONS

This chapter brings together additional information about the ceramic production traditions and general patterns of consumption at those sites within mainland Greece that have not yet been discussed in detail to provide a comparative contrast to the preceding detailed studies of Lefkandi and Asine. Due to the inconsistencies of excavation and publication of LEMII sites, all regions of the mainland cannot be discussed in the same degree of detail, so I will use the most comprehensively published sites in order to extrapolate from this a general regional picture. This will allow the technological traditions of each region to be identified and will sometimes allow me to assess patterns of importation and ceramic emulation between regions, and therefore, to investigate the nature of interaction between different LEMII centres.

Naturally, this exercise poses a number of problems due to the rarity with which local and imported products are distinguished in published reports and the equal rarity with which production technologies are discussed in those reports (in contrast to the more superficial categories of shape and surface treatment). The following section will discuss how to combat this inherent bias in the evidence and the way in which we can begin to compile a picture of local production traditions and, where possible, general patterns of ceramic consumption.

**Distinguishing between local production and importation**

The most basic problem hindering the study of LEMH pottery production and consumption is the fact that the variations noted between classes of ceramics are not necessarily related to production differences. The basic visual distinctions between classes of LEMH ceramics have long been recognised and attributed to 'regionalism', meaning that certain ceramic *styles* appear to be more closely correlated with specific areas of the mainland (e.g. EHIII Light-on-Dark [often known as Ayia Marina] painted pottery with central Greece and Dark-on-Light with the Peloponnese (Rutter 1988: 75-84, 1995: 648). However, it is currently unclear to what extent these stylistic grouping are representative of regional production traditions. The problem is that the vast majority of LEMH ceramic types, when found at a site, are treated as local products, or at least nothing is explicitly stated to the contrary in many published reports. Even if 1-2% of pottery at a site is both stylistically and technologically different from the other pottery, it is often not identified as an import even though it could well be (see Chapter 3 regarding the example of Fine Grey Burnished ware at EHIII Lerna). By failing to address whether or not ceramics are local or imported to a site we limit our ability to identify and distinguish between regional production traditions.
It is this type of generalising and homogenising approach to LEMH ceramic classification that has resulted in the fact that those attributes used to classify LEMH pottery are of limited relevance to units that we are able to detect archaeologically (i.e. they do not relate to production groups but rather to etically determined categories of surface finish and decoration). An example of this is Matt Painted pottery, assumed to uniformly consist of manganese-painted ceramics with dull, dark-on-light painted decoration. However, this is by no means a single production class of pottery and in some of the earliest classifications of Matt Painted pottery, a variety of fabric types was noted, thereby suggesting that it was manufactured in a number of different places (Buck 1964; French 1972; Goldman 1931). There are other technological aspects of this category that would suggest substantial differences in production tradition, such as the colour of the matt-paint, which is reported to vary from black to red, thus indicating that all paint used for Matt Painted vessels was not necessarily manganese-based, given that manganese paint, regardless of firing atmosphere, will not turn any colour other than grey, brown/purple, or black. Therefore, technologically, there is a division between manganese- and iron-based Matt Painted pottery that is entirely subsumed within the Matt Painted category (Buck 1964: 240). In a similar respect, the adoption of the Minyan nomenclature for all dark faced, shiny pottery (Howell 1992), rather than applying it solely to the specific fine, grey wheel-made variety, lumps together the products of significantly different production processes and locales. For example, besides the fabric differences between true Grey Minyan pottery and black burnished ceramics, the manner in which one achieves black, burnished and grey, polished surfaces are technologically quite divergent, and while sharing superficial surface similarities, should not be considered taxonomically similar in any other respect.

Even more problematically, this classification system has had a further knock-on effect for the implementation of petrographic and chemical sampling schemes. In many cases, the sampling of LEMH ceramics has been based on decorative ware groups; hence, the results of these analytical programmes often yield the unsurprising result that though reasonably visually homogeneous, the pottery is petrographically and/or chemically heterogeneous because the very nature of the classification system does not tend to distinguish between pots made by different producers. As discussed in Chapter 3, the work of Zerner and others has

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1 For example, many of the analyses of the Matt Painted and Monochrome Burnished classes at Argos show that while these two groups tend to be similar decoratively and morphologically, they display a wide variety of compositional groups (Kilikoglou et al. 2003). It is likely that these compositional groups would also relate to macroscopic fabric differences, but these have not apparently been taken into account in the classification of the pottery. This phenomenon should be distinguished from examples (particularly of fine pottery) in which no macroscopic fabric differences are discernible yet the sampled ceramics still form a number of different compositional groups. This suggests that while production may have occurred at a number of different sites, the similarity of clay
begun to clarify this problem, advocating the use of macroscopic fabric groups in order to classify pottery according to notional production units and locales, but outside of the Argolid this approach has not yet been widely adopted.

Furthermore, if the components of a ceramic assemblage are part of the familiar LEMH repertoire (e.g. Grey Minyan or Matt Painted), they are rarely considered to be possible regional or extra-regional imports, even if they represent a different technological tradition than the remaining majority of the ceramics at a site. The results of Chapters 4 and 5, which illustrate the substantial ceramic production differences that exist between the sites of Lefkandi and Asine and emphasise the divergent technological traditions that exist *locally at each site*, underscore how implausible it is that many numerous different local technological traditions would have co-existed at a single site. When provenance analysis is undertaken (petrographic and/or chemical), it has typically been shown that the ceramic assemblage of a site is largely a composite of local production and exchange (as was partially the case with the Asine material, see Chapter 5). Indeed, given that the small-scale movement of ceramics both within regions and between them has consistently been shown to be occurring in other periods and parts of the Aegean Bronze Age (Attas 1987; Whitelaw 1983; Whitelaw et al. 1997), the likelihood that it was occurring in the LEMH period is also high (Rutter 1984: 103, 1988, 1993: 27; Zerner 1978, 1993).

This has been partially corroborated for the LEMH period by (i) the intensive program of chemical testing that has revealed small-scale, yet intensive regional trade to have occurred in the EHIII Argolid (Attas 1987; Rutter 1984: 103, Rutter 1988, Rutter 1993: 27); and (ii) the NAA analysis of MH Δ1B type Matt Painted beaked jugs, whose chemical homogeneity suggests their manufacture in a single workshop, yet which are found in an extremely wide distribution pattern over central and northern Greece (Dakoronia 2006; Mommsen et al. 1996: 6). Consequently, it becomes necessary to consider the likelihood that LEMH ceramic assemblages contain local products, ceramics from sites in the neighbouring vicinity and long range imported pottery. It is with this set of cautionary assumptions about the potential mobility of LEMH pottery that I will be looking at the published material in order to isolate specific regional production traditions. Using Zerner's (1993) proposed macroscopic fabric divisions as a basis for the distinction between local and non-local material, other factors will also be used to make this distinction. This includes identifying the features shared by the majority of pottery at a site, and taking these as a baseline for the local technological tradition of a site (Orton et al. 1993: 203).

While this is unlikely to provide us with resolution beyond a regional level, it should provide enough information to begin to characterise regional technological traditions, processing traditions among those sites is indicative of a shared technological system as opposed to a shared decorative system.
consumption patterns and thus provide a basis on which to consider some of the socio-economic structures existent among LEMII mainland groups. Furthermore, making this distinction between local and non-local pottery, and considering the technological features that appear on the local material, will allow questions about the intensity of interaction between groups to be addressed, extrapolating from shared technological features to the transmission of knowledge between people and communities.

Let us turn, by way of a preliminary example of the problems associated with deriving this information from published material and ways to combat this, to a class of pottery that has been well-investigated and whose chronological duration is brief: the Kastri/Lefkandi I group. Though not technically within the LEMI, this late EBII ceramic group represents the introduction of a new manufacturing technique (the use of the potter's wheel), new morphological types and new surface treatments. Therefore, an investigation into the local employment of these characteristics may serve to highlight differential strategies of importation and technological adoption at mainland sites, allowing us to consider the subsequent implications this has for the nature of socio-economic organisation across the eastern Aegean, Cyclades and central Greek mainland at the start of the LEMH period.

The example of the Kastri/Lefkandi I group

While a great deal of attention has been paid to the origins of the Kastri/Lefkandi I assemblage, the distinction between the local production of this material and its presence as an import has only been addressed in a few published cases (e.g. in the Pevkakia, Ayia Irini, Mt. Kynthos and preliminary Keros publications) (Broodbank 2000b; Christmann 1996; Rutter 1979; Wilson 1999). This pottery assemblage is typically made up of five canonical shapes (the bell cup, tankard, beaked jug, shallow bowl/plate and the depas cup) and is frequently red or black slipped and burnished (Figure 6.1). The plate is the Lefkandi I/Kastri group shape most commonly to be wheel-made, though (Rutter [1979: 4, 8] suggests there are wheel-made bell shaped cups, tankards and depas cups, as does Christmann [1994: 41]). While originally thought to be evidence for an invading Anatolian population, more recent assessments of this material culture highlight the fact that its occurrence in such small amounts and in such a limited number of forms, makes it more likely to be a case of importation and/or local emulation (Broodbank 2000a: 309-17; Forsen 1992: 248-57).

With the publication of the Ayia Irini material (Wilson 1999), it became increasingly clear that the macroscopic similarities between some Kastri group types and the local fabric were able to demonstrate local production of at least some of the components of this assemblage on Kea. For example, of the five Kastri/Lefkandi I group shapes that are found at Ayia Irini, four are in the local fabrics (Wilson 1999: table 3.2, 3.3). However, the buff
wheel-made plates are considered imports, though a very similar shape, the hand-made shallow bowl, was produced locally and could well be considered the local version of this form though without the critical adoption of wheel-making technology. Thus, it appears that in terms of morphology, surface treatment (and the associated technologies needed to achieve that surface treatment), the entire range of Kastri group forms was locally produced at Ayia Irini; the only element missing is the local adoption of the potter's wheel.

This situation closely mirrors other sites at which Kastri/Leikandi I group material has been found: certain elements of it appear to have been made locally or made at other sites in the Cyclades (Broodbank 2000b; Wilson 1999: table 3.3). Therefore, the question is not simply whether the Kastri/Leikandi I assemblage is present at a site, but whether any of this group of material is produced locally, whether the local production of Kastri/Leikandi I group material implies the adoption of new techniques and whether this has any discernible effects on the remainder of the assemblage. This has obvious implications for the local potters and the technological system in which they worked.

Taking those sites at which Kastri/Leikandi I group pottery was being locally produced, one is able to isolate those elements of the assemblage that are most readily subject to transmission and adoption. The tankard and the bell-shaped cup are overwhelmingly the most frequently locally produced shapes throughout the Cyclades and the mainland, appearing both in a local fabric and as imports at Manika, Lefkandi, Akrotiri on Thera, and Ayia Irini on Keos and at a further 19 sites (Broodbank 2000a, 2000b; Nakou 1997b; Rutter 1979; Sotirakopoulou 1993; Wilson 1999). The depas appears to be locally made at Ayia Irini on Keos, Markiani on Amorgos and possibly at the Heraion on Samos, Palamari on Skyros, Panormos on Naxos, Kolonna on Aegina, and at Eutresis, Orchomenos and Pevkakia on the mainland (Broodbank 2000a, 2000b; Nakou 1997b; Rutter 1979; Sotirakopoulou 1993; Wilson 1999). The jug may have been locally made at Poliochni on Lemnos, Panormos on Naxos, Kastri on Syros and Ayios Kosmos on the mainland (Broodbank 2000b). The wheel-made plate appears to be locally produced at only a very few locations, the majority of these on the Anatolian mainland such as Tarsus, Troy, Aphrodisias and possibly Beycesultan, while Lefkandi is the only site where the wheel-made plate is clearly being locally produced on the Greek mainland (Blegen 1951, 1963; Goldman 1956; Joukouwsky 1986; Manning 1995: 59, n. 109; Nakou 1997b). Problematically, it is difficult to judge the extent to which the wheel-made plate is imitated as a hand-made vessel, as this is often subsumed under the category 'shallow bowl' and not classified with the Kastri/Leikandi I group material. While the implications of Kastri/Leikandi I group pottery for the adoption of new western Anatolian drinking and commensal behaviour has been given ample consideration (Broodbank 2000a:

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2 During the late EBII period, the local shallow bowl shape gains in popularity, forming 20% of the assemblage, up from only 0.3% in the earlier EBII phase (Wilson 1999: table 3.3).
the commensurate implications regarding the local production of this material have been generally overlooked.

What becomes apparent from this general review is that, technologically, only two features of the Lefkandi I/Kastri group were widely adopted by the local potters: shapes and surface treatment. From a production point of view, these shapes and surface treatments (e.g. tankards and dark/red slipping and burnishing) are elements that do not require a large-scale re-conceptualisation of a ceramic production system, and therefore, as predicted by the model proposed in Chapter 3, are readily observed, replicated and adopted within a locally established tradition. In particular, the techniques needed to achieve the Lefkandi I/Kastri group surface treatments (generally red/brown and black slipping and burnishing), required the adoption of very few new elements, particularly in the Cyclades where there is a precedent for red/brown slipping and burnishing (in the ECI-II Kampos group); only the black slipping and burnishing requires a modicum of firing control in order to achieve a uniform black colour.

Turning to Ayia Irini, which is far and away the best published site with Lefkandi I/Kastri group material, the popularity of red/brown slipping and burnishing rises significantly in late EBII, (comprising 2.4% of the assemblage in Ayia Irini Period II and rising to 7.4% in Period III), being used in this later phase not only for the surface finish of Kastri/Lefkandi I shapes but also for typical EHII shapes like the sauceboat and saucer (Wilson 1999: 92). However, specifically black slipping and burnishing is not said to be featured amongst the local products even though it appears in appreciable quantity on imports (Wilson 1999: 125), suggesting that the firing control needed to achieve a dark surfaced vessel was not yet known by the local potters. Therefore, if one were to isolate the techniques needed to produce the local ceramic assemblage at Ayia Irini (essentially hand-building, slipping and burnishing, and achieving an oxidising firing atmosphere), the production of some local Kastri/Lefkandi I group material did not require the adoption of new techniques. This comment could also apply to the majority of Cycladic sites during this period. Mainland sites, however, utilised a different range of production techniques to produce EHII pottery, and therefore must be considered separately.

For the mainland, information is even more limited, with only three of the ten sites documented above (Eutresis, Orchomenos and Pevkakia) having been published. Furthermore, two of these were published before 1940 and lack in comprehensive ceramic information. Of the ten mainland sites at which Lefkandi I material has been reported, preliminary data suggests that Manika, Lefkandi, Pevkakia (and possibly Thebes) are the only ones to have locally produced Kastri/Lefkandi I group components. At Pevkakia, a similar phenomenon to that at Ayia Irini is apparent, with shapes such as the bell-shaped cup, tankard and depas cup all potentially compatible with having been manufactured locally, but with the
wheel-made plate singled out as an apparent import due to macroscopic fabric dissimilarities with the local assemblage (Christmann 1994: 41-42). Unlike at Ayia Irini, some of the local Pevkakian material is black burnished, suggesting that the technique of controlled reduction firing had been achieved by the local potters; given that dark-faced pottery was being locally produced in the earlier EHII phase at Pevkakia, this is hardly surprising (Christmann 1994: 47-50). At Manika, of the four Lefkandi I shapes reported, only the tankard and jug appear in the local fabric though the jug also appears in a grey 'import' fabric potentially from the north-east Aegean and the bell cup appearing in the same 'grey import fabric'. Of the wheel-made plate, nothing is reported (Sampson 1993: 159-61). In terms of surface treatment, too little has been published to make any further comments. As mentioned in Chapter 4, the Lefkandi I group material from Lefkandi itself appears in both local and potentially imported fabrics, though examples of the wheel-made plates are almost certainly among the local material, as determined through bulk chemical analysis (Figure 4.12).

**Tracing the adoption of a technological innovation: the wheel**

If then, as suggested above, the introduction of the Lefkandi I/Kastri group generally represents very little technological innovation from the previous traditions employed in the islands or on the mainland, then let us turn to the one shape in this assemblage that in its very name does imply the adoption of a new technique: the wheel-made plate. By exploring the distribution of local production in this manufacturing technique it should be possible to (i) pinpoint those sites at which intensive interactions with western Anatolian craftspeople might have occurred, and (ii) identify which mainland and island centres adopted this intensive new technology and thus the commensurate innovation in production traditions that this technique requires (e.g. intensive apprenticeship). As mentioned in the previous section, though the plate is not the only Lefkandi I/Kastri group shape to be wheel-made, it is unfortunately the only shape for which manufacturing technique is consistently reported and therefore the only class we can consistently use to trace the extent and dissemination of this technique (Nakou 1997b: 343).

Within the eastern Aegean, this shape has a very limited distribution (Figure 6.2) and, based on current reports, the local production of the wheel-made plate has an even more limited spread (Figure 6.3). Even including western Anatolia, from where this technique was introduced, definitive evidence for the local production of wheel-made plates comes only from Aphrodisias, Tarsus and Troy (and possibly Beyçesultan and Kültepe), suggesting that while this shape had a widespread distribution, its production was limited to only a few sites.
Within the Aegean islands and the Greek mainland, out of the seven sites where wheel-made plates have been reported, at four sites (Emborio, Phylakopi, Christiana and Manika), it is unclear whether they are locally produced or not, and it becomes necessary to use other means to evaluate this. At two sites (Ayia Irini on Keos and Pevkakia) the very small numbers and dissimilarity to the local fabric has resulted in their identification as imports (Christmann 1996: 50-60; Manning 1995: 59, n. 109, Wilson 1999: table 3.4). Conversely, the bulk chemical analyses of wheel-made plates from Lefkandi has shown them to be compatible with local production (Figure 4.12).

At the majority of sites, wheel-made plates form an extremely minor component of the assemblage. This is true at both Pevkakia and Ayia Irini, where the wheel-made plates make up only a very limited amount of the respective assemblages (c. 1% at Ayia Irini) (Christmann 1994: 47-97; Wilson 1999: table 3.4). In contrast, at Lefkandi, the wheel-made plates form 6.7% of the Phase I assemblage with handmade plates/shallow bowls in general forming 40.5% of the assemblage during this phase; the Lefkandi I forms comprise around 50% in total, the vast majority of these being shallow bowls with tankards the second most common form. Thus, the relative proportions of each type of pottery present at a site might be indicative of where this technique was being manufactured locally. At Emborio, there are only a few published examples of wheel-made pottery from the late EHII levels, thus suggesting that the local manufacture of these vessels was unlikely (Hood 1982: 438).

A second way to evaluate whether this manufacturing technique was being employed locally is to look at the succeeding phases of occupation at a site and see if it continued to be used in subsequent phases and represents an increasingly large proportion of the assemblage. Given the attributes associated with wheel use (as outlined in Chapter 3), this is a technique that is likely to be slowly incorporated into the production tradition as greater skill is acquired and results in an increasing number of vessel types being produced using this technique given the investment necessary to gain proficiency. For example, the adoption of the wheel on Crete, albeit in a thoroughly different politico-economic context, shows this slow expansion in its employment, rather than a continued sporadic appearance in a single class of vessel (Knappett 1999a, 2004: 259-60). Therefore, by looking at the ceramic manufacturing traditions of a site following the first appearance of wheel-made products at that site, and seeing if this technique gains popularity, it may be possible to cautiously lend greater

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3 The spread of the wheel within Anatolia has also caused great debate, with Mellink's (1986) theory that this was a riverine/coastal phenomenon recently called into question with closer examination of wheel-made products found at sites along the inland 'Great Caravan Route' (Efe 1994, 1997).

4 Actually, this assemblage, as already mentioned in Chapter 4, has been highly selected and discarded and therefore this figure may be biased. Unfortunately, it is impossible to compare it to the non-selected "all kept" Phase 1 material from Trench B as the majority of the latter comprised body sherds and the identification of shapes was highly problematic. Clearly, however, wheel-made plates were a regular feature at the site.
credence to the introduction of the wheel in an earlier instance. However, at Ayia Irini, a break in occupation occurs in the phase directly following the appearance of the Kastri/Lefkandi I groups material. Additionally, looking at Manika and Christiana in this light sheds no new light on the subject given the aforementioned lack of publication in general and the lack of quantifiable material specifically. However, at both Troy and Tarsus in Anatolia, where it has been suggested that the wheel is locally employed, not only does the amount of wheel-made pottery substantially increase following the introduction of the wheel in the late part of the EBII period, but wheel-made pottery appears in an increasing number of fabrics and shapes ranging from flaring plates to jugs and storage vessels (Blegen 1951: 19-20, 1963: 103; Goldman 1956: 113-64).

Although the Lefkandi I/Kastri group material in stylistic terms has a relatively widespread distribution across the central and eastern Aegean islands and eastern mainland, if one focuses solely on a technological feature, the distributions of potentially locally-produced wheel-made plates, one gains a very different picture of the so-called Anatolianising phenomenon of the late EBII period.

**EHIII wheel-made and Fine Grey Burnished pottery**

Continuing to trace the expansion of wheel-making technology, let us now turn to the pottery of the next chronological phase. This discussion will include EHIII Fine Grey Burnished and other EHIII wheel-made pots. As with the Lefkandi I/Kastri group, though Fine Grey Burnished is not the only class of EHIII pottery that is made on the wheel, it is widely claimed to be the most predominant, and one of the few for which manufacture technique is regularly specified in publications (Rutter 1983a). In fact, from the published material available, there is no evidence that EHIII wheel-made pottery has been found at any sites besides the fifteen that have reported Fine Grey Burnished pottery. Among these fifteen sites, only at Lerna, Lefkandi, Olympia and Tiryns are wheel-made ceramics reported that are not Fine Grey Burnished. Given that the previous section demonstrated the local use of the wheel at only a single site on the Greek mainland, the assertion by Rutter (1983a: 347-348) that by the end of the EHII period “... the technique of wheel-made ceramic manufacture is relatively widespread in these areas [the northern Cyclades, Euboea, eastern Attica, the interior of Boeotia, Aegina and coastal Thessaly, where the Lefkandi I/Kastri group assemblage has been found]” seems untenable. Yet this belief has created a prevailing misapprehension that the potter’s wheel must have been in common use on the mainland by EHIII. It is perhaps due to the fact that the nature of this adoption and its true geographical distribution have never been explored in any detail that there exists confusion surrounding the apparent ‘sporadic’ use of the wheel within the subsequent MH period (Knappett 1999a: 104).
EHIII wheel-made material appears most frequently in the Fine Grey Burnished class and is produced in a strictly limited number of shapes. Fine Grey Burnished pottery, which shows a remarkable amount of visual, decorative and technological homogeneity, appears in three main regions: the Argolid, Euboea, and Elis, while in two other areas (Bocotia and Phokis) (at the sites of Thebes, Orchomenos and Kirrha) it may be present, though whether this material comes from contaminated deposits is unclear. In the Argolid, this material appears at Berbati, Gonia, Lerna, Nemea, Tiryns (and possibly at Asine and Korakou, though this may be early MH material rather than EHIII). Hand-made Fine Grey Burnished pottery also appears at Olympia and Pelikata on Ithaca, though this material will not be discussed in great detail in this section (Rutter 1983a).

At Lerna, the majority of the wheel-made pottery is Fine Grey Burnished, but a single wheel-made example exists in both Rutter’s pattern painted and non-burnished painted classes; within the Fine Grey Burnished group, only the bowl, tankard and kantharos are produced and decoration on this group is limited to incised patterns (Rutter 1983a: 342-3). However, given that Rutter calculates only 3-4% of the total pottery assemblage is wheel-made (and some of this is called ‘partially wheelmade’ by Rutter), wheel-made pottery in general does not form a substantial part of the overall assemblage (Rutter 1995: 285, 1983a: footnote 18).

Due to the limited proportion of the entire assemblage composed of wheel-made pottery and the limited number of forms in which it appears in (3-4% of the assemblage is wheel-made and limited to only three definite shapes: the tankard, kantharos and two-handled bowl), there seems to be a high probability that this pottery represented an import to the site. Yet this conclusion is not shared by Rutter (1983a: 351), who argues against such a scenario, citing the inconceivability of all EHIII fine grey burnished pottery being the product of a single production centre. Furthermore, chemical analysis of a single Fine Grey Burnished vessel claimed it to be a local product (Attas et al. 1987). However, there is no reason why these products need to have come from a single production centre, as opposed to being from a number of non-Lemean production centres that shared technologies for producing fine, wheel-made, completely reduced and incised vessels.

Two further points are suggestive of importation rather than local manufacture of these EHIII wheel-made vessels. First, Zerner (1993: 42) claims that none of the local early MH Lerna material is necessarily wheel-made. While the incipient stages of early wheel-making attested by Rutter for some of the EHIII Lerna pottery (1983: footnote 18) may

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5 Slightly oddly, Rutter argues (1984: 82-3) for the presence of a large number of producers/production traditions for EHIII pattern painted pottery on the basis of small-scale variability in design element, motifs and structure, but the overwhelming homogeneity of the fine grey burnished decoration is not, by the same token, taken as evidence for a limited number of producers or production centres.

6 Though see Chapter 3 (footnote 23) regarding some of the potential problems with this analysis.
suggest early experimentation with the wheel, the fact that this manufacturing technique does not become commonplace for at least the next two centuries belies the likelihood of it having been an established technological feature of the local EHIII ceramic assemblage. Second, by comparing the patterns at Lerna to those at Lefkandi with regard to what a signature of increasing wheel use looks like at a site, we can evaluate the likelihood of local wheel-use at Lerna. At Lefkandi, approximately 27% of the EHIII assemblage consists of fine wheel-made or wheel-assisted products. Furthermore, the wheel-made pottery at Lefkandi shows more decorative and morphological heterogeneity than the Lerna material. While 5.9% of the Lefkandi wheel-made EHIII pottery is of the same fine grey burnished variety, the remaining 94% are oxidised fine vessels with different slipped and burnished/polished/painted and/or incised exteriors. In addition, the Lefkandi wheel-made pottery is produced in about nine different shapes (including small and medium open shapes and some closed shapes like the jar), as opposed to the three open shapes from Lerna. This seems to suggest that at a site where the wheel is being employed locally, not only will a much larger percentage of the total assemblage be wheel-made, but there will also be a wider number of decorative and morphological classes represented.

The pattern from Lerna seems to be typical of all the Argive sites, in which Fine Grey Burnished pottery rarely comprised more than 1-2% of the total assemblage (Rutter 1983a: 336-42). At Pevkakia, this material appears in such limited quantities and is reported as being of such fine quality, that it is distinguished from the local material, and therefore most likely imported (Maran 1992: 81-4). At Kolonna, at which a differentiation has been made between a local and an imported variant of Fine Grey Burnished pottery, the local variety of dark faced pottery has been identified as entirely hand-made (Gauss 2005). As mentioned above, at Olympia and Pelikata on Ithaca, all the Fine Grey Burnished pottery is handmade, and thus could conceivably represent a divergent production tradition in which the technique of reduction firing existed independently of the wheel. A single solidly painted and burnished wheel-made vessel was found at Olympia, though this seems most likely to have been imported (Rutter 1983a: 342-3). Thus, there seems to be no convincing reason to believe that wheel-made Fine Grey Burnished pottery was being produced locally at any of these sites.

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7 Interestingly, at Lefkandi 46% of the Fine Grey Burnished is wheel-made and at Lerna 56.2% is wheel-made, suggesting that wherever the Lerna pottery was produced, a similar percentage of it was being made on the wheel.
8 This argument may also apply when looking at the spread of wheel manufacturing in the early MH period. Typically, Grey Minyan pottery is the only ceramic class within which this question is investigated. Yet at Lefkandi, in the MH period, over 40% of the wheel-made ceramics are fine, buff-coloured, oxidised products, thus illustrating the other, overlooked classes of early MH ceramics that are also wheel-made.
9 Due to the high proportion of fine, local wheel-made pottery in the early MH period at Orchomenos and Thebes, it is likely that the wheel was being employed during the EHIII period at these sites; it is
However, even if the appearance of wheel-made pottery at a site could be equated
with its local production, then the brief review here has demonstrated the different trajectories
that the adoption of the wheel can take. For example, at those sites where wheel use is
restricted solely to a single pottery class, or in which there is no evidence for use of the wheel
during the subsequent early MH period, this is likely to reflect a fundamentally different
*production tradition and socio-economic organisation* to the increasing reliance on and
employment of the wheel seen at Lefkandi, and possibly other parts of central Boeotia (such
as Thebes and Orchomenos).

**Regional characteristics of LEMH pottery**

Let us now turn to an exploration of the regional characteristics of all LEMH pottery types
across the mainland. Using published material I will delineate, where possible, those
techniques and styles that predominate within specific mainland areas, using information
from the most comprehensively excavated and published LEMH sites in order to provide a
baseline from which to build a wider regional picture. 10

*Messenia*

The detailed publication of the Nichoria material provides an excellent sample of a local
Messenian assemblage, and while there is no EHIII material reported from the site, the
ceramics identified by Howell as belonging to the MHla phase can surely be linked to EHIII
in other areas of the mainland (see Pullen 1993 for a similar argument), and therefore the
pottery published as early MH at Nichoria may be considered more generally dated to the
LEMH period.

At Nichoria, the earliest EHIIUMHI material is produced in coarse and medium-
coarse local fabrics. These become slightly better levigated over time with an increasing use
of fine fabrics towards the middle of the MH period, though the vast majority of the Nichoria
ceramics are of a coarse variety (Howell 1992: 43, 71). In terms of manufacturing, almost the
entirety of the assemblage is hand-made, though a very few of the fine ceramics are
apparently wheel-made. In light of the overall coarse nature of the ceramic assemblage,

10 As the published material is often incomplete regarding aspects of manufacture technology, two
assumptions will be made. These are: (i) that when manufacture technique is not specified, this
assumes pottery is hand-made and (ii) that, unless specified, the only two types of pottery that can
automatically be considered imports are Aeginetan (both the finer and cooking pot fabrics) and
Lustrous Decorated (except, at Lerna and Ayios Stephanos, which are two of the potential production
locales for Lustrous Decorated pottery).
though, it seems likely that these very fine vessels are imported products; if so, wheel use is not a local production tradition at least in the early part of the MH period (Howell 1992: 61, 72). An interesting note is the use of pushed through handles at Nichoria as a local production trait; this is not apparent at many other sites of the LEMH period and is probably most closely paralleled on Kythera and possibly at Ayios Stephanos (Howell 1992: 72-3; Kiriatzi 2006).

The firing of the Nichoria material is highly uneven and many of the thinner walled vessels are highly mottled and variegated during the early part of the MH period. During the MHII period, the dark-faced (or ‘Minyan’, as Howell refers to it) pottery forms a less prominent feature of the assemblage, and with this, the amount of reduced pottery also decreases. In the later LEMH, the so-called ‘Minyan’ pottery is consistently reduction fired to a black or grey colour and appears to be more highly fired, thus suggesting a slight increase in firing control. However, even in the MHII period, the dark-faced ceramics most typically have a red-firing core, illustrating the incompleteness of the reduction-firing process (Howell 1992: 74).

Among the types of decoration at Nichoria, painted pottery appears only in small quantities in the early part of the LEMH period. Lustrous Decorated, Matt Painted and a ‘crusted’11 variety of paint are all used during the early MH period, though in this early phase, the lustrous paint is used exclusively for linear mainland-style decoration such as large hatched triangles on the shoulder of closed vessels (Howell 1992: 71). In general, very little other decoration occurs besides rare incised lines on the dark-faced pottery and coarse vessels, though some plastic impressed bands and knobs are also typical of the coarse ceramics. Though the amount of painted pottery in general increases in MHII, this is not the case for the Matt Painted or ‘crusted’ categories; only the Lustrous Decorated remains in use and forms a significant proportion of the assemblage (Howell 1992: 74). In terms of motifs, during the MHII period both the geometric and linear patterns of the mainland Lustrous Decorated tradition and the polychrome Minoanising type are encountered (Howell 1992: 75). Coarse pottery continues to have incised decoration in MHII and the common bowl and jar shapes are also decorated with plastic knobs throughout the LEMH period, as well as with plastic impressed bands as seen at other Messenian sites (like Deriziotis Aloni which will discussed in more detail below)(Stocker 2002: figure 25: no.154,191).

There is not a large amount of variation in the range of shapes being produced at Nichoria, and the everted rim bowl with strap handles and a flat base, along with the more functional wide mouth jar categories predominate (Howell 1992:70). The stemmed goblet is absent, the carinated kantharos (a popular shape across the mainland) appears rarely, and all

11 This is a surface treatment in which a thick, dull, paint is so heavily applied that it appears ‘crusted’ in areas
the more elaborate and complex rim forms that are common on the fine pottery of the north-east Peloponnese and central Greek sites are also missing (Howell 1992: 76).

Some fine eggshell pottery from MHII Nichoria may be imported from Crete (Howell 1992: 76), and there appear to be some interesting hybridisations of mainland and Minoan ceramic traits in single vessels, such as a dark faced ('Minyan') jar painted with Minoanising decoration in lustrous paint. Lastly, local rectangular-section tripod legs are found in the MHII levels at Nichoria (Howell 1992:76). This may be an indication of the adoption of some Cretan food preparation and consumption strategies during this last phase of the LEMH.

Information about local production and consumption decisions during the EHIII period can be augmented by looking at the EHIII site of Deriziotis Aloni, a small EHIII-early MH farmstead 400 meters southwest of the palace at Pylos (Stocker 2002: 341). The local pottery at this site occurs in a fine (thought to be an imported class), medium coarse and coarse fabrics that are far and away the most predominant (Stocker 2002: 361-2). In general firing tends to be uneven, with the commonplace dark faced vessels ranging in colour from black and grey to brown and the coarse vessels generally incompletely fired (Stocker 2002: 362) In terms of surface treatment and decoration, there are very few types with the exception of dark and light slipping, burnishing and incision on the coarse vessels, plus plastic bands with impressed marks and knobs. In terms of shapes, everted rim bowls and cups predominate, though the fragmentary nature of the material makes any further classification difficult (Stocker 2002: 363); however, certain elements such as the rod handle and the thick incised strap handle show similarities to other late EHIII shapes (see Stocker 2002: figure 20: no. 66, figure 23: no. 120, no. 121).

The survey of the Pylos region by the Pylos Regional Archaeological Project (Davis et al. 1997), including the area around the palace on the Ano Englialanos ridge, combined with re-study of the excavated material from the Petropoulos trenches on the northwest side of the ridge, allows us some insight into the LEMH ceramic traditions at Pylos itself (Davis and Stocker 2006). Overwhelmingly, the EHIII-early MH picture is the same as that at Deriziotis Aloni, with almost all the pottery the result of local production. In the MH period, Matt Painted pottery is extremely uncommon, as is Grey Minyan pottery or other ceramic types commonly associated with the MH in other mainland areas. Locally produced dark burnished pottery exists, as does painted pottery that resembles the 'crusted' painted found at Nichoria. The only imported products are Minoanising pottery, or even actual Minoan imports, and these tend to occur very early in the period (Davis and Stocker 2006).

Laconia

Though evidence of the EHIII and early MH period is scanty in Laconia, the site of Ayios Stephanos provides one of the few examples of published material through which we can
piece together a picture of the local pottery producing traditions in this area (Taylour 1972). The excavations at Geraki are also proving to be helpful at filling in this little known period in Laconia, though only preliminary reports have thus far been published (Crouwel et al. 1998; Crouwel 2006).

Given that the Ayios Stephanos material has only been published in preliminary form (the detailed publication of one area by Rutter and Rutter 1976 begins with the MIII phase, and therefore is only of limited use for a discussion of LEMH pottery), this is a generalised overview gleaned from the preliminary report (Taylour 1972). There is no evidence of EHIII pottery at Ayios Stephanos, given the absence of pattern painted pottery or any other characteristic EHIII shape; the only examples of EHIII pattern painted pottery, and indeed of definite EHIII pottery at all, in Laconia come from the sites of Skoura: Ayios Georgios and Skoura: Vouno Panagias (Banou 1999: 79) located in western Laconia, circa 10 km south of Sparta. As discussed in Chapter 2, the absence of EHIII sites in Laconia may be a function of our inability to recognise the local pottery of that period.

There appear to be two to three main fabrics at Ayios Stephanos. One is a fine, well-levigated red to reddish-brown fabric used for the 'Dark Minyan' and 'Fine Minoanising' classes of pottery. A less well-levigated version of this may also have been used for the 'dull-painted' class, or this may represent a different medium-fine fabric. A second medium-coarse fabric with small to medium dark grits was used for the Lustrous dark-on-light pottery and the Oatmeal Minoanising. The similarity of the Minoanising fabrics to material being produced at the site of Kastri on Kythera at the same time suggests that these two sites shared a particularly closely linked technological tradition. Given that these fabrics all appear in appreciable enough quantities, with the possible exception of the Fine Minoanising, they will be considered to be of local origin, though this is never explicitly stated in the publication (see Rutter and Rutter 1976: table II), nor has chemical analysis been able to clarify this (Jones 1986: 418).

By the end of the LEMH, a large amount of the pottery at Ayios Stephanos is wheel-made, though this manufacturing technique is only attested within two classes; the dark Minyan and Fine Minoanising, which comprise c. 35% of the entire assemblage. The wheel is used almost exclusively to produce open shapes such as goblets, kantharoi and carinated cups. This is similar to the situation on Kythera, in which the first local wheel-made products are cups (carinated, conical and straight-walled) from deposit δ (dating to MMIB-IIIA), and these are the only forms for which the wheel is used until the later MBA (Coldstream and Huxley

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12 Rutter and Rutter (1976: 12-14) suggest that the Lustrous dark-on-light fabric may simply be an earlier variant of the Oatmeal Minoanising. This is similar to observations made about the Kytheran fabrics, in which the sand-tempered fabric of the first Minoanising phase (late EB II-early MBA) shares a great many similarities and is sometimes indistinguishable from the mudstone-tempered fabric of the First Palatial period (middle MBA) (Kriiatzi 2003).
The dull-painted pottery which forms c.30% of the assemblage at Ayios Stephanos is entirely hand-made and the Oatmeal Minoanising appears to be hand-made at this early phase, though by the MHIII period, this class of pottery will be exclusively wheel-made (Rutter and Rutter 1976: 11). In terms of firing technology, there is little evidence of highly controlled atmosphere or temperatures; typically the surface treatments that prevail require little control to ensure that the necessary colour is achieved.

The decoration and surface treatment of the Ayios Stephanos material shows the most variation from the other mainland material so far discussed; not only does true Matt Painted pottery not appear at the site until the MHIII period (and therefore after the conclusion of the LEMH period) but one of the most popular surface treatments is a so-called ‘dull-painted’, which seems to be extremely similar to the ‘crusted’ variety of painted surface treatment found at Nichoria and other Messenian sites (Howell 1992: 70-75). The colours of this dull paint range from red to black suggesting this was not a manganese, but rather an iron-based colourant. Also popular is dark Minyan, a dark-faced slipped and burnished pottery that is present from the early MH period, and tends to have grooved and stamped decoration, in a style associated with the dark slipped and burnished pottery of the Argolid. Amongst the coarse pottery, there is only a single example of incised decoration, a notable difference from the popularity of this surface treatment within other areas of the mainland, even in the neighbouring regions of Arcadia and Messenia (Forsen 2003; Holmberg 1944; Howell 1992). Perhaps this is related to the use of different cooking and coarse vessels at Ayios Stephanos that precluded the need for scored exterior surfaces, which are often considered to be advantageous surfaces for gripping wet and slippery pottery. It seems likely that some Cretan shapes like the tripod cooking pot were used, though only oval-sectioned (Middle/Late Bronze Age) tripod legs have been excavated, though rectangular-sectioned legs (presumed to be earlier) have been found at Nichoria in Messenia (Howell 1992: 76-77). With regard to shape, amongst the Ayios Stephanos material there is no evidence of the stemmed goblet, an extremely popular late LEMH shape, though the two-handled bowl and kantharos are common. However, the rim types illustrated (Taylour 1972; Rutter and Rutter 1976) show none of the elaborations more typical on central Greek material.

There is little evidence of imported pottery at Ayios Stephanos, and it is important to note that Aeginetan pottery, which is widespread by the beginning of the MH period in other areas of the mainland, fails to appear at Ayios Stephanos until the MHIII phase (Rutter and Rutter 1976: 45). Whether this represents the isolation of the area or the resistance of the Ayios Stephanos community to Aeginetan influence is unknown. However, given the

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Rutter and Rutter (1976: note 16) argue that this pottery class is equivalent to common Matt Painted types found at Tiryns and Argos, though the description he provides sounds a great deal more compatible with the Nichoria 'crusted' pottery (Howell 1992: 70-8).
likelihood of contact between Ayios Stephanos and the settlement of Kastri on Kythera, and the lack of Aeginetan pottery there also, perhaps the penetration of the southern and western mainland and islands was irrelevant to Aeginetan exploration, and belonged to a different trading and interaction network (see Figure 6.6a).

At Geraki, though EHIII appears to be entirely absent on the basis of the ceramic criteria used to identify this period in the Argolid and central Greece, the presence of coarse, one-handled jars with incised decoration known from EHIII contexts at other sites may reflect some EHIII occupation (Crouwel et al. 1998; Crouwel 2006). Amongst the early MH pottery, dark burnished ceramics are represented, along with Lustrous Decorated Minoanising style pottery, though some of it may represent actual Minoan imports. Grey Minyan pottery is extremely rare (and may only appear in the later part of the MH period), while Matt Painted pottery is entirely absent. Thus, the Geraki material shows a pattern almost entirely consistent with the material from Ayios Stephanos.

**Elis**

The most comprehensive information we have derives from the New Museum site at Olympia, also the only site in Elis that has definite evidence of EHIII occupation. It is assumed that the New Museum material is almost exclusively local, with both fine and coarser pottery derived from the clay deposits located nearby, with coarser variants containing mica, sand and 'stone' inclusions (Koumouzelis 1980: 172). The finer pottery in particular shows affinities to the EHII material from the site, and thus is thought to represent continuity in ceramic production traditions (Koumouzelis 1980: 141). The fine fabric (in which the majority of pattern painted ceramics occur) is said to be the same as that at Strephi (c. 8 km to the west), and therefore while these vessels may have been produced at both sites, this may also represent a product more widely distributed throughout the region.

With regard to manufacture, the EHIII material at the New Museum site is exclusively handmade, though some sherds show signs of possible wheel finishing (on a tournette) (Koumouzelis 1980: 141). The only evidence of wheel-making comes from dark slipped and burnished sherds with stamped and incised decoration, though these are found in limited quantities and appear in much greater numbers at the Altis site, also at Olympia. Within the MH period occupation at the Altis, hand-made pottery prevails, with few examples of wheel-made pottery appearing, though the overall quantity of this pottery and the fine fabric it appears in makes it unclear whether this is an imported class; the lack of wheel-use at either of the other five probable or possible LEMH sites in Elis suggests that it does represent imported material or that Olympia is the single site in the region to produce pottery on the wheel.
In terms of firing, the beginning of the MH period sees fine grey pottery appearing at Olympia in quantity (as opposed to other sites in Elis where it is reported to be scanty), though other sites in the region may also be successfully producing a reduced pottery type (e.g. Kato Samikon and Chlemoutsi). Typically, the local pottery is reported to be hard-fired, though generally in an oxidising atmosphere (Koumouzelis 1980: 172).

Dark-on-Light painted pottery appears in limited quantity (only a few whole vessels and several sherds) and, given the fabric similarities between this pottery and that found at surrounding sites, may represent a product more widely imported to Elis. Generally, the paint is applied on a slipped background, an unusual surface treatment for Dark-on-Light pottery of an EHIII date. The earliest Matt Painted pottery is also done on a light slipped surface. It is really not until the MHII period that Matt Painted pottery becomes widely used and distributed. A range of very unusual decoration is also found on the pottery and on the Grey Minyan of the early MH period. Circular, curvilinear and spiral incised decoration are found on the fine grey burnished pottery, with none of the linear grooved decoration that is so often associated with this ceramic type. This spiral-decorated grey Minyan has only two parallels: at Thermon in Aetolia and at Teichos Dymaion in Achaia, suggesting a field of interaction along the western coast of the Peloponnese and the Corinthian Gulf.

Turning to shapes, typical EHIII features and shapes like tankards, shoulder-handled bowls and one-handled cups are found; significantly, only neck- and rim-handled varieties of tankards, as opposed to the shoulder handled type that will be by far the most typical at Lerna, are popular at the Altis and are thought to most closely resemble the EH II Kastri/Lefkandi I type tankards (Rutter 1995: 644-45). Furthermore, EHIII one-handled bowls, which occur far more frequently in central Greece (specifically Boeotia), are also found at the Altis. Fine grey burnished pottery of this period appears in only two shapes, the kantharos and the shoulder-handled bowl. By the MH period, carinated Minyan shapes are frequent (Koumouzelis 1980: 229).

Material recovered from a small excavation at the site of Pylos in Elis is similar to the general picture provided by the Olympia material, though this material seems to lack the decorative elaboration of the Olympia pottery. All the Pylos material is hand-made of a semi-fine clay and is reasonably well fired (often without mottling or firing cores), possibly indicating that the firing control exhibited by the Olympia potters was a more widespread phenomenon than originally assumed (Coleman 1986: 12). Medium and coarse wares are grog-tempered and typical MH shapes like kantharoi and everted rim bowls predominate. A large number of the pots have been polished, a few of the grey ones incised and the coarse pottery is often decorated with herring-bone incisions. Matt Paint is relatively rare, with only a single example mentioned within the catalogue, and this piece may represent an intrusion from a later phase of the MH period (Coleman 1986: 12).
In general, ceramic production at Olympia tends to show a higher degree of technological skill and the employment of certain techniques (e.g. possible wheel-use, complete reduction firing) that are not widely disseminated at Elis in the MII period, including a form of decorative style that is more closely linked to northern coastal sites than other sites in inland Elis.

Achaia

Though very little is known of LEMH sites in Achaia, the recently excavated site of Aigeira, which is occupied in the EHIII-MHII period (though, interestingly, not in the EHII or MHIII phases), has a wide and diverse range of LEMH pottery types. This includes locally made handmade ‘Grey Minyan’, fine handmade carinated cups, large amounts of incised coarse ware and imported red slipped and burnished bowls and narrow neck jars (Alram-Stern 2006). The lack of any pattern painted pottery whatsoever (either of the EHIII variety or the MII Matt Painted type) is notable, though from the little that is know about other Achaian LEMH sites (like Teichos Dymaion) unusual decorative preferences seem to be more common in this area (e.g. the site of Teichos Dymaion provides one of the only parallels for the curvilinear incised decoration known from LEMH Olympia) (Papadopoulos 1978).

Arcadia

From Howell’s 1970 survey in eastern Arcadia (Howell 1970), the 1940’s excavations at Asea (Holmberg 1944) and the more recent survey in the Asea valley (Forsen 2003), a generalised picture of ceramic production and consumption can be constructed for the Arcadia region. Evidence for EHIII is particularly scanty, identified only at Asea and possibly at Levidhion Panayia by the recognition of a characteristic Lema IV import fabric, also found in the second phase of occupation at Lefkandi (Howell 1970: 10).

At Asea, the majority of the pottery from both the survey and excavation can be considered to be locally produced from a clay that contains white calcareous and black or brown grits with sparkling inclusions, appearing in a fine, medium and coarse variety (Forsen 2003: 173). Vessel manufacture throughout the LEMH at Asea is performed entirely by hand, and even the class of fine ‘Minyan’ pottery that represents only a small percentage of the assemblage (c. 5%) show no signs of being wheel-made; the most popular class of pottery, the dark slipped and burnished, is entirely hand-made also. Firing control is of average quality with many of the dark-faced vessels slightly mottled and ranging in colour from browns to greys (Holmberg 1944: 93). In terms of decoration, a limited amount of pattern-painted pottery was found in EHIII deposits at Asea and only c. 10% of the early MH assemblage is made up of Matt Painted pottery; based on the fabric descriptions of the Matt Painted pottery, it may have been largely imported from Aegina (Holmberg 1944: 90-98). Also occurring with
some frequency is Lustrous Decorated pottery in both the mainland and Minoanising styles, though Holmberg (1944: 100-2) describes these as 'Matt Painted with a white wash' and 'glazed ware', respectively (for comparanda with the mainland style Lustrous Decorated, see Zerner 1978: figure 14:5, 15:5). Coarse pottery is generally not burnished but incising is extremely popular, with this type of pottery second in popularity only to the dark slipped and burnished. The shapes of all the ceramics are relatively typical with everted rim, strap-handled vessels most common in all the fine, medium and coarse varieties. The more elaborate Minyan vessels, such as the stemmed goblet, are represented by only a single fragment and there are none of the elaborate rim forms known from Minyan pottery elsewhere. The only imported pottery represented is Aeginetan and Lustrous Decorated. Given that the location of Asea between Ayios Stephanos and Lema, at which the latter type of pottery abounds, this is hardly surprising, though it would require significant overland movement.

The Arcadia survey material corresponds well with the picture presented at Asea, with local material composed mainly of dark slipped and burnished vessels of either the shoulder-handled bowl or goblet variety. The unevenness and thickness of the walls compounded by the general coarseness of the vessels, seems to indicate that these were handmade, though this is never explicitly stated (Howell 1970: 111). Furthermore, firing control seems to be inconsistent as these dark-faced vessels are reported as often mottled and brown in colour.

In terms of decoration, incised lines and festoons were common on the dark faced vessels while Matt Painted pottery remains rare in the MH phase of the LEMH (just as at Asea), appearing only in a white slipped variant which may actually correspond more closely to the mainland decorated variety of Lustrous Decorated pottery. Coarse incised pottery is very common, however, which is interesting in light of its near absence at Ayios Stephanos (Rutter and Rutter 1976: 26).

**Northeast Peloponnese**

The site of Lerna, even though the majority of the MH material has not been comprehensively published, still provides a good deal of information. The ceramic material from Lerna shows many basic similarities to that of Asine (see Chapter 5). Beginning with the EHIII period, one of the predominant characteristics of the Lerna material is its heterogeneous appearance, in terms of fabric, surface treatment and shape. Therefore, in the Lerna IV publication, categorisation is based upon well-defined surface treatment and texture varieties, due to the incredibly large number of macroscopically visible fabrics among the material (Rutter 1995: 53). The subsequent phase (transitional EHIII-MHI) is said to have a more limited number of fabrics that are visually quite similar (Zerner 1978: 135, 1993: 42). On the
basis of this contrast, Rutter (1995: 53) goes on to suggest that the pottery of Lerna IV (EHIII) may have been produced at the household level while Lerna V (MII) pottery seems to be the product of more specialised workshops. However, even amongst Lerna V (MII) material, while a more limited number of fabrics are used, subtle processing variations within these broad categories are indicative of numerous co-existing producers (Rutter 1995: 53-55; Zerner 1986).

Petrographic analyses from Lerna IV have been published as well as a preliminary petrographic report on the Lerna V material, and this tends to confirm the observations made macroscopically. Only a small number of the ceramics were sampled (and this was heavily biased towards foreign imports as ‘outliers’ were comparatively heavily sampled), but even so, the results showed few of the samples to definitely derive from sources outside the Argolid. In general, it is very difficult to distinguish between site-local and regionally-local products, and the observed variations among the fabrics are thought to relate to the exploitation of a wide number of clay sources within the Argolid by Lemean potters or the frequent small-scale intra-regional exchange of ceramics (as at Asine, see Chapter 5) (Jones 1995, Rutter 1993: 27-8). Furthermore, very close correspondences between Lerna EHIII fabrics and material from Tiryns, Asine and sites in the Corinthia suggest interconnections between all these sites (Rutter 1993: 27, n. 77). Whitbread’s (2001: 369, 374) work on the MH Lerna fabrics indicates a similar overall situation: eight primary fabric groups have been petrographically identified, each with numerous subclasses, apparently reflecting a number of fabric processing traditions. According to this analysis, there are few correlations between fabric groups and decorative appearance. However, if one looks at the number of surface treatments (or ware groups) within each of the primary petrographic groups (as opposed to the much smaller sub-groups which are likely to represent micro-exploitation or minor clay processing differences), those ware groups produced in a wide range of different fabrics are likely to represent the existence of different production traditions, though producing visually homogeneous products (Figure 6.4) (Whitbread et al. 2002). It is also interesting to observe the number of ware types produced in a single fabric group, and therefore, to see if the same fabrics are being used to create Minyan, Matt Painted and Dark Burnished pottery, for example. In this case it is the mudstone calcareous class from which the greatest number of wares are produced, followed by the grey sand with silicates and the limestone/fossils and silicates. Given that coarse pottery (including pithoi) are produced in both the mudstone calcareous class and the limestone/fossils and silicates class, perhaps these could be considered as definite local Lemean products. Extrapolating from this, a wide range of different ‘ware’ types seem to have been locally produced at Lerna from Grey and Yellow Minyan to Matt Painted and Dark Burnished.
Conversely, those ware classes that are known to be made in a specific location, such as the Lustrous Decorated and the red slipped and burnished (typically either an Aeginetan or Cycladic product), are produced in a much more limited range of fabrics. For example, the Lustrous Decorated appears in only three fabrics: red/yellow fine, sand-mudstone/siltstone and chert. This would suggest no more than two manufacturing locations as the red/yellow fine is likely to be a levigated version of one of the other two clays. Similarly, red slipped and burnished pottery only exists in calcareous volcanic and schist fabrics, a finding that would be consistent with its production on Aegina and a Cycladic centre (possibly Ayia Irini), respectively. Therefore, using this logic, the vessels produced in the greatest number of fabrics are likely to be those that are produced at the largest number of production centres or by the greatest number of producers working in different clay preparation traditions. By way of an explanation for this patterning, the ware groups that are produced in many fabrics are likely to represent a number of producers at Lerna or the practice of importing these ceramic types from a wide range of other communities. Either of these explanations could result in visually homogeneous ceramics having a varied composition. It seems likely that both of these scenarios occur at Lerna, with a large number of co-existent producers and production traditions trading their products within a limited region.

Given the difficulty distinguishing between local, regional and even some of the imported products, it is difficult to clarify the manufacturing techniques employed at Lerna. While in the EHIII period there may have been some local wheel-made vessels at the site, this is not necessarily a manufacturing tradition that continues into the MH period, or at the very least, does not grow steadily with popularity during the MH period (Maran 1992: 342; Zerner 1978: 136, 1993: 42). The first advent of definitely wheel-made material is in Lerna VC (corresponding to MHII), and is restricted only to carinated cups, which, given that these begin to be wheel-made at Ayios Stephanos during this phase, could as likely represent importation to Lerna as local manufacture (Zerner 1978: 136). This is similar to the observations made at Asine in which there may be a few local wheel-made vessels appearing over time, but these could either be the product of an itinerant potter or the result of early intermittent experimentation with this manufacturing technique. In terms of firing at Lerna, we can merely extrapolate from the surface treatment the likely atmospheric conditions and degree of firing control that were attained. Even so, certain patterns become obvious: firstly, it appears that, in EHIII, only 5% of Lerna pottery is wholly reduced ('grey'), and the majority of this is may not be local. In the MH period, dark faced pottery (both 'Argive' Minyan, a black slipped and burnished type and other dark faced ceramics) gains popularity. However, given that the processes required to create a dark-faced or black vessel can differ quite appreciably from those needed to create a uniformly grey vessel (Vitelli 1984, 1994) this may
not represent the same technological knowledge or process as that being employed in the central Greek/Euboea region.

In terms of surface treatment and decoration, in Lerna IV, ten categories of surface treatment are used to classify the pottery, with painted pottery predominating followed by slipped pottery. In general, surface treatment and decoration are very heterogeneous, and Rutter (1995: 475-77, 649) makes eloquent arguments that a diverse group of influences shaped this decorative tradition, with the painted decoration owing debts to Cycladic, Boeotian and Attic traditions, and the ubiquitous plastic decoration having potential links to the Dalmatian coast. At the end of the EHIII period there is an abrupt "... disappearance of certain formerly common categories of artefact (e.g. ouzo cups, pattern-painted rim handled cups and narrow necked jars decorated with plastic bands)” (Rutter 1995: 649). Given the short time span of this phase (c. 25 years) this could represent the loss of a specific potting family/tradition and could therefore account for the very abrupt end to these artefact classes.

Regardless, the EHIII predilection for painted pottery continues into the early phase of Lerna V, when Matt Painted pottery (and specifically using a dull, manganese-based paint) becomes extremely popular at Lerna (the presence of this type of painted pottery is even used as a hallmark for the beginning of the MH period) (Zerner 1978: 150-1). Furthermore, decorative investment in pottery at Lerna seems to be of widespread importance; this is also borne out by the importation of a number of painted pottery groups including Aeginetan Matt Painted, Lustrous Decorated (of both Minoanising and mainland decorative varieties) and even rare examples of Minoan painted pottery. Although the shapes at Lerna represent the full corpus of typical EHIII and early MH shapes such as the tankard, kantharos, bass bowl, basin and stemmed goblet, many of the Grey Minyan shapes lack the rim elaboration seen on contemporary ceramics from central Greece, Euboea and coastal Thessaly.

A relatively large amount of imported pottery exists at Lerna in both the EHIII and the early MH periods, deriving from central Greece, the Cyclades and Aegina, with a single Western Anatolian pot found in the EHIII deposits (Rutter 1995). Petrographic work has confirmed these imports, and the acquisition of vessels from such a geographical range points to wide networks of interaction (Attas et al. 1987). This is further borne out by the next phase (early Lerna V, transitional EHIII-MHI), in which the identification and quantification of imports has been greatly aided by Zerner’s work on the correlation between fabric groups and likely production locales. One of the characteristics of this phase is the first appearance of Lustrous Decorated pottery, considered to be an imitation (in form, decoration and clay processing) of contemporary Minoan pottery. This Lustrous Decorated pottery appears in relatively high quantity in Lerna V, and continues through the later phase of the LEMH. Interestingly enough, Zerner (1978: 159) notes that the fabric of this pottery type appears to have been tempered with sand, an observation that could suggest its importation from the
island of Kythera where sand-tempered pottery demarcates the earliest Minoanising pottery produced in the late EBA and continuing until the very beginning of the Late Bronze Age (Kiriatzi 2003, 2006). Furthermore, these Lustrous Decorated vessels are entirely hand-made until the middle of Lerna V, a pattern mirrored by identical vessels found at Ayios Stephanos and consonant with patterns seen on Kythera. Yet there still remains a strong possibility that at least some Lustrous Decorated pottery was produced within the Argolid, due to manner in which mainland changes in morphology and decorative motifs are rapidly assimilated into the Lustrous Decorated production tradition (Kiriatzi 2006).

Though Aeginetan pottery appears in very limited quantities (less than 1%) during Lerna IV, it begins to be found in quantity during transitional Lerna IV/V, comprising a significant proportion (possibly 10%) of the overall assemblage, and representing a wide range of vessels from drinking and eating wares to storage and processing pots (barrel jars and cooking pots), and two distinct decorative traditions (Red Burnished and Matt Painted) (Zerner 1986; 1988). Lastly, a small number of Cretan imports are known from Lerna, representing one of the very few sites on the mainland with true Cretan (as opposed to Minoanising) material, but these are only found in transitional EHIII-MHII and early MH levels at Lerna (Zerner 1978: 170).

With Lerna and Asine now examined, we can turn to other sites from the Argolid to see if this is a standard picture of the regional production traditions and consumption patterns of that area. At Tiryns, material has only been published sporadically, but chemical analyses of the EHIII pottery have shown that the majority of ceramics continue to be produced from the same sources as in the EHII period, but with a good deal imported from other regional centres, just as at Lerna and Asine (Attas et al. 1987: 88-9; Rutter 1988). This is also apparent in the style of the pattern-painted pottery, in which the Tirynthian material has such close parallels to Lernean EHIII material that Rutter (1995: 647) has argued that the same potter’s work can be identified at both sites. However, some important differences must be emphasised between the EHIII production traditions at Lerna and at Tiryns that have come out of Attas’ (1984, 1987) NAA work. Firstly, there is a chemical group closely associated with local production at Tiryns (Group U), whose composition suggests the exploitation of a new clay resource in EHIII, and a number of different types of pottery were produced from this clay, including dark slipped and pattern painted pottery (some of which has been found at other EHIII Argive sites) (Attas et al. 1987: 89) Secondly, while shoulder-handled bowls, tankards and kantharoi are among the most popular shapes (as at Lerna), in the early EHIII period at Tiryns, some EHIII shapes continue to be produced (for instance, about 8% of this assemblage is made up of sauceboats). Thus, it would appear that two quite disparate production traditions were in existence in EHIII Tiryns that exploited two separate clay resources and produced morphologically different vessels. Little can be said about the
manufacturing techniques employed at EHIII Tiryns as these are usually not specified in the reports (Weisshaar 1980, 1981, 1982). In the MII period, there appears to be a homogenisation of pottery production, as also witnessed at Lerna. All the typical MII pottery types including Minyan and Matt Painted, are found (French and French 1971: 26-8). Imports are reported from the Cyclades and Aegina and though Minoanising pottery is present, it is impossible to say whether this is an early MII phenomenon or is likely to be associated with the later MII period.

At Berbati in the early MII period, vessels are locally produced from a medium coarse fabric, with a characteristic heavy wash and burnish applied on the exterior; these are exclusively hand-made (Lindblom 2006) My inspection of the Berbati material in the sherd collection at the British School at Athens confirmed some examples of seemingly ‘Minyan’ pottery, but while it is grey in colour, it is of a medium-fine fabric, handmade and burnished rather than polished on the exterior, thus suggesting a local imitation of the true Grey Minyan. This mirrors the situation at Midea, where the vast majority of Minyan is reported to be of a coarse fabric, handmade and overall, of a poor quality in comparison with Boeotian examples (Demakopoulou 2006). It seems likely that this is similar to the situation at Mycenae, though the publication of material is insufficient to state this definitively (Shelton 2006).

Turning to Argos, very little can be said about the EHIII pottery as no pure EHIII deposits have thus far been excavated (Touchais 1998). In terms of the early MII pottery, it is predominated by so-called dark-faced ‘Minyan’ wares and Matt Painted pottery; fortunately, preliminary publications of petrographic and chemical analyses allow one to tease out what the most basic characteristics of the local technological traditions might be. The pottery has been initially categorised according to decorative ware classes of coarse, Monochrome Burnished, Matt Painted and Lustrous Decorated. Of these categories, coarse, Monochrome Burnished and Matt Painted all appear to be produced locally. In addition, the Monochrome Burnished wares (which include categories like the grey and light coloured ‘Minyan’ pottery) and the Matt Painted pottery are chemically and petrographically very heterogeneous, suggesting that these ceramics were produced at a number of different production centres (probably representing both regional and extra-regional exchange as at Asine, Lerna and Tiryns). The only groups that showed strong compositional homogeneity are (i) the dark burnished group, (ii) the Aeginetan, and (iii) the Lustrous Decorated, which therefore could potentially represent the products of an individual centre. No information has yet been published about the manufacturing techniques used to produce the Argos assemblage.

In terms of surface treatment, Matt Painted pottery is far and away the most popular at Argos in the MII and II periods, comprising c. 37% of the assemblage; light and dark burnished wares account for about 20% of the pottery and Grey Minyan and Red Slipped combined comprise 5% of the pottery. Of the imported pottery at Argos, the sand-tempered
A variety of Lustrous Decorated makes up about 7% of the assemblage and is more frequent in the earlier MH deposits (Kilikoglou et al. 2003: pl. XXVIIa). Both fine and coarse Aeginetan material is also common, and are much more frequent in the early MII (MII and II) levels at Argos than in the later MH phases (Kilikoglou et al. 2003: 134).

Though there is only a limited amount of information about the production traditions of these Argive sites, in general the picture presented tends to conform to that of Asine, with no indication of increasingly sophisticated production traditions until MIII when the wheel was introduced to Lerna. Yet it is very likely that every stylistic type of LEMII pottery (from Grey Minyan, Dark Burnished, Matt Painted and even possibly Lustrous Decorated) was being produced at sites around the Argolid. The evidence of visually homogeneous products that are compositionally and technologically heterogeneous would point to the presence of a large number of potters at work in the Argive region, sharing a stylistic and decorative vocabulary. The difficulty in discerning local products is further exacerbated by the apparent Argive predilection for intensive intra-regional exchange of stylistically similar products, and seems likely to relate to the significance and mechanisms of inter-community contact and interaction.

**Attica**

Almost no data about LEMH ceramics is available from Attica, with the exceptions of Athens and Eleusis, which are extremely limited in their publication. The best data come from Eleusis where a preliminary petrographic and chemical analysis has been published. The following pottery types are reported: EHIII Light-on-Dark, Matt Painted, Grey and Yellow Minyan and Dark Burnished, with fine Grey Minyan and Matt Painted pottery the two most common types. The results of the petrographic and chemical analyses show two major petrographic and chemical groups that correspond to the Matt Painted and Minyan groups, respectively (Faber et al. 1999: 134-5). The majority of the Matt Painted pottery appears not to have been produced locally but is compatible with having been imported from Aegina. Imports from the Cyclades are also likely given the presence of a third, schist-rich petrographic group. Though the petrographic and chemical group that contains the Minyan pottery is said to be somewhat variable, this is attributed largely to the chronological span that the analysed pottery covers and it would not be impossible for this group to have originated from a single production centre (or a number of production centres operating within the same technological tradition) (Faber et al. 1999: 134-36). While the manufacturing method of this pottery is unspecified, the high firing temperature, control over firing atmosphere and polish

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14 This is similar to Asine, where the amount of Lustrous Decorated in the early MII period comprises 5-7% of the assemblage, falling to only 2.8% in the Barbouna area which represents later MIIII levels.
are consistent with this pottery having been manufactured in a similar technological tradition to that of Lefkandi.

**Euboea**

Given that very little LEMH ceramic material has been published from Euboea in general, it is difficult to define the local ceramic production techniques employed in different parts of the island. The limited publication of some tomb material from Manika has revealed a small wheel-made cup in a very fine fabric from an EHIII context, therefore suggesting potential similarities with the Lefkandi material (Papavasileou 1910). Sapouna-Sakellaraki (1987) has also published a preliminary report on material from Amarynthos; though little mention of fabric and manufacturing technique are made in her report, the pottery is morphologically very similar to that from Lefkandi.

An examination of the material from the 1960’s survey of Euboea (Sackett et al. 1966), currently stored in the BSA sherd collection, therefore, provided me with a good chance for primary analysis of material from five other Euboean sites: Amarynthos, Eretria Magoula, Psakhna, Vasiliko and Yialtra: Kastelli. As Sapouna-Sakellaraki’s report (1987) suggested, the pottery from Amarynthos shares a high degree of similarity with the contemporary Lefkandi material. Not only is there a high percentage of fine, slightly micaceous clay used for Grey Minyan (macroscopically indistinguishable from the Lefkandi material), but this is completely reduction-fired to an even dark grey colour. Furthermore, at least 50% of the observed material was wheel-made, including many fragments of ring stemmed goblets and rim-handled cups found amongst the survey material. There also appears to be a class of fine, oxidised pottery similar to that of the Lefkandi oxidised fine pottery, suggesting that both the oxidisation and reduction-fired fine clay wheel-making traditions known from Lefkandi were also being practiced at Amarynthos.

At Eretria Magoula a similar collection of material appears, made mostly from fine-bodied clays and including many examples of thin-walled, wheel-made products, most often grey in colour from complete reduction firing. Also present are oxidised versions of the same fine clay, including some shapes (like the closed jar with horizontal triangular handle) that appear at Lefkandi. At Psakhna, there is a slightly greater variation in the material, and while a lot of it is produced in a fine fabric, there are not as many wheel-made examples as at the other sites. Given that the Grey Minyan pottery looks quite early (possibly MI), with simple, everted rims, this may represent a more experimental phase of pottery production. Material recovered from near to Vasiliko is indistinguishable from the Lefkandi material in terms of fabric, forming, firing and shape. The only unusual feature of this material is the presence of a possibly Aeginetan Matt Painted open bowl; given that this type of pottery is very rare at Lefkandi during the LEMH, it is possible that this represents a later MHIII import. Lastly, the
material from Yialtra: Kastelli (located on the north-western coast of Euboea) is badly abraded, but even in this poor state of preservation, it is clear that this material is much more varied in terms of manufacture and fabric than the material from central Euboea. Though there are a number of examples of both Light-on-Dark and Dark-on-Light EHIII pottery and possibly some fine, oxidised and burnished EHIII shapes like the shoulder-handled bowl, the MH material is not of the uniformly fine material seen in the central region. Furthermore, only two fragments of the MH material appear to be wheel-made and in general, the reduction firing tends to be incomplete. This would suggest that ceramic production traditions at the very north-western edge of Euboea were not altogether as sophisticated as those in the central area.

Thus, the results from the analysis of the Lefkandi material correspond closely to the general observations made by Howell (1966: 94-100) with regard to the MH pottery from the Euboea survey. He noted that high quality grey Minyan was the predominant ware at the majority of all MH sites throughout the island, and occurred in a number of slightly different fine fabrics; this was taken to indicate local production (1966: 94-95, 99). Additionally, he recognised the ‘monochrome’ pottery (undoubtedly a form of oxidised Minyan from the descriptions of fabric, shape and surface treatment) as the second most prominent pottery type. It therefore appears that the reduced and oxidised fine buff vessels so common at Lefkandi shared a similar popularity throughout central Euboea.

Across central Euboea, many of the patterns seen at Lefkandi are replicated: true Matt Painted pottery is very rare, Aeginetan pottery appears with some frequency, only two examples of possible Argive Minyan exist and only a single example of Minoan or Minoanising pottery was preserved (and the decoration on the latter gives it a late MM date, and therefore outside of the scope of the LEMH period) (Howell 1966). Generally, then, many of the communities on Euboea seem to be utilising a comparable technological system for their local pottery production, and are consuming a smaller, more homogeneous range of pottery than contemporary sites in the Argolid, for instance.

**Boeotia-Phokis-Locris**

Though there has been only limited publication of the LEMH material from Thebes, Demakopolou and Konsola’s (1975) overview allow us to form a preliminary picture of local ceramic production and consumption patterns. Group Gamma at Thebes is correlated to the EHIII period, and within this phase, pattern painted (Light-on-Dark) pottery makes up the majority of the typical EHIII wares; much of this is produced in the local Theban clay which is well levigated with tiny black, white and red grits, and appears to be used throughout the LEMH period. Up until this point, published excavation has not revealed any Fine Grey Burnished pottery, though Konsola claims it exists (Konsola 1985; Rutter 1983a: footnote
Within the early MH period, fine Minyan pottery dominates the ceramic finds; Konsola (1985) even speculates as to the existence of a local production centre at Thebes due to the good quality of the Minyan, suggesting a high degree of wheel-use and completely reduction-fired vessels. Other typical MH pottery types like Dark Burnished pottery are said to be rare at Thebes and no variety of Lustrous Decorated has yet been found; furthermore, Matt Painted is much more rare than it is at sites in the Peloponnese (Konsola 1985: 12-15). In terms of shapes, the Minyan shapes from Thebes provide the closest comparanda to those found at Lefkandi, including the elaborated everted and thickened rims (Konsola 1985 figure 1: 2, 4, 5 and 6); similarly, the pedestal bases from the Thebes Minyan pottery (Konsola 1985: figure 2: 5, 6, 7) bear a lot of resemblance to those found regularly from Phase 4 onwards at Lefkandi.

The site of Eutresis provides definite evidence for EHIII ceramic traditions in Boeotia (Caskey and Caskey 1960; Goldman 1931). I was able to perform a brief primary study of the material from Eutresis, but due to the manner in which the material had been retained, quantification or chronological study is impossible.\(^{15}\) There were two major fabric groups amongst the Eutresis material; the first was a semi-fine fabric from which a great deal of the EHII Urfinnis and EHIII pattern painted ceramics was made. A slightly coarser variant of this also existed and comprised the majority of the slipped and burnished EHIII material and the grey burnished of the early MH phases. By the MH period, though, the dominant fabric was a type that was well-levigated (and bore a high degree of resemblance to the descriptions of local Theban clay). Thus, this pottery may have been imported from Thebes and was extremely well represented throughout the MH. The local coarser clay was used to make both reduced and oxidised Minyan shapes, that appeared to be exclusively hand-made, whereas the wheel-made material was almost entirely produced from the fine levigated (possibly Theban) clay. While Matt Painted pottery was quite common, it is unclear in which phase of the MH period this gained significant popularity, and the majority of this was compatible with an Aeginetan gold micaceous fabric. The MH painted pottery in the local clay was often not done in true matt-paint technique, but rather using an iron oxide-based paint (due to the red/brown colours that frequently occurred) and the decoration was often painted on a white slip. In terms of shapes, the stemmed goblet is extremely well represented, with elaborate rims and pedestal bases.

At Orchomenos, the local pottery is predominantly fine and wheel-made in the MH period. This includes both reduced and oxidised versions of many shapes (including elaborate rimmed bowls and goblets) nearly identical to those at Thebes and Lefkandi (Sarri 1988, 15 The material was stored in large bins corresponding to ware group (e.g. "Yellow Minyan") and so while this corresponded generally to the MH period, any further division within that phase was impossible.
2006). Technological manufacturing features, specifically relating to the attachment of the wheel-made stem of a stemmed goblet, are identical to those observed from Eutresis. In addition, during the Tanagra survey (in east-central Bocotia), 70% of the MH pottery recovered was Grey Minyan. Though speculative, the high proportion of fine-grained, well-fired and wheel-made ceramics would suggest the likely employment of many of same technological traditions as seen at Thebes, Orchomenos and Lefkandi (Sarri 1998, 2006).

At Kirpha, general trends are similar to those at Eutresis and Pevkakia. In the EIIIIII period, Light-on-Dark painted pottery is popular, with some Dark-on-Light and coarse pottery types appearing (Dor et al. 1960: 70-75). By the end of the EIIII period, black slipped and burnished pottery and grey (Minyan) pottery has begun to appear. During the early MH period, Grey Minyan pottery continues to gain popularity, and the high technical quality of this ceramic class is noted (Dor et al. 1960: 75), thus probably suggesting that a large proportion of it was wheel-made. Matt Painted pottery occurs for the first time in the MH period, followed shortly by the introduction of Aeginetan pottery (which composes 1-2% of the assemblage throughout the MH period). However, Grey Minyan is the dominant pottery type to the detriment of all other ceramic types, comprising up to 45% of the assemblage by MHIII; the second most common pottery type during this period is coarse ware, comprising 21%. Minyan forms are relatively simple, though in the MHII period more elaborate rim forms of the types known from Thebes and Lefkandi are present (Dor et al. 1960: pl. XLIII: 6284, 6270, pl. I: 6235). The overall homogeneity of this ceramic assemblage is remarked upon by the excavators, suggesting a standardisation of pottery similar to that seen at Eutresis, Lefkandi and Thebes (Dor et al. 1960: 70).

The MH ceramics from a variety of sites in Boeotia, that have been published by Mountjoy (1980), bear a close similarity to the Theban material. The majority of the pottery is Minyan and the fabric is described as being very fine and well levigated (Mountjoy 1980). The shapes of the Grey Minyan (particularly the elaborated rim types 47, 48 and 49 [Mountjoy 1980: figure 4: pg 145]), are very similar to the everted and thickened rims at both Thebes and Lefkandi, and the pedestal bases 41 and 42 (Mountjoy 1980: 145, figure 4) are similar to the flaring pedestal bases from these sites. Matt Painted pottery does not appear until late MHII-III, and no Lustrous Decorated material is recorded from this ceramic collection.

In the Sperchios Valley just to the north of Boeotia, only a very limited amount of information exists, but in general, LEMH sites show an affinity with both Boeotia and southern coastal Thessaly (the sites of Pevkakia and Iolkos) with significant quantities of fine, wheel-made Grey Minyan appearing in the early MH (if not earlier), but no fine Matt Painted ceramics (Maran 1992: 288).
Coastal Thessaly

Though somewhat outside the typically defined heartland of the LEMII world, the site of Pevkakia has been exhaustively published and therefore represents a very informative published data set. For the earlier part of the LEMI period, Christmann (1994) notes an increase in the use of finely levigated clay towards the end of the EH period, commensurate with an increase in harder, higher-fired products; in these later phases of the EBA, approximately two-thirds of the sherds appear to be completely oxidised (showing no firing cores), though very few are reduced. Furthermore, the end of the EBA brings an increase in the wiping/polishing of vessels, representing a shift from the popularity of burnishing in the earlier phases (Christmann 1994: 60). Within the first phases of the MH period, fine Grey Minyan is very rare, though stamped and incised dark Minyan (of a local, slightly coarser clay) appears from the beginning of this phase (Maran 1992: 205). Throughout the LEMH phases at Pevkakia, finely levigated Grey Minyan vessels are increasingly common to the detriment of the local coarser Grey Minyan variant, dominating all fine ceramics by Phase 4. By the beginning of Phase 6 the coarser Grey Minyan has almost entirely disappeared and is being produced in only a very limited range of shapes (Maran 1992: 209-10). This increase in the amount of fine Grey Minyan runs parallel to an increase in a fine, oxidised polished product ('Drehscheiben’ ware) that is likely to be the oxidised counterpart to the well-levigated Grey Minyan fabric (Maran 1992: 104). Hence, the process of clay levigation seems to be an increasingly integral part of the local manufacturing tradition, since the relative increase in the dominance of fine Grey Minyan suggests that while some of it may be imported, a large amount of it is likely to be locally produced (Maran 1992: 217).

In terms of manufacturing, both hand- and wheel-made products are found at Pevkakia from the EHII period onwards, though the earliest occurrences of wheel-made pottery are thought to be imported to the site. Both wheel-made Grey Minyan and light coloured pottery appear from the earliest phases of the MH period (Maran 1992: 205-7). This fine Grey Minyan is both hand- and wheel-made from its first appearance, although it is predominantly wheel-made. The local, coarser ‘Minyan’ is always hand-made, as are the brown, black and red polished wares that occur frequently at the site (Maran 1992: 102). The increase in the amount of fine ceramics throughout the MH period seems to correspond to an increase in the number of wheel-made products; given that these fine ceramics are, by the MHI-II period, thought to be locally produced, this would mean that the local use of the wheel also increased through the later stages of the LEMH period.

Amongst the local ceramics there is a dramatic increase in the amount of reduction-fired pottery from the earliest part of the MH to the end of the LEMH, increasing substantially from 5% at the beginning of the MH period to c. 30% by the end of the LEMH (Maran 1992: 83). This mirrors the trend within the fine pottery in which Grey Minyan (of both the coarse
and fine varieties) becomes the most common ceramic type (Maran 1992: 209). Both Dark-on-Light and Light-on-Dark pattern painted pottery is produced at the site and continues to appear until the early part of the MH period, when the first introduction of Matt Painted pottery (on a white slipped exterior) occurs, though the proportion of this, and its general restriction to jug forms, suggests that these Matt Painted jugs may have been imported (Maran 1992: 151-6, 286). The most common painted pottery of the transitional EH-MH phase is a reddish/brown dark-on-light painted pottery that is called Matt Painted. However, the reddish/brown colour of the paint indicates that this was not true manganese paint. All of the Matt Painted vessels are hand-made except for a rare pink-buff, fully-oxidised product with dark paint that shows some signs of wheel use in the collar necks of jars (Maran 1992: 148); this is paralleled in Phases 3, 4 and 5 at Lefkandi, where buff plain collar-necked jars appear to be wheel/RKE finished at the rim. On the grey fine pottery, grooving and incised lines are the only type of decoration (Maran 1992: 194-5).

Of the shapes of the Pevkakia LEMH pottery, all the typical everted rim, strap handled open vessels appear, including the more elaborated rim types of ‘1FLa’ (Maran 1992: 86), which closely resemble the everted, thickened and flattened rim at Lefkandi and the rim types from Thebes (Konsola 1985: figure 1: 2,4, 5 and 6, figure 2: 5, 6, 7). Furthermore, two different forms that do not appear widely in either Thessaly or southern Greece appear at both Pevkakia and Lefkandi, namely the T-rimmed bowl from Lefkandi Phase 2 and Pevkakia Phase 4, and bowl type ‘1FII’ with horizontal, up-swung tubular handles along the rim (Maran 1992: 85, 286). Carinated forms become common only by Phase 5, the middle of the MH period (Maran 1992: 210).

In terms of imports, Lustrous Decorated (Minoanising) pottery is absent in the LEMH and a single sherd appears only in MHIII (Maran 1992: 344). Red Burnished ceramics appear rarely and these are likely to be Aeginetan or Cycladic imports, and Aeginetan coarse pottery also occurs (Zerner 1993: footnote 63).

Many of the observations made about Pevkakia could also be applied to the surrounding region of coastal and nearby inland Thessaly, including the sites of Dimini, Larissa and Sesklo located around the Gulf of Pagai. Furthermore, Maran claims the Pevkakia assemblage is also similar to that found on the Phokis coast and in the Sperchios valley, where fine Grey Minyan is also widely distributed (Maran 1992: 285-6). At these sites an extremely similar range of ceramic types are present to those found at Pevkakia, though whether these are all locally produced is currently impossible to determine. The high proportions of fine, wheel-made ceramics seems to be a coastal Thessalian phenomenon, and these ceramic traits are not paralleled at inland Thessalian sites, where very little Grey Minyan and Matt Painted ceramics are found; for example, no Grey Minyan is known at Argissa until the later part of the MH period (MHIII) (Maran 1992: 285-286). This regional
division between coastal patterns and inland Thessalian traditions is typical and was equally
apparent in the EBA, when Macedonian influence was heavily felt in Argissa, but failed to
penetrate through to the coastal areas (Christmann 1994: 324; Maran 1992: 288).

**Technological fields and the socio-economic organisation of production**

This review has served to highlight the considerable variation that exists in the ceramic
production traditions of the LEMH mainland (Figure 6.5); let us now consider the degree of
ceramic specialisation and socio-economic organisation likely to be associated with these
different regional production strategies. As detailed in Chapter 3, the differences in the socio-
economic organisation of LEMH communities and their degree of interaction with one
another may be derived by looking at the techniques used locally to produce pottery and the
sharing and spread of those individual techniques among different regions. Having observed
these differences in ceramic production and consumption, it is necessary to return to the
inferential links explicated in Chapters 3, 4 and 5 in order to demonstrate how these might be
linked to different types of socio-economic organisation. While based in ethnoarchaeological
observations and anthropological inference, the links between this material variation and
complex socio-economic institutions are far from concrete, as explored in Chapter 3. For this
reason, any of the conclusions reached in this chapter about variation in socio-economic
organisation across the LEMH mainland should be treated as speculative.

In the Argolid, local pottery production is characterised by a large number of co-
existing producers and production techniques primarily based around techniques such as
hand-making, the use of clays of similar, semi-coarse varieties, relatively controlled firing and
the use of manganese paint in the early MH period. Chemical and petrographic analyses of
EHIII and MH pottery from Lerna, Tiryns and Argos suggest that a number of parallel
production traditions continue to co-exist for the entire LEMH period (e.g. producing
varieties of Matt Painted, Dark Burnished and Fine Grey Burnished pottery) that are widely
exchanged between these centres. Though visually homogeneous, this does not translate into
the homogenisation of a system of ceramic production; furthermore, none of these production
traditions utilise skilful and specialist techniques that are associated with specialised
production. Though Rutter (1995: 53) claims that the pottery of Lerna IV may have been
produced at the household level whereas Lerna V pottery seems to be the product of more
specialised workshops, the overall lack of standardisation amongst the Lerna material is
unlikely to be the product of an intensively specialised production system. The only pottery

16 The consideration of decoration in this section will be limited to the production techniques associated
with decoration rather than the visual effects created by the decoration. The latter will be given
consideration in the following section on style fields and consumption choices.
type that *might* have been produced in the Argolid whose composition, morphology and decoration shows a high degree of standardisation and technological uniformity is Lustrous Decorated. In fact, it is this degree of technological homogeneity in clay processing and tempering that makes it extremely difficult to identify (or exclude) the production location of this pottery type, though recent chemical analyses (Jones 1993) have shown that production very likely occurred in only one area in the southern Peloponnese.

Within the Argolid, there is no absolute evidence for the local use of the wheel before the MHIII period and, while this may coincide with a phase of increased firing capabilities, there is no clear evidence at the majority of Argive sites for major technological changes taking place within the system of ceramic production during the LEMH. The single exception to this might be Tiryns, in which the exploitation of new clay resources during the EHIII period, in combination with the bicamerality of this assemblage, may point towards two divergent production traditions existing at the site (Rutter 1995: 646-47). With more detailed publication it may become clear whether this continued into the MH period.

By way of comparison, most sites in both Euboea and Boeotia share not only similar production traditions (predominant use of fine, well-levigated clays, reduction firing and the potter’s wheel, the infrequent use of manganese paint, and the rare use of painted decoration, if at all) suggests an intensive interaction between these areas, if not the movement of craftspeople. It is not simply that technological traits are shared between these regions, but that those shared traits are of the deep-rooted and often invisible types outlined in Chapter 3 as being less likely to be transmitted horizontally (e.g. fabric preparation and manufacturing method) (see Figure 3.5). The fact that this production tradition becomes dominant *to the exclusion of other ceramic production systems* is suggestive of the depth with which these new techniques were adopted and replicated. Many features of this specialised production system are also adopted in coastal Thessaly, at the sites of Pevkakia, Dimini and Iolkos, where we see parallels for the patterns at Lefkandi and Thebes: increased fine fabric, increased reduction firing and increased local use of the wheel through the early MH period. It seems likely, therefore, that some of the morphological disparity between the Minyan pottery of Pevkakia/central Greece and the Peloponnese may directly relate to the use of the wheel and the shapes that are most conducive to this manufacturing technique.

It is also interesting that certain vessel forms (such as the T-rimmed and rim-handled bowl) are limited to the central Greek and coastal Thessalian area, an indication of these two regions shared an underlying technological system and a unique range of vessel forms. Also of interest is the fact that instead of this intensification of ceramic production going hand in hand with a nucleated system in which a single centre of production supplies a wide region

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17 I would like to thank Vangelio Kiriatzi for reminding me of this.
with pottery, chemical and petrographic work suggests that the ceramic products of this specialised production system (namely Grey Minyan) were produced at a wide range of sites (Whitbread et al. 2002). The fact that the specialised production of pottery occurred at numerous sites within this central region may have been due to limitations on mobility and restricted engagement in regular ceramic trade or may relate to the maintenance of communal economic autonomy. However, the shared technological system and the dissemination of this system within this central region stands testament to the fact that interaction, when it occurred, was likely to involve the movement of craftspeople and the direct transmission of information. Thus, it would appear that the Euboean Gulf and the coast of the eastern mainland provided a conduit for the spread and propagation of technological systems; in this way, it would be interesting to examine more closely those Boeotian sites along the eastern edge of the Euboean Gulf currently being excavated (e.g. Mitrou).

Returning to the Peloponnese south and west of the Argolid, in the case of Laconia we can only talk with assurance about the southern coast from which we have the Ayios Stephanos material. Here, the system of ceramic production shows signs of increasing specialisation over time, through the adoption and uptake of the potter's wheel, a new production tradition introduced presumably from Kythera or Crete. However, unlike the central Greek region, use of the wheel at Ayios Stephanos was, in the early period, only used for the production of small, open vessels. This type of wheel use finds parallels on Crete where the wheel/RKE was initially limited largely to produce small vessels (Knappett 1999, 2004: 260). This also appears to be the way the wheel was being employed at Lerna in the MH II period (Zerner 1978: 166-8). At Ayios Stephanos, an interesting hybridisation takes place of mainland and Cretan traditions: for example, some of the dark Minyan pottery, which elsewhere is most typically handmade, is wheel-made, thus combining a newly adopted externally derived technique to produce a classic local variety of pottery (Rutter and Rutter 1976: 6, 61). Hybridisation of a different type also occurs at Nichoria, where Dark Burnished (or dark Minyan) pottery has been found with painted Cretan-style decoration as well as occasionally in Cretan inspired forms (e.g. the piriform jar) (Howell 1992: 76-7). A further example of this hybridisation occurs at Ayios Stephanos in the MH III period, with imitations of Cretan stone vessels found in dark Minyan pottery (Rutter and Rutter 1976: 61).

In Messenia, the pottery production traditions of the EH III and MH periods are dominated by hand-building, uneven firing, coarse fabrics and little Matt Painted decoration; there are no signs that any specialised system was involved in the production of pottery, which could easily have been produced on a household level. At Nichoria, finer clays become used over time, but it is only in the MH II period that there is any indication that the ceramic production system has undergone a change. The shift to an entirely Lustrous Decorated painting tradition is of interest as it implies a closer technological connection to the Ayios
Stephanos area; this may represent the adoption of some techniques from southern Laconia and the presence of idiosyncratic manufacture elements such as pushed through handles and locally produced Kytheran/Cretan style tripod cooking pot legs in MHIII may be a further indication of this. In the inland and upland areas such as Arcadia and Achaia, local production traditions do not appear to differ dramatically from those seen in Messenia or indeed Elis, though the limited information available from these areas makes it difficult to consider them in any detail. The data seems to suggest little change in these areas from the EHIII traditions and there is no aspect of the technological systems used to produce these ceramics that would suggest a level of organisation beyond that of household level production.

Lastly, data from Attica is currently very limited and the complete publication of material from sites like Eleusis would be of particular interest. Because sites in Attica lie in a border region between two areas with substantial differences in modes of ceramic production (Bocotia and the Argolid), the prevailing production traditions in Attica could be highly informative about the patterns and processes of the transmission of certain techniques between mainland areas.

In order to highlight the differences between mainland production traditions, it has been necessary to make slight generalisations about the ceramic production traditions in the LEMH mainland (e.g. Figure 6.5 for a generalised scheme of production differences across the mainland). Future close study of micro-technological features might be able to further clarify the geographical distribution of small-scale LEMH technological traditions (e.g. Mahias 1993: table 5.2). Due to the fact that many regionally specific techniques are difficult to reconstruct from archaeological material (because of the fact that the traces they leave on vessels are universal to the majority of household production traditions), some of the finer detail may be lost in this overview, yet the fact remains that two divergent trajectories exist within the system of LEMH ceramic production.

Essentially two different types of socio-economic organisation are at work on the mainland: the first involves the development and intensification of craft production. This consequently leads to an increasing degree of separation between the roles of individuals within the community yet also demands increased economic interdependence between those community members. In this case, though, specialisation should not be equated with the nucleation of production. Instead, even at those sites showing signs of increased production specialisation, the pottery appears to be locally produced within a specific technological tradition widely disseminated throughout that region. What defines this system of technical logic is not simply the different technical elements that comprise it, but the increasing reliance on these elements and the increasing homogenisation of the products they produce.

The second mode of craft production seems to reflect the existence of smaller, possibly domestic level, production groups co-existing within a single site (see Figure 3.6). In
this case, the domestic-level scale of production is unlikely to require community-wide involvement and economic support; hence, this type of production, due to the direct engagement between producers and consumers, might result in the production of more idiosyncratic and varying products.

This draws an unnaturally sharp distinction between these two modes, and to some degree the reality may have been less clear-cut. However, this should not lessen the essential contrast between forms of production organisation in the LEMII. For example, it is impossible to state categorically that the wheel was not being employed locally at Lerna; thus, while it may have been used sporadically by local potters or itinerant wheel-using potters who were also contributing to the ceramic output of the site, it is clear that the use of the potter's wheel at Lerna is not the same as at Lefkandi in terms of the intensity, skill and increasing dominance of this technique within the local production tradition. This comment is not applicable only to wheel-made material, but also applies to the much higher degree of standardisation (both visual and technological) seen at Lefkandi compared to any Argive site. In a manner that is unparalleled at either Lerna or Asine, 80% of Lefkandi ceramics by Phase 3 were produced in a single fine fabric, underscoring this intensification of a single system of ceramic production, to the exclusion of all other production traditions. Therefore, even if rare examples of wheel-made products are local to Lerna and Asine, there is still a fundamental difference in the degree and extent to which these technological traditions are integrated into the socio-economic fabric of each community. At Ayios Stephanos, specialised techniques come into use by MHII, though this does not see a commensurate intensification in other aspects of the production system. This is much more similar to the way in which the wheel appears to have been adopted on Crete until the MMII period, for the fashioning of small and then medium sized vessels (Knappett 2004: 259-60).

Perhaps this disparity with the way the wheel was learned and subsequently employed between Crete (and possibly areas of the southern mainland) and Lefkandi (and possibly other areas of central Greece) relates to the different sources from which this technique was learnt. If the knowledge and skill involved in wheel-forming techniques came to Crete from Egypt or the Levant, where the use of this combined coiling/RKE fashioning technique are attested in the Vth Dynasty (c. 2450-2345 BC) (Arnold and Bourriau 1993: 39-41; Knappett 2004: 260; Roux 2003a), then this might explain the popularity of this method of manufacture during the incipient phases of wheel/RKE use on Crete. Alternatively, if the central Greek wheel-using tradition was transmitted from western Anatolia (Rutter 1979), where the wheel proper appears to be in use from the EB II period, then perhaps the resulting divergence of wheel use in the central mainland and on Crete is a vestige of the different sources from which the manufacturing techniques were learnt and the different social contexts in which they were employed.
The mobility of craftspeople

While it would seem that the technological unity seen in many central Greek sites implies a close level of interaction and contact between these communities, it is difficult to assess the degree to which this was also true for the areas without this same apparent degree of technological similarity. Further work is needed to clarify the subtle forming differences among LEMH ceramics from the Argolid, in order to be able to better define the movement of knowledge, and possibly even craftspeople, among these communities (Gosselain 1998: 92-5, 101, 2000: 208-10). However, within the central Greek region, the technological homogeneity of much of the LEMH pottery involved characteristics that can only be derived from direct observation during the manufacturing process; in other words, these are not techniques that are possible to observe or replicate by looking at the finished product. Thus, the observations made by Gosselain (1998: 102-104, 2000: 191-93) that the replication of technological features by different and geographically dispersed producers implies a certain level of close contact between those producers should be applied to the central Greek region of the mainland. For many features of this technological tradition to disseminate implies craftspeople moving around this area. Additionally, if mobile craftspeople were a feature of the central Greek technological production tradition, this could explain the rare examples of wheel-made pottery in local fabrics at sites on the fringe of this zone that otherwise do not appear to be locally employing the wheel (e.g. Asine and Lerna), though it would appear that contact occurred sporadically enough for these techniques not to be transmitted to the local potters in those areas.

Beyond the class of fine, wheel-made and often reduction-fired pottery from the central Greek area, only one other class of pottery shows the technological homogeneity suggestive of either a single production centre or a limited technological tradition: Lustrous Decorated. The use of sand-tempered clay, the incomplete oxidising firing (that leaves the characteristic grey core) and the often idiosyncratic manufacturing techniques (such as the use of pushed through handles) are all features that are invisible in the final product, and therefore their imitation requires intimate knowledge of the production tradition to replicate (Kiriatzi 2006). Though petrographic evidence is unable to definitively rule out a single centre of production, the combination of Cretan and mainland features seen in this pottery type (including up-to-date Cretan technological features with mainland shapes and decorative motifs), suggest a mobile potting group who maintained links with both Cretan and mainland technological and style fields (Kiriatzi 2006).

As we will be exploring in the next section on style fields, the imitation of superficial features (like decoration and surface treatment) is much more widespread across the mainland, because the requirements for this type of transmission are fundamentally less
intensive and require much less investment. Therefore, the examination of the visual homogeneity of LEMH pottery types consumed and produced at different sites across the mainland will allow us to gauge interaction and affiliation networks from a different perspective as well as explore overall patterns in consumption preferences.

**Style fields and consumption differences**

In exploring style fields, I will consider the preferences for certain visual styles on the LEMH mainland and what this might mean in terms of interaction and affiliation between LEMH groups. Furthermore, I will examine the range of imports found at sites as a definite indication of interaction, as well as what this can tell us about the differences in consumption behaviours between LEMH communities. The three main visual styles of LEMH pottery are monochrome burnished, pattern-painted (whether Matt Painted or not) and incised, and while none of these is strictly geographically bounded into a single region, we can explore the spatial extent of each style and the implications this may have for LEMH communities.

Beginning with the EHIII period, this phase has been identified as one in which a number of specific regional styles flourished amongst the finer pottery. A meticulous and detailed study by Rutter (1982, 1984) identified three major ceramic style zones for the EHIII period: (i) Light-on-Dark painted pottery which tends to dominate in Boeotia and Phocis; (ii) Dark-on-Light painted pottery, found mainly in the Argolid and Asea regions (though also appearing in small quantities in Euboea); and (iii) incised and impressed decorated pottery, present in large quantities in Olympia and Pelikata on Ithaca and present at Asea, Kolonna and six Argive sites (Korakou, Lerna, Mycenae, Prosymna, Tiryns and Zygouries) (Figure 6.6). Chemical analyses showed that while these pottery types were consumed in relatively discrete regions, this did not correspond to their areas of production which were distributed quite widely across the mainland (Attas et al. 1987: 89; Rutter 1988: 75-84, 1995: 619-23). The presence of Light-on-Dark pottery at sites along the Corinthian Gulf and across Boeotia to the western coast of Euboea is illustrative of the spread of this pottery (or local imitation of this pottery) along a communication or exchange network (Figure 6.6c). In general, the widest spreads of different EHIII pottery styles seems to occur along those axes of maritime communication, indicating that in the EHIII period, these were the important networks of interaction.

During the EHIII phase, monochrome burnished pottery also becomes popular, with the Fine Grey Burnished appearing at the sites shown in Figure 6.6b, and a number of other sites having dark-faced burnished pottery. Interestingly enough, there are limits to the expansion of this style field, for Asea (if the EHIII date of the Fine Grey Burnished pottery is accepted) is one of the furthest south-eastern extensions until later in the LEMH period.
It has been hypothesised that much of EHIII pattern-painted pottery is derived from basketry prototypes (Nakou 1997b: 320-9; Rutter 1984), much as at least some of the monochrome grey and black vessels of the same period (especially the kantharos) are thought to skeuomorph metallic forms. The latter is mirrored by a near contemporary fashion for grey polished ceramics in western Anatolia (İnegöl Grey Ware), which, while bearing no morphological similarity to the contemporary LEMH pottery, may reflect much more closely linked trends in metal vessels (French 1966, 1973; Nakou 1997b: 333). Interpreted in this light, the general pattern-painted versus Fine Grey Burnished split between the Peloponnese and the central Greek regions reflects different regimes of value in these areas connected to the consumption of basketry and metal.

This stylistic divide is further underscored by the marked trend in EHIII for the consumption of different morphological styles of pottery. This includes (i) sites at which EHII-type pottery remains present in the early EHIII phases and (ii) sites at which EHIII shapes cease to appear from the beginning of the EHIII period. The former of these scenarios is what Rutter (1979, 1995) has deemed ‘bicamerality’, and it could mark out those sites that have undertaken a fundamental shift in commensal behaviour and those that still retained certain EHIII traditions. In the EHIII period, Manika, Kolonna, Tiryns and Olympia all have co-existing EHII and EHIII shapes, whereas sites like Lerna and Lefkandi have only EHIII material. Thus, this distinction does not appear to be a regional characteristic but rather a site-specific one. The proximity of sites engaged in different commensal behaviour (e.g. Tiryns and Lerna, Manika and Lefkandi) is especially striking.

In terms of definite imports, the EHIII phase has long been assumed to be one of relative isolation, yet at EHIII Lerna imports indicate that a wide network of interactions were being pursued. Pottery coming from central Greece, the Cyclades, Aegina and even western Anatolia has been found at Lerna (and attested petrographically) (Rutter 1995). This relatively high level of importation in the EHIII period does not prove to be true for other Argive and mainland sites, particularly those inland such as Gonia and Korakou, where Aeginetan pottery does not appear until the MHIII period (Lambropoulou 1991: 145); and even Kolonna during the same phase has only Cycladic imports and none of the Minoan or Minoanising that will be so prominent at the site in future phases (Gauss 2005). By way of comparison, Lefkandi during the EHIII phase has only 7% imported pottery as opposed to the c. 15-20 % at Asine (Nordquist 1987: 49-50).

The beginning of the MH period, rather than the major decorative shift envisioned by some, brings about the codification of many of these EHIII decorative styles, with Grey Minyan and Dark Burnished dominating the monochrome burnished field and Matt Painted

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18 However, in the case of Lerna, Rutter (1995: 8) mentions that this may be a function of transitional EHIII material (from the wattle-and-daub structure) having been thrown out by the excavators.
the pattern-painted. In central and northern Greece, other non-Matt Painted pottery styles are also found, though these tend to be similar in motif and structure to the Matt Painted variety. The Lustrous Decorated style is introduced at this time, and while a large amount of this clearly references Cretan decoration of that period, a 'mainland' style of Lustrous Decorated is also popular that imitates the linear and geometric motifs most commonly found on Matt Painted pottery.

After the EHIII period, dark slipped and burnished pottery is found almost exclusively in the Argolid and southern Peloponnes; it is notable for its small quantities, or total absence, from deposits in Thebes and Lefkandi, though it appears at Pevkakia and Eutresis alongside grey polished pottery in the early MH levels at these sites. Grey polished pottery is found throughout the mainland, although it appears only in small quantities in the southern Peloponnes (at Nichoria and Ayios Stephanos, for example). At Argos in the early MH period, Dark Burnished pottery makes up c. 5% of the assemblage while grey polished pottery comprised c. 10% (Kilikoglou et al. 2003); at Asine this pattern is reversed, where I observed 12-14% of the early MH pottery being comprised of Dark Burnished pottery and only c. 5% of the assemblage made up of grey polished pottery. At Lerna, both Dark Burnished and grey polished pottery appear in relatively equal quantities (Zerner 1978: 135-47).

True Matt Painted ceramics are conspicuous by their absence in two regions: Euboea and the southern Peloponnes, although both of these regions have their own painted pottery traditions (an infrequent use of iron-rich paints in Euboea and the dull painted tradition of Laconia and Messenia). Matt Painted pottery is found in large quantities in the Argolid. At Argos, it makes up 35% of the assemblage, at Asine 24% of the assemblage, and a large proportion of the assemblage at Lerna and Kolonna (Kilikoglou et al 2003: 132; Siedentopf 1991; Zerner 1978). Coarse incised pottery is found at the majority of LEMII sites and the preponderance of this material (once dubbed 'Adriatic ware') suggests that it is decorated in such a manner for functional purpose to allow the pot to be gripped when wet and slippery. In fact, one of the only areas in which it is not commonly found is Laconia where the heavy Minoan (or possibly Kytheran) influence may account for this absence; this is also one of the few regions not to have Aeginetan cooking pots. In Laconia and Messenia, though the dull painted styles are popular in the early LEMH, lustrous painted pottery begins to dominate by the end of the MHII phase, and is the most commonly used decorative treatment among the Ayios Stephanos and Nichoria pottery (Howell 1992:74-6; Rutter 1979: 21).

Lustrous Decorated pottery appears at many sites in the southern Peloponnes and Argolid, but during the LEMH, has not been reported north of Athens. Significantly, the mainland Lustrous Decorated style does not appear on pottery from Kythera though it is common at Ayios Stephanos. Given the close contact that undoubtedly occurred between
communities on Kythera and at Ayios Stephanos, this seems to indicate an active choice by both mainland and island communities as to the style of pottery that they wished to produce and to acquire. This is equally matched by the apparently purposeful production of a mainland Lustrous Decorated style that was developed and consumed exclusively by mainland groups. This deliberate choice in the consumption strategies of mainland groups is further underscored by the choices made to emulate certain decorative styles and not others. For example, though Grey Minyan is locally imitated at nearly every LEMH site, the Cycladic and Aeginetan style of red slipping and burnishing, though frequently appearing imported to LEMH sites, is not noticeably copied within local ceramic repertoires.

In Boeotia and Euboea, Minoanising and Cretan pottery is effectively absent during the LEMH. There is none so far reported from Thebes, a single sherd has been found from Eutresis but appears to date to the late MMIII/MHIII period (Rutter and Zerner 1984), another was found near Amarynthos during the Euboea survey yet also dates to the late MBA (Howell 1966) and another has been found at Lefkandi in late MH levels. In southern coastal Thessaly, only limited amounts of imported Minoan and Minoanising material exist (Rutter and Zemer 1984:82). For example, at Pevkakia there is no Minoanising pottery and only two Minoan imports (a carinated cup and teacup); other reported pieces of Middle Minoan pottery at the site are in fact examples of EHIII Light-on-Dark painted pottery (Rutter and Zerner 1984:82). True Minoan imports are found only at Aegina, Argos, Asine, Athens, Ayios Stephanos, Eutresis, Iolkos Lerna, Mycenae, Pevkakia, and possibly at Ayios Stephanos, Nichoria, and Pylos (Davis and Stocker 2006; Taylour 1972; Rutter and Zerner 1984) (Figure 6.7c). In the Laconia area, though a good deal of Minoanising pottery is found, only a limited amount of imported Minoan pottery exists. It should be noted that the sites at which imported Minoan pottery is found correspond almost exactly to the sites where Minoanising pottery is also reported (Figure 6.7b) (with the exception of Geraki, Pevkakia and Iolkos), a scenario that would be consonant with emulation of a relatively rare and prestigious imported pottery type.

Another LEMH import category is the ubiquitous Aeginetan pottery that appears at a large number of sites (Figure 6.7a). However, there are substantial differences in the forms and styles of this ceramic imported to different sites; for example, at Lerna red slipped and burnished bowls, Matt Painted small open and large closed shapes and cooking pots from Aegina are all attested while at Lefkandi only cooking pots and rare shallow red slipped and burnished bowls and jugs have been found. In both Laconia and Messenia, Aeginetan and Cycladic material is conspicuously absent. There has been Aeginetan pottery reported at two sites in Attica (Athens and Eleusis), but it is unclear whether this material is from an MHIII context, rather than LEMH context (Zerner 1993).

Consistent with the ease with which morphological similarities can be imitated through observation of the finished product, there is little observable variation amongst the
shape repertoire across the LEMH mainland. The main difference between regions lies in the elaboration of rim types that are not found in Peloponnesian pottery traditions. This is presumably due to the fact that a great deal of this shape elaboration comes from the malleability of a fine clay body and the use of the wheel for the manufacture; therefore, if these two techniques are not employed, the production of certain elaborate morphological features will be very challenging.

Conclusions

In general terms, then, there are styles characteristic of different areas of the mainland. While certain aesthetic preferences are widely represented across the mainland, such as that of dark, shiny surfaces, there is no single style that occurs in all areas of the mainland, or is consumed in all areas of the mainland. Sites in the Argolid seem to be far and away the most extensively acquisitive, possessing not only the greatest range of imports but also exhibiting the greatest diversity in terms of consumption behaviours. In the area of Messenia, the closest decorative influence clearly derives from Laconia, and it has been suggested that rather than isolation, this is a case of deliberate resistance and the development of a strong southern Peloponnesian cultural identity (Korres 1984). Yet the increasing Cretan influence in both Laconia and Messenia over the course of the MH period (Howell 1992) seems to reflect a greater alliance with not only this production technology (e.g. the use of lustrous paint, pushed through handles, tripod cooking pots) but also with this consumption aesthetic (e.g. the use of Minoanising decorative motifs on mainland shapes and vice versa). Pevkakia, and coastal Thessaly in general, seems to share both a production and consumption preference with sites in Euboea and central Greece, showing a distinct inclination towards grey polished and buff fine vessels and exhibiting a relative lack of interest in the consumption of Matt Painted or Minoanising types.

Furthermore, these stylistic differences seen across the mainland are not solely the function of ceramic availability, but rather reflect active choices by the consumers. Consequently, two zones of style begin to emerge: one is the northern Peloponnesian in which a very wide variety of vessel styles are both produced and employed. There is growing evidence that these elaborate pottery types were also exchanged micro-regionally; within this sphere, new decorative styles of pottery were continually sought, emulated and imported, suggesting that their importance within the realm of socio-political expression may have been closely linked to diversity and variation.

In contrast, the region of central Greece (having already displayed a much greater uniformity of technological tradition), shared a much more limited aesthetic sense in which there is a highly homogenising tendency where elaboration is generally limited to
morphological features; this general tendency towards visual and functional equivalence is also reflected in the few overall imports that can be recognised. While chemical analysis has shown that there are a number of production centres where pottery within the technological tradition of central Greece was produced, it remains unclear to what degree pottery was frequently exchanged at a micro-regional level analogous to the material from the Argolid and southern Peloponnese. If the chemical analyses from Lefkandi are anything to go by, central Greek pottery was produced at a number of sites, but it may not be as widely exchanged, perhaps due to the homogeneous nature of the ceramics themselves, the unified technological tradition in which it was produced and the lack of socio-economic motivation for such an exchange. In the next and final chapter, we will explore what the implications of the central Greek region having both significantly different technological/production and consumption/style zones from that of the Argive region might be.
CHAPTER 7
CONCLUSIONS

Variation and diversity: production, consumption and scale

In the previous chapter, I explored the possibility that a variety of different production and consumption behaviours co-existed on the LEMH mainland. Looking first at the central Greek production tradition, the organisation of production could be classified as one in which production knowledge and skill were available to a limited group and practiced by very few members of a community. Two factors were isolated in Chapter 3 that allow us to consider some of the social implications of ceramic technologies. These were: (i) the degree to which knowledge is evenly distributed within a group and (ii) the demands placed on the other subsystems of a community to ensure that the technological system can be transmitted and replicated (Roux 1990:150; Roux and Matarrasso 1999) (see Figure 3.6). This kind of specialised production, within an otherwise undifferentiated community, causes incipient division of labour that may have encouraged the differential possession of knowledge and its transmission. This has the potential to create uneven social identities within a group that were unknown previously. With regard to (ii) above, due to the necessary investment of time in learning to use the potter's wheel, it seems likely that this activity would be undertaken to the detriment of other economic activities, and hence, the potter would become increasingly reliant on other members of the community for subsistence, while at the same time he or she could also be a source upon which the community came to rely more intensively for products which were now beyond the skill of others in the community to produce. Thus, this type of socio-economic organisation could potentially lead to an increase in the degree of differentiation between members of such a community, while simultaneously causing members of the community beyond the unit of the household to become economically interdependent on one another. In this scenario, the implication for the community is twofold: while having specialist producers in a community creates a degree of socio-economic integration beyond the level of the household, this system of production organisation could also conceivably lead to unequal acquisition of goods and materials.

Turning to the second mode of craft production that we identified on the LEMH mainland, we must look at the sites of Asine and Lerna. The production signatures of these sites (and others in parts of the Argolid and Peloponnese) suggest the existence of a number of co-existing producers making a range of pottery in different technological and decorative traditions. This suggests that production requirements were fairly limited, and could have operated on a less specialised level than that of central Greece; while production could potentially have occurred at the level of the household, it is more likely that a number of
semi-specialised households performed this activity on a part-time basis. Therefore, production would have been driven less by collective requirements, and would have been less heavily integrated into the community-wide socio-economic system of organisation. Analogous observations have been made about the EHIII and MH stone tool assemblages at Lerna, in which the nature of the tool-kits at that site indicate a more domestically-oriented form of production than their more specialised EHII counterparts (Hartenberger and Runnels 2001; Runnels 1985: 390).

In Chapter 6, it was noted that certain preferences for specific ceramic types existed throughout mainland regions. For example, communities in the northern Peloponnese (the region containing Asine and Lerna) placed an emphasis on the production and consumption of a wide variety of vessel styles. Furthermore, new decorative styles of pottery were commonly introduced and possibly emulated in this region, suggesting that material culture diversity and distinction may have played a significant role in social discourse. Alternatively, in central Greece a much more restricted assemblage of pottery was consumed and relatively little was imported, creating a homogenised ceramic assemblage.

In addition, a high degree of variation was also observed in Chapter 2 regarding settlement patterning, community size and presumably population during the LEMII period. Furthermore, it was estimated that some of these LEMH groups were likely to have reached critical population thresholds beyond which communal cohesion and egalitarian organisation were problematic to maintain. What I will be speculatively exploring in this final chapter, then, is how we might use such differences in socio-economic organisation, consumption practices and population in order to explore the nature of communal integration among LEMH communities.

Integration or differentiation: the logics of consumption

Though there is a great deal of diversity in the archaeological record of the LEMII period, from no site do we have any absolute indications of incipient hierarchical organisation or ostentatious material aggrandisement. It is this lack of the material manifestations of the emergence of complexity that has so often led the LEMII to be characterised in negative terms (see Chapter 1). Yet in Chapters 2 and 6 it was suggested that integrative mechanisms must surely have existed within these LEMH groups due (i) to their size and (ii) the existence of relatively complex specialised craft production systems (at least in some central Greek communities). The following section will explore what form these mechanisms might have taken and how to investigate this.

The size of a settlement, as discussed in Chapters 2 and 3, places a varying degree of scalar stress (the number of people in a community) upon social interaction. Putting it simply,
the larger the population of a community, the greater the need for integrative mechanisms to both moderate stress caused by high levels of interaction but also to create a common identity among a large group of households, lineages and kin groups. However, within a smaller community, the relatively fewer people and daily interaction between those people bypasses the need for any type of created collective identity. Accordingly, the two types of communities on the LEMH mainland that require integrative mechanisms the most are those at which there was specialised production and those at which the population had crossed a population threshold beyond which members of a community could be well acquainted with one another and interact on a daily basis (estimated by cross-cultural ethnographic analogy as anywhere between 60 and 250 people) (Chagnon 1979).

This leads to the question of how the larger LEMH communities were able to mitigate inevitable internal conflict and provide group cohesion (Bandy 2004: 323; Johnson 1982). Given that the rise of hierarchical offices cannot be demonstrated for the LEMH, studies of comparable communities have shown that a number of responses beyond that of institutionalised inequality and formalised leadership can occur. These include the fissioning of groups (Bandy 2004), an increased emphasis on ritual or ideology as a means of group cohesion (Kuijt 1996; Lesure and Blake 2002), or an intensification of different types of commensal behaviours that operate at different scales (Potter 2000). In most cases the nature of this response is heavily rooted in the degree of scalar stress within the community and the degree of self-sufficiency and resource circumscription within that group.

While none of these diverse responses is immediately congruent with the archaeological record of the LEMH, these studies are important in two main respects. Firstly, they provide alternative avenues of thinking about LEMH communal orientation beyond simply that of incipient leadership. Secondly, they emphasise that communal behaviours can be generally characterised as to whether the emphasis lies on integration or differentiation (Potter 2000: 472; Potter and Perry 2000). This is similar to the idea raised in Chapter 3 regarding the consumption of material culture as a means of maintaining equivalence (integration) or facilitating the development of non-equivalence (differentiation), and underscores the basic integrative/exclusive dichotomy of material culture consumption behaviours.

As suggested in Chapter 3, it is through an examination of consumption patterns and the behaviours they intimate that we can further explore along which axis of differentiation or integration LEMH communities were aligning themselves. In this section, we will explore scenarios that accord with the diversity of socio-economic organisation observed amongst these groups, the different degrees of scalar stress experienced within LEMH groups and the implications this would have had on a community- to region-wide scale.
Thus, even if the particular mechanisms of communality (e.g. kinship groups, clans, factions) cannot be discerned, the basic means by which communal assimilation was asserted can be assessed. In addition, it has widely been noted (Clark and Blake 1994; Johnson and Earle 1987), that inter-community integration may serve an equally important role within some groups as intra-communal integration, in order to develop wide-ranging alliances and networks, and the material signatures of this type of behaviour will also be given consideration. However, it is very likely that communities of the LEMII period turned to a range of different ways of negotiating identity, maintaining affiliation and expressing status in light of their differences in size and socio-economic organisation.

As I demonstrated in Chapter 6, a basic distinction exists between the style preferences of the central Greek region and the Peloponnese (primarily focussing on the north-east Peloponnese). In the context of integration versus differentiation, let us now explore what this distinction might mean. This analysis needs to occur at three different scales, considering the implications of these consumption choices (i) within the community, (ii) between communities and (iii) between regions (Figure 7.1).

Turning firstly to (i), the question of interpreting patterns of consumption within the community, there appear to be few discernible intra-community differences at many of the central Greek sites, where an overwhelmingly homogeneous body of ceramic material is dominant. Let us explore this further using the case of Lefkandi. From the early MH period, the vast majority of all ceramics used at Lefkandi conform to a very limited aesthetic range (plain, polished and incised in either buff or grey). This is not necessarily true of the EHIII period (Phases 2 and 2-3), but by Phase 3, over 60% of the ceramics are either plain buff or grey polished, and this proportion rises to nearly 80% in Phases 4 and 5 (see Figure 4.29 for a quantitative demonstration of the increasing visual homogenisation of all ceramics at Lefkandi.) At Lefkandi, at least, this demand for homogeneous products results in the growing dominance of a single local production tradition, suggesting that there is little place or requirement for the production of distinctive ceramic types. In contrast to the production of the decoration-focussed 'added-value' ceramics in the north-eastern Peloponnese, at Lefkandi (and those other central Greek sites which share the same ceramic production systems as Lefkandi) added-value is represented by the degree of technological knowledge required to produce these ceramics, and the underlying socio-economic investment that these complex skills require.

The lack of visual diversity amongst the Lefkandi ceramic record is also reflected in the limited range of serving and drinking ceramics 'sets' found at Lefkandi. In Figure 7.2 the Lefkandi drinking and serving ceramics have been grouped into general decorative and visually distinctive classes. Notably, there are only two visually distinctive types of pottery that make up a full drinking and serving set (though, these are technologically the same...
pottery simply differently fired), with red slipped and burnished (the only imported ceramic) representing a partial set. Conspicuous by their absence are Lustrous Decorated and Aeginetan Matt Painted ceramics (found in sets at Asine), which seems particularly noteworthy as an absence given that coarse Aeginctan ceramics are present. This lack of stylistic differentiation suggests a system in which communal integration and uniformity is of the highest importance and is predicated upon events and interactions that stress unity and similarity rather than differentiation; the similarity of the Lefkandi ceramics means that these are unlikely to act as a medium for accruing or displaying wealth or power (Thomas 1991: 214). Consumption rituals within such a community are likely to have a specific set of material referents that are not particularly mutable; hence, only a limited range of materials could legitimately be included in social events. Thus the rarity with which imported drinking and serving ceramics appear amongst the Lefkandi material could be a reflection of the standardisation and codification of these material referents (Adler and Wilshusen 1990: 143).

Some other interesting aspects of the Lefkandi assemblage within this context are the bimodal sizes of both the most popular drinking and cooking shapes (kantharoi of 10-11 cm and bowls of 18-22 cm; low collared jars of 10 cm and 22 cm) and a very high bowl to jar ratio (at nearly 2:1) throughout phases 2 through 5. This kind of pattern has been shown to relate to the common occurrence of large-scale eating events, causing two different sets of cooking and serving pottery to develop that reflect communal and domestic commensal practice (Potter 2000a). Furthermore, these ceramic signatures are indicative of events at which food is widely shared among members of the community and promotes a degree of socio-economic interdependence and reliance among community members (Potter 2000a). At central Greek sites there is an equivalence of ceramic types, and presumably, of the events likely to be associated with these vessels, including communal consumption events that highlight the consumption and redistribution of foodstuffs, not only enhancing social integration but engendering a sense of socio-economic obligation and dependence among all members of the community (Brandt 1994; Poyer 1991; Thomas 1991).

In comparison, within communities of the north-eastern Peloponnese, a much wider diversity in ceramic styles is apparent. During the EHIII period, diverse types of pattern painted pottery were widely consumed and in the early MH period, we see the introduction of Matt Painted pottery (Buck 1964), Lustrous Decorated ceramics arrives in the region (Zerner 1978) and a range of monochrome burnished (often incised decorated) types are also common. To explore this further, let us look to Asine. In Figure 7.3, the range of serving and drinking ceramics has been divided into decorative and visually distinctive classes. Even at a general level, there are six basic types of complementary serving and drinking vessels employed at Asine, emphasising the utilisation of distinctive and diverse ceramic types in social events. Within each of these styles of pottery, there appears a full range of serving and
drinking vessels that were consumed at Asine; therefore, each of these sets can be considered functionally equivalent. This type of pattern is one often associated with intra-community competition between households, in which frequent inter-community gathering events act as an opportunity to acquire a range of widely dispersed social and economic contacts with neighbouring groups. This would serve as a means of building up inter-community alliances and alleviating the need for household self-sufficiency (Rosman and Rubel 1981: 189). Furthermore, this type of localised exchange of drinking and serving vessels is heavily associated with commensal events focusing on the display and distribution of material wealth (a feature of non-equivalent consumption, such as the potlatch), as opposed to the redistribution of subsistence and foodstuffs (as in equivalent consumption events) (Marshall and Maas 1997).

Furthermore, this latter pattern towards visually distinctive ceramics also tends to be accompanied by a frequent regional exchange (e.g. Attas et al. 1987 for exchange throughout the Argive plain), as well as the acquisition of foreign and exotic items. This is coupled with the presence, in the north-east Peloponnese, of not only the majority of off-mainland ceramics, but also the majority of other foreign material culture objects as well. This includes items such as stone vessels, loom weights and seals found only at the sites of Lerna, Argos and Mycenae (Rutter and Zerner 1984: 82-83). Hence, the material patterning seen within sites like Lerna and Asine are not only signs of the acquisitive nature of individuals in these communities, but of the apparent drive within these communities to obtain numerous types of both regional and extra-local material. This is also suggestive of the significant role that a diverse material culture played in the dynamics of these communities. Furthermore, the possibility that this simply represents random patterning is belied by the fact that these patterns are consistently maintained for nearly 500 years. The increasing popularity of a diverse range of imported items (particularly Lustrous Decorated and Aeginetan ceramics) at Lerna, Asine and Argos indicates that these material culture types were increasingly in demand due to the important role they played within communal social negotiations. Though these were likely to be highly fluid social negotiations in which the material referents of social interaction had yet to become fixed and formalised, a wide range of material types would still need to be adopted and employed. It is also possible to speculate on the value of this material to LEMH consumers in the north-east Peloponnese due to the deposition of analogous types of ceramic material in the later Shaft Graves at Mycenae. The presence of large amounts of imported Minoan and central Greek polychrome pottery suggests that these ceramic types were of particular value (Wolpert 2004: 138).

The idiosyncratic nature of pattern painted pottery in the EHIII period has led some to hypothesise that these ceramics were a “vehicle for promoting the distinctness of smaller human groups, communities, lineages, households, and perhaps even individual potters, rather
than for enhancing cultural solidarity" (Rutter 1993: 26-29; for a similar argument about the regional distinction between consumption behaviours during the EHIII period see Nakou 1997b). The emphasis on stylistic distinctness (which suggests that ceramics were an active mechanism for differentiation) continues into the early MH period, making this argument feasible for the LEMH period as a whole.

Patterns are less clearly delineated in terms of intra-community consumption among many of the other sites on the southern mainland. However, it is possible to note that the impetus to consume foreign vessel types is often found in parallel to the local production of numerous ceramic styles, including Minyan, Dark Burnished, Matt Painted and potentially even Lustrous Decorated (Kiriatzi 2006; Whitbread 2001; Zerner 1993). This connection between an interest in exotic ceramics and the proliferation of diversity in the local ceramic repertoire reflects a demand on the part of the consumers at these sites for a wide range of visually distinctive products. Furthermore, the decorative elaboration of these ceramic types represents the addition of value, thus manufacturing a culturally enhanced local product for both intra- and inter-communal (possibly competitive) exchange across areas of southern Greece. It would be of great interest to observe the patterning in regions such as Attica that lie between these two delineated fields of consumption behaviour; however, the available data simply does not allow for such an investigation to currently take place.

Turning to (ii), the implications of these consumption practices at an inter-community level, what might these differences mean in terms of interaction taking place between communities? For the central Greek region, communities appear to be engaging in a very similar mode of consumption, replicating the homogenising and integrative pattern noted for Lefkandi. The uniformity with which this pattern is replicated across the central Greek area suggests that an extremely clearly defined and coherent cultural identity existed across this region as a whole. In the north-east Peloponnese, we see a similar pattern, insofar as each community appears to be engaged in a generally similar differentiating behaviour. However, though competition and differentiation may have been an important part of intra-community interaction in the latter case, this does not seem to be a feature of inter-community dynamics. There is no obvious difference between consumption practices at various sites in the north-east Peloponnese, yet the importance of micro-regional exchange between these groups indicates that inter-community interaction is likely to have played an important role in the socio-economic organisation of these communities; unfortunately, the significance of this

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1 This differentiating consumption logic, it is argued, was concerned with competitive feasting and the development of non-equivalence and this is why the Kastrí/Lefkandi I group (possibly the EHIII equivalent of Lustrous Decorated pottery) was so readily accepted in the central Greek region, whereas this type of behaviour, and thus material culture, was resisted in the Argive/Peloponnesian sphere where 'equivalence' (integrative) feasting was the major underlying structuring principle (Nakou 1997b).
cannot be clarified until detailed intra-community consumption patterns can be linked to
different micro-regional exchange patterns.

Lastly, at a regional level, the central Greek region stands out as one of great
uniformity in which cultural identity has been clearly defined. However, this could also be
interpreted as insular and closed, with few imports found in this region and little evidence of
intensive interaction occurring with regions outside of this central area. On the other hand, the
north-east Peloponnese represents an area with highly acquisitive inhabitants, in which
material objects appear to be playing a significant role in intra-community differentiation and
various social relations.

How, then, do the two major consumption patterns documented for communities of
the LEMH mainland relate to the production variations outlined in the previous chapter? The
strong cultural identity already identified in the consumption record of sites in the central
Greek region is compounded by the presence of intensively specialised production. These are
communities that, though deeply culturally unified, are occupationally differentiated. The
level of social integration exhibited by both the intra- and inter-community consumption
patterning suggests an underlying degree of socio-political control working at both a
community- and region-wide level in order to maintain this and resist external influences that
might have threatened this stability. On the other hand, the consumption, by north-east
Peloponnesian communities, of a diverse and visually distinctive range of material culture
suggests an internal social fragmentation along lines now impossible to untangle. This
fragmentation may have been fraught with internal socio-political competition. This seems to
affect the degree to which intra- and extra-regional ties were emphasised and actively sought,
resulting in a culturally open and adaptable regional character.

The seemingly fundamental differences that underlie the pottery production and
consumption patterns in the LEMH mainland may be speculatively related to the level and
nature of communal organisation and self-sufficiency enjoyed at each site, and the strategies
employed by the inhabitants of these communities. In this way, we can categorise LEMH
groups along the lines proposed in Chapter 3 regarding socio-economic differentiation and
scale as reflected in their consumption behaviour (Figure 7.4). With this in mind, what might
have been some of the unintended later consequences of the types of socio-economic organisation and communal orientation considered here? In the following section, I will
briefly explore the implications that this model might have for explaining and understanding
the patterns of material deposition and behaviour in the subsequent Shaft Grave period.

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2 It is impossible to speculate on the nature of this socio-political authority, though there is no material
evidence to suggest it was based around any single individual. Therefore, it seems likely it was a
collaborative group present within each community of the region that was closely linked to other
authoritative bodies in the region.
Looking ahead: integration in the Shaft Grave period

Though this thesis is explicitly not about the emergence of the Shaft Grave elites or behaviours, let us briefly look to see if any of these later phenomena (and indeed the variation they do exhibit) may be consonant with the models for LEMH socio-economic organisation and integration proposed here.

While the institutionalised economic inequalities of the Shaft Grave period represented a radical ideological transformation from the LEMII period (Voutsaki 1998, 2001, 2004), this was by no means a uniform phenomenon across the mainland. This is true not only with respect to the speed with which Shaft Grave practices were taken up across the mainland (Attica, Boeotia and other areas north of Corinth are said to retain their ‘MH’ character and material culture traditions for a much longer period than in other mainland regions [Dickinson 1977: 97, 1989: 133-4; Forsen 2006; Papadimitriou 2006]), but also with regard to the form which this expression of institutionalised inequality took. It seems likely that variation in Shaft Grave period behaviours are a legacy of the diverse forms of socio-economic organisation and communal integration proposed herein. This heterogeneity has also been noted regarding the concept of a Mycenaean cultural koiné; while it appears superficially uniform, the ambiguity surrounding systems of Mycenaean ideology, geography and territory may reflect the diversity of the heterogeneous MH groups that preceded them (Dabney and Wright 1990: 48). Thus, patterns of LEMH socio-economic organisation may be more important than previously thought in order to understand not only the diversity and dynamics of the Shaft Grave period, but also the structure and organisation of the succeeding Mycenaean palatial system. 3

For example, Wright (2001) has argued that the incipient stages of Shaft Grave social organisation in the Argolid were focused not upon economic redistribution but instead relied upon the material intensification of displays of wealth and power. This is exemplified by the Shaft Graves themselves, in which individual status seems to be the most heavily asserted feature of each burial. The fact that this is consonant with the competitive consumption patterns and household-based notion of communal organisation and identity observed for this region during the LEMH period suggests that LEMH patterns of behaviour may be relevant to understanding the emergence of Shaft Grave practices. Furthermore, the very nature of the Shaft Grave material (highly heterogeneous and derived from a vast number of sources

3 Consider, for example, Susan Sherratt’s (2001) argument that the economic power of the Mycenaean palaces was somewhat limited, thus explaining the transience of this system of organisation. If, as Snodgrass (1971) has argued, elements of Early Iron Age behaviour are a re-assertion of MH patterns, this would imply that there was a continuity of LEMH socio-economic behaviours underlying Mycenaean palatial organisation.
(Dickinson 1977:53) also mirrors the ceramic acquisition strategies of north-eastern Peloponnesian LEMH sites in terms of variety. In fact, considering the structures in place during the LEMH period amongst many communities of the north-east Peloponnesoe, the cultural and ideological transformation of using material culture as a competitive medium for individual status assertion may not have been as radical a shift as is commonly perceived.

Looking at the Shaft Graves from an LEMH perspective also requires a reconsideration of the Cretan material found in the grave circles, once considered emblematic of the ability of the local elites at Mycenae to acquire wealth and prestige goods. The inflated importance given to such Cretan material on the MHIII mainland ignores the equal (if not greater) quantities of central Greek polychrome pottery also found in the Shaft Graves. However, if one considers LEMH consumption strategies practiced in the Argolid, it may be the consumption of numerous and diverse imported and mainland pottery types that is critical in constructing the identities represented by the Shaft Grave deposits. In addition, it is only through knowledge of the strongly defined cultural identity of central Greek communities during the LEMH period that the importance of central Greek material in the Shaft Graves may be understood (Dietz 1991: 325; Wolpert 2004: 138).

Unfortunately, little comprehensive evidence exists from the Shaft Grave period in other areas of the mainland with which to compare this pattern. However, the little evidence we do have is enough to suggest that different social strategies were at work. Evidence from burials suggests that a number of power acquisition strategies were being employed; the tumulus continues to be used, in some areas of the south-western Peloponnesoe (at Samikon, Makrysia and Kissos and numerous sites in Messenia) and at Marathon, suggesting that the construction of monumental facilities – and hence the ability to command labour – was of much greater significance within this region of the mainland than in the north-eastern Peloponnesoe. This is corroborated by the appearance of the tholos tomb, a construction clearly associated with the ability to command a large labour force, which first appears in Messenia (Voutsaki 1998), though is soon adopted in the north-east Peloponnesoe.

The competitive aspect of Peloponnesian Shaft Grave mortuary behaviour is thus far unparalleled in most of the central Greek area; whether this is due to lack of archaeological investigation or due to the very different communal organisation enjoyed amongst these communities is difficult to tell. The fact that so few of the new Peloponnesian burial practices have been found north of Corinth during the Shaft Grave period is illustrative of the apparent survival of ‘older traditions’ in these areas (Dickinson 1977: 64). This suggests that alternate pathways to institutionalised inequality were being employed or, as was explored above, that

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4 For example, no LHI or earlier chamber tombs have been found north of Corinth, and many of the same MH pit and cist cemeteries continue to be used in Phokis, Euboea, Boeotia (Cavanaugh and Mee 1988; Dickinson 1977: 65).
there were LEMH social mechanisms in place that maintained a strong, regional cultural identity and were highly resistant to the introduction of new types of behaviour. Though there were many other external stimuli that had considerable effect on the developments of the Shaft Grave period and the later establishment of the Mycenaean palatial system, recognition of the LEMH foundations upon which these were laid are critical to have a full understanding of the local impetus behind these formidable changes.

Conclusion

This thesis is explicitly concerned with the EHIII and early MH phases of mainland prehistory and most prominently with the systems of ceramic production employed in different regions. Through an exploration of the manufacturing process behind LEMH ceramic material, we have been confronted by the unexpected emergence of a strongly coherent regional production tradition in central Greece, belying many suppositions about the complexity of systems of craft production during the LEMH period. By looking beyond the Argive triumvirate (Argos, Asine and Lerna) during the LEMH period, we have encountered significant differences in the ceramic production traditions of the LEMH mainland.

This can possibly be connected with visible and meaningful differences in consumption logics within LEMH communities, thus providing us with a material basis on which to explore socio-economic diversity and mechanisms of integration within this highly under-explored period of the Bronze Age. This clarification and exposition of the intrinsic dynamics of the LEMH period may also allow us to better interpret the differential developments of the Shaft Grave period as reflections of the diverse trajectories of the preceding LEMH groups. Using the production and technology oriented approach advocated here, it has been possible to delve more deeply into the fundamentally different expressions of collective identity, competition, replication and resistance that forged LEMH communities.
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