

Handmade Burnished Ware in Late Bronze Age Greece and its makers

by

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Abstract

This study focuses on the idiosyncratic type of pottery called Handmade Burnished Ware (HBW) which appears in the Eastern Mediterranean and more particularly in the Mycenaean area during the 13th-12th centuries BC. It includes my own *in corpore* study of published and unpublished material from various sites in the Aegean region, as well as previously unstudied material from Mycenae itself.

A major part of the study is devoted to a detailed definition of the chronological, geographical and depositional contexts of HBW, of its shapes and its varieties, in terms both of fabric and manufacture. This analysis was a necessary prerequisite to my goals of understanding the origin(s) and distribution of this pottery, of determining whether it is one ware or several similar ones and of understanding its role and significance in the social, economic and historical contexts in which it appeared.

I conclude that this group of pottery is a cultural marker for the presence of a small foreign population who produced these vessels and were living amongst the local population already during the Mycenaean Palatial (LH IIIB) period but also in the following phase (LH IIIC), after the major destructions.

The close relationship of this cultural marker, whether contextual, technological or in terms of origin, with several different types of artefacts linked to craft activities such as textile production or bronze-smithing, seems to point toward the interpretation of the occupation of the HBW makers as possible travelling artisans.

A mes grands-parents,
Geneviève et Daniel Pastor,

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List of Abbreviations

AAS	Atomic Absorption Spectrometry
AR	Archaeological Reports
EH	Early Helladic
EIA	Early Iron Age
EPG	Early Protogeometric
FBA	Final Bronze Age
FS	Furumark Shape
HMB	Handmade Burnished Ware
HBW	Handmade Burnished Ware
HMBW	Handmade Burnished Ware
IA	Iron Age
LB	Late Bronze
LBA	Late Bronze Age
LC	Late Cypriot
LH	Late Helladic
LM	Late Minoan
MBA	Middle Bronze Age
MH	Middle Helladic
NAA	Neutron Activation Analysis
NW	north-west
OES	Optical Emission Spectroscopy
PG	Protogeometric
RBA	Recent Bronze Age
SEM	Scanning Electron Microscopy
XRD	X-ray Diffraction
XRF	X-ray Fluorescence Spectroscopy
X-ray	Radiography

Introduction

i. What is Handmade Burnished Ware?¹

i.i Historical context

The class of pottery, called “Handmade Burnished Ware”, studied in the present thesis, appears in the Late Bronze Age (hereafter LBA) Aegean region, during the mid-13th to, at least, the 12th centuries BC², a period characterised by the end of the apogee of Mycenaean civilisation and the collapse of the palatial system it embodied.

The result of this breakdown is traditionally viewed as the beginning of the “Dark Ages”³ (Snodgrass 1971; Desborough 1972), so called, formerly, due to the lack of information available on the period and also to its association with a social, economic, demographic and artistic decline together with fragmentation/regionalisation of the population and culture, in comparison to the preceding, complex, Mycenaean palatial civilisation and following Classical Antiquity. However the term Early Iron Age (hereafter EIA) is used in the present study instead, due to the increased number of discoveries and studies on the period, undertaken since the 1970s, and our improved understanding.

¹ I did not realise headings might be useful in the Introduction and it seemed impractical to re-number the whole thesis.

² All dates are BC unless stated otherwise.

³ This period starts around the 11th-10th centuries: there is no definite scholarly consensus on the timeframe of this period (Dickinson 2006: 3-9, various scholars' opinions).

The Mycenaean culture of the 14th-13th centuries, on the contrary, is usually defined by its centralised and administrative organisation around a series of palaces (with a monarch, the wanax) which controlled several specific aspects of the society and economy.

At this point, it should be emphasised that there are diverging opinions on how involved the Mycenaean palaces were: seen as either highly centralised and specialised or as having had a limited political and economical control over their region, the economy in general and trade networks in particular (Sjoberg 1995; Shelmerdine 1997; Shelmerdine, Bennet 2008; several papers in: Voutsaki and Killen 2001; Galaty and Parkinson 1999; 2007).

It seems, in fact, that only specific commodities (prestige high-valued items and their production and exchange) and occasions (religious ceremonies for example) were directly managed by the palatial administration.

Cultural similarities over the core of the Mycenaean civilisation (Peloponnese and Central Greece) spread even further into what is called the periphery⁴: to the North (Thessaly, Macedonia), South (Crete), Eastern Aegean (Cycladic Islands) and West (Aetolia, Epirus, Ionian Islands), into various degrees of influence, contact and exchange.

However at the end of the 13th-beginning of the 12th century⁵, a succession of disasters within the Mycenaean area, identifiable in archaeological terms by the evidence of the multiple destructions of important sites and the abandonment of settlements in some regions⁶, resulted in the collapse of the palatial system.

The cause(s) of this collapse still appear to be an unsolved problem. It was traditionally linked with invasions of population from the North (Crossland and Birchall

⁴ As defined in: Feuer 1999.

⁵ Somewhat equivalent to the end of the LH IIIB-beginning of the LH IIIC period.

⁶ As detailed in: Treuil et al. 1991: 449-450; Rutter 1992: 68-70; 2000: lesson 25.

1974), and in particular the Dorian theory⁷. Dorians were either seen as the destroyers of the palaces (if this invasion was placed at the end of the LH IIIB period) (Hammond 1976) or responsible for ending Mycenaean civilisation and enabling the emergence of the Greek EIA society (if placed at the end of the LH IIIC/Submycenaean periods) (Desborough 1972; Eder 1998).

However, even if there are still diverging opinions, it is generally agreed that several elements⁸ might have been involved in the palatial collapse, amongst which are: a combination of political and economical factors (over-centralisation and specialisation of the palatial system: Kilian 1988: 134; Muhly 1992: 11-12, rivalries between rulers: Dickinson 2006, loss of control over trade: Sherratt 2001), natural disasters (earthquakes, in particular concerning the destructions of the palaces in the Argolid: Kilian 1988; French 2007, drought: Carpenter 1966), internal social crisis (Hooker 1976), influence of external aspects (infiltration of small groups of raiders, whether Sea Peoples or northern tribes: Deger-Jalkotzy 1977; Bouzek 1994; Drews 1993, or the repercussion of the collapse of the palaces in the Near East on trade activities: Kilian 1988: 134).

The period of instability lasted the whole of the 12th century and was also perceptible in regions of the Eastern Mediterranean: the Hittite empire in Anatolia collapsed, Egypt was attacked and sites in Cyprus and the Levant were destroyed (Ward, Sharp-Joukowsky 1992).

The situation in the Post-palatial Aegean reflects modifications in several aspects of the Mycenaean society even though it is the same population who was responsible for rebuilding settlements. The fall of the palatial system implied the disappearance of most of its

⁷ Directly influenced by both historical and linguistic evidence: the myth of the Dorians (Herodotus) and of the Returns of the Herakleidae (Thucydides) and the analyses of the evolution of the spatial distribution of various dialects found in the region in antiquity. Summaries of the history of the study of the Dorians: Hall 1997: 4-16; Schnapp-Gourbeillon 2002: chapter 3.

⁸ Their combinations and the degree in which these various aspects really played a part at the time are, at the moment, impossible to comprehend thoroughly.

characteristics: administration, Linear B, production of objects of highly skilled craftsmanship (Deger-Jalkotzy 1998; 2008).

In spite of this, the essence of Mycenaean civilisation remained with continuity in many settlements, with architectural features possibly inspired by previous features (as at Tiryns: Maran 2006), in the production of wheelmade painted fine pottery⁹, in overseas contacts (though possibly with modifications in trade routes within the Mediterranean: Sherratt 2001).

Contrary to what was thought many years ago, scholars now view the Mycenaean Post-palatial period as characterised, not anymore solely by its decline in comparison to the previous wealthy and powerful Palatial society, but as a succession of phases of recovery, prosperity, and then final decline at the end of the 11th century (Rutter 1992; Deger-Jalkotzy 1998; 2008; Dickinson 2006: 67-77).

The new leaderships which developed after the Palaces collapse, in the various regions of Greece, have been interpreted as being based on individual accomplishment as well as being linked to the descent from former royal families (Maran 2006; Eder 2006: 556).

It is within this atmosphere of profound changes of a very well organised society where pottery was of very high standard with well-organised and specialised ceramic workshops that a new class of archaic-looking pottery, called **Handmade Burnished Ware** (hereafter HBW), appeared. It is due to its idiosyncratic nature, in the context of the Dorians tradition, that it was very soon associated by scholars with the causes of troubles which brought the palaces to an end and more particularly as evidence for a foreign population migration from the North.

⁹ Even though at the beginning of the LH IIIC period, there is a development of regionalism in shapes and styles, a loss of execution quality and restriction in design varieties (Rutter 1992; Dickinson 2006: 122; WBM 16/17: 67-71), from the LH IIIC Middle onwards, the level of quality is high again and there are many innovations in design (Dickinson 2006: 122; WBM 16/17: 73-79).

The question of the link between HBW and the collapse of the Mycenaean palatial system at the end of the LH IIIB period is a rather old debate which is still regularly renewed (Kilian 1978: 314; Deger-Jalkotzy 1983: 164; Bouzek 1985: 187; Bloedow 1985; Eder 1998). It goes back to the first theorisation of the presence of HBW in the destruction levels of the sites where it was first identified in the 60s-80s or to the possible relation with the handmade pottery found in EIA levels (as postulated in: Reber 1991) which was often attributed to a foreign population (Bouzek 1969; Desborough 1972).

Whereas it is evident and generally agreed at present that the presence of HBW cannot be directly related to these troubles as the first specimens appear already in the Palatial period, before the destruction levels (*I.3*), the link between HBW and EIA handmade pottery has become a point of focus in recent studies, as discussed later on, which is directly related to the problem of the definition of the ware.

This leads us in consequence to the necessity to consider the HBW phenomenon in a more detailed way: its characterisation both intrinsic (typology and fabric) and extrinsic (chronological, geographical and depositional) and to reconsider its interpretation in relation to the changing and increasing knowledge of the social, political and economic context of the period.

i.ii General characterisation of HBW¹⁰

HBW (Handmade Burnished Ware)¹¹, as its name indicates, is a class of pottery made by hand and which usually has a more or less carefully created burnished finish and is sometimes decorated in a simple manner (applied plastic cordons, impressions, incisions, knobs). It is in some cases also accompanied by the additional descriptive terms such as:

¹⁰ For a full account, see: *Chapters* 2 (typology of shapes) and 3 (technological features).

¹¹ This abbreviation is the most commonly found in the literature on the subject; however the material from Mycenae is labelled with the following initials: 'HMB' (term also used in: Rutter 1990), and in some publications, the abbreviation: 'HMBW' is used ('hggK' in German).

coarse and/or dark-surfaced, in order to accentuate the particularities of its character compared to Mycenaean ware: this was made with a finer lighter-coloured fabric, on a wheel, fired hard and often painted. It has, by comparison, a crude and crumbly aspect as it is mostly fired at a low temperature.

The labelling of this group of pottery has changed several times since it was first discovered some fifty years ago: some were related to its possible area(s) of origin: “NW Greek ware” (Kilian 1978) or “Italian Impasto ware” (Hallager 1985; Kilian 1985a); others to its possible historical implication(s): “Dorian ware” (Kilian 1978) or “Barbarian ware” (Catling 1981; Bouzek 1985).

HBW appears for the first time during the 13th century, which corresponds to the later part of the Palatial period and is found all through the Post-Palatial period until at least the end of the 12th century. In archaeological terms, it includes the LH IIIB Middle up to the LH IIIC Late periods. However the exact limits are still a matter of discussion due, in part, to lack of precise analysis of the find context of HBW in several key sites (*I.1*) and in part due to the problem of its definition, as discussed later on.

The geographical distribution of this ware corresponds mainly to the Mycenaean area of influence and cultural homogeneity: including the Peloponnese and Central Greece (mainly with Attic, Boeotia, Euboea, Phocis, and Locris). However other areas included correspond to regions which came under Mycenaean influence even though they exhibit their own local variations and particularities, like Crete and Thessaly.

In addition, HBW has also been identified outside the Mycenaean area of influence in the Eastern Mediterranean which is an important trade route during the Palatial period: Cyprus and the coast of the Near East (*I.1.2*).

i.iii Previous studies

A chronological review of the discovery of HBW in general is already available in the publication of the HBW from Cyprus, undertaken by D. Pilides (1994: 1-9), and a detailed literature review of the HBW finds, by sites, is presented in: *1.1*.

Here, I wish to discuss the fact that most of the studies previously undertaken were not directly related to the character of HBW as the core element of the study, together with its definition and problems of identification. Instead they were related to peripheral aspects of the subject which can be categorised into three approaches: descriptive, historical or theoretical.

Studies from a descriptive point of view are concerned with a single site as they are part of an excavation report. They focus briefly on summarising the data from only a fraction of the specimens found, and are rarely very detailed in the shape typology or the fabric description (with some exceptions). The earliest one to be published was of the site of Korakou in 1975 by J. Rutter. Since then more than twenty-five sites have been reported with varying degrees of analysis of the data from a simple and brief mention¹² to a full publication of the ware (Hallager, Hallager 2000; 2003; Kilian 2007). It can often be noticed though that some information is missing, either on the fabric analysis, the detailed find context or illustrations. Moreover, in the case of some important sites (such as Teichos Dymaion, and Mycenae), this preliminary study of the material has not yet been carried out or published.

Studies related to a general historical point of view are linked to some other problem of the period concerned. They are based on a more general approach as their main concern is not necessarily HBW in itself but how it might form part of another area of research. For example, this is the case for the general accounts of the “European artefacts” found in the Aegean presented by A. Harding (1984) and I. Bouzek (1985), the study of the various

¹² This is often due to the fact that the excavation of the site is incomplete.

handmade wares from Cyprus, by D. Pilides in 1994, the BA European-Mediterranean comparative chronology study published by R. Jung (2006) or the work of S. Strack (2007) on the handmade pottery from the EIA period.

Many studies are related to a more theoretical point of view. They mainly focus on matters such as the origin of HBW (Bankoff, Winter 1984; Bloedow 1985; Jones 1986c; French 1989), the possible link with the collapse of the Mycenaean civilisation: cause (Kilian 1978; 1985a; Deger-Jalkotzy 1983) or consequence (Small 1990), or the relationships with other areas of the Mediterranean, especially Italy (Hallager 1985; Cline 1994; Betttelli 2002) or the Near East (Guzowska, Yasur-Landau 2005).

ii. Aims and objectives of the present study

From the above account of existing literature, it can be said that the many studies relating to the subject of HBW carried on over the years have been relying on fragmented preliminary studies and incomplete or out-dated information on HBW.

There is in fact only a single paper (Rutter 1990) which gives preliminary advice on the need to undertake a detailed study of the material itself and from different directions to incorporate both the intrinsic and extrinsic aspects of the ware, in order to consider the problem of its identification and definition, as discussed below.

That is why my first aim was to undertake the preliminary study and to establish a basic framework onto which further analyses and theories could be built. This included two issues:

- _ an assessment of whether previous studies on HBW could form a basis for further research or whether some more basic work needed to be undertaken before moving on.
- _ an insight into methodological issues related to the study of HBW.

My second aim related to the study and analysis of HBW material from Mycenae which is still unpublished but which had the potential to provide important new information to change or reinforce the present overall picture, as it is a relatively large quantity of material.

My final aim was to develop further the analysis of the possible social implication of the HBW phenomenon and to try to identify the occupation of the makers of HBW.

ii.i Problems of identification and definition of HBW

The first striking element to be noticed when starting to study HBW is the confusion in its identification, from as early as the first specimens were found in the 1920s up to very

recently. Indeed, the first specimens found at Korakou by Blegen (1921) were included into Furumark's typological classification of the Mycenaean pottery (Furumark 1941).

It was only in the 1960s when more material from Mycenae was excavated that HBW was identified, by French, as a separate entity from the Mycenaean ware (French 1969; French, Rutter 1977). Not long after this, it was attributed a foreign origin (Popham, Sackett 1968: 18; Popham, Milburn 1971: 338; Rutter¹³ 1974; 1975).

However, it can be argued that Mycenaean coarse ware is made of a darker shade of fired clay than the fine ware and is sometimes decorated with incisions and applied decorations instead of paint, in a similar manner to HBW, but this Mycenaean Coarse ware is mostly wheelmade¹⁴. Moreover, the general quality of the Mycenaean pottery in the Post-palatial period is seen as inferior to the previous period: the clay is not fired so hard, the quality of painting uneven and the poorer care in draughtsmanship. All this led some scholars to question the foreign origin of HBW and to prefer hypotheses of Mycenaean origin, as discussed in: 5.1.

Even though it still appears in publications that this ware is easy to identify and recognise in the Mycenaean repertoire¹⁵, in several reports on excavations where HBW has been found, it is mentioned that it can be quite difficult sometimes to distinguish HBW pots from contemporary Mycenaean or previous wares. Many mistakes have been made and many questions remain (1.2). Excavators have sometimes difficulty in distinguishing a HBW specimen from Mycenaean levels where EH, MH or even PG handmade pottery is also present. Indeed, even in the archives of Mycenae 1960's excavations, the HBW specimens are divided into two groups: “certainly HBW” and “possible HBW” (4.1).

¹³ The first date corresponds to his PhD dissertation for which an extract was published in 1975. This was the first publication of a detailed analysis of a group of HBW specimens found at Korakou.

¹⁴ It is sometimes also coil-made.

¹⁵ For example: in Catling 1981 (“Barbarian ware stands apart in shape, fabric, and ornament from all other classes of prehistoric pottery found at the Menelaion”, p. 74) or in Strack 2007 (p. 28).

One aspect of this problem is in fact also linked to the problem of definition of HBW. It was already pointed out by Rutter (1979; 1990) that some of the material attributed to the HBW corpus could represent another phenomenon related to the growing tradition of handmade pottery which developed in the Post-Mycenaean period.

Indeed, the HBW corpus found in LH IIIC levels from at least four sites (Corinth, Kalapodi, Asine and Mitrou) has been interpreted as representing precursors to the development in the EIA of handmade pottery in Aegean sites, where it becomes relatively common in the PG period. This aspect of the local development of handmade pottery in the EIA has recently been studied by Strack (2007).

There is now a relatively firm consensus on the distinction between what I have labelled in the present work ‘typical HBW’¹⁶ and the handmade pottery from these four sites which I call in this thesis: ‘EIA-related handmade pottery’. However, as highlighted throughout this work, there are several points which bring forward the problem of how distinct these two groups are (like the problem of co-existence of both wares within the same site), as discussed in: *1.1.3*.

It is still too early to discuss this problem much further, as not enough information is available or published for the very end of the LH IIIC period in respect of these two groups. That is why it is not part of the main objectives of the present study.

There is another group of pottery which was first identified as HBW and labelled “Impasto ware”, in reference to the local handmade pottery produced in the Central Mediterranean during the LBA. It comes from the Cretan site of Kommos. However this pottery is now seen as different again from the typical HBW, as it is in fact imported from Sardinia as shown by clay analysis (*1.1.3*), whereas the typical HBW is locally made, as discussed in: *3.3*.

¹⁶ Four sites which are the first ones where HBW was identified are defined here as the core of the HBW phenomenon in the Aegean: they represent what could be called the typical HBW. They form a reference group upon which to compare the other sites. They include: Korakou, Mycenae, Tiryns and Menelaion.

We are now faced with three different groups of pottery, two of which have recently been studied in detail: the ‘EIA-related handmade pottery’ (in: Strack 2007) and the Sardinian pottery (in: Rutter 2006), and one, the typical HBW, for which a clear analysis of its features was still lacking. This is another reason for establishing a clear methodology for analysis of HBW in order to determine all aspects of this ware.

In addition, more and more material is being found and published from more varied locations¹⁷, thus creating the problem of determining whether those sites should or should not be included in the Mycenaean HBW phenomenon.

Aside from the two aspects mentioned above (along with the sites involved), the problem of diversity of the typical HBW is still present in the remaining sites. Many variations are represented not only between sites but also within sites and because of a lack of a systematic study of the whole corpus, the exact meaning of this has been unclear.

ii.ii The methodology reconsidered

Despite so many previous studies, no single methodology was established in the analysis of the HBW corpus. That is why the development of a uniform methodology for study of this handmade pottery has been a major aspect of this study.

This might partially be due to the fact that specialists of the Mycenaean LBA are more familiar with wheelmade and standardised pottery. It might also be due to the fact that HBW, being of a crude and somewhat unpleasant-looking aspect, didn't obtain the detailed attention it needs.

As already mentioned, previous studies of HBW started by treating the subject as one aspect of a wider problem rather than studying the material in detail and for itself. My

¹⁷ Both within the Mycenaean zone of influence, like Thessaly, as well as outside the Mycenaean zone of influence: in Cyprus and the Near East and to some extent at Troy (*I.I*).

method of research is the reverse of this: I have started from a detailed¹⁸ and multi-dimensional analysis of the material.

The prime objective of this study is the establishment of a prototype of a study of HBW in particular. In the first phase of defining a pottery group which is characterised by diversity, finding a way to classify it under several aspects is the first step towards understanding it. This classification includes, amongst other aspects, the shapes and the technical features which define HBW.

- **Typology of shapes**

The first intrinsic aspect which needs to be addressed is related to the typology of shapes of the HBW corpus, discussed in detail in: *Chapter 2*. To begin with, it should be noted that negative views have been expressed concerning the need for a detailed typological study of HBW. Indeed, it has even been claimed that due to the household mode of production and/or to the generic nature of the ware, a detailed typology would be irrelevant (Guzowska, Yasur-Landau 2005: 472; Strack 2007: 92).

However now that a large quantity of material has been published, it seems that it is a necessity to establish a methodology of classification by shape (as presented in: 2.1), since no such process has been undertaken before¹⁹, leading scholars publishing HBW in various sites to use different names for the same shapes.

The HBW typology presented (in: 2.2) is a first step in the definition of HBW, since it provides a base for comparing the corpora of material from the different sites in order to determine how similar or different these are. It also helps to provide an overall view of the

¹⁸ The importance of the attention to details: “In art as in science there is no delight without the detail, and it is on the details that I have tried to fix the reader’s attention. Let me repeat that unless these are thoroughly understood and remembered, all ‘general ideas’ (so easily acquired, so profitably resold) must necessarily remain but worn passports allowing their bearers short cuts from one area of ignorance to another” (V. Nabokov, in his translation of *Eugene Onegin*, originally written in Russian by Pushkin).

¹⁹ Rutter (1990) was the first to start a preliminary list of characteristic HBW shapes.

range of shapes in terms of identifying the function of HBW vessels individually and as a group (2.2.3).

In addition, it facilitates further research on comparative typological studies such as the question of the reciprocal influence with Mycenaean ware (2.3.1) or the degree of similarity with HBW found outside the Mycenaean area (2.3.2).

Finally, the problem of the origin of HBW makers needs to be addressed here, since the origin of HBW has always been linked with comparative typological studies. As discussed in: 2.4, many such studies have been undertaken and many theories born from them but, as yet, there is still no clear scholarly consensus on the subject. This relates principally to the fact that the thorough preliminary analysis and its results (the definition and identification of HBW) have not been done, consequently the basis for comparison is unsystematic and the various theories are related to different data sets.

- **Fabric analysis**

The other intrinsic aspect, discussed in *Chapter 3*, is related to the characterisation of the fabric of HBW. Many generalities have been published in the various studies of material from individual sites (3.1) but no thorough comparative analysis of the fabric and manufacturing process involved has been undertaken, let alone the use of a systematic methodological approach.

Concerning the scientific studies of HBW, most of them have focused on finding out whether HBW is locally made or imported (3.3). Not much attention has been paid to understanding the manufacturing processes of HBW and what these might help us understand. In fact, most of the scientific studies undertaken were designed to the requirements of other specific issues unrelated to HBW.

Consequently my purpose here has been to determine a methodology of fabric study of HBW which took into account several specific research objectives (3.2). This methodology was then tested by a selected sampling process.

It wasn't possible, for the present thesis, to study material from all the sites where HBW has been reported and since one of the principal aims of this thesis was to undertake the analysis of the unpublished and unstudied HBW material from Mycenae, it was necessary to take as a comparative corpus, a site which is well established as characteristic of HBW: Korakou (analysed as part of the pilot study in: 3.4). Three other sites were included in this pilot study as part of the problem of identification and definition of HBW, as detailed in: 3.4.

ii.iii New HBW material: Mycenae

I am presenting, in *Chapter 4*, a practical application of the framework of HBW analysis, using the methodology established in *Chapters 2 and 3*, to a selected sample of unpublished and unstudied HBW material discovered in the area of the Cult Centre at Mycenae, by the Helleno-British team during the excavation sessions undertaken between 1954 and 1969. Here I would like to thank very much Dr. K.A. Wardle and Dr. E.B. French for giving me permission to study the material and for providing me with all the information needed.

I would like to emphasise the importance of such a study. First, Mycenae is the preeminent social and political palatial site of Mycenaean culture, with a continuous stratigraphy for the whole existence of HBW and especially the transition from the LH IIIB to the LH IIIC period.

Due to the quality of the excavation, the material uncovered has a precise stratigraphic context. This enabled the detailed analysis of the find context and of the chronological and quantitative evolution of the material at the site (4.2), a task unfeasible at other sites for

varying reasons: at most sites the restricted quantity of material found or its limited chronological presence (1.3) and in the case of Tiryns, the problem of stratigraphy and storage system (1.2.3).

In addition, I have had access to a great amount of information (published and unpublished: 4.1) and the opportunity to study the material at first hand, in order to present a typology of shapes (4.3) with their depositional context (4.2) and to undertake a preliminary fabric analysis, presented in: 4.4.

Another important element is the large quantity of HBW material excavated compared to the other sites where HBW was found. This site along with Tiryns, recently published (Kilian 2007), represents, at the moment, more than half of the whole corpus of HBW found and published.

ii.iv HBW makers as foreign artisans: a working hypothesis

There have been many different hypotheses for the interpretation of HBW and its makers which have been summarised, reviewed and criticised over the years (Pilides 1994; Jung 2006; Strack 2007): these hypotheses range from local Mycenaean development of the ware, to migration of a foreign population for varied reasons, whether as large-scale invasions or infiltrations by small groups.

My aim in the last chapter of this work is to present and develop a selection of specific possible hypotheses for the interpretation of the presence of HBW makers in Mycenaean sites. It raises questions which seem to have been neglected in previous studies, as they were more concerned with the whole range of theories and critiques published rather than focusing on the ones which are now worth considering in more detail.

Two foremost aspects have instigated this process: first the fact that there is a general consensus for identifying HBW makers as a foreign population, as detailed in: 5.1, and

secondly, that the invasion theory is not valid anymore, as seen earlier. This leaves us with the option of a migration of foreign people.

It was, on one hand, the detailed study of the context of HBW and, on the other hand, the possible association of HBW with the appearance of several new types of artefacts of foreign origin or inspiration (as discussed in: 5.2), that prompted the idea of taking as a working hypothesis the possibility that HBW makers might be associated with craft activities (discussed in: 5.3). This led to the discussion of the concept of travelling artisans and the possibility that this concept might correspond to the HBW phenomenon (5.4).

The analysis of this hypothesis, presented in: 5.2-4, is in fact partly based on aspects related to HBW and partly on theoretical discussions concerning how this interpretation would fit in the actual social, political, economic and historical context of the period. It should be kept in mind, though, that this is a preliminary analysis which will need further development, but provides a fresh starting point for interpretative analysis of the significance of HBW.

Chapter 1:

Corpus characterisation and contextual analysis

Even though many studies have attempted to interpret the HBW phenomenon, as seen in: *i.iii*, very few thorough analyses have been made on precise analysis of the depositional and chronological context of this ware.

In addition, with the increase in the quantity of sites (from both the Mycenaean area and from the Eastern Mediterranean) included in the debate, confusions and problems of characterisation and differentiations have arisen. That is why the first part of this chapter deals with the entire corpus of sites associated in previous publications with the HBW debate, in order to determine which are still to be discussed in the present study and which are not related to the HBW phenomenon anymore.

1.1 Corpus characterisation

Here is presented a list of all the sites traditionally involved in the study of HBW. This is an update of the previous literature review done by Pilides (1994)²⁰, since then more material has been found and/or published: including four important Aegean sites: Midea, Dimini, Thebes and Mitrou.

Most sites included in the HBW debate are situated within the Mycenaean core and periphery. However, some are located eastward, outside of the Mycenaean zone of direct influence: in Cyprus and Near East. These two regions, along with the foreign handmade pottery found in Troy VIIb, are included in this chapter as they have been mentioned as being part of the HBW phenomenon.

The following data has been organised according to the quantity of specimens found/inventoried and published on each site in order to give an idea of the variation in the amount and quality of information available. References are only made to the most important excavation reports where HBW is mentioned, along with the main points and problems particular to each site.

1.1.1 Mycenaean sites included in HBW debate [Figure 1.1]

The quantitative classification used here is only indicative as it might not reflect the actual reality, either due to the fact that some sites were excavated before HBW was first identified (Teichos Dymaion), or that HBW can be difficult to distinguish from earlier or later handmade wares (Aigeira), or that it can be secondary when publishing a final

²⁰ I, however, deliberately excluded the sites of Iria and Medeon, since the material previously identified as HBW isn't, as discussed by Pilides (1994: 17) for the former site and by Deger-Jalkotzy (2009: 91-92) for the latter. The Kerameikos was also mentioned by Pilides (1994:23-24) but only in reference to Reber's (1991) theory, however, since the material is outside the lifespan of HBW, it is not part of the present analysis.

excavation report. However many recent publications of sites have included the corpus of HBW found (Lefkandi, Tiryns, Menelaion).

1.1.1.1 More than 100 specimens

It is during the excavations conducted by Taylour in the Citadel House Area at **Mycenae**²¹, in the Argolid, that HBW was recognised for the first time as a specific kind of ware belonging to the LBA period and not to earlier periods as it has mistakenly been assigned before. It was first identified by French during the excavation season of 1964 (French, Rutter 1977: 111). During the succeeding years more HBW was found. However, as yet, no study has been undertaken in order to publish the material. Only four specimens have been published and illustrated in: French 1989 and WBM 16/17; others are briefly mentioned in the context information in: WBM 10 and 13. Even though there isn't any indication of the approximate amount of sherds found, it has been mentioned that it was found in considerable quantity (Pilides 1994: 11). As can be seen in my study of Mycenae HBW presented later on (4.2.2), there had been indeed a very large quantity excavated.

It is in the palatial site of **Tiryns**²², in Argolid, that the largest quantity of HBW so far published has been reported. The final report of the material excavated in the Lower Citadel area has recently been published (Kilian 2007, edited by Mühlenbruch) and is said to give an account of all HBW²³ found (484 specimens), with illustrations, focusing particularly on the shape typology and its comparison with overseas pottery, especially the Italian Impasto ware but also north-west Greek handmade pottery of local tradition (Kilian 2007: 54-55). Other specimens previously published under this class of pottery have been excluded and new

²¹ Excavation: 1959-1969. Material studied by the author in 2010.

²² Excavation: 1976-1983; material first called: "Northwest Greek Ware", then: "hgk" for handgemachte geglättete Keramik

²³ It seems however that only the specimens with special features have been included as no simple body sherds and only very few undecorated fragments are listed.

specimens have been added, like spindle whorls and statuettes (5.2.2). It should be mentioned that this account was prepared by Kilian in the 1980s and was published, after his death, without any updating of the more recent information and publications neither on the subject of HBW nor on the revision of the Tiryns chronology (1.2.3). In addition, very little data concerning the fabric or the find context is included. Although it is not discussed in the final publication, the presence of wheelmade Grey ware or “Pseudo-Minyan ware”²⁴ was also noted (Kilian 1988); ware often associated with HBW.

The excavation of the site of **Khania**²⁵, on the north-west coast of Crete, has been published for the periods LM IIIB2 and IIIC (Hallager, Hallager 2000; 2003), with a detailed description of the HBW found in those contexts. It has, however, been mentioned (Hallager 1985) that HBW was also found in LM IIIB1 levels (1.2.5). The excavators, who associate the ware with the presence of an Italian population on the site, have given Italian shape names to these vessels with bibliographic references of comparative Italian Impasto ware examples. 121 specimens (most of which are fragmentary) are published²⁶. In addition, specimens of Grey ware (locally made as determined by scientific analysis) have been identified as related to HBW (being found in the same depositional context) and belonging to the same Italian population²⁷ (Hallager, Hallager 2000:166; 2003: 254-256).

²⁴ The interpretation of the presence of this ware in the LH IIIB-IIIC contexts is still open to debate: as either reminiscent of the local tradition (Kilian) or as linked to the presence of Italian population (Belardelli 1999; Belardelli, Bettelli 1999; 2005; Jung 2006: 47-50). The presence of Grey ware in Greece is well attested until the LH I period (Pavuk 2007), but opinions diverge on whether it continues to be present in very small quantity until the LH IIIB –C periods or if it stops and then appears again in those later periods as a result of the presence of population from the Italian peninsula. Indeed, Grey ware forms part of the Italian corpus during the end of the 14th century, having been introduced by Mycenaeans (Vagnetti 1999a: 71; 3.3.2.2).

²⁵ Excavation: 1970-1987, 2001

²⁶ In addition, unpublished HBW is said to have been found in "other plots close to the plateia excavated by the Ephoreia" (Hallager, Hallager 2003: 254).

²⁷ However objections have been brought forward concerning the real resemblance between carinated shapes from Khaniote Grey ware and Italian Impasto ware (Girella 2007). In addition, there are two types of shapes which are not produced in the Italian Impasto ware: the kylix and the spouted cup which are of Mycenaean/Minoan types.

1.1.1.2 Between 10 and 100 specimens

HBW has been found in the settlement of **Menelaion**²⁸ near Sparta, in Laconia, and assigned the name “Barbarian Ware” in relation to the ware that appeared in Troy VIIb. Catling (1981) has published a substantial study of thirty-four HBW vessels found on three out of the five areas excavated. Even though it was mentioned that an additional eighty-six HBW fragments were found but not included in this preliminary study, the final publication of the site (Catling 2009: 380-383) only reports a total of fifty-two HBW specimens catalogued (mainly rim fragments), including the ones previously published. This final study only gives a brief description of the fabric and shapes.

The HBW found on the hilltop site of **Aigeira**²⁹, in Achaea, was first studied by Deger-Jalkotzy (1977). Fourteen fragments were recorded but scholars objections were made concerning several of these which do in fact belong to the MH or EH periods (Rutter 1990: 43). These objections have been discussed and agreed by Deger-Jalkotzy (2003a). Some more vessels have been mentioned in other papers (Deger-Jalkotzy 1983: 168-9; Deger-Jalkotzy, Alram-Stern 1985: 410, fig. 13). A recent paper (Deger-Jalkotzy 2003a) presents twenty-one specimens either previously illustrated or newly attested. This brings to thirty-four the number of HBW published from the site³⁰. Another element very particular to this site is the appearance of HBW in levels predating the Mycenaean first appearance on the site (1.2.4). A study of HBW from the site is under way, by Deger-Jalkotzy; consequently the amount of information available at the moment is limited.

²⁸ Excavation: 1973-77, 1980, 1985

²⁹ Excavation: 1972-1988

³⁰ More than 100 fragments are said to have been collected from the excavations (Deger-Jalkotzy 1977).

A few HBW from the site of **Korakou**³¹, near Corinth, were first published by Blegen (1921) but the specimens were included in the Mycenaean typology³². It was then re-studied in detail by Rutter (1974; 1975), including seventeen specimens³³ with a description of each specimen and the creation of fabric groupings (3.1.4). These groups were compared with the two wares from Troy (1.1.2.3). This formed the foremost detailed study of the HBW.

The Mycenaean settlement of the Kadmeia hill, at **Thebes**³⁴, in Boeotia, is mainly known for the important amount of Linear B tablets found in the LH IIIB period. The final publication of the archaeological context has revealed the presence of nine or ten HBW specimens (Andrikou et al. 2006: 53-54) in the excavation of the Odos Pelopidou (identified as site 6). The study of the material was aimed at analysing the context of the Linear B tablets archive found in the eight trenches excavated but none of the HBW specimens are linked to the destruction of the tablets at the end of the LHIIIB2 period. Additional areas excavated of the Kadmeia hill have provided other Mycenaean deposits with HBW (Andrikou et al. 2006: 53, note 10).

HBW has been discovered on the Mycenaean settlement of **Dimini**³⁵, situated in Thessaly and identified as the Iolkos of Homer by Adrimi-Sismani (2000). In preliminary publications, eighteen specimens of handmade pottery are said to differ both in shapes and fabric from the local handmade pottery tradition (Adrimi-Sismani 2006a; 2006b: 471). The amount of information available is still limited. This is the first site where HBW has been found located as far north as Thessaly. Grey ware specimens, said to be related to the one

³¹ Excavation: 1915-1916. Material studied by the author in 2008.

³² A Furumark shape had been assigned to the three complete specimens found: FS2:1, 3:1, FS 5:1.

³³ Sixteen specimens are published but two fragments said to belong to the same vessel are in fact of two different shapes.

³⁴ Excavation : 1993-1995

³⁵ Excavation: 1977-ongoing

found in the Italian peninsula at the time (Jung 2006: 48-50), have also been reported to be found in association with HBW.

On the site of **Asine**³⁶, in the Argolid, the situation identified is unusual: two groups of handmade pottery have been differentiated (*1.1.3*) on chronological ground (Frizell 1986: 82-83). The first group is assimilated to the HBW of the LH IIIB-IIIC periods found elsewhere. It however only includes four specimens. The second group comes from the LH IIIC Late or Submycenaean period and is identified as "standard type of coarse ware in the PG period" of which fifty-nine specimens are mentioned (Frizell 1986: 83). However the excavator admits the difficulty in differentiating the HBW from the EH, MH or PG wares: "Often only the context can confirm their chronological position" (Frizell 1986: 83).

It is mentioned in the final publication of the site of **Kalapodi**³⁷, in East Locris, that several types of handmade pottery were identified: included in the publication's typology in both 'Cooking ware' and 'Domestic ware' which are again divided into sub-categories: burnished/unburnished, light/dark-coloured (Jacob-Felsch 1996). Only a small proportion of this group of handmade pottery has actually been included in the HBW debate³⁸: Fourteen specimens of this type are listed in the catalogue³⁹ for the periods LH IIIC to Submycenaean (Jacob-Felsch 1996: 75). However it was first noted by Rutter (1990: 33) and then by Pilides (1994: 19) and Jacob-Felsch (1996) that these specimens do not belong to the HBW phenomenon (*1.1.3.1*).

³⁶ Excavation: 1970-1974

³⁷ Excavation: 1978-1982

³⁸ According to its fabric features: dark fabric and burnished

³⁹ This doesn't represent the entire corpus excavated, it is only a selection.

The site of **Kommos**⁴⁰, situated on the southern coast of Crete, has been associated with the HBW debate. This pottery was first studied in detail by Watrous (1989; 1992): description of the shapes and fabric and comparison with Italian Impasto ware vessels from various sites. These vessels have been identified first as “imported Italian ware”, linking it with Italy and Central Mediterranean ceramic. It was also associated with another type of pottery interpreted as foreign: Grey Ware. However, it has recently been mentioned that this ware is different from the Grey ware found at other sites during the same period (including Khania) and is said to be definitely of local origin on the site (Shaw and Shaw 2006: 678-680). Scientific analysis of part of the HBW corpus has revealed that all the specimens analysed were imported from Sardinia (1.1.3.2). The HBW from Kommos is now called “Sardinian pottery”. It was recently re-studied by Rutter (2006) who differentiated this corpus from the other sites with HBW, including Khania (1.1.3.2).

1.1.1.3 Less than 10 specimens

Two HBW found on the settlement of Xeropolis at **Lefkandi**⁴¹, in Euboea, were first mentioned in the preliminary reports of the excavation of the LH IIIC period (Popham, Sackett 1968: 18, fig. 34; Popham, Milburn 1971: 338, fig. 3.7). In the final publication of the LH IIIC levels, it is mentioned that there is indeed a small amount of “Alien Handmade vessels” on the site. However, it has been noted that all the specimens grouped into this category might not belong to the same phenomenon (1.1.3.3) because of the difference in features and chronological gaps (Evely et al. 2006: 215-218). There are eight vessels inventoried and some more specimens are mentioned but not inventoried. In addition, it was mentioned to me by Wardle that no HBW was found in the LH IIIB levels, which he will be publishing.

⁴⁰ Excavation: 1967-2001

⁴¹ Excavation: 1964-1969. Material studied by the author in 2008.

Two specimens from the **Athenian Agora**⁴², in Attica, reported as “non-Mycenaean ware” and having “... closer ties with Middle Helladic” (Immerwahr 1971: 119) are handmade and burnished. One of them⁴³ (collared jar) has been compared by Rutter to a HBW specimen from Korakou (3.4.3).

Rutter (1979) has published a study of the Mycenaean material from the Sanctuary of Demeter and Kore in **Corinth**⁴⁴. He reported eight specimens of HBW which he thought to be of a different type than the one from Korakou and included it in the Cooking Ware section with other wheelmade specimens. These specimens have been included in the tradition of handmade pottery of the EIA period (1.1.3.1).

In preliminary reports of the excavations of the south-west part of the Acropolis at **Midea**⁴⁵, in the Argolid, undertaken by Demakopoulou (et al. 2003: 10, 14), are mentioned the presence of three fragments which are identified as HBW (two of which belonging to the same vessel). No further details are yet published.

The site of **Mitrou**⁴⁶, a small tidal islet in East Locris, has recently also been included in the HBW debate. It has been suggested that two types of handmade pottery groups can be identified in the LH IIIC levels of the site: HBW and handmade pottery related to the EIA (1.1.3.1). Three specimens have been identified as HBW by Rutter (Van de Moortel, Zachou 2003-2004; Rutter 2007). This site is still under excavation and little information is available.

⁴² Material studied by the author in 2008.

⁴³ The other one is a miniature askos (“black-burnished”). Handmade miniature vessels do appear in the Mycenaean repertoire (Wardle 1969: 277-278).

⁴⁴ Excavation: 1965-1974. Material studied by the author in 2008.

⁴⁵ Excavation: 1983-ongoing. More HBW specimens continue to be found (AR 2010: 35).

⁴⁶ Excavation: 2004-2008

Five sites for which the excavation has been fully or partially published only report the presence of a single HBW specimen:

_ In the final excavation report of the site of **Nichoria**, in Messenia, one piece of HBW, is mentioned: a carinated vessel (McDonald, Wilkie 1992: 512). However, there is no illustration of the fragment and whether it is actually related to HBW or it is, in fact, a prototype of Mycenaean carinated cups is a problem that needs to be taken into consideration.

_ According to Rutter (1975: 29), a specimen of HBW was found in a LH IIIC Early/Middle Mycenaean funerary context at **Perati**, in Attica (Iakovides 1969: 15, no. 357). The illustration (Iakovides 1969: pl. 45c) shows a small jug and whether it can with certainty be classified as HBW is uncertain.

_ On the Cretan site of **Kastelli Pediada**, a single fragment of "non-Cretan origin", as mentioned by Rethemiotakis (1997: 313), was found in a LM IIIC level. This specimen was included in the debate on HBW in the publication of the site of Khandia (Hallager, Hallager 2000: 166, note 310). However, it can be seen on the illustration (Rethemiotakis 1997: 313, fig. 15c) that it is a very unusual specimen compared to the HBW corpus and it will need to be verified whether it belongs to this ware.

_ The cemetery of **Pellana**, north of Sparta, in Laconia, has been surveyed by Demakopoulou who reports the presence of "the so-called 'Barbarian' pottery" (Demakopoulou 1982: 117, 176). However, since the presence of HBW in funerary context is very uncertain, a question mark has to be noted for this site.

_ The site of **Emporio**, on the Aegean island of **Chios**, has first been included in the debate on HBW by Hood (1986: 178). Several specimens were identified as HBW but, in fact, only a single one, found in a LH IIIC context, could possibly belong to HBW, according to Pilides (1994: 30-31).

1.1.1.4 Lack of data

Two sites where handmade burnished pottery has been reported in a LBA period are still lacking a preliminary study of the material: Teichos Dymaion and Delphi. The excavations are old and the reports do not give a precise idea of the stratigraphical context and description of the handmade pottery. Indeed, since HBW was not recognised as a distinctive feature of the LHIIB-IIIC periods, the material from those sites has either been assigned to earlier or later periods.

A large quantity of specimens⁴⁷ from the excavations of a Mycenaean settlement, in the north-east part of the Sanctuary of Apollo in **Delphi**⁴⁸, in Phocis, has been reported as belonging to the HBW type (Rutter 1975: 29; Müller 1992: 458). These specimens do not have a precise context: Late Mycenaean. In the preliminary excavation report, Lerat mentions five different types of fabrics in the LH IIIC period, of which one could concern this ware (Lerat 1938: 214-17). This has been confirmed more recently (Müller 1992: 458). However, no detail is given on the amount and shapes of these specimens. It consequently remains unclear whether the material should be included in the handmade pottery related to the EIA (*1.1.3.1*) or if, at least part of it, might belong to HBW, as might be the case in other sites (Asine, Mitrou). It should be added that, in the study of the pottery from the Geometric

⁴⁷ " ... abondance de la céramique grossière non tournée à surface lissée..." (Müller 1992: 458)

⁴⁸ Excavation: end 19th century AD

period, Lerat refers again to this pottery identified as HBW which he differentiates from the traditional handmade pottery of the EIA period (Lerat 1938: 201).

The site of **Teichos Dymaion**⁴⁹ at Araxos, in Achaea, is situated on a promontory surrounded by a Cyclopean Wall. The excavation was conducted before HBW was recognised and mentioned for the first time so it is difficult to interpret the preliminary reports. The presence of LH IIIB and IIIC habitations is attested as well as handmade pottery which is interpreted as belonging to earlier periods (Mastrokostas 1965a; 1965b). Deger-Jalkotzy (1977: 31) and Pilides (1994: 21) argued that some specimens shown on the photographs, of five plates of the preliminary reports, could be HBW from the LH IIIC period. They are assigned to EH I by Mastrokostas. The material still remains unpublished⁵⁰. A specimen first noted by Kilian (et al. 1982a: 90, n. 155) and examined by Bettelli (2002: 122) is associated to a type present in Italy: it is an elevated handle with blunt horn-like protrusions and a central knob ("ansa a corna di lumaca").

Seven other sites without detailed publications of the material found have been mentioned in previous publications:

– **Knossos, Tylissos and Ayia Pelagia**: HBW from these three Cretan sites has been mentioned in several publications (Hallager 1985: 303; Hallager, Hallager 2000: 166; 2003: 254). None of these specimens have yet been published. In most sites only a single specimen is reported, except for the site of Knossos where a carinated vessel and several fragments of decorated handles have been mentioned (Bettelli 2002: 122-124). However, no illustration or details are published.

⁴⁹ Excavation: 1962-1965

⁵⁰ It has been mentioned that some of the material from the site is under study by Kolonas (Deger-Jalkotzy 2003a: 456).

_ **Kandia-Kastro**, in Argolid: this site was mentioned in the HBW survey undertaken by Pilides (1994: 17), but without further details.

_ **Mavrovouni**, in Laconia: in a general survey of settlements from the region, a single worn fragment of body sherd with plastic decoration has been identified as HBW (Banou 1996: fig. 72.2).

_ **Palia/Kastro**, in Thessaly: HBW has been identified first by Kilian (Adrimi-Sismani 2006b: 476). Only general preliminary reports of the excavation have been published, consequently no further detail is available.

_ **Volos**, in Thessaly: a single specimen compared to HBW has been published by Jung (2006: taf. 17.7). Whether it is related to HBW is doubtful since the shape and the decoration style is unlike any other HBW specimens published so far.

1.1.2 HBW outside the Mycenaean area?

I would like to include here a brief account of the areas and sites, located in Eastern Mediterranean (Cyprus, Near East and Troy), where a certain amount of handmade and burnished pottery has been interpreted as being related to HBW found in the Mycenaean area. Even though there are traditions of handmade pottery in these areas, the excavators of several sites have identified groups of handmade pottery which first appeared on the sites during the LBA, and which differs from the local ware.

For the present study, the correlation with the Mycenaean chronology is based on the excavation reports of these sites where the correlations are made according to the Mycenaean pottery found at the different levels⁵¹.

⁵¹ A project of chronological synchronisation between the Near East and Greece is undertaken by Mühlenbruch (n.d.).

1.1.2.1 Cyprus

The presence, on the island of Cyprus, of the same type of HBW as found in Greece was first pointed out by Karageorghis (1986b) and then re-assessed by Pilides (1991; 1994) due to a problem of differentiation between local and foreign handmade pottery.

The detailed study of the Cypriot HBW material has already been presented in detail by Pilides (1994). This type of pottery is said to be different from the local traditional handmade pottery found on the island and to be similar to Aegean HBW. It first appears at the end of the LCIIC, corresponding to the LH IIIC Middle or Late (Pilides 1994: 107).

Thirty specimens were recorded, mostly found on the coastal site of Kition (twenty-one specimens) but also on four other sites along the southern side of the island: four at Enkomi, three at Hala Sultan Tekke and a single one at Sinda and Maa-Paleokastro [Figure 1.2].

It is mentioned that the pottery arrives at the same time as Mycenaean pottery and is interpreted as the arrival of both Mycenaean people and HBW makers (Pilides 1994: 107). Provenance studies have put forward the possibility that a few specimens might have been imported (Pilides 1994: 73-74), however, most were locally made (3.3.2.1). It should be added that the Grey ware specimens found in Cyprus are of Anatolian origin (Pavuk 2008) and are consequently not related to the ones found in Greece.

1.1.2.2 Near East

Handmade burnished pottery of a type distinct from that of the local handmade pottery found in several sites of the Near East has been identified as similar to the Aegean HBW (Pilides 1994: 40-42; Badre 1998; 2003; 2006).

It has been reported from three sites in the north coast: **Ugarit** (Lagarce 1974: 21; Badre 1998: 77; Guzowska, Yasur-Landau 2005: 474), **Ras Ibn Hani** (Badre 1998: 77; 2003:

40-42; Caubet 1992: 127), **Ras al-Bassit** (Badre 2003: 95) and five sites in the south coast: **Tell Qasile** (Mazar 1985; Pilides 1994: 40-42), **Tell Kazel** (Badre 1998; 2003), **Beirut** (Badre 1998: 76-77), **Tell Tweini** (Bretschneider et al. 2008), **Tell Arqa** (Charaf 2008: 121-166) [Figure 1.2].

Whether the origin of these specimens and the phenomenon they are associated with are related to the Aegean HBW is still open to question and this has been one of the purposes of a fabric analysis of HBW material from the site of Tell Kazel (Syria), undertaken at the Fitch Laboratory in Athens (Badre et al. 2005; Boileau et al. 2010). The study discusses the origin of the clay use, the technical features of the material and its relation to the Aegean HBW (3.3.2.1).

As concluded in a recent paper (Boileau et al. 2010: 1678-1679), the pottery found at Ras Ibn Hani, Ugarit and Ras al Bassit has been differentiated from HBW. This seems also to be the case for the specimen found at Tell Tweini. The corpus from Tell Qasile has a quite different set of shapes and the specimen from Beirut is chronologically unrelated.

Six recently excavated specimens identified as HBW have been found on the site of Tell Arqa. They are said to possibly have been produced at Tell Kazel but include different shape types⁵². However, since no detailed information is yet published; only the site of Tell Kazel is discussed here.

The ceramic identified as HBW, by the excavator Badre, was discovered in the transitional LB II/IA I phases (Badre 1998; Capet 2003). The identification was made quite straight forwardly by the fact that the first specimen found was a cup with cordon decoration, very similar to the Lefkandi "Italian cup" (2.3.2). It is said to come from a LB IIIA/IIIB context, corresponding to the Mycenaean LH IIIC period (Badre 1998: 78).

⁵² As mentioned in the abstract of a recent unpublished conference: Karageorghis, Kouka 2010.

Additional material was published in more recent excavation reports (Badre, Gubel 1999-2000; Capet 2003) and in specific studies of this material (Badre 2003; 2006). Four complete vessels, one full profile and twelve sherds are reported (Badre 2003: 83). It can be noted that there are several unusual shapes, which do not match any specimens from the Aegean (2.3.2). They were found in two areas of the site (Temple complex and Area II). The detail of the find context is published in: Badre 2003.

This ware was always found associated with local pottery. It is also mentioned that strong links existed between Cyprus and Tell Kazel where imported Cypriot pottery was found. This was also the case with Mycenaean pottery, which, however, ceases to be imported at the time when Tell Kazel HBW appears and is instead locally made (Badre et al. 2005: 36).

It was also noted that two types of Grey ware (one from Anatolia and the other one from unknown origin) appeared on the site at the same time as the Levantine HBW (Badre et al. 2005: 36). Whether the latter is related to the specimens found in Greece is still unknown.

Lastly, it should be highlighted that one HBW vessel is reported from the IA I level (Badre 2003: 94). The shape has been compared to specimens from Kerameikos and Delphi, although it is also found in Aegean HBW: collared jar with horizontal handles (2.3.2). This aspect brings us to the problem of HBW versus EIA-related handmade pottery (1.1.3.1), since this specimen is classified with the HBW corpus from Tell Kazel but found in an EIA context and compared with EIA handmade pottery.

1.1.2.3 Troy

Handmade burnished pottery of foreign tradition, found at Troy [Figure 1.2] was the first group of pottery to be compared to the Aegean HBW. Typological and technological analogies were especially underlined by French and Rutter (Rutter 1975; French, Rutter

1977; French 1989) for the HBW from Mycenae and Korakou. It was, consequently, put forward that HBW was related to the arrival of the same people that came to Troy and brought with them this handmade pottery. From the beginning, this handmade pottery was identified as locally made and not imported (Blegen et al. 1958: 144). This has been corroborated by recent scientific analyses (Guzowska et al. 2003; Pinter 2005).

Two different types of handmade wares⁵³ appear in the citadel and in the lower town in Troy VIIb phase (Blegen et al. 1958: 139-181). The traditional type of pottery present at Troy in the preceding period (Troy VI) and which continue to be used in Troy VII is wheelmade (Tan and Grey Wares), although some handmade pottery was also present (Gritty ware). The presence of Mycenaean pottery⁵⁴ is attested well before the arrival of the two foreign handmade wares and it continues during Troy VII.

Troy VIIa was destroyed violently which led the excavators to identify this event with the Greek myth of the Trojan War of Homer (Blegen et al. 1958: 143). It was during the following phases that those two types of handmade pottery appeared.

The first one has been labelled "Coarse ware" or "Barbarian ware" and it occurs for the first time in Troy VIIb1 (Blegen et al. 1958: 158-159). It is described as a handmade coarse pottery, often burnished and characterised by the presence of lugs and plastic decorations (2.4.1).

The other type is called "Buckelkeramik" or "Knobbed ware", and contrary to what was thought before⁵⁵, it is also already present in Troy VIIb1 (László 2003: 109; Aslan 2009: 145-147). This type of pottery is also handmade and burnished but is characterised by an abundance of decorations, especially knobs (2.4.1).

⁵³ They are being studied in detail by Hnila in her PhD thesis, entitled: "Troia VII-Waren und die handgemachte Keramik der frühen Eisenzeit in Südosteuropa und Nordwestanatolien".

⁵⁴ For a study of the Mycenaean, Tan and Grey wares in Troy VI and Troy VII: Mountjoy 1999b; 1999c.

⁵⁵ First appearance of this ware in Troy VIIb2 and dissociation of the two wares which were seen as representing two different phenomena (Blegen et al. 1958: 158-159).

The chronological correlation between the successive phases of Troy and the Mycenaean chronology has provoked many problems and discussions⁵⁶. One of the latest studies of the Mycenaean pottery found at Troy and its relation to the establishment of a chronological correlation between the two areas was undertaken by Mountjoy (1999c: 298, table 1). It is agreed now that Troy VIIb1 starts probably during the transition period between the Mycenaean LH IIIB2 and LHIIC Early⁵⁷.

The question of its duration is more problematic as there is no consensus. It is often mentioned that this phase lasted until the beginning of the Mycenaean LH IIIC Middle phase and then that Troy VIIb2 corresponds to the LH IIIC Middle to the middle or end of LH IIIC Late (Mountjoy 1999c: 298).

However it has been argued more recently that Troy VIIb1 is likely to have ended at the end of the LH IIIC period and that Troy VIIb2 should in fact be placed in the Post-Mycenaean period (Wardle et al. 2007).

There is also a third phase in Troy VIIb which is either said to last until the beginning of PG period (Koppenhöfer 1997; Korfmann 2000: 30-32) or to correspond to the EPG period (Wardle et al. 2007) where the presence of "Barbarian" and "Knobbed" wares is still attested, along with Grey and Tan wares (Guzowska et al. 2003: 235-236; Aslan 2009: 148-150).

Whichever chronological correlation, this clearly indicates that the two handmade wares appeared at Troy after the appearance of HBW in Greece and that they lasted for a longer period of time.

These two wares which were before seen as representing two distinctive groups of new population (Blegen et al. 1958: 144-145) are now, after more recent excavations and detailed study of the material, regarded as a single group⁵⁸ and the difference is instead linked

⁵⁶ Reviews of the various correspondences previously proposed are summed up in: Korfmann 2000 (32-33, figs. 27-28) and Guzowska et al. 2003 (230, fig. 1).

⁵⁷ Mountjoy's Transitional phase (*1.2.1*).

⁵⁸ The origin of the Trojan wares is discussed in *2.4.1*.

to its function: “Barbarian ware” being for cooking and storage and “Knobbed ware” for serving and drinking (Guzowska et al. 2003).

Previous objections regarding the relation between Aegean HBW, especially from Korakou, and the two Trojan handmade wares were related to both chronological (Bloedow 1985; Pilides 1994) and typological⁵⁹ aspects which are no longer valid.

This does not mean, however, that there is a link between the two groups as other aspects, some of which have arisen more recently, differentiate the Trojan group from the Aegean HBW. Indeed, typological differences are important (2.4.1) and the Trojan group is said to be found in abundance compared to the other wares present: between 50% and 70% of the pottery assemblage of phase VIIb2 (Aslan 2009: 147), contrary to the Aegean HBW (1.3.4). This latter aspect tends to show a different kind of phenomenon where a much larger population has migrated to Troy, compared to Greece.

1.1.3 Differentiating wares

The list formed earlier (1.1.1) refers to all of the Mycenaean sites, which have been included in the debate on HBW over the years, up until recently. However, as scholars found out more information about each group of pottery and also about the site contexts, major differentiations turning into categorisation have appeared.

Three different groups have already been formed: handmade pottery related to EIA, also called “Handmade Domestic Pottery” (Lis 2009: 156) from Kalapodi, Asine, Corinth and Mitrou, “Sardinian pottery” (Rutter 2006: 674) from Kommos and the HBW from the other sites.

⁵⁹ It was argued that “Barbarian ware” might be, in fact, of local origin and related to the local Gritty ware (Bloedow 1985). This opinion was reinforced by Mountjoy (1999c).

1.1.3.1 EIA-related handmade pottery

Concerning this group, a consensus seems to have been reached on its difference from the typical HBW. The four Mycenaean sites, where such pottery is found in LH IIIC contexts, have been excluded from the HBW phenomenon: by Rutter⁶⁰ for the material from Corinth (Rutter 1979: 391; 1990: 33) and Kalapodi (Rutter 1990: 32; Jacob-Felsch 1996), by Frizell (1986: 83) for the material from Asine and by Lis (2009: 156-159) for Mitrou.

The arguments for differentiating it from HBW have been discussed in detail recently (Strack 2007; Lis 2009) and are consequently only briefly mentioned here:

- _ At Asine, Kalapodi and Mitrou, there is a net increase in handmade pottery during the end of the LH IIIC period, which ends in the amount of handmade pottery overtaking the amount of wheelmade pottery (Lis 2009: 158, fig. 18.4). In contrast, HBW is always found in much a smaller quantity than wheelmade pottery (*1.3.4*).
- _ The late appearance of this ware: the pottery from these sites starts appearing in the latter part of the LH IIIC period, whereas the typical HBW does appear earlier (*1.3.1*).
- _ Typological differences from the typical HBW, mainly concerning the fact that it has a narrow set of specific shapes, including mainly collared jars (Lis 2009: 156, fig. 18.3) [Figure 2.2].

This pottery, which is locally made, is said to be of local origin and its appearance is said to be linked to other causes than for HBW. However, it has been postulated that the EIA handmade pottery might in fact originate from HBW (Bouzek 1985: 197; Reber 1991: 163-167) and that this ware would represent the link in-between the two.

Strack (2007: chapters III and V) has recently worked on this problem, interpreted as two distinct unrelated phenomena which, consequently, will not be treated in this work in

⁶⁰ “... a typical of the HBW phenomenon as it has been documented elsewhere” (Rutter 1990: 33).

great detail as I think that more analyses of both phenomena have to be undertaken prior to being able to compare them in a meaningful manner.

It should, however, be noted that, in two of the sites mentioned above (Asine and Mitrou), specimens of typical HBW are also reported (*1.1.1.3*). It has been postulated by Lis (2009) that this phenomenon (the presence of both wares within a single site) might also concern other sites where HBW is said to continue to appear at the end of the LH IIIC period, like at Tiryns (*A.3*) or at Lefkandi (*1.1.3.3*). However, this suggestion is based on the assumption that HBW is a short-lived phenomenon, which is a debatable aspect (*1.3.2*).

There are still, in my opinion, problems related to the differentiation between these two wares and, if the chronological gap disappears, whether they can actually be differentiated. Indeed, I have noticed several features related to this problem, which seems to complicate the picture such as the ones mentioned in: *1.1.2.2*, *2.3*, *4.3*, concerning typological and chronological aspects.

1.1.3.2 Sardinian pottery

This group of handmade pottery can be set aside mainly due to the fact that all the specimens studied are imported⁶¹, unlike the typical HBW found in the other sites, including Khania (*3.3.1*). It is also different in its typology⁶². Both aspects have been re-discussed in detail by Rutter (2006) who stresses two points: the difference with the HBW from the mainland and also from Khania.

⁶¹ The preliminary petrographical study, by Day at the Fitch Laboratory in Athens, showed a volcanic/igneous composition of the clay which points in the direction of a non Cretan origin (Watrous 1992: 163) and the chemical analysis by ASS of twenty-four specimens has determined the Sardinian origin of the samples (Watrous et al. 1998).

⁶² At Kommos, the corpus include a specific and narrow set of only three main types of shapes (wide-mouthed ovoid jars with vertical handles and round base and with or without a neck, jugs and bowls/lids) and no plastic decorations or carinated vessels.

The depositional context and distribution of this ware seems to indicate that it was related to the storage of scrap metal. Much evidence makes it clear that the HBW found at Kommos is related to trade and metalworking activities (Rutter 2006).

1.1.3.3 Handmade Burnished Ware

This group includes, theoretically, all the sites mentioned earlier which do not fit in the other two categories. However, only the sites which have been published in enough detail can be taken into consideration in the present study, including: Korakou, Tiryns, Thebes, Menelaion, Lefkandi, Aigeira, Dimini, Khania and Mycenae.

General studies of the ware tend to assume that HBW from the different sites is similar enough to belong to the same phenomenon and/or come from the same region of origin. However, there are some diverging opinions on the matter which often set a site apart from the others (like Khania for example).

The present study is consequently directed towards the analysis of whether HBW represents a single entity or if several features point toward important differences, which might reflect the existence of distinctive groups. This might imply the existence of populations of different origins and/or diverse purposes for their presence in the Mycenaean area.

The site of Khania is often associated with the Mainland HBW phenomenon. Hallager (1985: 113) mentions that there are differences between the mainland HBW and the Khaniote HBW but the few similarities observed mean that they have a common source. The term used to define the ware, in the final publications of Khania, is "HBW" (Hallager, Hallager 2000; 2003). In addition, Jung (2006) associates Tiryns, Lefkandi, Dimini and Khania HBW and links them to the Italian Impasto ware.

However, it also has been postulated that the HBW from Khania bears important differences, especially in the quality of the fabric, the techniques used and the typological differences which place it apart from the mainland HBW (Rutter 2006; French pers. comm.⁶³).

Concerning Lefkandi, it has been highlighted in the recent publication of the site, that the handmade pottery classified as "alien" does not represent the same phenomenon⁶⁴. First there are the handmade carinated cups, which are said to possibly be prototypes of wheelmade carinated cups⁶⁵ (Evely et al. 2006: 138; French: pers. comm.)

Then the so-called "Italian cup"⁶⁶ is placed apart from the other specimens as it is said to be different and possibly imported (3.3.1.2). In addition, two HBW jars⁶⁷ have been presented as a separate group, which is related to the phenomenon of EIA handmade pottery, due to their chronological context⁶⁸.

Finally there are two more handmade burnished cups and a jar mentioned that also are differentiated: one cup⁶⁹ has a similar shape to a wheelmade specimen, the other one⁷⁰ has a rather fine fabric and the jar is not burnished.

In addition, the question of the homogeneity of the HBW corpus needs to be addressed for all the sites, especially the ones recently published like Thebes and Dimini but also the ones published long ago as no detailed comparative studies of all the sites has been undertaken and published.

⁶³ French has had the opportunity to see specimens from all three sites at the Manchester laboratory.

⁶⁴ "... it is possible that more than one phenomenon is contained within this category [the coarse handmade fabric], with correspondingly different explanations for their presence" (Evely et al. 2006: 227)

⁶⁵ The problem of the origin of carinated vessels is discussed in: 2.3.1.2.

⁶⁶ 65/P107

⁶⁷ 69/P92 and 69/P17

⁶⁸ They come from phases 2b and 3 in contrast to all the other HBW specimens which are from phase 1.

⁶⁹ 69/P90

⁷⁰ 69/P91

1.2 Issues associated with chronological aspects

Prior to analysing the find contexts of HBW found in the Aegean, it is necessary to address several problems that arose in previous studies of the material. Chronological aspects that need consideration are related to the chronological synchronisation between sites, the chronological boundaries of the presence of HBW (appearance, disappearance) and stratigraphical concerns of some sites (Tiryns, Aigeira).

1.2.1 Relative and absolute chronology

It is not the task of the present study to analyse in detail the problem of the absolute chronology⁷¹ of the Aegean LBA since its determination is very difficult and still a matter of debate. In addition, I have chosen to use the relative chronology⁷² (detailed in next section), as it is the most common in publications on the subject (for both Mycenaean sites and sites from outside the Mycenaean area, which are involved in the present study⁷³) and it is more accurate for the period concerned.

The detail of recent studies on absolute chronology for the Aegean LBA is summarised in: Dickinson 2006: 20-24 and Shelmerdine 2008: 3-7, with bibliographical references. There is in fact no general consensus on this matter and revisions have to be made regularly as new findings and scientific analyses are published.

For a general chronological localisation of the period involved in the present study, it can be said that the start of the LH IIIB2 is generally placed around 1250/1225, the start of the LH IIIC around 1200/1190 and the end of the LH IIIC period around 1075/1030 or around 1050/1025, depending on whether it included the Submycenaean phase or not.

⁷¹ Based on links with the chronologies of Egypt and the Near East and on various scientific analyses, including C14 and dendrochronology.

⁷² Based on decorated pottery analysis.

⁷³ Since Mycenaean pottery found on those sites (in Cyprus and Near East) enables the correlation of the local phasing with the Mycenaean chronology (1.1.2).

However scientific analyses of material from the site of Assiros, in Macedonia, has determined a date between 1270/1250 for the end of the LH IIIB period (Wardle et al. 2007) and a date between 1100/1070 for the start of the PG period (Newton et al. 2005).

1.2.2 Synchronisation between Aegean sites

Aspects of the chronological correlations between sites for the end of LH IIIB and LH IIIC periods have first been discussed in: Rutter 1977 concerning the division of the LH IIIC into seven phases and in: Mountjoy 1986 and 1999a, concerning the division of the period into four, then five phases with the addition of the “Transitional phase LH IIIB2-IIIC Early”.

Three recent conferences, entitled: LH IIIC (Early, Middle and Late) chronology and synchronisms (Deger-Jalkotzy, Zavadil 2003; 2007; Deger-Jalkotzy, Bachle 2009), have provided a thorough discussion of the definitions of the phases in various Mycenaean sites and their correlation.

In [Figure 1.3] is presented a chronological correlation for the period LH IIIB-IIIC of the sites where HBW has been found in more than one phase, as detailed in: *Appendix A*. This table is based on publications of the sites when available, on general studies of the period (Rutter 1977; Mountjoy 1999a; 2007; Vitale 2006) and on papers which discuss the correlations between certain sites: Mycenae and Tiryns (French, Stockhammer 2009). It is only an attempt and it might have to be revised when more studies are published. This is due to four main problems, which are discussed below.

The first point concerns the problem of the transition between LH IIIB2 and LHIIIC Early: either viewed as an early stage of the LH IIIC Early period (Rutter 1977), or as an in-between phase by Mountjoy (1999a), proposal rejected by Vitale (2006) who prefers to divide this phase into LH IIIB2 Late and LH IIIC Phase I of Rutter 1977.

A detailed synchronisation of the period of the sites of **Mycenae** and **Tiryns** has recently been published (French, Stockhammer 2009). It shows that this period of transition is best identified, in those two sites, as LH IIIB2 Early (LH IIIB Middle) and LH IIIB2 Late replacing the term “Transitional LH IIIB2-IIIC”.

In six other sites, HBW has been found in this phase of transition and whether it correspond to LH IIIB2 Late or LH IIIC Early is still difficult to determine. At **Menelaion** (A.5), the term “Transitional LH IIIB2-IIIC” is still being used in the recent publication (Catling 2009: 462) and it is in this phase that HBW was found.

At **Nichoria**, the single HBW specimen (A.4) comes from a deposit assigned either to the LH IIIB2 or to Mountjoy’s Transitional phase (Vitale 2006: 189). However, it seems more likely, judging by the final publication (McDonald, Wilkie 1992: 512), that the HBW specimen was found in a LH IIIB2 deposit.

At **Korakou**, the HBW material (A.6) was found in levels first determined as Rutter’s LH IIIC phase 1 and then identified as Mountjoy’s Transitional phase (Vitale 2006: 187). The study of the HBW by Rutter (1975) makes it clear though that the material is of LH IIIC Early date.

At **Midea**, it is mentioned that the material assigned to Mountjoy’s transitional phase might in fact correspond to LH IIIB2 Late (French, Stockhammer 2009: 221) and, in particular, that the material from the destructions of the West Gate and South-West slope, in which HBW was found (A.10), dates to the end of LH IIIB2 (Demakopoulou et al. 2003: 90-91).

At **Dimini**, the last phase of occupation, after the destruction, is dated to the end of LH IIIB2 and beginning of LH IIIC (Adrimi-Sismani 2006b: 468). The destruction is assigned to the “Transitional LH IIIB2-IIIC” and the re-occupation ceased during the LH IIIC

Early period. However, the material from this re-occupation phase, in which HBW was found (A.8), is said to be identical to the preceding period.

At **Teichos Dymaion**, the main bulk of pottery found is of LH IIIB2 style, however some LH IIIC Early pottery was also found (Vitale 2006: 187-188). Since the site has not been fully published yet (*1.1.1.4*), no more detail is available.

Consequently, the determination of when exactly HBW appear on some sites is still difficult to establish and the attempt made, in [Figure 1.4], to summarise the quantitative evolution of HBW in all the sites involved is hypothetical concerning this period of transition between LH IIIB2 and LH IIIC Early. In the cases of Menelaion and Dimini, since the level where HBW was found is after the destruction, in a phase of re-occupation, it was included in the LH IIIC Early 1, in order to differentiate it from the sites where HBW comes from the destruction level (Mycenae, Tiryns, Midea).

The second problem that needs to be addressed concerns the division of the LH IIIC period into phases. Each site has its own system which needs to be correlated first with the general chronology and then between sites. These systems are presented in: *Appendix A*, with each site discussion of find context.

The third aspect is related to the end of the Mycenaean period and the problem of the existence or not of a Submycenaean phase in between the LH IIIC Late and the PG period⁷⁴. It is not the place to debate this matter but it poses the problem of the variations in labelling of the final stage of the Mycenaean period in different excavation reports and material studies. This is due to the variation in the meaning attributed to this term (Dickinson 2006:

⁷⁴ This is due to the fact that some scholars attribute this period to a regional phenomenon not applicable to the whole of the Mycenaean area. For details: Desborough 1964; Rutter 1978; Mountjoy 1988; Ruppenstein 2003.

14-15). It then makes it quite difficult sometimes to interpret the information on the presence or not of HBW in the latest stage of the Mycenaean period (1.3.3, 4.2).

Finally the chronological correlation between Crete and Greece for the period: end of the LH IIIB and LH IIIC is discussed in a recent paper (Hallager 2007). The end of the LM IIIB2 phase in Crete is suggested to be slightly later than in Greece and LM IIIC Early seems to end during the LH IIIC Middle period. The end of the LM IIIC period is said to still be difficult to determine; but in the present study, this is not very important, since HBW is not found in Crete in the later part of the LM IIIC.

1.2.3 Tiryns: Stratigraphy problems

As seen in the A.3, the stratigraphical context of many of the HBW found at Tiryns is often not precise, especially regarding the chronology but also the room or area where specimens have been found. The same HBW sherds published in different papers were sometimes given different dates. This confusion concerning the detail of the find context is in part due to the system of storage of the material. Indeed the pottery of the site is stored by type of ware instead of excavated units (French, Stockhammer 2009: 184).

Concerning the final publication of the HBW from Tiryns (Kilian 2007), the chapter related to the find context is very succinct and only mentions a very small fraction of the specimens published: many HBW are given a period range (Kilian 2007: 50-52). In addition, the publication wasn't revised using the more recent definition of the LH IIIB2-IIIC strata done by Meinhardt and Mühlenbruch (Kilian 2007: 81). Consequently many of the dates provided are questionable and this should be considered when analysing the context and especially the chronological distribution of the ware on this site.

1.2.4 Aigeira: the "Pre-Mycenaean phase"

The site of Aigeira has a particular unique phenomenon compared to the other sites concerned with the presence of HBW. In all the other sites, HBW has always been reported to be associated with Mycenaean pottery, which is always present in a much larger quantity than the HBW (1.3).

At Aigeira it is mentioned that the first specimens of HBW⁷⁵ appear in a first layer where no Mycenaean pottery is attested (A.7). This layer is situated below layer I, which is LH IIIC Early and above the bedrock. This has been interpreted as an independent stratum, which is said to represent the arrival of the makers of HBW before the installation of Mycenaeans (Deger-Jalkotzy, Alram-Stern 1985: 395). The HBW was found, however, together with pre-Mycenaean pottery and without any structures.

Critics arose concerning the actual date of some of the specimens identified as HBW (Rutter 1990: 43, note 1). However, it has recently been reconfirmed after the re-examination of the stratigraphy and the material (Alram-Stern 2003: 15; Deger-Jalkotzy 2003a: 461) that the "pre-Mycenaean level" is situated in part of the settlement and does include HBW specimens⁷⁶. It is mentioned that it is possible that the buildings present before the Mycenaeans arrived might have been destroyed by levelling prior to building the first Mycenaean houses (Deger-Jalkotzy 2003a: 441). However, we are awaiting the final publication for the detailed study and locations of the HBW on the site.

1.2.5 Crete: earlier appearance?

In previous publications of the material from Kommos, the date of first appearance of Sardinian pottery was the LM IIIA1 period (Watrous 1992: 164-168). However, in a recent volume of the publication of Kommos excavations (Shaw, Shaw 2006), the chronological

⁷⁵ So far, twelve HBW specimens have been published for this layer (Deger-Jalkotzy 2003a: 462-463).

⁷⁶ Some of the specimens previously identified as HBW have been recently given an earlier date (Deger-Jalkotzy 2003a: 461).

context of the Sardinian pottery has been reassessed and Rutter, who was in charge of the study of the pottery, affirms that no Sardinian specimen appears in an earlier context than the LM IIIB period (Rutter 2006: 674).

Concerning the site of Khania, only the final excavation reports of the LM IIIB2 and IIIC levels have been published (Hallager, Hallager 2000; 2003). It has, however, been mentioned before that HBW does appear in earlier levels, the exact chronological level of its appearance though is not clear. Hallager (1985: 361) mentioned that 14% of the total HBW from the site comes from LM IIIA/B levels whereas 78% comes from LM IIIB and IIIC levels⁷⁷. Also, it was reported more recently that a very small amount of HBW comes from a LM IIIB1 level (Hallager, Hallager 2003: 254).

However, there is no publication yet of the material from the LM IIIA/B and LM IIIB1 periods. In addition, since, as discussed later on (1.3.1 and 4.2.1), the first specimens of HBW seem to appear in the Mainland during LH IIIB Middle, there is no precise published evidence for the first appearance of HBW in Crete.

1.2.6 Synchronisation with the Central Mediterranean

Due to the fact that the relation between the Mycenaean and Central Mediterranean areas are discussed later on (5), due to the now dominant view of the possible Italian origin of the HBW makers (2.4), it is necessary to discuss briefly here the chronological correlations between the two regions.

Studies concerned with synchronisations between the Italian peninsula and the Mycenaean chronology are mainly based on the imported Mycenaean pottery found on many sites of the Central Mediterranean area. Traditionally, the South-Italian Recent Bronze Age

⁷⁷ Statistics done in 1982; since then more HBW was published, all found in LM IIIB and C.

(RBA) corresponds to the LH IIIB2 Late and LH IIIC Early and the Final Bronze Age (FBA) to the LH IIIC Middle (Peroni 1996: 384-389; Bettelli 2002: 96-98).

More recently, this widely accepted model has been challenged by Jung (2005; 2006), using other categories of artefacts to assert his theory. These artefacts include (amongst a reassessment of the chronological context of the Mycenaean pottery found in Italy) objects found in Greece, which have been identified as of Italian origin or tradition: bronze artefacts (5.2), Grey ware and HBW. His chronology divides the two Italian periods into two sub-periods (Jung 2005: plate CVI i):

- _ RBA 1: corresponding to Mycenaean LH IIIB Middle to the beginning of the LH IIIC Early;
- _ RBA 2: to LH IIIC Early to beginning of IIIC Advanced;
- _ FBA 1: to LH IIIC Advanced;
- _ FBA 2: to LH IIIC Late/Submycenaean.

My purpose here is not to discuss whether his model fits in with the overall picture; I would just like to warn against the use of HBW as evidence on matters such as chronology, until this ware is well defined in all aspects concerned, both intrinsic and extrinsic, and that it can be identified securely. But obviously above all, a consensus amongst specialists should be reached on its definition and interpretation.

1.3 Analysis and interpretation of the find context of HBW

The detailed study of the chronological and contextual aspects of each Mycenaean site is presented in: *Appendix A*. Here is a summary and analysis of the data collected, including only the sites which publications have provided enough information on the depositional context [Figure 1.4].

1.3.1 First appearance

It has already been established in early publications that the first HBW specimens appear in Mycenaean sites before the major destructions of the end of the LH IIIB2 Late period, at least at Mycenae (French 1989: 44), Tiryns (Kilian et al. 1983: 295) and Khania (Hallager 1985: 359).

In addition, in these sites, it seems that it appears already in LH IIIB Middle (Tiryns: A.3; Mycenae: 4.2.1.1), and possibly LM IIIB Early for Khania (1.2.5), consequently well before the destruction levels (unlike that mentioned in: Deger-Jalkotzy 1998: 106).

1.3.2 Chronological and geographic evolution

During the end of the LH IIIB2 period [Figure 1.5], before the major destructions at several Mycenaean sites⁷⁸, HBW is only present in Crete (on the west, at Khania and possibly in the Centre at Tylissos and Ayia Pelagia) and in the north-east Peloponnese where it is found in major sites: Mycenae, Tiryns and Midea (and also perhaps at Nichoria⁷⁹).

⁷⁸ Including sites where HBW has been found and sites where it is not present. In addition, it appears that the cause of the destructions of sites where HBW is present during this period is an earthquake (Mycenae: French 1998: 4; 2007; Tiryns: Kilian 1985a: 75; Midea: Sheldermine 1997: 543).

⁷⁹ As mentioned earlier (1.1.1.3), the identification of the specimen as HBW still needs to be confirmed.

In addition, just after this phase of destruction, HBW appears in two sites in the phase of re-occupation which in fact only lasted a short period of time: Menelaion in south Peloponnese (A.5) and Dimini in Thessaly (A.8).

In the LH IIIC period [Figure 1.6] HBW continues to appear at Tiryns, Mycenae and Khania. It is only at the beginning of this period that HBW spreads into central Greece and western Peloponnese, both in sites which already existed in the Palatial period (Korakou, Thebes, Lefkandi, Mitrou) and in newly founded sites (Aigeira).

Concerning other sites: Teichos Dymaion, Knossos and Asine, further studies of the specimens identified as HBW and of the find context and stratigraphy will be needed to confirm these identifications and their exact chronological context.

In addition, contrary to what is sometimes believed (Lis 2009: 152), HBW is not found in every Mycenaean site still occupied during the end of the LH IIIB and/or during the LH IIIC Early period. For example, no HBW was found at the recently published sites of Ayios Stephanos in south Peloponnese (Taylour, Janko 2008) or Phylakopi on the island of Melos (Renfrew et al. 2007).

It should also be added here that HBW is almost never found in Aegean islands with the exception of Crete⁸⁰, none of the overviews of the islands during this period have mentioned its presence (MacGillivray, Barber 1984; Deger-Jalkotzy 1998; Vlachopoulos 1997-98; 2003; Guzowska, Yasur-Landau 2003).

Another important point is that, from the information collected in the present study, HBW can't be taken as an short-lived phenomenon, at least in some sites, contrary to what is often published (Schnapp-Gourbeillon 2002: 80; Lis 2009: 153).

Indeed, we can observe [Figure 1.4] that, in most of the sites where HBW is found in more than one phase, it is present from the LH IIIB period up to the middle or later part of the LH

⁸⁰ With the exception of one possible HBW identified at Chios (*I.I.I.3*), although, since other specimens first identified as HBW have been excluded (Pilides 1994: 31), it remain to be confirmed.

IIIC period. In particular, on the site of Mycenae, HBW is present from phase VII to phases XI or XII (4.2.2).

It cannot be denied, however, that there is a great disparity in the length of time in which HBW appears in the different sites. In some sites, only one or two HBW specimens have yet been found (Midea, Nichoria, Tylissos, Ayia Pelagia, Knossos); it is thus difficult to know if this is due to the fact that, on those particular sites, HBW is a brief phenomenon or if it is due to the excavation process. For example, in the case of Midea, the excavations are continuing which means that more material might be found but at Nichoria, the final publication only presents one specimen of possible HBW.

In some sites, a larger quantity of specimens have been found and published but they only correspond to a single phase: Menelaion, Thebes. In other sites, the HBW lifespan is less narrow, such as the whole LH IIIC period (Aigeira and Lefkandi).

1.3.3 HBW presence in Submycenaean period?

The question related to the possible presence of HBW in the Submycenaean period is unclear. This is due to three problems:

- _ the problem of the existence and definition of this period, as discussed earlier (1.2.2). Is the Submycenaean period part of the LH IIIC Late phase or a succeeding phase, in the sites concerned here (Tiryns and Mycenae)?
- _ the lack of detailed and precise published analysis of this phase for the sites concerned.
- _ the question of whether, in those sites, the material from the later part of the LHIIIC period should in fact be interpreted as EIA-related pottery (1.1.3.1).

Consequently this question of the disappearance or continuation of HBW in the Submycenaean period will need further preliminary investigation.

1.3.4 Quantitative evolution

A quantitative analysis can only be done on three sites: Khania, Tiryns and Mycenae. At Khania, the quantity of HBW is more significant in the LM IIIB2 period and then decreases in the LM IIIC Early, whereas at Tiryns, the quantity of HBW, which increases slowly during the LH IIIB period, is at its highest peak during the LH IIIC Early [Figure 1.4]. This phenomenon has been interpreted as due to a shift in the importance between the two regions in the Post-Palatial period (Iacono 2009).

However, if we take into consideration the chronological correlation mentioned earlier between the two areas (1.2.2), we can observe [Figure 1.4] that, since for the time being the Late Minoan chronology is not as refined as the Mycenaean one is for this particular period, it is difficult to interpret this trend as a shift in importance between the two places.

The main difference between these two sites is that HBW continues in the later part of LH IIIC in Tiryns and not in Khania, though in smaller quantity, but with an increase from the LH IIIC Middle to the LH IIIC Late periods.

Another point often mentioned is the idea that HBW is seen as characteristic of the LH IIIC Early period only and that it almost disappears after this period (Schnapp-Gourbeillon 2002: 80; Lis 2009: 153). As it can be seen [Figure 1.4], HBW is indeed more widespread during this phase but it does continue to occur in at least five sites during the later phases. In addition, at Mycenae, the evolution of HBW quantity shows, a more or less, constant continuation in LH IIIC, as discussed in more detail in: 4.2.2.

It can also be mentioned that HBW seems to always represent a small proportion of the whole pottery assemblage of a site: 1% at Tiryns⁸¹, between 2.8-3.7% at Khania⁸². A similar situation is also found at Mycenae; a detailed analysis of the HBW proportion at the

⁸¹ Based on the total of unpainted pottery of the Lower Citadel area (Pilides 1994: 13).

⁸² Based on the table representing the quantities of the different wares and the total amount of pottery found in the LM IIIB2 (Hallager, Hallager 2000: 298).

site of Mycenae (including a comparative analysis of the different wares found) is discussed in: 4.2.2.

The last point is that the main bulk of HBW material overall is found in the Post-palatial phases of the two main palatial sites of Tiryns and Mycenae.

1.3.5 Nature of the sites

HBW is mainly, if not only, attested with certainty in settlement contexts. In only possibly two cases, HBW has been identified in a funerary context: Perati and Pellana (1.1.1.3). However, these very few specimens have not been studied by any specialists in HBW. That is why, until a detailed analysis of the shapes and fabric is done, it should not be emphasised too much as they might not belong to the HBW tradition.

It is apparent however, that HBW presence is attested on very different types of sites, which include presumably large ones: palatial centres (like Mycenae, Tiryns, Midea and Thebes), medium ones: sometimes interpreted as regional administrative centres (like Dimini and Khania) and small ones (like Aigeira).

It should also be noted that the list of sites where HBW is attested includes mainly settlements, which have a long history, starting much earlier than the period studied here. Indeed at only one site (Aigeira) does HBW seem to appear before the Mycenaean arrival on the site. Besides, HBW does seem to appear both on sites which are abandoned at the end of the Mycenaean period (Thebes) and on sites which continue into the PG period (Lefkandi).

1.3.6 Relation to Mycenaean habitation

HBW is always found associated with Mycenaean pottery except in one instance, Aigeira, where it is attested in a “Pre-Mycenaean” phase⁸³ (1.2.4). In Crete, especially at

⁸³ However, as mentioned before the HBW from this period is not associated with any structures.

Khania, HBW specimens have been found, in most cases, associated with Mycenaean pottery and in one case, in particular, in a building that has been interpreted as a Mycenaean refuge place due to the many Mycenaean features found (A.1).

At Dimini, the excavator suggested that the phase of appearance of HBW (corresponding to the period just after the destruction) is interpreted as the moment of arrival of a new non-Mycenaean population (Adrimi-Sismani 2006b: 471). However Mycenaean pottery was also found in this phase.

A spatial segregation of HBW is not really visible. On most sites, it is quite widespread with very few specimens of HBW found together in the same room. However, there are, on some sites, areas of special concentration, like at Tiryns in Room 127 (interpreted as an administration area: A.3), at Khania in the Rubbish Area North (interpreted as a cult deposit: A.1) or at Dimini in the re-occupation of Megaron A (A.8).

1.3.7 Functional interpretation of the find context

A significant interpretation of the context in which HBW has been found would require the context to be a floor deposit and the HBW vessel(s) associated with it to be at least partially preserved. This case is, however, quite rare.

An assessment of the function of the rooms in which HBW has been found is only possible for sites that have been fully published. Consequently, this section takes into account the following sites: Lefkandi and Khania, for which full publications of the sites are available, along with the presentation of the HBW find context, and Tiryns and Korakou, for which only partial information is published.

The discussion of the find contexts of the material from Mycenae is detailed in: 4.2.1, and an overall analysis of the interpretation of the find context can be found in: 5.2-3.

As mentioned so often in publications dedicated to the study of HBW, the primary find context for this ware is linked to domestic activities, such as food preparation, consumption and small-scale storage. Indeed, in all the sites included here, a large quantity of the HBW corpus has been found in this type of context.

Often the function of the room is interpreted as both for food preparation and consumption, like in the case of Khania (a jar and an open vessel found in Room E, Building 1) or at Lefkandi (the "Italian cup" found in North Room and a jar found in Southern Area).

In other cases, the room can be interpreted as for both storage and for food preparation like at Khania (two complete vessels: a carinated cup and a jar found in Room A, Building 1). Sometimes the function of the room is only defined as a cooking area, like at Korakou (the large ovoid jar CP 130 and the shallower jar CP 666 found in House L).

It should also be mentioned here that even though this type of ware is often associated with this type of function, it is not always found in domestic buildings. Indeed HBW was also found in areas used for cult practice, craft activities and official buildings.

At both Khania and Tiryns, HBW was found in areas used for cult activities. At Khania, the majority of the HBW (75 specimens for the LM IIIB2 period and ten specimens in the LM IIIC period) were found in Rubbish Area North, which has been interpreted as waste from cult activities undertaken in a nearby area (A.1).

At Tiryns, one specimen was found in casemate west 7, which is said to be a place of official cult activities (A.3). The site of Mycenae should also be included here since the material comes from the Cult Centre (4); however its relation to it is not clear.

At Tiryns, HBW is said to be absent from the higher-class houses in the upper citadel area⁸⁴ (Kilian 2007: 74), but some specimens have been found in areas which are linked to

⁸⁴ However early excavations at Tiryns and Mycenae of the palaces would have been undertaken before HBW was first recognised and therefore its absence may reflect failure to identify it.

official activities, in the Lower Citadel area: “House of the Priestess”, Building VI and "Zwinger" in the LH IIIB period and Room 127 in the LH IIIC period (A.3).

Concerning areas of craft activities, HBW has been found in several sites in possible relation to these, as discussed in more detail in: 5.3.2.

1.4 Discussion

Objectives attained in this chapter include the identification and definition of the corpus studied, in order to take into consideration, amongst other aspects, the problems related to the identification of HBW outside the Mycenaean area and the fact that HBW is considered as a distinct group from EIA-related handmade pottery.

In relation to the former aspect, it should be emphasised in particular, that in the Near East, only the site of Tell Kazel (and maybe Tell Arqa) should still be considered to have produced HBW (*1.1.2.2*). The other sites mentioned in previous publications (Pilides 1994: 40-42; Badre 2003; Guzowska, Yasur-Landau 2005) are, in fact, not related to the HBW phenomenon due to varying strong chronological and typological differences. Concerning the site of Troy, the ‘foreign’ pottery found in Troy VIIb does not represent a similar phenomenon to HBW. Indeed, this pottery does not follow the same patterns of chronological or quantitative presence as HBW (*1.1.2.3*) and indicates rather the movement of a larger (relative to the size of the site) foreign population and a longer-lasting presence at this site.

In relation to the commonly-made distinction between sites with HBW from sites with EIA-related handmade pottery (Rutter 1990; Strack 2007; Lis 2009), it is necessary to exercise caution. Indeed, some of the key elements (chronological and typological) for the distinction between these two groups are becoming less clear (*1.1.3.1*), in particular if, as suggested by Lis (2009), both pottery groups are found within same sites.

Another important aspect of this chapter was the detailed analysis of the chronological and depositional contexts of HBW. It can be seen that HBW appears during the Palatial period well before the important destructions at the end of the LH IIIB2 period, in major palatial sites (in particular Tiryns and Mycenae) and it continues to be present during the whole of the Post-Palatial period, which indicates that it is a long-lasting phenomenon (*1.3*)

contrary to what is often asserted (Lis 2009; Strack 2007). In addition, it was observed that HBW does appear not only in domestic contexts but also in contexts of cult and craft activities (1.3.7). The presence of HBW in such contexts has never been mentioned before and therefore never been analysed and interpreted.

Chapter 2: Typology of shapes and comparative analyses

One of the criterion that has been used to determine whether some groups of pottery assigned to HBW belonged to this category or not is the presence of certain characteristic shapes. Rutter (1990: 37-39), in his paper intending to find a way to give a definition to this group of pottery, mentions a preliminary list of representative shapes, commonly found in the typical HBW. Since then, a fairly significant amount of HBW specimens have been found and published (*1.1*), allowing now a more detailed account of the typology of this ware to be made.

An attempt to classify the whole corpus of HBW by shape has never been done before. All the publications of this ware give different names to the same shapes, which prevented a comparative analysis of the group itself as well as with other pottery groups. That is why this classification is of prime importance to define HBW and as a basis for the study of differences and resemblances within the HBW corpus as well as with other wares.

2.1 Methodology of shape classification

The first aspect of this chapter concerns the detailed study of the shapes and decorations which characterise the HBW corpus. This is preceded by some methodological considerations and definitions of the criteria chosen for the identification of shape types.

The observations and conclusions obtained from the analysis of the HBW typology are essentially based on the eight sites which are the most well documented (1.1.1): Tiryns, Korakou, Menelaion, Lefkandi, Aigeira, Thebes, Dimini and Khania. References to the site of Mycenae, which HBW typology is discussed in more detail in: 4.3, are also included.

It should also be mentioned that other types of artefacts have been included in the HBW corpus, essentially at the sites of Tiryns and Aigeira: spindle whorls and/or beads and figurines. They are discussed in: 5.2.2.

2.1.1 The criteria

As it has often been mentioned, the first remark we can make by looking at the corpus of HBW is that even similar specimens tend to look quite different from each other, there is no standardisation as it is the case in the Mycenaean pottery.

Being made by hand and often locally (3), it is normal that each HBW potter has his own particularities and that they are reflected on the wide variety of little specificities (shape of the rim, handles or decorations), as attested in both archaeological and ethnographic records (Henrickson, McDonald 1983: 635). That is why I have tried to differentiate types for their general aspects first and then included some particularities⁸⁵, but without being as rigorous and detailed as for a typology of wheelmade pottery.

⁸⁵ This methodology bears similarities to the one established for Neolithic handmade pottery from two sites in Iran, following the compilation of a typology (based on the function of the vessels) of a large quantity of ethnographic records (Henrickson, McDonald 1983).

This typology is illustrated on tables [Figure 2.1], where a specimen of each site where the shape type was found is represented. In order to be as objective as possible, I have selected criteria which enable one, by comparing particular points of one HBW vessel, to evaluate similarities and differences. The primary criteria for the present typology are: the dimensions, the general shape of the body and the handles.

Three other aspects of the vessel are usually taken into account when creating a typology: the shape of the rim and base and the decoration used (Rice 1987: 212-222). However, these aspects are not part of the criteria of classification of the general types in use in the present study. They are only secondary criteria. This is due to the fact that these elements vary too much to be relevant in this classification.

2.1.1.1 Primary criteria

- **The dimensions:**

This is the first information, which enables to pre-classify the corpus. The dimensions are mentioned whenever possible and are often approximate due to the state of conservation (especially concerning the heights). The main categories are also divided according to the link between height and width, as suggested in: Rice 1987 (217). This is an important aspect since it is partly linked to the function of the vessel: large shallow vessels could be more suitable for food preparation, small shallow vessels for consumption, large and deep vessels for long-term storage and smaller version for short-term storage⁸⁶.

When the information is not available because the specimens are fragmentary, it is the general shape of the vessel or any other specific element that determine the category in which the vessel is placed.

⁸⁶ Aspects established from ethnographic records: Henrickson, McDonald 1983.

The first aspect to emerge for the HBW corpus is that the dimensions are often quite variable between specimens belonging to the same type. Another important remark is that HBW includes a wide range of sizes, from very small cups or bowls to very large wide-mouthed jars, which points towards a wide range of functions being fulfilled.

- **The shape of the body:**

This is the second most important characteristic, since it is the most significant element, along with the dimensions, to identify the type into which specimens are included. The main shapes are sub-categorised according to the shape of the body.

Since, as in the case of Tiryns (where an important quantity of material has been found: *1.1.1.1*), the shape of the body can be so varied, the classification has to be minimal and in keeping with the other sites. This means that instead of following the detailed classification of the publication of the Tiryns HBW (Kilian 2007), which is too specific, a more general classification has been chosen. It groups together types separated by Kilian, but which seem too similar to be separated according to the present methodology.

However, the decision was made to separate buckets from wide-mouthed jars⁸⁷ because the former is a definite open shape with an outcurving upper body and it can be easily imagined that this type of vessel was used for some kind of preparation and not only for storage, especially since they are usually quite wide and shallow, whereas wide-mouthed jars have an incurving upper body and are probably only suitable for storage.

- **The handles:**

There is a wide range of shapes and types of handles in the HBW repertoire and some are quite unique. It is also sometimes difficult to determine whether the element should be

⁸⁷ Even though it might sometimes be difficult to decide where some of the specimens should be included.

classified as handle or decoration. This is the case of what is sometimes called lug handle or knobs or horn handles and which is mostly present on open vessels [Figure 2.4].

Some of the protrusions identified as lug handles are in fact too small or fragile to have been used to lift up the vessels, especially if it is full and heavy. Several other functions can be postulated: a simple decorative purpose (in the case of horn shapes for example), used for resting a rounded bowl type of lid on, for tying some fabric around it (to protect the food from dirt or insects), or for tilting the vessel⁸⁸.

2.1.1.2 Secondary criteria

- **The shape of the rim⁸⁹:**

Rim fragments are the most published elements of the vessel consequently it is the easiest part to classify. With the exception of the few types, which have a set shape of rim, variation seems to be the rule as if the exact aspect of the rim was not important for the maker and/or user. It has, however, been demonstrated that the shape of the rim and lip can be of functional value (Rice 1987: 241); obvious examples being a thickened rim to strengthen this part of the vessel or a rounded lip to make pouring easier, as in HBW collared jars (2.2.1.7).

- **The shape of the base:**

Since most specimens found are fragmentary (the base is often missing). However, a large number of base fragments from Tiryns have been published and most of them are flat. There are though a few exceptions, such as the concave base of some carinated vessels (2.2.1.1).

⁸⁸ Many possibilities are demonstrated by ethnographical studies (Henrickson, McDonald 1983).

⁸⁹ For the description of the rim, the base and the handles I have used the terminology given by Mountjoy 1986: 201, fig. 270.

- **The decoration:**

A large quantity of the published HBW specimens is decorated; the various features are detailed in: 2.2.2. A look at the corpus of Tiryns shows that the majority of the material illustrated in the final publication (Kilian 2007) is decorated. However, one can wonder if this only represents the selection made by the archaeologist, which might be based on presenting the most interesting specimens. It does seem though that some shape types are almost always decorated (wide-mouthed jar: 2.2.1.6) and others are almost never decorated (rounded bowls/lids, collared jars: 2.2.1.3, 2.2.1.7).

Since there is a variety of combinations (with or without decoration, plain or finger-impressed cordon) within types, the decorations is often not taken into account in the categorisation.

2.1.2 Defining types

The labelling of the types is, as much as possible, directly related to the names used in previous HBW publications in order to facilitate the assimilation of this typology. These eight main types are clearly defined and vessels can easily be classified in one rather than another type. Below are the basic definitions of the shape names and the sub-categories, which are discussed in: 2.2.1 and illustrated in: [Figure 2.1].

Type 1: carinated vessels

Definition: includes all vessels with a carination on the body

Type 2: cups

Definition: D (rim) < 15 cm and deeper than wide or as wide as deep

T2 C1: convex-sided and vertical handle

T2 C2: collared

Type 3: bowls

Definition: D (rim) < 20 cm, wider than deep

T3 C1: rounded and no handle? (link with lids: T8 C1?)

T3 C2: rounded with vertical handle

T3 C3: conical

T3 C4: vessel on foot (including kylix)

Type 4: basins

Definition: D (rim) > 20 cm, wider than deep, rounded profile

T4 C1: no handle?

T4 C2: with handles

T4 C3: with strong incurving rim

Type 5: Buckets

Definition: D (rim) > 15 cm and everted profile

T5A: with conical profile

T5B: with vertical handle on rim (also called situla)

T5C: with straight profile

Type 6: Wide-mouthed jars

Definition: deeper than wide or as deep as wide and incurving profile

T6A: with rounded profile

T6B: with shoulder and incurving rim (also called hole-mouthed)

Type 7: Collared jars

Definition: deeper than wide or as deep as wide and with a neck

Type 7A: simple, without handles?

Type 7B: with vertical handle(s) from rim to shoulder

Type 7C: with other types of handles

Type 8: Utensils

T8 C1: lid (link with rounded bowls: T3 C1?)

T8 C2: stand

T8 C3: dipper/ladle (?)

T8C4 : spouted cup

T8 C5: pan (?)

T8 C6: spoon (?)

2.2 Typology

The typology detailed below is illustrated in tables [Figure 2.1]. Each type mentioned in this section, is referred to it⁹⁰. In these tables, each specimen mentioned is named according to the site in which it has been found and the reference number is that used in its publication. The names in brackets are the ones used by the excavators or archaeologists who first studied the material⁹¹. The dimensions⁹² are either the ones published or the ones measured on the published drawings and are sometimes approximate. The date given (when available) corresponds to the find context published for the specimen illustrated.

2.2.1 HBW shapes

2.2.1.1 Type 1: Carinated vessels

Type 1 corresponds to vessels, which have a carination. It is sometimes difficult to determine which of the three shape types, cups, bowls or basin, it corresponds to and it is a specific and rather elaborated shape; that is why these specimens have been classified apart from the rest of the corpus.

The variation in size is noticeable and probably influenced the archaeologists in the name they selected: including small shapes (with a rim diameter less than 7 cm: [Aigeira 1985: 3]⁹³) as well as large ones (with a rim diameter up to 25 cm: [Aigeira 2003a:8.5]). All specimens are wider than deep, except for one [Aigeira 1985: 3]. The rim is usually flaring,

⁹⁰ For example, the section of the text called "Type 1: Carinated vessels" correspond to Figure 2.1: "Type 1: Carinated vessels".

⁹¹ Only given when available.

⁹² The illustrations are not to scale due to the discrepancy in size amongst the specimens, even belonging to the same category. Putting them to scale would prevent seeing some of the drawings clearly.

⁹³ In the text, the individual HBW specimens mentioned are given in brackets with the name of the site followed by the reference number which can be cross-referenced to the illustrations tables.

the lip rounded and the base flat although there are exceptions: some specimens have a straight rim [Aigeira 2003a: 8.5] and others have a concave base [Lefkandi 8/13].

It should also be noticed that no carinated vessels are decorated on the body. However as it has often been published, the handle is sometimes decorated as detailed in: 2.2.2.

This type has been divided into five sub-categories based on three elements: the type of carination, the upper body profile and the type of handle.

Types 1 C1, C2 and C3 correspond to vessels with a strong carination but they differ in the profile of the upper body. Type 1 C1 has an everted profile. This is the most common category. All the sites where carinated vessels have been found, with the exception of Khania, are represented in this category (including Mycenae: 4.3.1.1). Some of the specimens have high-swung handle attachment preserved. It is possible that nearly all carinated vessels (except T1 C5) did have at least a high-swung handle but most specimens are too fragmentary. Type 1 C2 has an upright upper body. This category is found only on two sites: Tiryns and Khania. Type 1 C3 has an upper body turning inward, only found at Tiryns, Aigeira and Dimini. This type is however somewhat arbitrary since all three specimens have varied sizes and consequently don't look much alike.

Types 1 C4 and C5 correspond to vessels with a possible more subtle carination; it can be argued that these types might not in fact belong to carinated vessels as such. Type 1 C4 possesses at least one high-swung handle whereas T1 C5 (only found at Khania) is characterised by the presence of one or two knobs or lug handles on the carination. Some specimens from Khania are said to have a "knob" (Hallager, Hallager 2000: 171) and others a "lug handle" (Hallager, Hallager 2003: 254) on the carination. However the difference in shape isn't visible on the illustrations published.

Apart from the site of Khania where the first specimens appear in the LM IIIB2 period, the carinated vessels recorded seem to be found first in LH IIIC Early levels⁹⁴. No specimens were found at the sites of Menelaion and Thebes.

In addition, two more sites have been reported to have HBW carinated vessels but there are no published illustrations: Nichoria (McDonald, Wilkie 1992: 512) and Knossos (Bettelli 2002: 122-124).

2.2.1.2 Type 2: Cups

Type 2 is represented by cups, which are all of rather small size, less than 15 cm rim diameter. In the specimens fully preserved, the diameter is nearly equal to the height or it is deeper than wide.

Type 2 is mainly defined by the convex-sided cup with a single vertical handle from rim to shoulder (T2 C1), labelled “Italian cup” in previous publication (Jones 1986c: 476; Pilides 1994: 26). The rim is often straight and round but can also be everted, and the base is flat. They are sometimes decorated with a plastic cordon. This type was found at Lefkandi, Tiryns, Menelaion and possibly at Aigeira (although the Aigeira specimen is rather different in shape and execution).

There is another type only found at Tiryns (two specimens): it is a small version of a collared jar (T2 C2). The diameter is less than 12 cm and there is the scar of a handle and a plastic cordon. They are labelled “mugs” in Kilian 2007 (31).

⁹⁴ Apart one specimen from Aigeira, said to have been found in the “pre-Mycenaean” level (Deger-Jalkotzy 2003a) and few specimens from Mycenae but these are unusual specimens which might not in fact be carinated vessels as detailed in: 4.3.1.1.

2.2.1.3 Type 3: Bowls

Type 3 is associated with bowls, which in some cases (T3 C1) could also be identified as lids (2.2.1.8). The size of the rim diameter of bowls is rather heterogeneous (from 5 to 20 cm) and some specimens could possibly be classified as cups, especially T3 C3, but as mentioned earlier, cups and bowls are differentiated by the fact that the former is deeper than wide or as deep as wide whereas the latter is wider than deep.

Most specimens have a straight rim with a rounded, pointy or square lip. The base of most specimens is missing but there are two examples of flat base. A rounded base might have also been used. Some specimens are undecorated whereas others bear impressed and/or plastic cordon decorations.

Type 3 can be divided in four categories according to the shape of the body and the presence of handles and of a foot:

_ simple and possibly without handles (T3 C1): this is the most common category. Some of the specimens might also be lids but others might have only or mainly been used as bowls as they are decorated (with plastic cordon) and/or are very highly burnished on both surfaces: the latter observation was made during the study of the Mycenae material (4.3.1.2) where similar types of bowls/lids are found.

_ with vertical handle(s) (T3 C2). These two specimens are separated from the T2 C1 because they are wider than deep and larger.

_ with a conical body shape (T3 C3). The specimens belonging to this category are of varying sizes from 5 cm diameter to 22 cm (but the Dimini [13f] specimen might not really belong to this category). One of the specimens [Tiryns 326] in a previous publication (Kilian 1985a:

fig. 13.1) was classified as a possible kylix but no stem has been found in the Tiryns material and in the final publication (Kilian 2007) it is defined as a bowl. However kylikes have been found elsewhere, and consequently makes it possible that, at least, some of the specimens belonging to T3 C3 are, in fact, part of kylikes. Some conical specimens from Mycenae, classified either as bowl or buckets (4.3.1.2,4), could also be included here.

_ with foot, including kylix (T3 C4). It includes two types: a large bowl on probably three legs from Tiryns (unique example) and possibly some specimens imitating Mycenaean kylikes (2.4.3.1.1) from Mitrou. One kylix stem was also found at Mycenae (4.3.1.2).

2.2.1.4 Type 4: Basins

Type 4 corresponds to basins which are quite similar to bowls in the general shape but are larger (rim diameter superior to 25 cm). The shape of the base, when present, is either flat or concave.

T4 C1 is the simple basin, somewhat similar to the rounded bowls (T3 C1) but perhaps slightly more conical. T4 C2 and T4 C3 are unique in the HBW corpus.

The former type is characterised by the presence of horizontal or lug handles on the body. The two specimens are rather different however, in both the shape of body and handle as well as in the decoration: zigzag paint for the specimen from Korkaou and two rectangular knobs on rim for the specimen from Dimini.

The last type, only found at Dimini, is characterised by a strong incurving rim and also has incised zigzag lines under the rim, in a similar way as the specimen from Korakou T4 C2. The method of execution is however different (2.2.2).

2.2.1.5 Type 5: Buckets

Type 5 represents buckets: medium to large vessels, deeper than the basin and with an open profile. They can be divided into three categories mainly according to the shape of the body.

Type 5A (bucket with conical profile) includes mainly two categories: ones with lug handles (T5A C2) and ones with vertical handle(s) (T5A C3). Some of the most fragmentary specimens could instead be conical bowls. There is a great variety in the shapes of rim and lip: from rounded flaring to square everted, T-shaped or simply straight and flat.

Specimens belonging to T5A C1 might have had handles but they are too fragmentary, as with specimens from Mycenae (4.3.1.4) and specimens from T5A C2 have mainly lug handles, below the rim, but in one case the presence of horseshoe handles is attested [Khania 71-P 0941]. The shape of the body is also different, more rounded. The specimen from Dimini [11a] has handles lower on the body than on the other specimens.

Type 5A C3 only corresponds to one specimen [Aigeria 1977:14] and is very fragmentary. This means that it might not in reality be classified as a bucket.

Type 5B (bucket-situla) includes both conical and straight upper bodies. It is a very specific shape due to the presence of a vertical handle on the rim. They might have been two but all the specimens are only fragments. The rim is straight and the lip rounded, square or triangular. The specimen from Menelaion has a horn-decorated handle. There might also be a specimen from Mycenae but it is very fragmentary (4.3.1.4).

Type 5C (bucket with straight upper body) can be divided into five categories:

- _ T5C C1: this could correspond to specimens with handles but the vessels are too fragmentary, as it applies to the specimens from Mycenae (4.3.1.4). The specimen from Lefkandi [pl. 49.4] (no drawing published) might belong to another category.
- _ T5C C2: this type is represented by buckets with lug handles or sometimes in a slightly horned shape [Tiryns 119]. In the specimen from Dimini [11b], the handles are placed much lower down than on the other specimens, as it was the case for the specimen belonging to T5A C2 (see above).
- _ T5C C3: this category is questionable since it is only represented by a single specimen (from Khania) which is very fragmentary. It has been separated from the others because it is mentioned in the publication (Hallager, Hallager 2003: 253) that it has horizontal handles. However, only the beginning of the handle is preserved and the illustration published does not exhibit enough evidence.
- _ T5C C4: this group is very heterogeneous and includes vessels, which are difficult to classify. They all are small to medium-sized, with a straight-sided body and are defined either as "bowl" or "jar" depending on the archaeologist. They are included here because they are too straight to be bowls, too small and too open to be jars. The specimens from Aigeria, in particular, are rather strangely executed and shaped, especially [Aigeira 1997:10].
- _ T5C C5: this group only includes one specimen from Tiryns which is very unusual. It is characterised by a straight profile and a T-shaped rim, and could have been some kind of utensil (like a stand?), but it is not included in the utensil category (T8) because it is very well decorated compared to most HBW specimens (2.2.2).

2.2.1.6 Type 6: Wide-mouthed jars

Type 6 (vessel deeper than wide, medium to large and with rounded incurving profile) includes two categories of wide-mouthed jars, differentiated from each other by the shape of the upper body.

Type 6A corresponds to the most characteristic shape of HBW. However, within this type, there are many variations but only the general shape of the body and the presence and type of handles are used for the sub-categorisation:

_ size: from small to very large. The rim diameter ranges from 17 cm [Thebes 383] up to 35 cm [Korakou 9] and the heights from 18 cm [Tiryns 68] up to 37 cm [Menelaion 1].

_ general shape of the body: most are ovoid (T6A C1) but some are more globular (T6A C5). Some might be wider than deep and others deeper than wide.

_ presence and shape of the handles: some might not have had any handles (T6A C1), but most specimens show the presence of handles: horseshoe (T6A C2), lugs/horns (T6A C3) or vertical handles⁹⁵ (T6A C4). The latter case corresponds to a single specimen from Tiryns [179].

_ decoration: most if not all specimens in this category have a plastic decoration (plain, incised or finger-impressed cordon). One specimen from Tiryns has a circular hole on the plastic cordon (Kilian 2007: no. 66) and another one has incised zigzag lines [Tiryns 127].

_ shape of the rim: straight, everted or flaring, sometimes with thickened lip.

_ the shape of the base: for the specimens where it is preserved, it is usually flat but, in rare cases, it can be slightly concave [Korakou 2].

⁹⁵ The general shape is similar to the convex-sided cups (T2 C1) but the size is much larger.

Type 6B corresponds to hole-mouthed jars which have a strong incurving rim. They are only found at Tiryns (several specimens) and Korakou (a single specimen). In the corpus of HBW from Tiryns, it was possible to differentiate three types of hole-mouthed jars: with angular shoulder, with rounded shoulder and with slight shoulder. The rim and lip are either straight and square or T-shaped. Even though the illustrations presented in the table are not representative, most of the specimens in this type are strongly decorated (2.2.2).

2.2.1.7 Type 7: Collared jars

Type 7 is characterised by the presence of a neck. The size of the vessels is variable. The diameter of the rim is between six and 35 cm. The height is difficult to evaluate as most specimens are fragmentary but from what is available they measure between 12 and 30 cm. The smallest specimens belong to Type 7C: the jugs. The rim and lip are, in most cases, curved and round or square. The shape of the base is usually flat but one specimen of jug has a round base [Lefkandi 69/P17] and two other specimens have a raised base [Tiryns 198 and Aigeria 1977: 9]. Most of the specimens recorded are not decorated.

Type 7A is classified as collared jars possibly without handles because of the uncertainty of the presence of handles since the specimens are fragmentary. They might in fact fit in the other categories. Three groups can be distinguished according to differences in the shape of the neck:

_ T7A C1: basic flaring neck. This type is the most common.

_ T7A C2: globular with a straight (collar) neck. In Tiryns there also is a very small version of this shape (diameter estimated: 10 cm).

_ T7A C3: accentuated shoulder and long straight neck with flaring or everted rim. The specimen from Korakou [5] looks slightly similar but is very fragmentary and might in fact be quite different from the Tiryns specimen [183].

Type 7B is only represented by collared jars with vertical handle(s) from rim to shoulder. They are placed apart because they form an important category with many variations in the number of handles (from one to possibly three), the shape of the neck (possibly non-existent to flaring, straight or very long), the rim (rounded, square, thickened) and the base (flat, raised or rounded). The specimens from Dimini [11k and 11i] are most unusual.

As most of the specimens are fragmentary, it is impossible to classify them more accurately. The names given in the various publications are representative of this difficulty: the specimens are called jug, cooking pot jar or amphora. Several specimens (including from Mycenae: 4.3.1.6) have indeed been compared with Mycenaean shapes (2.3.1).

Similarities with specimens of EIA-related handmade pottery from Asine or Kalapodi can also be observed⁹⁶ [Figure 2.2], also noted for Mycenae (4.3.1.6).

Type 7C includes the other collared jars with different handles types:

_ T7C C1: lug or horn handle(s).

_ T7C C2: two horizontal handles on the shoulder and a globular body.

_ T7C C3: two horizontal handles on neck and body and one vertical handle from rim to shoulder. This is a unique specimen (found at Tiryns), which has been identified as an example of a Mycenaean hydria (2.3.1).

⁹⁶ At Mitrou as well (Lis 2009: fig. 18.3).

_ T7C C4: two vertical handles on the body and a globular body with often a wide short neck.
This category is only found at Tiryns.

HBW collared jars are found as early as the LH/LM IIIB period in both Crete (Khania) and the Mainland (Tiryns, Mycenae) and all through the LH IIIC period, in all sites with HBW. A large quantity was found at Mycenae (4.3.1.6).

2.2.1.8 Type 8: Utensils

Six groups of HBW specimens can be classified as utensils due to the characteristic shapes they have. Utensils have so far only been found in four sites: Tiryns (where several types of utensils are represented and where they are the most common), Menelaion, Aigeira, Dimini and Mycenae.

Lids (T8 C1) are partly linked with the rounded bowls T3 C1 (2.3.1.3), as this type of vessel might have had one or the other function but possibly also both. In the Tiryns publication (Kilian 2007), some of the specimens are classified as bowls and some as lids.

Considerable variations in rim diameters in the Tiryns material might, indeed, reflect the fact that some of these vessels might have served as lids⁹⁷ as there is a wide range of jar sizes.

In addition, from the pilot study of HBW fabric (3.5), it was observed that the quality of finish varies between the interior and exterior surface and that this might be linked with the function of the vessel. Indeed, some of the lid/rounded bowl specimens found at Mycenae, are only burnished on the exterior surface whereas the interior is left untreated (4.3.1.2), possibly suggesting a use as a lid and not bowl.

⁹⁷ Such function has been observed in both ethnographic and archaeological records (Henrickson, McDonald 1983).

However it can also be argued that both functions might have applied for the same vessel. Multi-functionality of such vessels has been proposed for the Impasto ware bowls from the Italian peninsula (Bettelli 2002: 119; Recchia 2004: 256-260).

I have decided, for the present study, that unless the surface finish can indicate that the vessel would have been used for one purpose rather than the other, these vessel types are to be included in the bowl category T3 C1.

In addition to this shape, there are, in the Tiryns corpus only, other vessel shapes which can more easily be identified as lids, with often the start of a handle; various shapes are present: low raised edge, rectangular in section [Tiryns 228, Tiryns 232], flat conical shape, round in section and quite deep with a spreading rim [Tiryns 230] or flat [Tiryns 227].

Stands (T8 C2) vary greatly between sites. There are no two similar specimens. The best preserved comes from Dimini. It has four legs and forms a sort of small square table. The three other specimens have a rounded shape. The specimen from Menelaion is a type, which has a cylindrical shape with apertures on the sides. The specimen has several plastic decorations, finger-impressed cordons. There also are two other types of stands within the same site of Tiryns, one has a conical shape [Tiryns 260] and the other one has a cylindrical shape and apertures on the sides [Tiryns 266]. Possibly three specimens from Mycenae might be similar to the Menealion and the Tiryns stands mentioned, however, they are very fragmentary 4.3.1.7).

Dippers/ladles (T8 C3) have been interpreted as such due to their similarities with the Mycenaean type, semi-globular shape with rounded base and high-swung handle. The two HBW specimens come from Tiryns and possibly two others from Mycenae (4.3.1.2), although in this latter case, they could also be cups.

Spouted cups (T8 C4) are only represented by a single specimen from Aigeira. Since it is the only specimen in the whole HBW corpus to have a spout, it is classified apart from the others. However, it was also belong to the category of dippers (Shelton pers. comm.).

Pans (T8 C5) are only represented by a single specimen from Tiryns. It is a shallow conical tray with a flat base and a short attachment preserved at the rim.

A **spoon (T8 C6)** has been identified at Aigeira by Deger-Jalkotzy (2003a: 465). It is quite thick and small and is said to have a bird's head at the tip of the handle. This is the only specimen of this type recorded in the HBW corpus.

2.2.2 HBW decorations

The types of decorations used on HBW differ greatly from the traditional Mycenaean fine ware (usually painted) and coarse ware (usually not decorated). Its closest parallel would be some of the decorations found on pithoi (applied plastic cordon, incisions and finger-impressions) but these are rather different in their execution (difference in the shape of the impressions or other decorative marks) and arrangement (presence of many successive rows of applied cordons whereas decorated HBW usually only has a single plastic cordon).

The typical features of HBW consist of: applied cordons, incised lines, finger impressions, impressed dots, and knobs. These features are found on most sites, where the corpus is large enough to provide several specimens. Also, decorations are almost absent from several shape types: most of the carinated vessels (T1 C1 to C4), rounded bowls (T3 C1)/ lids (T8 C1) and collared jars (T7). On the contrary, decorations seem to be present very often on buckets (T5) and wide-mouthed jars (T6).

The most characteristic decorative feature is the **applied cordon**⁹⁸, which is usually a horizontal relief band just below the rim, either rounded or triangular in section. It is either plain, finger-impressed (attested by the presence of nail marks), dot-impressed, oblique-slashed or in the piecrust technique [Figure 2.3a]. This type of decoration occurs mainly on open shapes such as convex-sided cups and wide-mouthed jars. Applied cordon is found on most sites where detailed publications and/or illustrations are available. However, it can be noticed that they are rare at Khania, especially during the LM IIIB2 period [Figure 2.7].

As it should be expected with pottery made by hand and locally (3.3.1), there are variations in the choices and arrangements of the decoration. These are particular to one site or even to one vessel. For example, applied cordon decoration can be either vertical or wavy [Figure 2.3a]. On several sites (Tiryns, Menelaion, Aigeira), there are two to four parallel horizontal applied cordons below the rim [Figure 2.3b].

Another feature that only appears on one type of shape, the hole-mouthed jar (T6B), which are found only at Tiryns and Korakou, is the use of a combination of applied cordons, which are sometimes associated with knobs arranged in between the applied cordons [Figure 2.3b]. Wavy applied cordons are rare but appear at Menelaion on a collared jar specimen. It should also be mentioned that stands (T8 C2) are sometimes decorated with applied cordons.

Another decoration feature, which is less common is **incised lines** directly on the vessel, either on the rim or on the body [Figure 2.3c]. On the rim, they are executed as fine and short oblique lines going around the rim. This feature is only present on wide-mouthed jars at Menelaion (on a single specimen) and Tiryns (on two specimens). On the body, there are usually long and thin rows of zigzag lines going horizontally around the upper body. This

⁹⁸ This type of applied feature sometimes has been interpreted as having a functional purpose, as the imitation in clay of functional elements made of other material, like rope or wood (Bouzek 1985) or for strengthening the joins of vessel parts.

has only been identified at Tiryns on a single globular wide-mouthed jar (T6A C5) and at Dimini on one basin (T4 C3).

Finger-impressions directly on the vessel [Figure 2.3d] and especially on the rim are rare but present on a small bowl from Aigeira (T3 C1). At Midea and Tiryns, horseshoe handles are decorated with finger-impressions.

Barbotine decoration has been mentioned by Kilian (1978) for several HBW specimens from Tiryns (five specimens are mentioned in: Kilian 2007: 8). It consists of irregular grooving on the body [Figure 2.3e].

As an exception to the rule, a single **painted vessel** has been found in the whole HBW corpus. It comes from Korakou. The basin (T4 C2) is covered with a zigzag of thick lustrous black paint [Figure 2.3f].

Then, there are some types of handles, which sometimes look more like decorative features than practical elements. First, it might be worth wondering if some of the **horseshoe** handles present mainly on wide-mouthed jars could have been simple decorative features instead of useful features [Figure 2.4]. Indeed, it seems that in some cases, the feature seems too shallow, short or small to actually serve for handling a large vessel.

A type of handle which might be decorative is the lug handles in the shape of one or two **horns** [Figure 2.4]. Lug handles going upwards and creating the illusion of a horn are quite common at Tiryns on buckets (T5) and wide-mouthed jars (T6). Another style is found at Menelaion on a bucket where the lug is divided into two knobs which form a double horn.

In addition, **knobs** can be either identified as handles (when there are only two to four aligned horizontally on the upper body) or as decoration, especially when there are many spread out on the body. This is mainly found on hole-mouthed jars (T6B) and they can be short and rounded or flattened and square [Figure 2.4].

Finally, some decorative features do not concern the body of the vessel but the handle. This is mainly restricted to carinated vessels (T1 C6). Most of the specimens are fragmentary and the body is not always preserved, which should prevent classifying it as carinated vessels. However, most of them have been classified by the archeologists who studied the specimens as handle fragments belonging to carinated vessels according to the similarities in shape and decoration with Italian impasto specimens of carinated vessels with **handle decoration** (2.4.1).

The decorations include [Figure 2.5]:

- _ Two horns/axe-shape on the top of high-swung handles: either two cylindrical protrusions or a flat rectangle with pointy corners (Tiryns and Dimini). This feature has also been reported from the site of Teichos Dymaion (Kilian et al. 1982a: 90, n.155).
- _ An animal protome on the top of a handle (probably a vertical handle): these identifications were provided by the excavators, however, the exact shape is not clear on the published illustrations (Lekfandi and Khania). It might be the same type of decoration as the one on the spoon from Aigeira (2.2.1.8).
- _ A rectangular protuberance on the rim (Dimini).

2.2.3 Identifying vessel functions

It has been debated in previous papers whether HBW represents a whole household assemblage (as established in Rutter 1990: 42) or if it is only a partial assemblage (as favored by Strack 2007: 68).

The identification of the function of vessels can rely not only on morphological matters but also on the find context (discussed in: A, 1.3.7, 5.3.2), physical properties (*Appendix D*) and the analysis of use wear marks and residues⁹⁹.

From these various aspects, the simplest function, which can be identified here is related to **food preparation**. Both utensils (T8) and some of the collared jars imitating Mycenaean cooking pots¹⁰⁰ (T7B) can certainly be included in this function for morphological reasons. On the base of one of the HBW cooking pot jars found at Mycenae (60-461, *CD-ROM: Excel table 4.3*), residue of soot was identified. It might also be possible to include some of the buckets (T5) which are open jars with an out-curving upper body (making it easier to put ingredients in, to stir), contrary to the wide-mouthed jars (T6), which have an incurving upper body. This better suits the function of food storage (needed for a good insulating capacity, preventing spilling) (Rice 1987: 241).

The study of the physical properties of HBW specimens should also help in better defining the group of shapes which are linked to food preparation, as it seems to appear in the pilot study of the fabric analysis on some HBW specimens (3.4.2).

Another obvious identifiable function of the HBW is the **storage of dry food**, concerning in particular the wide-mouthed jars (T6). Some of them might have been covered with lids (T8 C1 and possibly also T3 C1), but features such as a thick rim or plastic cordon just below the rim might also indicate the use of flexible material as lids, as shown in ethnographic records (Henrickson, McDonald 1983).

⁹⁹ These last two aspects are not included in the present study due to the fact that scientific training is needed, especially in the case of analysis of residues for which scientific methods is necessary, like infrared absorption or gas chromatography (Skibo 1992: 38-46). It is also linked to poor state of preservation of a large proportion of the material (worn surfaces).

¹⁰⁰ For the function of Mycenaean vessels, including cooking pots: Tournavitou 1992.

In addition, it can be observed that there are many different sizes (medium or large) and shapes (tall and thin or shallow and wide) of wide-mouthed jars¹⁰¹ which can possibly reflect their specific function and/or their use as either short or long term storage vessels (Tournavitou 1992: 183-4; Henrickson, McDonald 1983).

Another function, which can be almost straightforwardly identified is **pouring and storing of liquids**, such as most of the collared jars, with small versions for pouring (especially jugs) and larger ones for storage. The shape of the lip, neck and handles influences the ability of the vessel to be used for pouring (Tournavitou 1992: 184, 188). In addition, the analysis of the quality of the interior surface finish (3.4.2) might help determine whether the liquid it was used for was oily or not. Indeed, it was noticed in some ethnographic reports that liquid containers were only burnished (for reducing porosity) if the liquid wasn't oil since oil would already have this property (Henrickson, McDonald 1983).

However, other types of vessels might have been used as storage of liquid (some of the open jars T5 or T6) or to serve and eat/drink liquids (small vessels: cups T2 and bowls T3, kylikes and possibly carinated vessels). This can also be deduced from the quality of interior finish. Vessels with a very thorough burnish might more likely be related to liquids or liquid food¹⁰² (3.4.2, 4.4.3).

This leads to the function of small vessels (cups T2 and bowls T3), which can be associated with **serving, drinking and eating** for both morphological reasons and the properties mentioned above¹⁰³. Basins (T4) could possibly be included here as it might be the

¹⁰¹ As it is the case with the Mycenaean pithoi also associated with storage function (Tournavitou 1992: 183-4).

¹⁰² However some vessels of Mycenaean shapes associated with liquid use (shallow cups and kylikes) were found to be porous and it was suggested that the interior surface was once possibly covered by an insulating layer (Tournavitou 1992: 196, 205).

¹⁰³ However cups T2 C1 have also been associated with food preparation because of the presence of soot on the base and due to the depositional context in which some specimens have been found (Lefkandi: A.2).

familial version¹⁰⁴ of the bowls used for eating. The fact that they are decorated is perhaps further evidence¹⁰⁵ for this function.

The fact that some specific shapes are very well decorated might also be an indicator of some specific function (hole-mouthed jars T5B and bucket with T-shaped rim T5C C5 especially) which is, however, difficult to interpret.

Concerning carinated vessels (T1), it can easily be argued that their function is related to food consumption but it might also be linked to more formal purposes judging by the fact that the shape is rather specific and original and the quality of finish of both interior and exterior surfaces is fine (3.4.2, 4.4.3). In addition, decorated features are sometimes present (2.2.2).

Two more aspects should be mentioned here: the presence of spindle whorls made of HBW fabric at Tiryns and possibly Aigeira (5.2.2.1) and the find of a small HBW bowl, which might possibly have been a crucible (4.3.1.7). Even though it cannot be confirmed as yet, whether these specimens have the function that have been attributed to them¹⁰⁶, it does bring the question of whether some of the jars (which are plentiful and of varying sizes and shapes) could have been used for other functions than just food preparation or storage (5.3.2).

Only more detailed analyses of the physical properties, surface finish and the identification of residues and wear marks of HBW vessels might help understand better the function of the various shapes represented.

¹⁰⁴ It was observed, in ethnographic studies, that both individual and familial (for sharing) eating vessels can be used, small bowls being between 10 and 23 cm diameter and large ones between 20 and 95 cm (Henrickson, McDonald 1983: 632).

¹⁰⁵ However it has been observed that eating vessels which often have a short lifespan "...could discourage decorative efforts" (Henrickson, McDonald 1983: 632).

¹⁰⁶ Or that these specimens are indeed related to HBW.

2.2.4 Distributional analysis

An analysis of the typological similarities and differences between HBW from the different Mycenaean sites seems necessary to understand the HBW phenomenon and how homogenous it actually is. Quantitative information of the amount of specimens per shape type and site is displayed in: [Figure 2.6], including Mycenae¹⁰⁷, to facilitate comparisons.

One element to consider initially concerns the amount of identifiable and unidentifiable shapes. The present typological analysis can only be done on a restricted quantity of the material found and published, only two-third of the Tiryns and Menelaion HBW corpuses and one-quarter of Khania HBW corpus have identifiable shapes.

It can be noticed, at first, that the HBW repertoire of each site is composed of a wide range of shape types, around seven to fifteen categories. Even in the two sites where only ten specimens have been found (Thebes and Lefkandi), they can be categorised into seven/eight different shape types.

The HBW shape types that are the most widely distributed amongst the sites (in more than five out of the nine Aegean sites studied) are: carinated vessels (T1 C1), “Italian cup” (T2 C1), rounded bowls or lids (T3 C1), conical bowls (T3 C3), conical buckets (T5A C1), straight-sided buckets (T5C C4), wide-mouthed jars (T6A C1, T6A C3), simple collared jars (T7A C1), and collared jars with vertical handles (T7B). All (but one: basins T4) the main shape types are represented, including both large and small vessels. It is also interesting to note that some of these shapes are less common, like the cup T2 C1 (not found at Khania and Mycenae where the HBW corpus is large), the conical bowl T3 C3 and the two types of buckets T5A C1 and T5C C4.

¹⁰⁷ It is however discussed in more details in: 4.3.3.2.

It should be noticed, however, that five of these shapes are basic ones (like bowls, buckets and wide-mouthed jars) and that two other shape types (the collared jars) are only theoretical groups since they might have different types of handles or no handles at all, different functions (for cooking or not) and influences (Mycenaeen imitations).

In addition, about half of the sites studied include more than seven (out of ten) of these most common shape types, with the exception of Korakou, Lefkandi, Dimini and Khania. There are two possible reasons for this, the quantity of material found and published and/ or it might relate to an intrinsic difference in ware.

It might then be useful to have a look at the specific shape types which are only found in one or two sites and which bear some characteristic features.

Out of the 43 categories of shapes recorded throughout the entire HBW corpus, thirteen are only represented at one site: mainly Tiryns but also Aigeira, Dimini, Khania and Mycenae¹⁰⁸. In addition, five shape types are only found in two sites at a time. They concern jars (T6/T7) and utensils (T8) and are always found at Tiryns.

It is at the site of **Tiryns** that the largest quantity of exceptional shape types can be found: seven shape categories are only found at Tiryns and five are only found at one other site. It includes a type of collared cup (T2 C2), a type of bucket with a T-shaped rim and many knob decorations on the body (T5C C5), a globular wide-mouthed jar with incised zigzag lines (T6A C5), hole-mouthed jars (T6B, also found at Korakou) with cordon and knob decorations, a type of collared jar with vertical handles (T7C C4) and one utensil (a pan T8 C5): all of these are similar to shapes and/or decorations found in the Trojan “Knobbed ware” (2.4.1). Two other types of collared jars (T7C C3 and T7C C2) and some of the Tiryns

¹⁰⁸ The Mycenae specimens are discussed in: 4.3. They are not included in the table since the material was studied after the typology was established and new shapes found at Mycenae didn't correspond to any of the entries created.

specimens of lids (T8 C1), stands (T8 C2) and dipper/ladle (T8 C3) are also exceptional. They might be imitations of Mycenaean shapes (2.3.1.1).

On the site of **Aigeira**, there are four exceptional types, one (T7C C2) of which is also found at Tiryns and is a probable imitation of a Mycenaean shape (2.3.1.1). The other shape types include: a bucket with vertical handle (T5A C3) and two utensil types, a spouted cup and a spoon decorated with a bird (T8 C4 and T8 C6) for which I have not found any parallels. In addition, some differentiations in either the decoration (bowl with impressed rim: T3 C1) or the overall manufacture are sticking. Indeed, some of the specimens have a very low quality of forming (walls and/or rims very irregular, sometimes deformed) and they look very different from the other specimens [Aigeira 1977: 12 and 1977:10]. It is, however, difficult to understand and interpret the corpus until the full repertoire of the HBW from the site is published.

At **Dimini**, several aspects of the HBW corpus are not found at other sites, it concerns both shape and decorative features and it represent half of the corpus published. A small conical cup (T3 C3), a very incurving basin (T4 C3), a kind of neckless jug (T7B), a collared jug with three handles (T7B) and a four-legged stand (T8 C2) are the most unusual shapes. Two specimens of buckets are also quite unusual with lug handles placed very low on the body (T5) [Dimini 11a and 11b]. Then there is one type of uncommon decorations of a carinated vessel (2.2.1.1).

Finally, on the site of **Khania**, there are two types only found there: a carinated vessel type with knobs on carination (T1 C5) and a bucket with horizontal handles (T5C C3). In addition, it can be observed that there is very little decoration on the HBW specimens: no plastic cordon with finger-impressions in the LM IIIB2 period [Figure 2.7].

The site of **Korakou** also includes some very specific features, such as the hole-mouthed jar (T6B) mentioned earlier, which is highly decorated, and another type of decoration only found on one HBW so far, the zigzag paint on a basin (2.2.2).

All this tends to indicate that there are important variations in both typology and decorations between several sites. It does not look like it is linked to the chance of excavation finds or the fact that the corpus in some sites is not very large, since variations appear in both sites with large and small corpus.

Another aspect of this distributional analysis concerns the proportion of shape types per site and how it compares between them. Great variations in the total quantity of specimens for each site prevent a comparative study without the use of charts providing a percentage of the main types per site [Figure 2.8]. Only the sites with the largest quantities are illustrated since the smaller the quantity the less representative it might be. Observations made might be biased by the fact that excavation finds might not be representative of the actual reality of the time but it does provide some interesting aspects to look into.

Groups have been made to try to avoid subjective appellations. Cups (T2) and bowls (T3) have been grouped as small vessels, wide-mouthed (T6A) and hole-mouthed (T6B) jars have been separated and basins (T4) have been included with utensils (T8) as they would fit best in this group and are not present in enough quantity to justify forming a separate group.

The first element to note, in the proportion of main types, is the similarities between only three sites: Tiryns, Korakou and Menelaion. Indeed, it appears that, in those sites, Type 6A (wide-mouthed jars) has the largest percentage of specimens: between 35 and 45%. Then buckets (T5) and collared jars (T7) represent the second largest groups with nearly the same proportions.

Aigeira and Dimini¹⁰⁹ can possibly form another group where Types 6A, 5 and 7 are nearly as important, even though it is less obvious for Dimini where it seems that all the groups (except T6B) are equally important. In addition, carinated vessels (T1) and utensils (T8) form an important part of the corpus.

On the contrary, at Khania (a site which can be placed apart from the others), it is Type 1 (carinated vessels), which has by far the largest proportion (nearly 50%) and only then it is the buckets (T5) with almost 30%.

Last, it should be mentioned that a diachronic analysis of the shape distribution amongst the sites is impossible at the moment either because HBW only belongs to a short period of time (Menelaion, Thebes), or the context is not precise enough (Korakou, Tiryns, Khania), or because not enough material or information is published (Aigeira, Dimini).

In conclusion, it seems that if we combine the evidence of the presence of specific shapes and the proportion of the various shapes within a site, there seems to be important and possibly significant variations (in shapes/decorations and in quantitative distribution of shapes) between at least four sites: Tiryns, Aigeira, Dimini and Khania.

¹⁰⁹ It should be noted that the material from these sites is only partially published (*I.I.I.2*).

2.3 Comparative analyses

As mentioned in the previous section, some aspects of the HBW corpus, including both shapes and decorative features, have been linked with Mycenaean pottery. In addition, groups of handmade pottery found outside the Mycenaean area have been identified as HBW: in Cyprus and the Near East (1.1.2).

Reciprocal influences of HBW and Mycenaean ware have been outlined by Rutter (1990), shape similarities between Aegean and Cypriot HBW have been discussed by Pilides (1994) and with Near East HBW by Badre (1998; 2005) but to what degree these influences/similarities extend and whether they are actually reciprocal are two directions, which need to be reconsidered now that the corpus of HBW is well established and that more material has been published.

2.3.1 Comparison with Mycenaean wares

First, it should be underlined that HBW differs greatly in fabric and production from the Mycenaean wares (3.1.1). In addition, Mycenaean shapes are often more complex and elaborated (such as stirrup jars, kalathos, rython), and simpler Mycenaean shapes (such as cups and bowls) bear characteristics which are almost absent from HBW: such as raised and/or concave base, flaring rim, thin walls and most of all paint.

However, it has been pointed out in previous publications that there are similarities between certain HBW and Mycenaean shapes, decorative features and even some technical aspects. Indeed, even though the conservatism of potters can generally be observed, whether in the archaeological record or in ethnographic studies¹¹⁰ (Rice 1984), HBW has been

¹¹⁰ As an example, in a study of an Indian hill tribe, it was shown that the population who was well aware of the use of the wheel had decided to continue making pottery by hand for spiritual reasons (wheel-thrown pots were

reported to include Mycenaean shapes like amphora and hydria (Kilian et al. 1982a: 90; Rutter 1990: 37- 39; Kilian 2007: 52). In addition, it also has been mentioned that the reverse is also true, HBW influenced Mycenaean ware (Kilian 1978: 315; Rutter 1979: 391; 1990: 37-39).

I have grouped, in a table of shape comparisons [Figures 2.9-11], the specimens of HBW that have been labelled with a Mycenaean shape name and illustrated a representative Mycenaean specimen to compare. That was the starting point of this research, which led to the presentation of other HBW shapes, which bear similarities with Mycenaean specimens and to re-assess the evidence previously published.

I have mainly used for comparison the overview of Mycenaean decorated pottery by Mountjoy (1986), the studies of LH IIIB pottery from Mycenae (Wardle 1969; 1973), the recent studies of LH IIIC pottery from Lefkandi (Evely et al. 2006) and the studies of Minoan pottery from the Cretan site of Khania (Hallager, Hallager 2000; 2003).

2.3.1.1 HBW influenced by Mycenaean wares?

The Mycenaean influence on HBW is mainly attested on the site of Tiryns¹¹¹ and can be of two different approaches: Mycenaean shapes made in HBW technique and HBW specimens produced on a wheel.

This phenomenon seems to have appeared rather early on (in the LH IIIB period), contrary to what Rutter (1990: 39) mentioned, and not only on the site of Tiryns but also in other locations.

It should, however, be mentioned that not all the correlations published before seem to be correct. Indeed, Kilian (Kilian et al. 1982a: 90) mentioned the existence of HBW pyxis,

seen as impure) even though their technique was much more time consuming and non-efficient (much loss by breaking in firing) (Aiyappan 1947: 57-59).

¹¹¹ It is mentioned that the specimens imitating Mycenaean shapes represent about 9% of the total HBW (Kilian 2007: 52).

kylix and tripod cauldron at Tiryns, which do not appear in the final publication (Kilian 2007).

- **Shape imitations:**

The HBW types, which imitate Mycenaean shapes the most are collared jar types (T7) and utensils (T8). Comparative illustrations of Mycenaean and HBW specimens are presented in: [Figure 2.9].

First, a single HBW vessel in the shape of a Mycenaean **hydria** (FS 128) has been found at Tiryns in a LH IIIC Early context (Kilian 2007: 21).

Several HBW specimens of collared jars with handles from Tiryns have been labelled collar-collared amphorae (Kilian 2007: taf. 16). However, only one of them is similar enough to be an imitation of the Mycenaean **amphora** (FS 69), it has a well defined shape, a thin wall and a ring base, all of which are rather uncommon in the HBW repertoire. It comes from a LH IIIC Late context. Some HBW specimens from Mycenae might also be included here (4.3.2).

Another HBW specimen of collared jar with horizontal handles from Tiryns has been associated with the Mycenaean **amphoriskos** (FS 59) (Kilian et al. 1981: 170, fig. 40.2; 1985a: fig. 12.1). In addition, two HBW specimens from Aigeria have also been interpreted as imitation of the same Mycenaean shape (Deger-Jalkotzy 2003a: 458).

Mycenaean **two-handled cooking pot** (FS 65) imitations have also been reported from the HBW corpus of Tiryns (Kilian et al. 1982a: 90). Eight HBW cooking vessels and a handle fragment are labelled under the name cooking pots, either with one or two handles. They belong to the LH IIIC Early to Late periods. A specimen from Aigeira could also be mentioned here.

Two HBW specimens from Tiryns, along with a specimen from Korakou, have been interpreted as Mycenaean **tubs** (Kilian 2007: 26-27). The specimens from Tiryns are, however, very fragmentary to be certain of the exact shape and size and the specimen from Korakou is rather small to be a tub/vat, which are large and heavy storage vessels.

HBW **jugs** from Tiryns (also present in other sites) have been compared to Mycenaean specimens (especially FS 110 which are medium-sized), in the Tiryns HBW final publication. The Tiryns specimens appear for the first time during the LH IIIB period and all through the LH IIIC period (Kilian 2007: 24).

HBW simple rounded **lids** from Tiryns have been compared with Mycenaean specimens (Kilian 2007: 25). The thirty-four HBW specimens appear from the LH IIIB Developed to the LH IIIC Late. However, the HBW shape is not really close in overall shape to the simple Mycenaean lids (FS 334) which have a straight wall rather than rounded.

One type of HBW **cooking stand**, found in Tiryns, has been compared to Mycenaean specimens (Kilian 2007: 27). In this case too, the first HBW specimens appear during the LH IIIB Advanced period and continue into the LH IIIC.

The HBW hole-mouthed jars have been compared to the Mycenaean **alabastra** (FS 98) (Kilian 2007: 31). However the Mycenaean type has a short neck and horizontal or vertical handles, features which have not been found in the HBW corpus. 24 specimens (some of which are very fragmentary) are reported from Tiryns. They all bear many applied decorations, an uncommon feature in Mycenaean ware.

The HBW category entitled 'vessel on foot' includes specimens related to the Mycenaean **kylix** (FS 274). At Tiryns, the presence of this type in the HBW corpus was mentioned in early publications (Kilian 1985a: 81, fig.14: 5, 7) but no entry corresponds to this type in the final report (Kilian 2007). In spite of this, it might be possible that some of the

vessels interpreted as conical bowls or lids could belong to a type of Mycenaean conical kylix (FS 274) since HBW kylix stems have been found at other sites (2.2.1.3).

A HBW rounded cup with an attachment of a high-swung handle found at Tiryns (dated to the LH IIIC Late period) bears similarities with some Mycenaean **dippers/ladles**. Some specimens found at Mycenae might also be related to this type (4.3.1.2), even though they slightly differ in shape. Mycenaean ladles do vary in shape, especially the handle and the base (WBM 10: fig. 14: nos. 68-1411, 68-1431).

- **Technique imitations?**

Eleven HBW specimens (including three horned handles) from Tiryns were first reported to have been made with a typical HBW fabric and burnishing but formed on the wheel (Kilian 1985a: fig. 6). However, in the final publication (Kilian 2007), none of those specimens are included in the corpus.

Wheelmade burnished vessels have also been reported at the site of Aigeira but without any further information (Deger-Jalkotzy, Alram-Stern 1985: 421). This is, however, an early publication where some of the HBW material has later on been excluded from the corpus (1.1.1.2).

2.3.1.2 Mycenaean wares influenced by HBW?

Several different shapes and decorative feature, found on Mycenaean vessels, and which appeared during the LH IIIB or IIIC period, have been interpreted as being derived from HBW specimens. Comparative illustrations are presented in: [Figures 2.10-11].

- **Shape imitations:**

The first shape type to mention is the Mycenaean **carinated cup** (FS 240). Indeed the carinated cup is a new shape in the Mycenaean repertoire, which appears at the beginning of the LH IIIC period. The same shape type is also present in the HBW corpus and it does also appear at the same time, at least on the Mainland (2.2.1.1). This has led to the interpretation that the Mycenaean version is an imitation or is inspired by HBW specimens (Kilian 1978: 315; Rutter 1990: 38-39).

Indeed, at Lefkandi, the first specimens of carinated vessels in both Mycenaean fine wheelmade ware and in HBW fabric appear at the same time, during the LH IIIC phase 1a (A.2). However, it is mentioned that, while the Mycenaean specimens continue to occur in the subsequent phases, the HBW ones are said to only appear in the initial phase¹¹². In fact, the HBW version is said to be “the prototype of the wheel-made” ones, which are said not to be of Mycenaean tradition (Evely et al. 2006: 138).

At Tiryns, the Mycenaean monochrome carinated cups, which appear in the LH IIIC Early 2 period, have been linked to HBW versions due to the fact that they have been found together, in the north-eastern Lower Town (Stockhammer 2008; 2009: 420). Their connection has been interpreted as defining a group of foreign immigrants who were differentiated from the local population.

At Khania, however, the earliest HBW specimens come from the LM IIIB2 phase (Hallager, Hallager 2003: 255). Minoan carinated cups do also occur in LM IIIB2 period, in very sparse quantity, and are said to be “unsuccessful local experiments” (Hallager, Hallager 2003: 202). In fact, the Minoan version is said to have been inspired by HBW as well as Grey Ware specimens, both being quite common at the time.

¹¹² The HBW carinated specimen found in phase 2a could be, according to the excavators, of an earlier level (Evely et al. 2006: 218).

At Mycenae, the situation is different as it is still unclear whether the first HBW specimens of carinated cups appear before the first Mycenaean ones (4.3.2).

It should be underlined here that ultimately the origin of the HBW carinated cup shape is believed to be in the Central Mediterranean region (Hallager 1983: 358; Bettelli 1999: 464-465; 2002: 121) where specimens made in the local Impasto ware and Grey ware appear already in the MBA period, and are a common shape of the local repertoire (Belardelli 1994).

What seems to be lacking in the current discussion and might need to be debated in the future is whether the Mycenaean carinated cups could in fact be direct imitations of the Italian versions¹¹³; since it is well known that there were strong contacts between the two regions as early as the LH I period, such as the possible presence of Mycenaean potters in southern Italy (5.4.3).

Another Mycenaean shape type, underlined by Rutter (1990: 37) and is said to have been influenced by HBW is the **angular krater** (FS 282). The only two HBW examples mentioned by Rutter come from Menelaion and are rather small fragments of rims which do not really give an appropriate idea of the overall shape of the body. This is a hypothesis which cannot really be verified by the present available corpus.

The last Mycenaean shape mentioned by Rutter (1990: 37) as being derived from HBW is the **shallow tray** (FS 322). However, there are problems with the HBW specimens used by Rutter, for comparison. First, the first two specimens mentioned (Kilian et al. 1979: fig. 31:1; Avila 1980: pl. 25: 383) do not belong to the HBW corpus anymore¹¹⁴. Secondly, as it can be seen on the illustration [Figure 2.10: 1-2], the other two fragments (Kilian 1985a:

¹¹³ As suggested by Wardle (pers. comm.).

¹¹⁴ They are not mentioned in the final publication (Kilian 2007).

fig. 13: 6, 10) are of another type of vessel, a stand (T8 C2). Another specimen from Menealion (Catling 1981: no. 34) was mentioned but again it is not the same type of vessel [Figure 2.10: 3], as it also a stand¹¹⁵.

- **Decoration imitations:**

The first type of decoration concerns the handle decoration of some carinated vessels with **bull's head finials** attached to the top of the handle [Figure 2.11] (Rutter 1990: 38). Mycenaean versions are found from the LH IIIC Middle period onward on most sites (Mycenae, Tiryns, Asine, Korakou) (Evely et al. 2006: 225, note 81). However, they seem to already appear during the LH IIIC Early period at Lefkandi where the first Mycenaean specimens belong to LH IIIC Phase 1a (Evely et al. 2006: 183-184). Found in this same phase, a scar of an attachment on a HBW handle has been interpreted as a possible animal protomes (Evely et al. 2006: 218). It should be mentioned that even though animal protome in HBW have been mentioned for five sites, clear published illustrations are rare, and the illustrations published show differences among the HBW specimens as well as with the Mycenaean specimens¹¹⁶.

Another hypothesis on the origin of the bull's head finials has been put forward associating it with the influence of metal vessels (Evely et al. 2006: 225, note 81). It is mentioned though that the metallic versions probably originated in the Central Mediterranean.

Plastic decoration, such as **applied cordons with impressions** (diagonal slashes) below the rim, appear on Mycenaean kraters (FS 282) during the LH IIIC period and this is, according to Rutter (1979: 391), "clear evidence of the influence of these earlier wares

¹¹⁵ This specimen has also been compared to a type found in Macedonia and called Pyraunos (Rutter 1990: 37).

¹¹⁶ Other, more similar HBW specimens from Tiryns have been published before (Kilian 1985: fig. 6: 6, 8, 10), but they are not included in the final publication of HBW from the site.

[HBW] on later Mycenaean pottery". As seen earlier, this type of decoration is characteristic of HBW and especially the wide-mouthed jars [Figure 2.11]. Mycenaean specimens with such decoration appear during the LH IIIC Middle period (Rutter phase 4) at several sites in the Argolid: Mycenae (Developed phase) and Tiryns, as well as Corinth, Lefkandi (Phase 2a) and Athens. A Mycenaean specimen found at Corinth is slipped and burnished (Rutter 1979: 361).

In addition, it has been noticed in the final publication of Khania LM IIIC material, that finger-impressions and pinched decorations on Minoan lids and jars are an innovation in the local utilitarian fabrics of the period, which post-date the appearance of HBW at the site (Hallager, Hallager 2000: 163).

It should be noted, however, that applied cordon with indented wavy lines and fingerprints used on Mycenaean pithoi appear during the LH IIIA-B period in some sites (Evely et al. 2006: 225, note 80).

The last influence recorded concerns **painted imitations** of plastic decoration [Figure 2.11]. According to Rutter (1990: 38), there are two types of painted imitations:

_ Dark-on-light dashes or light-on-dark **dots at the carination** of cups (FS 240) are said to correspond to the grooved decorations, in the same area of the pot, on HBW carinated vessels.

_ Dark-on-light or light-on-dark **dots on the rims** of carinated cups (FS 240) and deep bowls (FS 285) are said to correspond to continuous finger-impressions on rims of HBW specimens from Tiryns and Aigeira. However, the Tiryns specimens mentioned by Rutter do not have finger-impressions on the rim but diagonal incisions. Besides, out of the three specimens mentioned, only one is still present in the final publication (previously published in: Avila 1980: pl. 15: 206 and recently in Kilian 2007: no. 271).

Whether these two decorative features found on Mycenaean vessels do imitate HBW features is not really obvious. In the first case, dots and a grooved line are two different types of decoration and, in the second case, dots on the rim of HBW is rather uncommon, which makes one wonders if the Mycenaean potters would have been aware of it.

2.3.1.3 Conclusion

From this analysis and for the time being, it can be concluded that, indeed, some HBW specimens are imitations of Mycenaean shapes, especially concerning vessels for food preparation. These specimens are mainly found at Tiryns (and at Mycenae) and they do start appearing from the LH IIIB period onwards, hence at the same general time as HBW appears. Concerning the imitation of techniques, more material needs to be published.

Concerning the HBW influence on Mycenaean ware, the situation is unclear. Evidence related to this aspect is weak; the only aspect, which will need to be debated more thoroughly, is the carinated cup.

2.3.2 Comparison with HBW from the Eastern Mediterranean

First, it should be noted that, for the present study, only the specimens published in enough detail and with a good stratigraphical context (1.1.2.2) are taken into account. Consequently, for the Near East, it only concerns the site of Tell Kazel.

Secondly, there is a difference in quantities of material found between the three regions, restraining the interpretations; for Cyprus (five sites) as well as for the Near East (one site), only between 20 and 25 specimens, in each area, are published/illustrated and have identifiable shapes.

Typological comparisons between Aegean, Cypriot and Levantine HBW are illustrated in: [Figure 2.12]. There are five HBW shape types, which are common to the three regions. They are quite basic and commonly distributed shapes (rounded bowls, buckets, wide-mouthed jars), except for one (collared jar with horizontal handles), which might be an imitation of a Mycenaean shape (amphora), although the specimen from Tell Kazel is quite different.

Then, there are possibly five more shapes from the corpus of **Cyprus** similar to the present HBW typology [Figure 2.13]: two of those are common ones (collared jars T7A and conical bowl T3 C3), and the other three are exceptional HBW shapes only found at a single site.

The possible carinated vessel, found at Kition, is very fragmentary. The shape of the carination could be similar to a specimen from Dimini (T1 C3). A type of collared jar, found at Kition, has strong similarities with a HBW specimen from Tiryns, a globular collared jar with vertical handles on the body (T7C C4).

A basin with lug handles also found at Kition resembles both in shape and in decoration to the Korakou specimen (T4 C2). They are both decorated with a zigzag. However, the technique is different. The Korakou specimen is painted whereas the Cypriot one is made with several incised lines, which were filled with white paste.

The decoration of two other Cypriot HBW specimens (a bowl and a collared jar, both from Hala Sultan Tekke) is done in the same way (Pilides 1994: no. 29, 31). Those Cypriot specimens are said to be imports¹¹⁷ (Pilides 1994: 39, 72). There are other specimens with the same decoration but made in a local fabric, found at Kaloriziki, in Cyprus (Pilides 1994: fig. 35.6).

¹¹⁷ Results from a NAA of the specimens (3.3.2.1).

It should be added here that Pilides (1994: 38-40, 72-73) underlined that this is very similar (both in shape and decoration) to specimens of the Trojan "Knobbed ware" (shape A101). The Trojan specimens are also incised and not painted but they are not filled with paste, as with a globular jar from Tiryns (T5C C5).

Concerning the HBW material from **Tell Kazel**, in addition to the five specimens mentioned earlier, there are six more shapes, which are similar to the Aegean corpus [Figure 2.14]:

- _ carinated vessel (T1 C1): but it has simple vertical loop handles, whereas all the Aegean HBW specimens of carinated vessels with preserved handles show that they had high-swung handles (2.2.1.1).
- _ "Italian cup" (T2 C1): it is very similar to the one found in Greece, at Lefkandi (2.2.1.2). Several specimens have been found at the site with slight variations (Badre 2003: fig. 9.5).
- _ Conical and straight-sided buckets with lug hands (T5A C2 and T5C C2)
- _ Two types of collared jars: with short straight neck (T7A C2) and with a vertical handle (T7B): possibly a jug.

In addition, there are two specimens of HBW found at Tell Kazel, which do not match any HBW specimens recorded in the Aegean [Figure 2.15], a shallow plate and a high straight, cylindrical container with a vertical loop handle on the body. This latter specimen is said to possibly be a measuring container as such a shape is found nowadays being used in this way (Badre 2003).

In conclusion, it can be observed that the corpus of HBW from Cyprus and Tell Kazel finds close parallels in the Aegean HBW, in particular the latter one, even though two

unmatched shapes have been found. It is also interesting to note that the range of shape types is varied with most main types are represented at Tell Kazel.

2.4 Origin(s) of HBW:

Previous theories and methodological considerations

There have been many typological comparative studies in the past and also more recently, and among them many possibilities of finding similarities are possible. Nearly all the areas around Greece, from the west with Italy, the Adriatic coast, to the north with the Danube area, the Balkans and north-west Greece, to the north-east with Rumania, Bulgaria and Troy, have been taken as the answer to the question: where do the HBW makers come from?

The primary aim here is to present a critical literature review of a selection of typological comparative studies previously undertaken. This analysis brings forward some problems of methodology which are necessary to take into account prior to undertake a comparative study.

2.4.1 Literature review

First, it should be noted that there are two types of comparative studies: early studies, which only compare HBW from a single site with other areas, and later studies, which focus on specific HBW shapes or decorative features, from whatever site they come.

The following review¹¹⁸ is organised by geographical area. However, the first study to be mentioned should be Rutter's comparative study, as it is the first one published and the basis for all the following studies undertaken. Rutter (1975: 23-32) compared the HBW from Korakou with many possible areas of Europe and Troy, and from that, following studies have concentrated on particular regions.

¹¹⁸ The literature review of the publications on the possible origin of HBW presented here is not exhaustive. This is due partly to the fact that other such literature reviews have been done before (Bouzek 1985: 182-196; Pilides 1994: 1-32; Jung 2006: 32), partly to the fact that some views are shared by several archaeologists, and also, simply because there are too many studies published to be able to summarise them all here.

- **Troy and south-east Europe:**

As mentioned earlier (1.1.2.3), two foreign wares (“Coarse ware” and “Knobbed ware”) found at Troy were compared with the HBW from Korakou. These two wares were interpreted as being the evidence for the arrival of foreign populations at Troy, coming from south-east Europe: Bulgaria, south-eastern Romania, Thrace or Thasos¹¹⁹. This has led to the interpretation that HBW might also come from one of these regions. The first step should then be to re-assess the typological comparisons between the two Trojan wares and the whole corpus of Aegean HBW.

The first aspect to notice is that the repertoire of shapes of the Trojan **"Barbarian ware"** is rather limited compared to the Aegean HBW. It includes only nine shape types, as reported by Blegen (et al. 1958: 159): one cup type (cup: A102), three types of wide-mouthed jars (C86, C39, C58) and jars (B33, B42, C85) and two types of utensils (a lid: D36 and a baking tray: D37). Out of those, three shape types (B42: amphora, C39: pithos and D37: baking tray) are of local origin as they were also made in the local Tan or Grey wares and found in the previous phase (Troy VIIa).

Rutter (1975: 23-24) associated this ware with his Korakou Group 1¹²⁰ due, in particular, to the similarities between the Korakou wide-mouthed jars decorated with finger-impressed cordon (nos. 1, 9, 15) and Troy shape C86, which are indeed much alike [Figure 2.16A]. It was also noted that the Korakou HBW incurving rim of the hole-mouthed jar (no. 1) has a parallel in the Trojan “Barbarian ware” [Figure 2.16A]. In the Aegean HBW, this shape is only found at Korakou and Tiryns. The other element is the lug shape of the handles

¹¹⁹ The details of the arguments, and how valid they are, are beyond the scope of this thesis. For summaries: Blegen et al. 1958: 144-145; Rutter 1975; Koppenhöfer 1997; 2002; Guzowska et al. 2003. In addition, the wares and their origin are being studied by Hnila.

¹²⁰ For the detail of the Korakou groupings: 3.1.4-3.4.2.

of some buckets from Korakou HBW which are found on shapes C85 and C86: [Figure 2.16A].

Six other "Barbarian ware" shape types can possibly find parallels in the Aegean HBW, essentially from the site of Tiryns [Figure 2.16B]. Some of those shapes (cup A102, baking tray or pan D37) are only found at Tiryns and others are possible imitations of Mycenaean vessels ([Figure 2.16C]: amphora B42, jug B33, pithos C39).

Turning now to Trojan "**Knobbed ware**", it has a larger corpus with fourteen shapes recorded by Blegen (et al. 1958: 159). There seems to be five groups of shapes (as identified in Blegen's publication): one main type of cup (with high-swung handles: A103, A105, A106), three types of bowls (round with lug handles: A101, slightly and wide with high-swung handles: A107 and deep with a vertical handle and knobs: A104, it could be a jar), several types of jugs (very small to large: B46, B48, B44, B47, B45) and two types of jars (no handle: C83 and with vertical handle and knob: C84). In fact, most of the shapes have a neck with variation of sizes from a cup to a large jar.

Rutter (1975: 27-28) associated his groups 2 to 4 from Korakou HBW to this Trojan ware [Figure 2.17A]. The first element to be noted is the handle found in Korakou group 2 and at Troy (A107), which is of a similar type (high-swung) but with rather different features: the Trojan specimens seem to be more elongated to the side, in a diagonal, with sometimes a pointy end and a knob whereas the Korakou specimen no. 7 is vertical. Moreover, in the HBW corpus, high-swung handles are only present on carinated vessels (T1) whereas in "Knobbed ware" they are found on cups (A105, A106), bowls (A107) and jugs (B45).

The other important aspect, noted by Rutter (1975) for his group 3, is the basin/bowl with zigzag decoration (T4 C2), which is similar in shape and design to Troy shape A101. However, the technique used for the decoration is different: the Trojan specimen is incised

whereas the Korakou HBW specimen is made with a thick black paint. Though there is an HBW specimen from Tiryns (a globular jar T5C C5) with incised zigzag lines and a knob on the body [Figure 2.17A].

Then Rutter (1975) related the single specimen from his group 4 with two Trojan "Knobbed ware" shapes: B45 and C84 [Figure 2.17A]. The Korakou specimen is very fragmentary (the overall shape is unknown) but the specific shape of the neck (very pronounced) isn't very similar to the Trojan specimens, which have a simple smooth neck and are very different.

Concerning the other "Knobbed ware" shape types, they include a range of vessels from what is identified as cups, for the smaller specimens to large jars with and without handles of various shapes (high-swung, vertical) and with or without decoration (incisions, knobs) [Figure 2.17B]. Such a variety is not matched in the Aegean HBW corpus where vessels are mainly large and without decorations (2.2.1.7), with the exception of one cup found at Tiryns (T2 C2).

At last, the selection of more recently published "Knobbed ware" material presented in: [Figure 2.18] gives an idea of the extensive selection of decoration present. Some of the decorations of "Knobbed ware", which are abundant (hence the name), are also present on HBW but often on different shape types and rarely so abundant (2.2.2).

Knobs and horns are mainly found on HBW wide-mouthed jars but never on cups (like Troy A106) and rarely on jars (like Troy A104, C84), with few exceptions (T7C C1). Incisions and impressions are found in the HBW corpus but more scarcely and often minimal (Korakou T4 C2, Tiryns T6A C5, Dimini T4 C3) whereas it is rather common and in more varied combinations on "Knobbed ware": on bowls, cups and jug. A channelled feature that seems quite common in "knobbed ware" is absent in the HBW corpus.

In conclusion, only a few Aegean HBW specimens nearly exclusively from Korakou and Tiryns, bear some similarities with the Trojan wares. However, it can be seen that there are some specific and characteristic shapes and decorative similarities, although most decoration of “Knobbed ware” is not very common nor expressed in the same way in the Aegean HBW repertoire.

- **North-west Greece, Epirus:**

Comparisons with north-west Greece, where handmade pottery is of local tradition, were also first mentioned by Rutter (1975: 26), due to the presence of handmade pottery and shapes such as wide-mouthed jars and finger-impressed cordon decorations at sites like Dodona, Elaphotopos and Mazaraki.

In addition, this region was also selected as the origin of the HBW makers (in the Mainland only) by Kilian (1978: 313; 1985a: 82-84; 1988: 133), as well as Cephalonia. The main evidence for it was related to the presence of Barbotine, knobbed and finger-impressed cordon decoration (2.2.2) on the HBW material from Tiryns. In the final publication, it is said that about 9% of the Tiryns HBW corpus has been influenced by north-west Greek tradition (Kilian 2007: 55).

- **Central Europe, the north-alpine cultural complex:**

The possible origin of the HBW makers in the central Danube area ("Urnfield culture") was postulated by Deger-Jalkotzy (1977; 1983) on the basis of the HBW material from Aigeira. The link between the "Urnfield culture" would have been through the “Adriatic koine” via southern Italy (discussed later on).

This theory was based on two elements:

_ carinated vessels similar to "Early Urnfield cups".

_ presence at Aigeira of a grooved HBW specimen. Groove decorations are characteristic elements of the Proto-Villanovan pottery assemblage as illustrated in: LoPorto 1963; 1964.

I want to emphasise here the fact that this is the only grooved HBW specimen published up to now. This aspect, along with the stratigraphical problem discussed before (1.1.1.2), makes the evidence quite weak.

- **Central Balkans:**

Comparisons between HBW and pottery from the Balkans was first mentioned by Kilian (1978: 311-320), on the basis of the presence on HBW of finger-impressed cordon and pellet lugs. Other authors have provided specific comparisons with pottery from various areas, the latest being from the Morava valley (Bankoff and Winter 1984: 8-10; Bankoff et al. 1996: 193-194). Comparisons are made using material from both cemeteries and settlements.

The latest comparative study on HBW, published by Jung¹²¹ (2006: 24-31), has one section dedicated to the comparison between HBW and pottery from the Balkans. Four pieces of evidence (two shape types and two types of decoration) are reviewed in great detail, with many references to various cultures including central and south-eastern Europe:

_ cups with handle and finger-impressed cordon, as found at Lefkandi, Tiryns and perhaps Aigeira (T2 C1): Jung 2006: 24.

_ hole-mouthed jars, as found at Korakou and Tiryns (T6B): Jung 2006: 25.

_ finger-impressed and plain cordon decorations: Jung 2006: 25-28.

¹²¹ The main subject of this publication is however related to chronological correlations between the Mycenaean area and Italy.

- **Central Mediterranean:**

This area is divided into several cultures with different typological and decorative variations in their pottery, living in different regions¹²². They all share the fact that the local pottery produced, labelled Impasto ware, was handmade and burnished¹²³. It is this ware that is, in most research studies, interpreted as the source for HBW and this view has reached a rather wide consensus even though often reservations are made concerning some specific shapes and/or decorations, which are more closely related to the above mentioned regions.

The first comparative studies were relying on rather old and often incomplete excavation reports (Popham and Milburn 1971: 338; Rutter 1975; Deger-Jalkotzy 1977: 51; Kilian 1978: 314; Hallager 1983: 111-119; 1985). At the time, chronological correlations between the two regions were still lacking and this led to some confusion¹²⁴. More recent publications of HBW also include comparisons with Italian shapes but again they all rely on the same published material of Impasto ware.

In the final publication of the site of Khania, the HBW material is labelled using Italian shape names: ciotola carenata, olla, scodella, dolio, vaso situliforme (Hallager, Hallager 2000: 165-166; 2003: 253-254). Each shape is compared with Sub-Apennine pottery from Southern Italy, but unfortunately no illustrated comparisons are provided and the publications used are the ones already presented in the previous publication: Hallager 1985.

In the final publication of the HBW from Tiryns (Kilian 2007: 54-55), most shape types defined by Kilian are matched with specimens from Southern Italy: 82% of the HBW

¹²² For the time frame considered (LH IIIB-IIIC): Subapennine and then Porto-Villanovan in Southern Italy, Terramare in Northern Italy, Thapsos and Pantalica in Sicily, Nuragic in Sardinia and the Ausonio in Aeolian Islands (Vagnetti 1998: 73).

¹²³ For a discussion of the technological aspects of Impasto ware and its comparison with HBW: 3.3.2.2.

¹²⁴ Rutter (1975) compared HBW with the Impasto ware of southern Italy, especially from the sites of Porto Perone and Saturo in Apulia (LoPorto 1963; 1964). However, he did not believe that HBW could come from this area due to chronological discrepancies which are now obsolete since the Impasto Ware started much earlier than the HBW. The same situation arose in: Deger-Jalkotzy 1997.

corpus from Tiryns is said to be of Italian inspiration (Kilian 2007: 54). The Italian publications used though are also rather old and often the same as the ones used by Rutter and Hallager, including: Bergonzi et al., 1982a, 1982b and 1984.

Finally, the most recent overviews, done by Bettelli (2002) and Jung (2005; 2006), of the comparison between HBW specimens from different sites with handmade pottery from various areas: central Mediterranean for the former and both central Mediterranean and southern and eastern Europe for the latter. The conclusion for both is that HBW is mainly (but not exclusively) closely related to Italian Impasto ware. The evidence used relating to specific shapes and decoration similarly found in HBW and Italian Impasto ware is of two kinds, as discussed below.

Evidence that corresponds to HBW shapes commonly found (as established in the distributional analysis: 2.2.4) is:

- _ carinated vessels with high-swung handle (T1 C1) said to be characteristic of the Subappennine culture of RBA: Bettelli 2002: 121; Jung 2006: 32-33.
- _ cups with handle and finger-impressed cordon (T2 C1): Bettelli 2002: 125; Jung 2006: 32.
- _ buckets with conical profile and lug handles (T5A C2): Jung 2006: 35. This type is, however, not part of the most common shapes found in the HBW corpus.

The other type of evidence, corresponding to more specific shapes/decoration, is found only on isolated specimens (most of which are from the site of Dimini):

- _ stand only found at Dimini (T8 C2): Jung 2006: 34-35.
- _ stand only found at Tiryns (T8 C2): Jung 2006: 34-35.
- _ stand only found at Menelaion (T8 C2): Eder, Jung 2005: 486.
- _ basin with strong incurving rim only found at Dimini (T4 C3): Jung 2006: 36.
- _ jar with three vertical handles only found at Dimini (T7B): Jung 2006: 36.

_ different handle decoration types as found at Tiryns, Dimini and Khania [Figure 2.5]: Bettelli 2002: 121, 124; Jung 2006: 33-34. The specimen from Dimini is said to occur in Italy during the RBA.

2.4.2 Methodological considerations

The review presented above tends to show how difficult it is to find one origin for the HBW makers. One reason for this is related to methodological aspects.

- **Chronological correlation:**

One of the problems of the early comparative studies mentioned above is related to the lack of knowledge of the exact chronological context of HBW, since not enough material was discovered and analysed in detail to provide a clear timeframe for the appearance and lifespan of HBW. The same problem was, and in some cases still is, true for the areas compared and their correlation with the Mycenaean chronological system. Two examples can be outlined here: the correspondence between Troy VIIb with the Mycenaean LH IIIC period (1.1.2.3) and the correlation of the Italian chronology (mentioned above).

- **Selection of material:**

Another important preliminary requirement is the selection of the material to be compared, as, for example, in the case of comparing the horned handle from Teichos Dymaion with Italian specimens (Bettelli 2002: 121) or the grooved vessel from Aigeira with pottery from Central Europe (Deger-Jalkotzy 1977: 51).

The material from Teichos Dymaion has not been fully published (1.1.1.4) and the chronological context of this specimen is unknown or at best, guessed, which is not enough upon which to build a theory. In the case of the specimen from Aigeira, a confirmation of the

context is necessary since other specimens published in that same paper have been reclassified as EH or MH (1.1.1.2).

Then there is also the problem of the find context. It seems that since most, if not all, HBW specimens have been found in settlement contexts (1.3.5), the material to compare it to, should also come from settlements. This is especially true since the function of the HBW vessels is mainly related to household functions (2.2.3).

However, this has not always been the case as material from settlements is not always well published as opposed to funerary material, especially in north-west Greece and south-east Europe. For example, Kilian (1978: 295) compared some HBW specimens from Tiryns with pottery from Epirus, which came from cist tombs. This is also the case of material from the Balkans, found in funerary contexts, and compared with HBW in: Bankoff et al. 1996.

- **Method of comparison:**

As can be seen above, HBW typological comparative studies have mainly focused on the methodology of one-to-one specimen comparison, as advised by Vagnetti (talking about comparing HBW with Italian Impasto ware):

"Direct influence can only be demonstrated when types very characteristic and exclusive of Italy are recognised, such as for instance, a horned handle from Teichos Dymaion" (Vagnetti 1985: 31-32).

This method has led to finding a multitude of possible places of origin for HBW. For example, the wide-mouthed jar with finger-impressed plastic decoration can be found, as noted by Rutter (1974; 1975), in Troy, Romania and Italy or the ovoid jar from Cyprus (2.3.2) can be compared with specimens from the Aeolian islands, Macedonia, Bulgaria, Troy and Romania (Pilides 1994: fig. 36-38).

In addition, it has revealed *a priori* contradictory situations, like for example, the presence at Tiryns of features characteristic of both the Italian Impasto ware (carinated vessels) and the Epirote handmade pottery (barbotine decoration).

The other methodological comparison, based on whole corpus studies, has instead been ignored due to the fact that no matching assemblage to HBW typology was found. Several suggestions for this phenomenon have been attempted, the fact that handmade pottery of household production is not standardised and variations have to be expected (Guzowask and Yassur-Landau 2005: 472) or that the HBW makers being in a different context might not have needed the whole assemblage used back home (Strack 2007).

Both proposals ignore the fact that there are characteristic shapes and decoration, which are of different traditions, as in the Tiryns situation, mentioned above.

At this point it might be worth considering the question: instead, could these various aspects indicate that the HBW corpus is not homogenous and that it might not represent a single entity?

2.5 Discussion

The typology of HBW was established on the basis of a precise methodology (presented in: 2.1) including all the sites involved: no previous study has attempted this. There is a wide range of shapes and sizes in the overall corpus as well as within individual sites (2.2.1) and that some specific shapes and decoration types are only present at a single site (2.2.4). There are also important differences in the quantitative distribution of shapes with the possibility of distinguishing at least three groups of sites (2.2.4).

These observations made on the great variations in the HBW corpus from the Aegean are also visible in the HBW corpus from Cyprus and the Near East (2.3.2) and this leads to the question of the reasons for these differences. One possible explanation might be that it reflects the presence of different traditions within the HBW corpus.¹²⁵

This might, in turn, be linked to the problem of why so many different areas of origin can be postulated between the different sites as well as within a same site (2.4.1). Even though it is now widely accepted that the origin of HBW makers can be attributed to the Central Mediterranean, there are still aspects which prevent ascribing the whole corpus to the Italian Impasto tradition, as suggested in: Jung 2005; Kilian 2007. These variations might in fact be related to differences in the origin of the potters and their traditions.

Another important aspect studied in this chapter is the many HBW shapes which imitate Mycenaean pottery and in particular cooking ware (2.3.1.1), at least on a general level (shape of the overall pots), since true copies (including specific characteristics of the Mycenaean pottery: thin walls, raised bases...) are quite rare. The reverse situation (Mycenaean pottery influenced by HBW) seems, however, to not be true (unlike previously

¹²⁵ Such hypothesis was implied by Kilian (2007: 80) to explain the presence of different features in the Tiryns corpus, and it was also mentioned in: Bankoff et al. 1996.

published suggestions: Rutter 1990). In my opinion, the origin of the carinated vessel shape (FS 240) will need to be explored further before attributing its origin to HBW (2.3.1.2).

Chapter 3: Fabric and manufacturing technology analysis

The first and main aspect that has been dealt with in the previously published study related to HBW fabric (discussed in: 3.3) is the question of the origin of the vessels: the source(s) of the raw materials used and place(s) of probable manufacture.

However other important research objectives can be assessed, such as understanding the manufacturing process which reflects the technological choices of the potter. The many steps of the process of pottery-making can be analysed: choice and preparation of the clay, forming and finishing processes and qualities, and firing techniques.

As mentioned by Peacock (1970: 375), all these steps are an expression of social and cultural identity: signs of the traditions followed by the potter, as much as decoration and shape choices.

3.1 Literature review of HBW fabric studies

This general overview of HBW fabric description, extracted from various publications, is correlated with the information a fabric analysis can lead to, in order to determine which characteristics of HBW fabric and potting techniques are already well established and which aspects might necessitate further attention in the designing of a fabric analysis, as undertaken in the pilot study (3.4), the methodology which is presented in: 3.2.2.1.

The structure of the present literature review is divided according to the different phases of pottery production, so as to analyse all important aspects of the manufacturing process and potting techniques used by HBW potters.

Since the amount of information available from the various sites where HBW was found varies significantly (1.1.1), this part of the study will mainly concern sites where a substantial amount of pottery has been found and published and where the material has been described in more or less details, including: Korakou, Tiryns, Menelaion, Lefkandi, Aigeira, Khania, Thebes and to some extent Mycenae¹²⁶.

A chronological approach to the analysis of HBW fabric, in order to identify an evolution or chronological characteristics, is unachievable for the time being¹²⁷. This is due to two problems: in some sites where there is a fabric description of each specimen, all these specimens belong to the same period or the chronological division is not well determined (Korakou, Thebes, Menelaion, Lefkandi), and in other sites where HBW specimens appear in several successive periods, there isn't any detailed description of each specimen and/or the chronological phasing is not secure/precise enough to be taken into consideration (Tiryns, Aigeira, Dimini, Khania).

¹²⁶ The observations made during my own study of the material are detailed in: 4.4.

¹²⁷ A chronological analysis of the ware is presented in: 1.3.

3.1.1 Forming and finishing

Due to the fact that HBW is, in its appellation, defined as handmade and burnished, these two elements are discussed first, before the paragraph on fabric preparation, which is the preliminary step of the manufacturing process. The two main elements that are the foundation of this ware are directly related to technological aspects of its manufacturing process: forming and finishing.

Indeed, most if not all pottery included in this study is handmade¹²⁸ and has some kind of burnished finish. Even though, as mentioned in early publications on the origin of the ware (Rutter 1975: 18; Walberg 1976: 186; Rutter 1976: 187-188), handmade as well as burnished techniques are present in the local Mycenaean pottery throughout all periods, these characteristics are very distinctive in the Mycenaean pottery tradition of the LH IIIB-C periods:

“Their [HBW] identification as “non-Mycenaean” rests in their handmade manufacture and that the shapes which they represent combined with the decoration which they exhibit are decidedly abnormal in Mycenaean ceramics” (Rutter 1976: 187).

Comparisons (of technical features, shape and decoration) between HBW and the local Mycenaean pottery (including Coarse ware and local handmade pottery from previous periods) on sites where HBW has been reported, have been discussed in detail for Menelaion (Catling 1981: 74-75) and Tiryns (Kilian 2007: 3-9).

¹²⁸ Some specimens from Tiryns are, however, said to be wheelmade, they are discussed in: 2.3.1.

Techniques of potting (coil-made, slab-built or a combination) related to handmade pottery are often difficult to identify by simple visual examination¹²⁹. The surface of the pots are usually subsequently worked to compact the clay, bond the segments in order to remove the potting marks, and smooth the surface using techniques such as paddle and anvil, scraping or trimming (Orton et al. 1993: 126).

Indeed, there is no much information available in the publications on HBW about the identification of the potting technique. As far as I am aware the forming process of HBW was only mentioned for one specimen from Korakou (Rutter 1975: 19) and at Tiryns (Kilian 2007: 8). In both cases, specimens are said to have been made by coil.

Another aspect of the potting process, which is often overlooked but has been included in the pilot study (3.4.2), is its quality of manufacture: has the pot been carefully formed? Is the shape regular and well proportioned or are there parts of the pot that are distorted?

The main descriptive information available concerns the thickness of the walls, in most cases, it is said to be thick (Mycenae, French 1989: 39), but there are some exceptions (Menelaion, Catling 1981: 76, nos. 1, 7). This aspect can be related to the shaping of the vessel, its size and its function (Rice 1987: 227): a vessel with thick walls has good structural support for working wet clay and, when fired, is more resistant and advantageous for storage (by keeping the moisture out for example) but it has low heat conduction¹³⁰.

The surface finish is the other main characteristic of this ware, which can be easily identified: most of the pots have a burnished surface, defined, for this ware by Rutter (1975: 17), as a:

¹²⁹ Scientific analyses can be more useful in this matter. Pattern of the breakage of the vessel, irregularities of the wall (observed using X-ray images) can provide information on the forming techniques and especially to identify the use of two different techniques on the same vessel like coiling and wheel-throwing (Levi 1999: 175-202). Also Xeroradiography can be used to identify coil-made vessels (Henderson 2000: 118).

¹³⁰ A discussion of the properties of pottery can be found in: *Appendix D*.

“... lustrous surface on which the marks of a burnishing tool are visible. These marks vary from broad and shallow grooves to mere thin lustrous lines. They all represent the application of a tool to the leather-hard surface of the vase, an action which has brought up the finer particles of clay to the vessel surface before firing and which results in a lustrous vessel surface after firing.”

As well as an easy and quick aesthetic way to finish a handmade pot and give a finer texture to the surface, the pressure applied with the tool also helps to compact the surface, strengthen the vessel walls and make it less permeable (Gibson and Woods 1990: 109).

Depending on how well the surface was burnished, it will result in a well-smoothed satin finish to a very lustrous finish, after firing. As mentioned in catalogues of published HBW (Korakou: Rutter 1975; Thebes: Andrikou et al. 2006), burnishing marks are visible on most specimens, often but not always both on the interior and exterior surfaces. The direction of the burnishing is always recorded. It is said to be usually adapted to the shape, mainly horizontal and vertical, sometimes diagonal, concentric and sometimes in all directions.

The size and/or shape of the marks and the possible tools used are also sometimes recorded: Korakou ("These marks vary from broad and shallow grooves to mere thin lustrous lines", Rutter 1975: 17), Menelaion ("...applied either by pebble, bone, or wooden spatula"; Catling 1981: 75) and Tiryns (by fingernail, wood or bone; Kilian 2007: 8).

It can be observed that the burnishing varies in quality from site to site as well as within the same site. At Lefkandi, it has been observed that HBW specimens are not all burnished, and the ones that are, are only lightly or roughly burnished (Evely et al. 2006: 215). On the contrary at Mycenae (French 1989: 39) and Tiryns (Kilian 2007: 8), it seems to be mainly well burnished. At Korakou (Rutter 1975: 20) and Menelaion (Catling 1981: 75), the surface finish is described as going from burnished to smoothed, and often lustrous.

Analysis of differences in quality of finish between specimens from the same site and whether they are related to other aspects of the vessel (like fabric or shape), and whether the same features observed can be identified in the other sites, are aspects which need more consideration and which have been included in the pilot study (3.4.2).

In addition, it has been stated that the quality of finish does also vary depending on the area of the pot. This can, in part, be explained by the fact that some areas are not easily accessible.

It is also generally agreed that the quality of surface treatment on the interior is better than on the exterior. This could be linked to an attempt to reduce the permeability of the container (Rice 1987: 353). However, it was sometimes noticed that the burnish quality of HBW is said to be better on the outside than on the inside which is instead only smoothed or left rough (Menelaion, Catling 1981: 78, no. 14); it is another aspect taken into consideration in the pilot study (3.4.2).

Other types of surface treatment have been observed such as simple smoothing¹³¹ at Thebes (Andrikou et al. 2006: 41), polishing¹³² at Aigeira (Deger-Jalkotzy 1977: 16), barbotine¹³³ at Aigeira, and Tiryns (Deger-Jalkotzy 2003a: 465; Pilides 1994: 14, 22) and slipping¹³⁴ at Korakou (Rutter 1975: 20).

At Tiryns, the "Barbotineverstrich" or smoothed-over barbotine mentioned by Kilian (2007: 8) for some HBW specimens is characterised by an irregularly grooved surface. The use of the slipping method and barbotine can be aesthetic (by changing the colour or surface

¹³¹ Definition: Technique used to lightly treat the surface after forming, in order to even it out. "Since there are degrees of smoothness, *smooth* is proposed for the texture obtained by rubbing a leather-hard surface with a hard, extremely smooth tool" (Shepard 1956: 66). It is however less smooth than a burnished surface. "The surface has a matt rather than a lustrous finish..." (Rice 1987: 138).

¹³² Definition: Technique which creates "... a glossy lustre on the surface..., produced by rubbing it while leather-hard with a yielding tool; lacks the individual parallel facets characteristic of burnishing" (Rice 1987: 480).

¹³³ Definition: "Slip trailing or barbotine is the application of a thick mixture of clay and water to the surface of a vessel, often creating a raised design" (Rice 1987: 149).

¹³⁴ Definition: "Surface treatment involving the application of a suspension of clay in water to a vessel in the leather-hard stage" (Gibson, Woods 1990: 243).

aspect of the vessel) and/or functional (by reducing the permeability of the vessel, addition of applied plastic decoration).

The quality of the forming, especially the repeated stroking of the clay while building the pot and also the quality of finishing (intensive burnishing or not) can affect the drying process. If the particles of the clay are not well orientated the pot might crack (Henderson 2000: 128).

It has been mentioned in some publications (Thebes, Andrikou et al. 2006: 41) and observed during the pilot study (3.4.2), that HBW specimens are covered in cracks. However, their presence can be the results of various phenomena, like the firing conditions (Gibson and Woods 1990: 143), making it difficult to assess what they are related to.

3.1.2 Fabric texture

Clay can be used either directly as it is found or prepared before forming. Several processes can affect the properties of the clay:

- _ Purification by diluting into water or drying, grinding and sieving: to get rid of some inclusions
- _ Levigation¹³⁵: to reduce the coarseness of the fabric
- _ Wedging, kneading and/or foot-treading: to eliminate pockets of air
- _ Tempering¹³⁶: addition of inclusions, also called opening materials (for example: grog¹³⁷, organic inclusions, calcium carbonate, quartz, sandstone, basalt)

The first and third stages are not visible on archaeological artefacts. Levigation can hardly be identified on such coarse clay. Tempering is the only process that can be recognised

¹³⁵ Definition: "... mixing clay and water to a sufficiently thin consistency to permit the coarser particles to settle and leave the fine material in a suspension that can be poured off..." (Shepard 1956: 52).

¹³⁶ Temper is a non-plastic material which is added to the clay before it is worked. Molecules of clay adhere to the temper material and improve the quality of the clay (Orton et al. 1993: 115).

¹³⁷ Definition: "Crushed, previously fired ceramic ..." (Gibson, Woods 1990: 171).

to some extent: making the distinction between naturally occurring inclusions and intentionally added ones is difficult without the use of a thin-section analysis (*Appendix C*).

The first general published observations of the clay texture is that it is a rather coarse fabric, containing small to very large organic and/or mineral inclusions like mica, sand, quartz and /or schist. However, as discussed later on (3.1.4), the fabric coarseness does vary between specimens from the same site.

In several cases it has been noticed that potters have used temper in the preparation of HBW. At Menelaion (Whitbread 1992: 306), Khania (Hallager, Halleger 2000: 165) and Aigeria (Badre et al. 2005: 23); it has been mentioned that grog has been added to the clay (3.3.1). Other types of possible temper have also been mentioned: like organic matter at Korakou (Rutter 1975) and Menelaion (Catling 1981: 75) and perhaps sand at Khania (Hallager, Hallager 2000: 165).

The use of tempering is a deliberate choice of the potter to obtain the right consistency (harder clay is more suitable for hand-forming) or to improve some properties of the pots: such as porosity, stability of the clay in forming, to reduce shrinkage, to avoid cracks when firing and to reduce thermal stress when cooking (Rice 1987: 406-411). Sometimes the amount of temper added is increased in the parts of the pot that have to resist physical shock, like the bases, as observed in the pilot study (3.4.2).

However, the use of temper is also sometimes related to cultural choices or traditions of the potter¹³⁸. At Menelaion, the presence of grog has been interpreted as the result of a difference in potting technique from the local Mycenaean pottery (Catling 1981: 75).

On many sites, the fabric is also described as soft and porous (Tiryns, Kilian 2007: 6-9), but again there are exceptions and variations between sites and within the same site, as observed in the pilot study (3.4.2). When having a soft and porous fabric is intentional, its

¹³⁸ It has been noted in ethnographic studies, for example, that the addition of grog temper, which is the reuse of old pottery in a new pottery, can be seen as “an act of ‘rebirth’ in which a ‘reversal of time’ is achieved” (Barley 1994).

purpose can concern the improvement of fabric properties, such as being more resistant to heat and avoiding cracking during activities such as cooking (*Appendix D*).

Information related to the use of temper and the variation in fabric coarseness form an important aspect in understanding the techniques used by the potter and identify the characteristics of HBW fabric; that is why it is also part of the pilot study (3.4).

It should also be added that due to the fact that the texture of the fabric used for making HBW pots is rough, heavy and crumbly and has a bulky feel, it might imply that these pots would be unsuitable for long-distance travels.

3.1.3 Firing conditions

Before firing, the pots are left to dry. This process can be influenced by diverse factors¹³⁹ which will affect the physical structure of the pots (Rice 1987: 63-64). The addition of non-plastic material to the clay can prevent it from cracking when shrinkage occurs (Gibson, Woods 1990: 240). The presence of cracks on some pots might be an indicator of this step.

Firing conditions relate mainly to the temperature, the atmosphere in the firing structure (reducing or oxidising) and the duration of firing. An oxidizing atmosphere occurs when the fuel (containing carbon) receives enough oxygen to burn well so the heat rises enough to achieve a regular colour. A reducing atmosphere is where not enough oxygen is present during firing and the heat does not rise so much (Orton et al. 1993: 133). This affects the colour of the clay: it is black all the way through due to the oxide of iron (Shepard 1956: 103). Also the smoke causes the core to turn black and the body to be brittle, and the organic materials contained in the clay do not burn completely, leaving traces of carbon.

¹³⁹ Amount of water in the clay, humidity in the atmosphere, the temperature, the alignment of clay particles and the temper added.

There are two main methods for firing pottery: using a kiln or an open structure (surface bonfire or pit). The differences between those two methods are that, in the case of a kiln, the combustible material is separated from the pottery and both fire and pottery are enclosed. In the case of an open fire, both combustible material and pottery are in contact and in the open. This does influence the control the potter has on the temperature and the heating rate (Rice 1987: 155-156). Consequently, the pottery fired in an open structure might be fired at a fairly high temperature for a shorter period of time (fast firing).

Some observations of the fabric can help identify the type of structure the pottery has been fired in and its atmosphere, it affects the colour of surfaces and core, hardness and porosity of the fabric and some types of inclusions, like organic or calcareous matters.

It has been observed that, contrary to Mycenaean wares that are fired in a kiln, HBW has been fired in open structures (Tiryns, Kilian 1978: 312; Aigeira, Deger-Jalkotzy 1977). One of the first pieces of evidence is related to the colour of the fabric. In the case of HBW it is always described as:

- _ surfaces with a general dark tone, with many variations of colours (from greyish, brownish, reddish to black).
- _ presence of a thick dark grey or black core which is visible in the fracture of a sherd.

However, contrary to what is often mentioned, in an open fire neither of those atmospheres (oxidising or reducing) is reached completely, hence the wide variability in colour (Henderson 2000: 131). Important variations of colour in the HBW corpus have been observed on several sites, like a specimen from Korakou, which is red-coloured all the way through and has consequently been separated from the other specimens in the fabric grouping made by Rutter (1975: 28).

The variations observed form an interesting focus of research on the identification of firing types, as undertaken in the pilot study (3.4.2). This categorisation might have the

potential to help identify the scale of production (pots made all at once in one large firing or several small ones), to observe if the firing is related to other aspects of the vessel (fabric, size...) and possibly to determine whether the potters had some control over the firing technique.

It should be mentioned that open firing involves many parameters that can create many problems: like the rapid change in temperature causing cracks, an uneven temperature causing over- and/or under-fired pots, a low temperature resulting in a soft and crumbly fabric (Henderson 2000: 135), all aspects noticed in the HBW studies.

Also, on most sites, it has been noticed that the surface is mottled: “as a result of firing or as a consequence of subsequent fire-blackening” (Rutter 1975: 18) at Korakou. Rutter also found that the surface is sometimes “riddled by patches of fine cracks radiating from points where granules have risen to or burned out the surface” (Rutter 1975: 19) at Korakou. It has been noticed that some specimens from Tiryns have been fired while they were not fully dry causing cracks on the exterior surface (Pilides 1994: 13).

3.1.4 Intra-site variations of the fabric

The variability of the fabric within a site was mentioned for the first time in the study of Korakou HBW (Rutter 1975: 23-28). Four groups were formed, according to fabric texture, surfaces and core colour and finish, which were then related to the range of shapes they correspond to, as detailed in: [Figure 3.1].

A similar phenomenon was observed on several other sites: Aigeira, Menelaion, Tiryns, Khania. However, on those sites, no detailed analysis of these differences has been undertaken, and, as can be seen [Figure 3.1], the overall picture is incomplete.

This was consequently one of the primary purposes for undertaking a fabric analysis (3.4.1): determine whether there are different types of fabric, what are the characteristics of

these types, whether they are related to other aspects of the vessel (size, shape...) and whether it is common to several sites.

3.2 Methodology for visual, petrographic and compositional analyses

Based on the observations discussed in the previous section (3.1), it is evident that one of the main directions of research on HBW should include a detailed and systematic fabric analysis of a consequent amount of material from several sites which is one reason why a pilot study of part of the HBW corpus has been undertaken (3.4).

Prior to carrying out such a study, it is necessary to establish a methodology designed especially for the fabric analysis of HBW. The process of analysing any artefacts should be divided into several stages (Rice 1987): the determination of the problems and research objectives, the types of techniques to be used, the sampling of specimens to be studied, the analysis of the results and their interpretation.

3.2.1 Determination of research objectives

The first step in the designing of a prototype of fabric analysis is to identify research objectives. Concerning the HBW study, they can be divided into four main topics:

- _ determination of the origin of the raw material
- _ identification of the potting techniques
- _ finding out whether HBW is or is not a homogenous group
- _ determination of the origin of the manufacturing techniques

3.2.1.1 Origin of the raw material used

The first question that arose when HBW was first identified ("Ceramic Evidence for Northern Intruders..." at Korakou, Rutter 1975; "Possible Northern Intrusions at Mycenae?", French 1989) was related to the origin of the pots: were they imported or made locally?

Since then, several scientific analyses have followed this question with more or less success. The details of these studies and their results along with an assessment of the methods used are discussed in: 3.3.1. Even though the general response to this problem is straight forward (HBW is made locally), there are still several points to elucidate and questions that have arisen from these studies. These are detailed in: 3.3.7.

Aside from these queries, it should be mentioned that most of these studies have only included a very small amount of material (less than eight samples per site, except for Aigeira). In addition, in most cases, the main purpose of the analyses concerned other problems unrelated to HBW directly (Thebes, Mycenae). That is another reason why more analyses related to this topic should be intended. They may relate to:

- _ analysing HBW from sites where little or no study has been done.
- _ re-considering doing new analyses, in a different way, for the HBW from sites where answers are still ambiguous (Lefkandi for example).
- _ making those new analyses on a wide range of specimens.

The present reference to this topic is, however, only a preliminary set of directions for future work and goes beyond the scope of this thesis¹⁴⁰.

3.2.1.2 Characteristics of HBW fabric and potting techniques

As observed earlier (3.1), only general features of the HBW fabric and technical aspects have been presented in the various publications of the material and there are still some important sites lacking a thorough study. As a result, it seems necessary, now that more material is published, to undertake a detailed fabric and technical analysis of the HBW material. This should include the creation of fabric groups related to many different parameters of the manufacturing process.

¹⁴⁰ This is due, amongst other matters, to time, technical and financial constraints.

This is one of the aims of the pilot study presented later on (3.4) as well as the Mycenae study (4.4). The details of the information to be collected and the methodology used are discussed in: 3.2.2.1.

Another reason for the characterisation of HBW fabric and potting techniques concerns the study of the properties of the pottery and whether these were intended by the potter, which could possibly hint towards the level of knowledge of the potter, and/or the function of the vessels.

3.2.1.3 Determination of the homogeneity or heterogeneity of HBW

The main motive of the fabric analyses undertaken in the present thesis was to try and determine whether HBW forms a homogenous group or if important differences are observable as mentioned in: 1.1.3.3. The details of the objectives of the pilot study are noted in: 3.4.1.

Such a topic necessitates conducting the same type of analysis (with the same methodology) on all the sites so as to provide a background of comparable data. Only then, HBW from different sites can be compared as objectively as possible.

3.2.1.4 Origin(s) of the manufacturing techniques used

Once the fabric and technical characteristics have been understood, another aspect, which can be looked at concerns the identification of the origin of the potters. This can be done by comparing the potting techniques of HBW with similar types of pottery found in neighbouring regions and belonging to the same period.

Comparisons with specific Mycenaean wares (like cooking ware) have already been presented and are conclusive on the fact that fabric and technical processes are different (3.3.1.4 for Menelaion and 3.3.1.6 for Aigeira).

However, very few studies concerning comparisons with foreign pottery have so far been published. There are two exceptions though:

- _ compositional studies by Jones (1986b): comparing Aegean HBW with Cypriot HBW (3.3.2.1), and HBW from Lefkandi with Italian Impasto ware (3.3.1.2)
- _ petrographical and compositional studies by Badre (2005): comparing HBW from Tell Kazel in Syria, Aegean HBW and Italian Impasto ware (3.3.2.2, 3.3.2.3).

Results concerning the link between the Aegean HBW and the Cypriot and Tell Kazell HBW tend to show that there are general similarities. Nevertheless, these studies only relate to the most obvious and general aspects of the HBW fabric and techniques, due to the fact that, as yet, no detailed and systematic analysis of the whole HBW corpus has been done.

Questions related to the link between HBW and Italian Impasto ware are still very faint since either studies are inconclusive, due to the lack of comparable material, or they are very limited, relying on a single aspect of the technical process (like the use of grog).

This topic is not treated in detail in the present thesis for the foremost reasons that it should only be undertaken when the other previously mentioned topics have been carried out or at least when the HBW corpus has been analysed in enough detail to provide a set of characteristics and whether these are matched in all the sites involved or if several sets of characteristics should be established.

3.2.2 Techniques and sampling for fabric analysis

The scientific methods used for the identification of pottery provenance and the study of pottery-making techniques and fabric can be divided into three main processes:

- _ Initial visual examination: macroscopic visual examination
- _ Petrographic analysis: microscopic visual and mineralogical examination

_ Compositional/elemental analyses: chemical examination. There are a variety of techniques available, which are to be chosen mainly according to the aim of the problems addressed.

Both petrographic and compositional analyses are used to characterise the composition of the clay and identify fabric types. But whereas petrological studies also help find out about the technological process, chemical analyses are instead used mainly for provenance studies: the determination of the place of manufacture.

For the purpose of the pilot study of HBW, the only method I have used is the initial visual examination. The reason for this is that other methods require some extensive training, time and funding.

The methodology described for the initial visual examination refers to the process used for the pilot study (3.4) as well as for the Mycenae study (4.4). In contrast, the parts on petrographic and compositional analyses are an insight into the methods available for the study of pottery in general and how they could be useful for the study of HBW.

The first step is sampling the material to be studied. Whichever technique is going to be used, the sampling has to start with a preliminary study consisting of a visual sorting and classification of pottery which makes the initial visual examination almost a necessity prior to any other method of analysis (Rice 1987: 323).

In the case of the initial visual examination, the choice of sampling depends on the amount of pottery concerned with the research. During the present pilot study, the amount of material covered by the subject was not very important so all the specimens were examined. However, for a study of the HBW from Mycenae, considering the quantity of the material and the time limit, the sampling selection has to be carefully decided upon according to different predetermined parameters and constraints (4.4).

Concerning the petrographical and chemical analyses¹⁴¹, the selection should include:

¹⁴¹ An extensive list of parameters to take into considerations is discussed in: Rice 1987 (321-325).

- _ the problems of post-depositional contamination and the cleanliness of the specimens chosen,
- _ specimens that are characteristic of the ware as well as exceptional ones,
- _ specimens with a reliable context,
- _ a few other types of ware of a well-known origin to compare and
- _ sampling of local raw clays for comparison.

3.2.2.1 Initial visual examination

Purposes of an initial visual examination are both to analyse in detail the fabric of the pots and to compare the specimens in order to determine initial fabric types which can then be analysed and validated using other methods, especially petrographical analysis.

It is often debated, in the literature concerned with methodology for pottery analysis (Rice 1987; Orton et al. 1993), whether in the process of creating fabric groups, the archaeologist should start by looking at similarities and differences and make a first attempt at grouping the specimens or if it is better to start by analysing each one in detail and then create fabric types. It probably depends on the amount of sherds to analyse. I found, during my pilot study, that the latter solution worked better on a small amount of samples.

The problem of the amount of groups hence the degree of difference of those groups is quite subjective. Some people will prefer to create fewer groups because the sherds seem to gradually fill the gap in between types and some people will think that differences are a characteristic of this type of ware and should not be ignored.

In my opinion, a study of each specimen first could help manage the problem. In addition, to try to avoid the problem, it could be useful to define a precise list of a wide range of criteria (including not only fabric texture, elements related to firing conditions but also data related to the quality of forming and finishing and the general overall impression) and

then decide on the amount of criteria that will make the difference between one type or another.

The method of fabric analysis used in the pilot study and in the Mycenae study, which is detailed in: *Appendix B*, is based on several previously published methodologies (Peacock 1977; Rice 1987; Orton et al. 1993; Sanders 1999) as well as additional information, which has lacking from the previously made fabric analyses of HBW, as discussed earlier on (3.1).

All the information on the fabric and other aspects of the specimens analysed were recorded on pre-established forms: an example can be found in: *Appendix B* and the ones for the Mycenae preliminary fabric analysis are recorded on: *CD-ROM, Excel file 4.3*.

These data were then used for comparison and categorisation of the material according to similarities and differences identified. A grid of criteria was established in order to arrange and interpret the results collected into three main themes: observations related to the fabric used by the potter, observations related to the firing conditions and observations related to the quality of craftsmanship. The detail of the data analysed is mentioned in: [Figure 3.2], which is the framework of analysis and interpretation used in the pilot study and the Mycenae study.

3.2.2.2 Petrographic analyses

The second step should be the petrological analysis by microscope of a thin-section of sherd under polarised light in order to identify in more detail the inclusions (shape, texture, degree of sorting, identification), the presence of temper and verify whether the groups created during the initial visual examination are relevant.

This method of fabric analysis is the one that has been used the most in the study of HBW (3.3.1). There is another method, less common, but it was applied to HBW from Aigeira: heavy mineral analysis. Both these methods are discussed in: *Appendix C*.

3.2.2.3 Compositional analyses

Compositional (or elemental) analyses involve the identification and quantitative measurements of the mineral and/or elements composing ceramic paste¹⁴² and the statistical manipulation and interpretation of those measurements.

The main purpose of this type of analysis is to determine the origin of the clay. In order to carry out a provenance study, a reference collection is needed so as to be able to compare the results obtained with a series of other results from pottery studied previously and of known origin, as well as analysis of clay sources.

It should be kept in mind, though, that clays from various areas can be very similar. There is the need for a sensitive method that enables the analysis of as many elements as possible¹⁴³ but that also can detect minimal amounts of an elemental concentration (Bishop et al. 1990: 539). In addition, the composition of the fabric can be affected by a number of factors: the clay preparation (levigation, addition of temper, use of several clays...) and the post-depositional environment (Orton et al. 1993: 146-147).

There are also other aspects that can be dealt with, especially the firing conditions and some features of the technological process of pottery-making (like the forming technique).

There are many scientific techniques of pottery analysis but only a selection of eight different types is presented in: *Appendix C*. This selection is based, first, on the choice of techniques previously used in HBW analyses, discussed later on. It also includes other

¹⁴² Major, minor and trace elements which depend on the geological conditions of the source used to collect the raw material (Van der Leew, Pritchard 1984: 65).

¹⁴³ Between 20 and 25 elements minimum should be analysed to obtain precise results (Mommensen 2001: 658).

scientific techniques, not previously used on HBW, which could be relevant in answering questions related, in particular, to potting techniques.

- **Choice of analytical technique:**

The selection of a particular technique of analysis should depend on several requirements to account for¹⁴⁴:

_ choice of an elemental analysis method that can answer the question established in the research objectives.

_ choice of a method sensitive to elements needed. This means paying attention to the amount and type of elements each technique can analyse.

_ a large number of samples to be analysed in order to obtain the maximum and most detailed information possible.

Sometimes petrographical and compositional analyses are combined (it is called "integrated approach"), like for the HBW studies of Mycenae (3.3.1.1) and Tell Kazel (3.3.2.1). This can help reinforce the fabric groups created with one technique and compare with the fabric groups created with another technique. It helps dissolve doubts and problems, like the causes of the chemical variability in pottery or the influence of burial alteration on chemical composition (Buxeda I Garrigós et al. 2003: 369). It helps in strengthening the results and conclusions¹⁴⁵.

An integrated approach also multiplies the range of information that is related to the manufacturing process like in: Belfiore et al. 2006, where thin-section petrography, SEM, XRD, XRF and NAA¹⁴⁶ were used. It made it possible to correlate fabric recipes with shape,

¹⁴⁴ However laboratories of pottery analysis have often already set their own methods and determined which techniques they are using. So the archaeologist has to conform to this pre-determined set of requirements.

¹⁴⁵ However it has been mentioned that an integrated approach should not be needed in the case of provenance study using NAA since this technique is precise and accurate enough to provide secure results (Mommensen 2004: 267).

¹⁴⁶ These techniques are discussed in: *Appendix C*.

to find out about the firing conditions and to establish a chemical reference group, taking into account burial alteration and contamination.

3.2.3 Presenting results and conclusions

Once the results from the experiments are obtained, they need to be interpreted and, in the case of the use of an integrated approach, they also need to be compared.

In the process of forming clusters of fabric types, the groups categorised with each technique are organised in a table or a graph in order to compare them and see if the clusters match. This is often the case when comparing first visual examination and petrographical analysis (Buxeda I Garrigós et al. 2003: table 4) or the latter and NAA for example (Badre et al 2005: table 2).

Computer aided methods using statistics are used to help the classification into fabric groups. But measurement errors, inaccuracies of the results, poor sampling or post-depositional disturbances should be taken into account by the scientists when creating the fabric groups because the statistical methods do not (Mommsen 2004: 269).

In the case of a provenance study, the results obtained with compositional analysis are compared with a data bank of a large amount of pottery samples for which the composition is known. For example, in the case of the study of pottery from Tell Kazel (3.3.2.2), 500 samples have been used for comparison (Badre et al. 2005: 17). This comparison was made on the basis of the analysis of 27 compositional elements. This data bank was compared with the samples just studied to see if the group of compositional elements chosen matches with each other, which would mean that the clay comes from the same source.

Conclusions made should include the parameters that may alter the answers to the questions: quantity of samples analysed, sensibility and precision of the analytical techniques used, various errors and doubts encountered, etc.

3.3 Previous scientific analysis of HBW and comparative studies

This section includes a discussion of the scientific analyses of HBW previously undertaken, from both Mycenaean sites and from regions of the Eastern Mediterranean (Cyprus and Near East). It also includes some preliminary discussion on the fabric and techniques relations between HBW and Italian Impasto ware.

3.3.1 HBW from Mycenaean sites

To my knowledge, scientific studies of HBW found in the Mycenaean area have been done on six sites, using five different methods. In some sites, several methods were employed. Information concerning the research objectives, the analytical method used, the sampling choices and the conclusions obtained, for each site, are summarised in: [Figure 3.4].

3.3.1.1 Mycenae

The analysis of two HBW specimens¹⁴⁷ chosen by French (1989) have been analysed with three different methods: through thin section by Riley (unpublished), NAA by Scourtelli (1983) and AAS by Jones (1986b).

One of the HBW samples (no. 73/16) is from a collared jar (60-461), previously published (French 1989: fig. 3), which is also part of the selection made for the present fabric analysis (4.4).

The first study was a petrographical analysis which remains unpublished and the extent of the sampling selected is unknown. Only the two specimens mentioned had been analysed in time for the following publications: French 1989 and Jones 1986b.

¹⁴⁷ In Scourtelli 1983: No. 72 (rim and handle) and no. 73 (rim and applied cordon). In Jones 1986b: nos. 15 and 16.

Riley found that the two specimens were petrographically different: no. 15 containing tufaceous-like grains and rare quartz, and no. 16 made of a calcareous clay (Jones 1986b). The latter one has a similar fabric to large Mycenaean vessels of local origin (French 1989: 47-48).

The scientific analysis by NAA, done in Manchester, has examined seventy-two samples from Mycenae as well as samples from other North-East Peloponnese sites: Tiryns, Asine and Berbati. The samples from Mycenae included, as well as the two HBW, fine, heavy and coarse wares and a few Pre- and Post-Mycenaean specimens. Samples of local clays were also analysed.

It was part of a "programme for the detailed analysis of the various wares found on sites in the NE Peloponnese in the LH IIIB period" (French 1989: 48). The objectives of the study were to determine the origin of the clay used, whether different wares were made with different clay beds and if different parts of the same vessels were made with different clays.

Six groups were identified: four groups includes only fine ware (Groups 1-3 and 6), Group 4 only includes heavy ware and Group 5 only coarse ware. The other twenty-eight specimens are outliers, including the two HBW, contrary to what was published before¹⁴⁸ (French pers. comm.). It has been confirmed that they, in fact, do not belong to any of the six identified groups. They are part of the outlier group which includes: much coarse ware, some Hellenistic and very few fine ware specimens.

The study has shown that the specimens analysed are of local origin but different clay beds were used for different wares.

The physical analysis by AAS included nineteen specimens of HBW: the same two from Mycenae, three from Lefkandi, seven from Khania and seven from Cyprus¹⁴⁹ (Jones 1986b). The purpose of the study was to assess the origin of the clay used. The compositional

¹⁴⁸ It was previously thought that the HBW specimens clustered with Fine and Heavy wares (Scourtelli 1983; Jones 1986b).

¹⁴⁹ HBW material from Lefkandi, Khania and Cyprus are discussed later on.

results obtained were compared with local pottery: at Mycenae, five coarse ware specimens were also analysed.

It was found that the two Mycenae HBW specimens are rather different from each other, chemically, no. 15 does not match the local material either from Mycenae or from the Argolid whereas no. 16 is “more typical of the central Argolid” (Jones 1986b: 261). But none is similar to Mycenae coarse ware, as noticed with the NAA analysis.

3.3.1.2 Lefkandi

Scientific analyses done on HBW from Lefkandi were published by Jones (1986a; 1986b). The objectives of the project were "... to establish the composition of the locally-made pottery and with this data set to examine ... classes of pottery ... suspected to be imported" (Jones 1986a: 474).

Forty-five samples from Lefkandi have been analysed by OES, including six HBW (no. 1, 5-7, 34 and one without a number: "black burnished carinated sherd") all of LH IIIC context. The samples studied form two clusters which appear to have different compositions.

Three “Italian” cups (no. 1, 5-6) and a plastic decoration specimen (no. 7) belong to the same cluster (no. I) which contains local pottery (Jones 1986a: fig. 6.12). But these samples are further away from the other samples which makes Jones think that they could be imported although the two elements which make this difference are "among the less origin-sensitive" (Jones 1986a: 474). The comparisons with samples from Policoro, in Italy and from Troy VII are said to be inconclusive (Jones 1986a: 476) and, in another paper (Jones 1986b: 261), it is mentioned that the difference between the HBW and Mycenaean specimens might relate to poor sampling.

The fragment of “Knobbed ware” (no. 34) belongs to the other cluster (no. II) and is said not to be of local origin. Concerning the last specimen (the "black burnished carinated

sherd"), it is only mentioned that it has no obvious link with Italian Impasto ware (Jones 198a: 209).

3.3.1.3 Khania

The final publication reports of the Khania excavation note that two fragments of HBW from the LM IIIB2 period and two others from LM IIIC strata have been chemically analysed and considered to be "sure local products" (Hallager, Hallager 2000: 165; 2003: 253).

They were analysed by Jones (1986a: 261-264), using AAS. This analysis shows that the seven HBW specimens studied match the local "Red ware" (consisting of conical cups), with which the HBW specimens were compared. It was also noticed, in another paper (Jones 1986b: 260), that the group was homogenous in composition.

There is also the mention of a petrographical study, by Riley, of two samples from LM IIIB2 and another four from LM IIIC but the results are not published (Hallager, Hallager 2000: 165; 2003: 253).

3.3.1.4 Menelaion

A petrographic analysis was conducted on thin sections of HBW from the Menelaion, by Whitbread (1992: 297-306). The purposes of the study were to determine whether the origin of the raw materials used is local and also to compare the technological process with several Mycenaean wares.

A small number of HBW samples were analysed (eight specimens) as well as a few of coarse ware, pithoi fabrics, "Kitchen beaker" and micaceous ware. The first step was to compare all of these different wares and group them into fabric classes. The twenty-one

sherds studied resulted in a division of eight fabric classes. All the HBW appeared to belong to the same class (Class 1) and was definitively apart from the other groups.

The diagrams (Whitbread 1992: fig. 82-83) illustrate well the differences between the fabric groups. They show clearly that the types and quantity of the mineral composition, even if slightly different, are similar enough to show the use of local raw materials for all the classes. There are particular similarities with the "Kitchen beaker" (Class 2), the coarse ware (Class 3-4) and the pithoi fabric (class 5) (Whitbread 1992: 304).

On the contrary, the analysis of the inclusions (which are not visible on the diagrams) shows that there is a technological difference between HBW and the other wares. It has been noted that the inclusions used in HBW are larger and more frequent than in the other fabrics (Whitbread 1992: 304). It is also mentioned that it is difficult to assess whether these inclusions are naturally occurring in the clay matrix or whether they are added intentionally by the potter. But according to Whitbread (1992: fig. 84), the observation of the pictures enabled him to identify the brown types of these inclusions as grog, which features show that it might be crushed HBW pottery added to the clay matrix (Whitbread 1992: 306).

To conclude, the results of this petrographic analysis show that the HBW at Menelaion was made with local raw material but with a different technological process (addition of grog) than the local pottery.

3.3.1.5 Thebes

A recent clay analysis has been made for ceramic material from Thebes (Mommensen et al. 2002) as part of the project: "Pottery production and distribution of Bronze Age settlements of Mycenaean Greece and the Aegean". About two hundred samples from Boeotia (Thebes and Orchomenos) were analysed by NAA including four HBW samples (two of which could be from the same vessel) from Thebes, using the "method of 'chemical

fingerprinting' applied in Bonn to classify pottery according to their production 'recipes'" (Mommsen et al. 2002: 608). The material analysed has been chemically classified into nine groups.

The two HBW samples that are perhaps from the same vessel belong to the group f (local origin), only found at Thebes and include as well an uninscribed tablet from the Theban archives and a clay lump ready to be used for tablet preparation. The two other samples belong to another group but no more information is given.

3.3.1.6 Aigeira

The problem of distinguishing between Neolithic handmade pottery and LBA HBW, as mentioned previously (1.1.1.2), has been one of the aims of the scientific study undertaken by Sauer. The other aim was to consider the origin of the clay used. It was mentioned in a preliminary account that samples of LBA HBW, Neolithic pottery, Mycenaean ware and local clay were examined by thin section and heavy mineral analyses (Deger-Jalkotzy 2003a: 465-467; Sauer 2006).

In the published account of the mineralogical-petrographic analysis (Sauer 2006), nineteen LBA HBW samples (sixteen HBW from Mycenaean levels, three HBW from Pre-Mycenaean level), twelve samples of Neolithic pottery, one sample of Mycenaean ware and three Post-Mycenaean samples were analysed.

Six different fabrics were identified but most of the specimens analysed belong to Fabric A. The twenty-nine specimens of Fabric A belong to three types:

- _ eleven LBA HBW samples (nine of Mycenaean level and two of Pre-Mycenaean level),
- _ six samples of Neolithic pottery,
- _ two samples of Post-Mycenaean pottery.

Fabric A is said to be "... (most likely) of local origin" (Deger-Jalkotzy 2003a: 267). The raw materials used are however quite rare.

The other fabrics are:

- _ Fabric B: Single Neolithic specimen, said to be of local origin.
- _ Fabric C: two specimens (one LBA HBW from LH IIIC Phase 1 and one Neolithic) said to be imported. They were high fired and have a different heavy mineral composition.
- _ Fabric D: one LBA HBW from LH IIIC Phase 1b, said to be "possibly" of local origin.
- _ Fabric E: one Post-Mycenaean ware, said to be an import from Corinth.
- _ Fabric F: one specimen of Mycenaean kitchen ware, origin not determined.

The mineralogical-petrographic analysis has showed that the handmade pottery from all periods at Aigeira is made of the same raw material (Deger-Jalkotzy 2003a: 465-466). It was concluded that "... no differentiation between Barbarian ware [HBW] and Neolithic pottery is possible based on archaeometrical analyses alone" (Deger-Jalkotzy 2003a: 467).

Sauer also concluded that the raw material had been "... intentionally carefully selected for technological reasons" (Deger-Jalkotzy 2003a: 466) since it is composed of elements that are not very common in the area. He determined that the local clay bed used for handmade pottery is different from the one used for Fine wheelmade wares since the Mycenaean specimen has a different fabric (Deger-Jalkotzy 2003a: 467; 2003b: 59 n. 14). In addition, it has been briefly mentioned, elsewhere, that grog was used for the making of HBW from Aigeira (Badre et al. 2005: 23, note 37).

3.3.1.7 Conclusion

As seen, various types of compositional and petrographic analyses have been used in the study of HBW. As far as the effectiveness of the processes used goes, it seems that the

OES (Lefkandi) was the least conclusive compared to NAA (Mycenae, Thebes) and AAS (Khania).

However, it is quite difficult to compare those compositional studies because of the difference of research objectives chosen and also the fact that, in several cases, the study of HBW was only a small part of each research program which principally related to Mycenaean pottery analysis. The most thorough results, though, were obtained with petrographic analysis.

The conclusions related to the origin of the HBW vessels are still unclear to some extent. The obvious result is that, in most cases, HBW specimens are made with local clays, but there are a few specimens in several sites for which it might not be the case: Lefkandi (3.3.1.2) and Aigeira (3.3.1.6). Concerning the latter site, it has also been mentioned that a HBW specimen of a carinated vessel might be an import because of its unusual fine fabric (Deger-Jalkotzy 1977: 22-23, fig. 11).

In addition, in the recent publication of the HBW from Tiryns, Kilian (2007: 54) mentioned that at least four specimens could be Italian imports:

- _ no. 184: a large collared jar, similar to a specimen of Sardinian pottery from Kommos (Watrous 1985: no. C1147)
- _ no. 299: a deep cup with handle, similar to the "Italian cup" from Lefkandi (2.2.1.2)
- _ no. 310: a carinated vessel (2.2.1.1)
- _ no. 311: handles with square horned protuberance (2.2.2)

He also mentioned that fifty-five specimens seem to be of local origin. However no information on the method used to determine this is given.

It seems that it nearly always concerns very specific shapes and or decorations and it would be useful to determine with certainty if these are indeed imports, as it might raise important questions: if the specimens which seems to have strong typological links with the

Central Mediterranean (2.4.1) are imports and the other specimens with no identified origin of tradition are locally made, should the HBW still be seen as a single group or does that point towards the idea that even within a site, there might be different groups.

Concerning the relationship between HBW and Mycenaean ware, it has been observed that HBW makers used different potting techniques (like the addition of grog: Menelaion and Aigeria) but also different sources of raw materials (Aigeria and possibly Mycenae).

In the case of Mycenae, there might be a possibility that one of the specimens was made in a more distant location than the Argolid: could that imply that some specimens were made at other sites and then brought to Mycenae (either by simple movement of people or in the form of exchange)? Only with a greater number of specimens analysed may some of these questions be answered.

3.3.2 Comparisons with various handmade wares

As mentioned previously (1.1.2, 2.4.1), several regions around the Mediterranean have produced dark, coarse, handmade and burnished pottery at a similar period as HBW production in the Aegean, including the presence HBW in the Eastern Mediterranean.

Since the question of the origin of the techniques used by the potters is still being debated, could a comparative study of the pottery techniques used in different regions help to understand how closely or not the potting traditions are related?

Given that scientific studies of handmade pottery from neighbouring regions to Greece, focusing on the technical aspects of the production, are very rare, an appropriate and detailed comparative study is at the moment very limited. However some recent research projects are pointing in this direction.

The objectives, here, are consequently limited to an overall description of the petrographical and compositional analyses realised in particular areas and to analyse their conclusions. The first group for comparison is related to HBW in regions outside of the Aegean (Cyprus and Near East) and the second group to Italian Impasto ware.

The choice made here to analyse the pottery from this latter region, instead of any other, is due to the fact that the most recent typological comparative studies of HBW and handmade pottery from neighbouring areas have focused on this particular region, as discussed in: 2.4.1.

3.3.2.1 HBW from Cyprus and Near East

The fabric of HBW from **Cyprus** was studied by Pilides (1994). The main objective was to identify and differentiate HBW from local Cypriot handmade pottery. Concerning the study of the HBW of foreign tradition, which she related to the specimens found in the Aegean, two different fabric types were identified, which were then related to vessel shape and size (Pilides 1994: 69-70), as detailed in: [Figure 3.5].

These observations, concerning the existence of at least two types of fabrics associated to the size of vessels, are somewhat related to the ones made for several sites of the Aegean, as discussed in 3.1.4 and [Figure 3.1].

Moreover, twenty-five samples of HBW from four different sites of Cyprus, as well as specimens of local Monochrome ware, were analysed by NAA (Jones 1986a: 259-263). A great variability in the element concentrations was observed without being able to understand the reason for it.

Three main groups were identified. Groups 1 and 2 were interpreted as possible imports (Pilides 1994: 73), group 3a (included both HBW and Monochrome ware) as locally made, using the same clay bed as for local pottery. However, it was also noted that some of

the makers of HBW were probably using different clay sources to the makers of local Monochrome ware (Jones 1986a: 261-262).

HBW material found in the **Near East** has been subject to a series of scientific analyses (petrographic and compositional). Eleven samples of HBW have been studied by means of thin section analysis and NAA. They were part of a larger project on the provenance study of pottery from the site of Tell Kazel in Syria, including Mycenaean wares, local Syrian wares and Grey ware (Badre et al. 2005).

The results have shown that there are quite a few similarities in the fabric and possibly in the techniques used for Syrian and Aegean HBW. The fabric of samples is said to be porous, with inclusions poorly sorted. The colours of the surface are similar to the Aegean HBW specimens. Also worth noting is the presence of plate-like voids surrounded by black (also noticed in the pilot study of Korakou material: 3.4.2). The possible identification of one inclusion as grog has been mentioned (Badre et al. 2005: 23), although this is not certain and it has only been seen in a single sample.

The compositional analysis of the Tell Kazel HBW has shown a division of the specimens into four groups and two singles (Badre et al. 2005: table 5) but the petrographical analysis¹⁵⁰ has grouped all specimens in a single cluster. The interpretation of this phenomenon is that "... different clays were used, but the same type of temper was added" (Badre et al. 2005: 35). A local origin has also been concluded for the HBW (Badre et al. 2005: 35).

The fabric studies carried out on HBW from areas outside the Aegean have shown some similarities to HBW from Mycenaean sites. These features as well as other elements,

¹⁵⁰ More petrological analyses of HBW from Tell Kazel have been undertaken by Boileau, at the Fitch Laboratory (Athens).

like the appearance of this pottery on the sites at the same time as Mycenaean pottery (1.1.2.2), has been interpreted as indicators of some kind of relationship. However, the type and degree of the relationships involved need, in my opinion, to be addressed more precisely in future work on comparative studies.

3.3.2.2 Italian Impasto ware

Some microscopically examined HBW from Tiryns and Mycenae, HBW from Tell Kazel and Impasto ware from Broglio di Trebisacce¹⁵¹ were compared¹⁵² by Jung (Badre et al. 2005: 35). He concluded that there were similarities in the surface finish, the temper and the method of firing. It was then assumed that the Italian peninsula is "...the region where the technique of potting HBW possibly originated..." (Badre et al. 2005: 35).

However, very little detail is given on the exact degree of similarity and whether the common features reflect real shared traditions or basic features common to all handmade burnished pottery. The only point made in that study is the presence of grog in Italian Impasto ware from the sites of Broglio di Trebisacce and Coppa Nevigata¹⁵³:

"Approximately 20% of the analysed Impasto vessels from contexts of the Recent Bronze Age (which is contemporary with those contexts from Tell Kazel containing HMB [HBW]) show grog inclusions" (Badre et al. 2005: 35, note 67).

From other petrographic research undertaken on Impasto ware, more information on the characteristics of the fabric and techniques used by the potters can be identified. Even though most of this research is focusing on provenance studies more than technological analyses, some features of the potter's traditions can be highlighted in the hope that further

¹⁵¹ Northern Calabria, Southern Italy

¹⁵² The method used is not mentioned.

¹⁵³ Northern Apulia, Southern Italy

work on both parts of the Mediterranean will increase their focus on manufacturing processes.

First, it should be mentioned, about the pottery from the LBA Italian peninsula and more widely from the Central Mediterranean, that there are at least five different types of wares included in the typical assemblage: three are wheelmade (Mycenaean/Minoan imported or locally made wares, Grey ware and Figulina) and two are handmade (Impasto ware and Dolia ware).

The general characteristics of each ware and their chronological span are defined in: Jones et al. 2002: 174, table 2. It is now established, by typological analogies and scientific analyses (Vagnetti 1999a; Jones et al. 2002), that four of these wares are of Aegean origin or influence: Mycenaean/Minoan wares, Grey ware, Dolia and Figulina.

There is a definite difference in techniques between the Aegean imported or Aegean influenced but locally made pottery (Mycenaean/Minoan wares) and the pottery of local tradition (Impasto ware). The main aspects are that in the former case, the pottery is wheelmade, painted, made of a fine calcareous clay and fired at high temperature in a kiln whereas Impasto ware is handmade, simply burnished, made of a coarse non-calcareous clay and fired at low temperature in an open fire (Buxeda I Garrigós et al. 2003). This difference in type of clay constitutes together with the firing conditions different technological traditions.

The difference between the Impasto and Dolia wares is said to lie in the coarseness of the fabric, the type of temper, the surface finish, the firing conditions and the shapes and function of the vessels. Concerning the difference between Impasto and Grey ware, it is mentioned that, for Grey ware, the treatment of the clay and the use of the wheel are Aegean-inspired, but the repertoire of shapes is related to the local tradition (Belardelli 1994; Bettelli 2002). Some features of Impasto ware fabric and manufacture are discussed below.

It has been mentioned that the **coarseness of Impasto ware** fabric varies within the same site, like in two settlements situated near Imola¹⁵⁴ (Amadori et al. 2002). The study of twenty-one samples of Bronze Age Impasto ware by petrographical analysis has shown that finer fabric was used to make table ware of a fine forming and finishing quality and coarse fabric was used for larger vessels, and was probably related to cooking and transporting. On the contrary, Dolia ware, corresponding to storage jars and pithoi, was used mainly for transport (Levi et al. 2002: 195).

The identification of the **fabric composition** of samples from Broglio di Trebisacce (Jones et al. 2002: 176) has shown that the raw material was available close to the site. In addition, the variability in the clay content from close-by sites in Northern Apulia¹⁵⁵ suggests that the production of Impasto ware was not centralised in a few sites but widespread in many settlements (Levi et al. 2002: 195).

Also, it has been mentioned that the **types of temper** seem to be different between Impasto ware specimens from different sites. For example at Rosa Russa¹⁵⁶, the materials identified include garnet and mica (Buxeda I Garrigós et al. 2003: 276) and at Coppa Nevigata where temper is particularly abundant, the presence of grog is attested as well as various other types of temper (Levi et al. 2002: 195).

The **firing conditions** of the Impasto ware are variable which induce a variation of surface colours (red, brown or black). It was found that the Impasto ware samples from Broglio di Trebisacce and Rosa Russa were fired at a low temperature, not exceeding 750°C

¹⁵⁴ Western Romagna, Northern Italy

¹⁵⁵ Coppa Nevigata and Madonna di Ripalta. See: Levi et al. 2002: 195-205

¹⁵⁶ Northern Calabria, Southern Italy

(no vitrification), resulting in a porous fabric. In the study of the sites of Broglio di Trebisacce and Rosa Russa a variety of firing temperature was observed: from no vitrification to extensive vitrification (Buxeda I Garrigós et al. 2003: 278).

If we compare this overview with the literature review of HBW (3.1), it is tempting to conclude that there are similarities between Aegean HBW and Impasto ware, like the use of grog temper, the firing temperature, the burnishing, and the use of at least two types of fabric.

A question that emanates from this though is: to what extent are these common features related to shared potting traditions? Could they be instead linked to intrinsic characteristics of pottery manufacture made by hand and using basic techniques/tools? These interrogations will need further research on pottery-making techniques of both HBW and Impasto ware as well as comparative studies focusing on these questions.

Another aspect needs to be outlined here. It concerns the fact that if it is postulated that HBW represents the product of an Italian population present in the Aegean (2.4.1), other types of ware present in Italian sites should also be found in Mycenaean sites. Since, as mentioned earlier, Impasto ware only represents one part of the pottery assemblage of a site.

There is, indeed, another class of pottery, found in similar contexts as HBW (same site and sometimes same find spot): Grey ware from Tiryns, Khania and Dimini, which has been interpreted as being also of Italian origin. There is, however, no definitive answer to whether this is correct, as a whole or even partially.

This has been briefly mentioned in: 1.1.1 and is not discussed further as it is a whole different subject, which links with HBW are discussed in: Kilian 1988; Belardelli 1999; Belardelli, Bettelli 2005; Jung 2005; Girella 2007. The important point though is that there is no certainty about the exact origin of this ware nor if it is indeed linked with HBW.

It is a fact, though, that this type of pottery does not appear in all sites where HBW has been found, even in sites like Mycenae, where a large quantity of HBW was found and where it cannot be due to excavation coincidence or sites like Lefkandi, Menelaion or Thebes which pottery from the LH IIIC levels are fully published (*1.1.1*).

3.4 Pilot study of HBW fabric

This pilot study was conducted on four sites, in addition to a sampling of the unpublished HBW material from Mycenae which is fully detailed in: 4.4.

Fifteen HBW specimens (out of sixteen¹⁵⁷ published in: Rutter 1975) from the site of Korakou were chosen to be analysed, as they represent a “reference site” for the study of HBW. Korakou is one of the first sites where HBW has been identified and the first one where it has been studied in detail; that is all the other identification of HBW were relying on the characteristics outlined by Rutter (1975).

In addition, HBW from the Agora at Athens (a single specimen found and published in: Immerwahr 1971 and Rutter 1975) and Lefkandi (two specimens out of ten published¹⁵⁸ in: Evelyn et al. 2006) were also included in this study. They were both chosen to determine the degree of similarities with the reference site. The material from Lefkandi was also selected in order to analyse the hypothesis of the presence of several distinct groups of unrelated phenomenon (1.1.3.3).

The last site, Corinth (eight specimens published in: Rutter 1979) where the handmade pottery found is related to another phenomenon distinct from HBW (1.1.3.1), was added to the present study in order to compare it, on fabric and technological grounds, with the reference site.

3.4.1 Objectives

Several points have been taken into consideration. The foremost aspect was to undertake a systematic preliminary visual examination of HBW fabric and potting techniques, using the previously presented framework (3.2.2.1). Indeed, in order to compare

¹⁵⁷ The last one was inaccessible at the time.

¹⁵⁸ Due to problems of coordination.

sites and the results obtained from the fabric analysis, the specimens have to be studied using the same methodology: a set of criteria to be analysed, and the same research objectives.

That is why even though HBW from the site of Korakou (Rutter 1975: 23-29) has already been analysed and grouped by types of fabrics (detailed in: [Figure 3.1]), it has been decided to re-study the corpus using the present framework.

The first aspect of my work was to note down the details of the fabric description and technical features of each specimen.

Other objectives were to determine if the fabric groups already established were relevant using the present method and, most importantly, to determine what the characteristic features of HBW fabric at the site were. I also took photographs of the fabric texture and colour to justify my analysis and make comparison easier.

Another sub-objective was to try to determine (to some extent) the skills of the HBW potters and to understand the function of the vessel by analysing some physical properties and the quality of finish.

Then the next step was to study in detail the specimens from the Agora, Corinth, and Lefkandi in order to determine as well the characteristic features of the fabric and to compare them with the results of the Korakou study.

This preliminary work was intended first to assess whether the framework of analysis proposed for the study of HBW was well adapted to this class of ceramic, and secondly, to try to establish if HBW from the various sites formed an homogenous group.

As a continuation of this pilot study, a preliminary fabric analysis of HBW from Mycenae was undertaken (4.4) in order to, amongst other aims, compare the results obtained with the study of the material presented here (HBW characteristic fabric features) to determine if the characteristic fabric features in each site are closely related or distinct.

3.4.2 Korakou HBW analysis

First, one objection to Rutter's Korakou HBW corpus needs to be addressed. It concerns a sherd (CP 2924), which has been excluded from the study; it has a different type of fabric (fine fabric, quite a smooth fracture), and a different method of firing (very light and homogenous colour, very hard fabric)¹⁵⁹.

- **Observations related to the fabric used by the potter:**

The first feature, which drew my attention when I started this analysis, was the abundant presence of several different types of inclusions and voids:

- _ Presence of many white glistening flakes¹⁶⁰
- _ Presence of striated and elongated voids left burnt-out black
- _ Presence of small grits only
- _ Presence of dull red rounded inclusions
- _ Presence of very large angular inclusions¹⁶¹
- _ Presence of large amount of rounded white inclusions

These observations led me to cluster the specimens into distinct groups related to the abundant presence of these specific types of inclusions/voids. It could then be observed [Figure 3.6] that most of Rutter's groups seemed consistent with a division based on the inclusions cited above, with the exception of Rutter's Group 1, which seems to encompass two groups:

- _ Fabric Group 3: characterised by the presence of a large amount of white rounded inclusions of various sizes [Figure 3.7]

¹⁵⁹ It might belong to the Byzantine period, as Sanders (pers. comm.) suggested and I agree for having looked at some of the local Byzantine pottery.

¹⁶⁰ More specimens containing these have been mentioned by Rutter (1975) but I am referring here only to specimens that bear a very visually noticeable quantity.

¹⁶¹ Size: more than 3 mm

- _ Fabric Groups 1A and 4: characterised by the presence of dull red rounded inclusions [Figure 3.8] and of large to very large inclusions.
- _ Fabric Group 1B: characterised by the presence of dull red rounded inclusions and also by the presence of many white glistering flakes [Figure 3.9].
- _ Fabric Group 2 and one specimen from Group1: characterised by the presence of many white glistering flakes and of striated and elongated voids left burnt-out black.

Even though arguable, it can be supposed, from these differences in type of inclusion, that either different types of temper or types of clays were used or that different potters made the vessels. It can be observed that the quantity of the same inclusion present in the various vessels is important enough to suggest that it might not have been coincidental.

The fabric of vessels from Fabric Group 2 was made using fine inclusions and what could possibly be identified as straw/grass temper (striated and elongated voids left burnt-out black).

The fabric of vessels from Fabric Groups 1A-B and 4 were made using what could be identified as some other type of temper (red dull rounded inclusions): perhaps grog.

Vessels from Fabric Group 3 have been made of a very distinct type of fabric which suggests that those white inclusions (probable calcium carbonate) were added deliberately. Also the white inclusions seem to have suffered from firing: lime blowing¹⁶² [Figure 3.13]. As mentioned in: *Appendix D*, it is well known that calcium carbonate inclusions were sometimes added deliberately by the potter to enhance the thermal shock resistance of the vessel.

The three types of inclusions mentioned above are somewhat similar to the ones observed at Mycenae (4.4). However, they bear some distinct specificities and are present in

¹⁶² Definition: it reflects the process of decomposition of the calcium carbonate starting when the temperature rises above 750°C (Gibson, Woods 1990: 197).

much less quantity and therefore cannot be used to create groups. This reinforces the idea that, at Korakou, some intentional behaviour might be the result of what we can observe: the use of tempering material.

Obviously, the interpretations of the presence and type of temper are only suggestions. They would need to be verified by petrographic and/or compositional analyses of the specimens in question. Grog is difficult to identify with a simple visual examination and calcareous matters do occur naturally in Greek clays and might only reflect the local geology (Vitelli 1984: 117; Rice 1987: 410).

Worthy of note is some singularities present in the fabric of a few specimens [Figure 3.10]:

- _ CP 2927: presence of several large rhombohedra, clear glassy white inclusions (quartz-like or calcite?).

- _ CP 2923: presence of a very large rounded void¹⁶³ blackened inside and presence of a large white glassy plate-like curved inclusion (shell-like?), a similar feature appears on one of the Mycenae HBW specimens (4.4.1). But such an element can be found occurring naturally in the clay, especially if it is not found in a large quantity in the sherd (Rice 1987: 410).

- _ CP 2922: presence of many rounded voids, only on the lower part of the body. These could be interpreted as calcium carbonate inclusions that have dissolved. In this case, it might be that special care was taken by the potter to improve the heat resistance on the lower part of the body (*Appendix D*).

¹⁶³ Size: 5 mm

- **Observations related to the firing conditions:**

The aspects representative of the firing conditions have been organised in order to form groups depending on the colour of the surfaces and core, the presence of a margin, the degree of hardness and the texture of the fracture. There are three main types of colouring of the vessels, some of which can be divided into two sub-categories depending on the presence or not of a margin [Figure 3.11]:

- _ Firing Types 1A: two types with a rather light-coloured and mottled surface, dark core and crumbly to medium hard (without margin or with margin only on one side).
- _ Firing Types 1B: two types with dark-coloured homogenous surface, dark core, hackly or granular texture and hard (without margin or with red margin).
- _ Firing Type 2: one type with red-coloured surface, homogenous all the way through, a granular texture and hard.

Firing Type 1 is characterised by the presence of a black core, which indicates a short firing, in a reduced atmosphere and consequently the use of an open fire. Most specimens fall into this category. However, one specimen (CP 2919) of Firing Type 2 does not have a black core, the clay is red all the way through [Figure 3.12] which indicates different firing conditions (oxidising atmosphere).

These differences in firing results could indicate two aspects: the fact that vessels were not fired at the same time (at least of the specimen of Firing Type 2) and that there might have been some control over firing in order to obtain Firing Type 2.

Similar types of firing have been observed at Mycenae (4.4.2), including specimens of homogenous colour and without a grey core. However, there seems to be more variations there.

Several other features, related to problems of the fabric behaviour when fired, are visible on the vessels [Figure 3.13]:

- _ Fireclouds or mottled surfaces: they are additional evidence for the use of an open fire or they can be related to the use of the pot in cooking (Rice 1987: 235-236).
- _ Bloating: it occurs if the firing of the pots was too rapid (Gibson, Woods 1990: 106).
- _ Cracks: discussed in: 3.1.
- _ Lime blowing or spalling¹⁶⁴: in the case of the two specimens in question it is localised only on some parts of the body: on the interior and some parts of the exterior surface for CP 2775 and only on the interior surface for CP 2920. Concerning the latter specimen, it could also be linked to internal wear of the vessel.

Some of these features might indicate that the potters had a restricted knowledge of some potting techniques or that they may have not been familiar to the clay available to them.

- **Observations related to the quality of craftsmanship:**

The first element observed is related to the differences of quality of forming/finishing on the same pot. Indeed, important degrees of variation in quality can be observed between the interior and exterior surface of the same vessel as well as on the same surface area: between neck and body or handle and body.

The second element to mention is the thickness of the walls; most specimens have a rather thick wall, not always even. There is, however, an exception: a carinated vessel (CP 2927) where there is a careful change in wall thickness between the upper body and the lower body. Such care taken in this achievement is unique in the corpus of Korakou.

Considering that HBW is often said to be associated with food preparation and storage (2.2.3), the quality of surface treatment on the interior surface would be expected to be better,

¹⁶⁴ Definition: "Flakes of clay pushed or blown out of the surface of the vessel when the temperature is raised too quickly during the early stages of firing. Corresponding scars are left on the surfaces of vessels" (Gibson, Woods 1990: 246).

which is the case with most specimens, except for two which have a higher quality of surface finish on the outside than on the inside without being of an aesthetically high level (CP 2928, CP 2930). This aspect was also noted at Mycenae but on a larger quantity of specimens (4.4.3).

Burnishing is said to be both functional and decorative (Gibson, Woods 1990: 109). An element that stands out in the observations made is the variety in the **quality of the interior surface finish** [Figure 3.14] and its probable link to the functionality of the vessel since compacting the surface helps to reduce the permeability of the wall. Could the pot carry liquids or liquid food? Or is it more suitable for dried food? Or is it not suitable for food at all?

The **quality of the exterior surface finish** [Figure 3.15] is however linked with both functional and aesthetic parameters. It also is directly associated with the presence of decoration and how well the overall vessel is formed and finished. Even though reasons for the choices of finish made by the potters are difficult to assess objectively, they can tentatively be divided into three: mainly aesthetic, only functional and both aesthetic and functional.

Two vessels can arguably be included in the mainly aesthetic reasons. They have been rather carefully made, with attention paid to the exterior surface finish and the addition of decorations [Figure 3.15a]. The plain applied cordons (two horizontal and one in zigzag) of CP 337 cover the whole wall area, a feature uncommon in HBW (2.2.2). The other vessel (CP 2775) is the only one in the whole published corpus of HBW that has been painted. It was

noted by Rutter (1975: 28) that the paint used is different from the paint usually used on Mycenaean pottery due to its texture¹⁶⁵.

Two other vessels can be assigned to the group of functional reasons only. The large jar (CP 2919) has a very well burnished surface, a rare feature for large HBW vessels, which suggests that it could have been quite suitable for containing liquids and the wide-mouthed jar's handle (CP 2928), which is a double horn, have not been executed with much care [Figure 3.15b]. So the aesthetic reason for designing such a handle can probably be ruled out. This handle is, however, too small to grab easily but it could have had another function (like for tipping over for example).

Then there are three vessels that might have had both aesthetic and functional reasons for being finished at a high level. They are rather highly burnished both on the interior and the exterior surface; the general shape is very precisely formed as well as the handle when present [Figure 3.15c]. Adding to this the fact that they are small and two of them have a specific shape (carinated), it can be suggested that they were used as serving vessels.

The last aspect that can be analysed is related to the different burnishing techniques and tools used¹⁶⁶. Long and thin grooved traces related to the finishing stage have been observed on six specimens [Figure 3.16]. Also two specimens show marks that might indicate that they were burnished/smoothed while they were still wet [Figure 3.17].

In addition it was mentioned that three specimens have been slipped¹⁶⁷ (Rutter 1975: 20, 22). These specimens belong to the medium to high burnished category [Figure 3.18]. Even though it has been mentioned that the presence of slip on a surface can be identified by

¹⁶⁵ “The paint on the basin looks almost like tar and appears to be of a totally different composition from that used on Mycenaean fine ware” (Rutter 1975: 28).

¹⁶⁶ It cannot be ruled out though that the traces might represent unrelated phenomena (use traces, post-depositional or post-excavation processes...).

¹⁶⁷ As mentioned earlier, slipping or barbotine techniques have also been identified at Tiryns.

the strong contrast of colour between the surface and the core (Shepard 1968: 191) only a thin section analysis can really determined if this technique was used (Vitelli 1984: 122).

- **Discussion:**

Evidently further analyses (thin section and compositional analyses) would be necessary to test the validity of the present preliminary study. However the analysis undertaken has permitted assessing, with a list of precise criteria, the fact that there are several different groups of fabric, firing types and degrees of finishing quality.

A comparison between firing groups and fabric groups shows first another particularity of the specimen from Fabric Group 4, which has a different type of firing than the other specimens [Figure 3.19]. Fabric Groups 1¹⁶⁸ and 3 share a similar type of firing whereas Fabric Groups 2 and 4 have been fired in different ways.

A comparison with the quality of burnishing also demonstrates the same kind of differentiation [Figure 3.20]. Indeed the specimens with a low burnishing quality belong to the Fabric Groups 1A-B and 3 whereas the specimens with a high burnishing quality mainly correspond to specimens of Fabric Groups 2 and 4 [Figure 3.21].

Considering the small amount of material studied it could be coincidental but there still is a visible differentiation on several stages of the technological process which makes think that it was done intentionally.

Then, a comparison with the size of the vessels shows that pots from Fabric Group 2, of a high finishing quality and rather well fired are small vessels whereas pots from Fabric Groups 1B, 3 and 4 are large vessels [Figure 3.22].

¹⁶⁸ With the exception of one specimen : CP 336

When all three forms of combinations are associated, four of the five fabric groups, determined earlier and based on Rutter's groups, are still consistent [Figure 3.23]. There are however a few specimens which do not match these:

- _ Fabric Group 3 is characterised by a low finishing quality, a firing type 1A. It is comprised of large vessels.

- _ Fabric Group 1A is characterised by a medium finish quality, a firing type 1. It consists of large vessels.

- _ Fabric Group 2 is defined by a high quality of finish, a firing type 1B. It mainly includes small vessels.

- _ Fabric Group 4 (only including a single specimen) is different from all the other groups first by the firing type but also by the fact that even though it is a large vessel it is well finished.

- _ Then the last few specimens belonging mainly to Fabric Group 1B have the same Firing Type 1A but can be either low or highly finished and of medium to large size.

This categorisation shows that the four fabric groups do relate to some extent to the firing conditions and the quality of finish but not necessarily to the vessel size since large vessels could be made of at least three different types of fabric. This is unlike the situation observed at Mycenae where the three fabric types relate to the difference in vessel size (4.4.4).

In conclusion, several features of the fabric of Korakou HBW can be pointed out as characteristic:

- concerning the fabric:
 - _ presence of certain types of inclusions in abundance allowing for a differentiation of fabric mixtures (different from Mycenae)

_ possible presence of tempering material: organic, grog, calcium carbonate (to be verified)
(different from Mycenae)

- concerning the firing process:

_ most specimens have a grey core
_ presence of red-coloured and homogenous specimens
_ presence of black homogenous specimens
_ presence of features that seem to relate to a low knowledge of firing consequences
_ some possible control over firing

- concerning the quality of finish:

_ variation in forming and surface finish quality
_ bulkiness of material: thick walls (different from Mycenae)
_ possible relation of the finish quality with functional and aesthetic purposes of vessels
_ presence of slip on some specimens (to be verified) (different from Mycenae)

- concerning the overall aspect:

_ heterogeneity of the fabric (different from Mycenae)
_ relation between fabric, firing, surface finish but not vessel size (different from Mycenae)

3.4.3 Comparison with the Athenian Agora HBW

It was mentioned in Rutter 1975 (29) that the collared jar from Korakou Fabric Group 4 is similar to a handmade collared jar found in the Agora at Athens (P 15531).

The first aspect to notice was the difference in shape of the neck. The Korakou specimen has a pronounced separation between the neck and the body marked by an angle [Figure 3.24] whereas the Agora specimen has a transition. The quality of execution is somewhat also different: the Agora jar is quite thick-walled and rough with variation in the

thickness of the walls, contrary to the Korakou one which is rather well executed for a large vessel.

Concerning the fabric and inclusions present, apart from medium to large rounded voids, there is no visible inclusion on the surface of the Agora jar. The fabric is rather fine for such a large vessel with quite thick walls. In this respect, the fabric is similar to Korakou Fabric Groups 2 and 4.

It can also be noticed that the presence of striated and elongated voids left burnt-out black [Figure 3.24] which is also a feature of the Korakou Fabric Group 2. This probably does not indicate the use of temper as it is rare.

The colour of the surface of the Agora jar varies from mainly red to brown and is sometimes mottled. The exterior surface is darker than the interior. The core is black, with a red margin [Figure 3.24]. The specimen is definitively darker than the Korakou specimen (of Fabric Group 4), which is the only specimen in the Korakou corpus not to have a grey core. It would be more related to the firing conditions of Korakou Fabric Group 2.

Concerning the finished aspects, there are thin and long oblique burnish marks at the rim and at the base. The aspect of the surface is a bit lustrous in some places. The surface is smooth outside. All this is quite common at Korakou. However, the level of burnishing is lower than in the Korakou specimen of Fabric Group 4.

In conclusion, there is no doubt that the Agora jar belongs to HBW, as there are many similarities with specimens from Korakou, but this jar does not necessarily have a particular resemblance with the Korakou jar.

3.4.4 Comparisons with Corinth handmade pottery

Following the same methodology as for Korakou HBW, here is a comparison with the handmade pottery from Corinth that has already been differentiated from the HBW as

mentioned previously (*1.1.3.1*). My concern here is about the fabric similarity and differences with HBW. It was difficult though to conduct this comparison because the corpus is very small (eight small sherds) and in a bad state of preservation.

- **Observations related to the fabric used by the potter:**

On the whole, the fabric of all specimens is medium coarse, with many medium to very large inclusions visible on both surfaces and fracture [Figure 3.25a]. Many light grey and cream angular inclusions are present on most specimens, rising above the surface.

To note as well, is the presence of many light-coloured inclusions similar to the ones observed in Korakou Fabric Group 3. However, in only one case, it was possible for me to interpret these inclusions as being calcium carbonate, because of the presence of round voids that could be interpreted as calcareous inclusions that have dissolved when buried¹⁶⁹ [Figure 3.25a].

However, in comparison to the Korakou material, the fabric at Corinth does not seem to vary as much: absence of fine fabric and not much diversity of inclusions.

- **Observations related to the firing conditions:**

All specimens are soft and crumbly. Most of them have a dark-coloured surface, some of them with a variation of shade from black, dark grey to red, some only red [Figure 3.25b]. The core was difficult to analyse because of the dirt. But it seems that the darker multi-coloured sherd looked like the core was black, in a similar way as Korakou Firing type 1A1.

However, two sherds have a light-coloured surface, between beige and cream, slightly yellowy. The core is the same colour as the surface [Figure 3.25b]. These specimens are

¹⁶⁹ Indeed these voids are present all over the sherd: on both surfaces and all around the fracture. This phenomenon is similar to Pre-Mycenaean pottery from the area, as mentioned by Tzonou (pers. comm.) I had a look at some of other specimens in the collection that do have a similar aspect: they are dated to the EH or MH.

rather different from the ones observed at Korakou, even from the specimen of Fabric Group 4 which is red. It is somewhat similar to the Mycenae Firing Group 1 though (4.4.2).

- **Observations related to the quality of craftsmanship:**

It is difficult to identify the quality of execution and finish as they all are rather small fragments and they have been damaged by post-depositional conditions. However, the thickness of the wall can give an indication. They all have rather thin wall except for one specimen. The handle is quite well executed with a regular rounded section.

It is difficult to assess the similarities and differences given the very fragmented group to study. All that can be said is that the walls of most HBW are thicker especially in large vessels and that the rims of the Corinth corpus are rather well formed.

I could only see traces of burnishing on the handle fragment [Figure 3.25c]. However, it has been mentioned that traces are also visible on the rims (Rutter 1979: 391). On all rim fragments the exterior surface is crackled, very rough and dull [Figure 3.25c]. However the interior surface is better finished: slightly smoother.

- **Discussion:**

Interpretations of the fabric relation of this group of pottery with HBW are very difficult for all the reasons mentioned above but also because the corpus only includes one type of shape: collared jars. This implies that the homogeneity of the fabric is to be expected. However, it does mark an important difference from the material from Korakou, which is very heterogeneous in fabric, with a wide variety of visible inclusions. There are some similarities with the Mycenae corpus in the homogeneity of the fabric and the firing conditions. All this might relate to the fact that the potting techniques used were generally

similar, being rudimentary. This, however, does not necessarily imply that it is a related phenomenon.

3.4.5 Lefkandi HBW analysis

The two aims of this study were first to analyse in detail the specimens published, because it has not been done before, and then to try to understand the problem mentioned in the publication of the probable differences of phenomenon and origin between the sherds (*1.1.3.3*). Unfortunately, I was only able to see two specimens¹⁷⁰: the so-called "Italian cup" of phase 1 (65/P107) and the jar with a round base of phase 3 (69/P17).

- **Observations related to the fabric used by the potter:**

It can be observed, at first, that the fabric of both vessels is rather coarse, but it is the smaller vessel that is coarser, an aspect unusual in the HBW corpus studied at both Korakou (*3.4.2*) and Mycenae (*4.4.1*). Indeed, the cup has many small to large inclusions and irregular voids highly visible on the surface, unlike the jar which has few large to very large angular inclusions only visible in the fracture [Figure 3.26a].

Different types of inclusions were observed in the two pots: red dull angular inclusions on the jar and white or greyish inclusions on the cup. The inclusions observed on the cup are especially concentrated on the lower body and on the base, a feature also observed at Korakou: could this be linked to the fact that it was used for heating or cooking (*Appendix D*)?

The red inclusions found on the jar are not similar to the ones found at Korakou but they seem to resemble the ones found on HBW specimens from Mycenae (*4.4.1*).

¹⁷⁰ For shape illustrations: [Figure 2.1]

- **Observations related to the firing conditions:**

Differences of firing results between the two vessels are observable: the fabric of the jar is soft and crumbly whereas the fabric of the cup is quite hard. Both pots however have reddish surfaces with mottled patches [Figure 3.26a].

Since the cup has been reconstructed entirely it is difficult to assess the colour of the core but it seems to be quite dark. This is rather unusual for a small vessel which, at both Korakou and Mycenae, are fired black or dark grey all the way through. Differently, the jar is dark red all the way through (without a different core), somewhat like the Korakou Fabric Group 4 jar.

- **Observations related to the quality of craftsmanship:**

Both the rounded jar and the cup have a very thick wall. They give an impression of bulkiness. The quality of execution of the cup is rather low: the handle of the cup does not have a regular shape, it is bumpy and the decoration has not been done with much care. The slashes look like they have been done very quickly without paying much attention to the appearance. In addition, the walls are also uneven with bits of clay not removed [Figure 3.26b]. This is also unusual for a small vessel as observed at both Korakou and Mycenae.

Comparatively the jar has been better executed with a nicely rounded base, very even (possibly made in a mould, like a specimen of rounded jar found at Mycenae) and a regular shape of the start of handle.

The burnishing of the jar is more carefully done than on the cup, hence there is a lustrous surface in few parts of the jar surface. The exterior surface of the cup is not or only very slightly burnished in very few places but the interior surface is quite well burnished.

- **Discussion:**

The study of the fabric of those two vessels shows that they do have many differences in all three criteria. This could be expected as a consequence of the large difference in size.

The Lefkandi rounded jar has similar firing type and quality of burnish to the Korakou Fabric group 4 which is also a collared jar. The fabric includes inclusions which are found in HBW specimens from Mycenae. In addition, the jar bears similarities in shape with a specimen from Mycenae (4.4; *CD-ROM, Excel table 4.3*: 60-461).

Consequently, there isn't, in my opinion, any reason to doubt that the Lefkandi jar belong to HBW. In some respect, the Lefkandi cup is more dissimilar to the small HBW vessels from the other sites studied, being a small vessel made of a coarse fabric with thick wall and a low quality of execution and finish. It is possible though that these are linked to the function of the pot.

3.5 Discussion

Technological information collected in this chapter demonstrates that HBW was not intended to be used for trade (since it is made of a coarse and fragile fabric, is a bulky and heavy product, 3.1.2, and mostly produced and used locally, 3.3.1), or at a workshop level (minimal equipment and simple techniques used, 3.1, together with wide variations in fabrics and shapes). It is best related to the most basic mode of production, as discussed by Peacock 1982 (13-14), and defined by Papadopoulos (1997: 452):

“Household production: This is the simplest mode of production, in which each household makes the pottery it requires for its own consumption. Pottery is made by the women on a seasonal basis and is not intended for sale”.

It can additionally be noticed that these vessels show technological differences from the local traditional Mycenaean pottery¹⁷¹ which possibly is a marker of the foreign identity of the people who made and used HBW, as it has been noted that:

“Specific behavioural patterns (manufacture and function of pottery) are closely connected with the perception of group identity, and are less prone to change, as the habitus of a group is likely to persist even in situation of great social stress, as in the case of migrants in a foreign society” (Guzowask and Yassur-Landau 2005: 472).

In addition at Mycenae (3.3.1.1), Lefkandi (3.3.1.2) and Aigeira (3.3.1.6), it is suggested that some specimens might in fact be imported, from varying distances (regional or international), but further research needs to be carried out on these specific aspects in order to confirm the foreign origin of the makers and their possible mobility, regional or even international.

¹⁷¹ Use of different clay beds at Mycenae and Aigeira, or of grog at Menelaion and Aigeira, 3.3.1.

Important outcomes of the present pilot study (3.4) include the identification of several fabric groups within a single site, which seems to show a link between the fabric, the quality of finish and the shape (and also possibly the function) of the vessels (3.4.2). The study also points toward care taken by HBW makers to enhance specific pottery properties (3.4.2), therefore suggesting skilled knowledge of pottery production by the HBW makers as well as the possibility of the use of these vessels for specific purpose(s): cooking is one obvious option, but it could also be used in the various processes involved in other crafts (5.3.2).

It should finally be added that whereas important differences in the fabric have been noted between HBW at Korakou and Mycenae, the present analysis shows that it was not possible to differentiate the pottery, said to belong to the group of EIA-related handmade pottery, from Corinth (3.4.4) or Lefkandi (3.4.5) from the HBW group.

Chapter 4: HBW from Mycenae

This chapter is concerned with the discussion of the detailed study of a large sample of HBW found in the Cult Centre of the Citadel House Area of Mycenae [Figure 4.1], by the Helleno-British team during the excavation sessions undertaken between 1954 and 1969. The history of the excavation is published in WBM 1 and the methodology of excavation and material recording system¹⁷² can be found in WBM 10 (CD-ROM 103).

The first obvious reason, which instigated this study is that a large quantity¹⁷³ of HBW, in comparison to the finds at other sites (*I.I.I.I*), had been discovered during the eight excavation sessions and that most of this material had not been studied as yet.

One important aspect of such a study lies in the quality of the excavation previously undertaken and of the recording and analysis of the site and material discovered. Indeed, the site provides a continuous sequence of stratigraphy for the whole of the lifespan of HBW from the LH IIIB to the end of the Mycenaean period. This enables the study of the evolution of HBW from its first appearance to its end as well as a precise chronological and depositional analysis of its contexts. In fact, Mycenae is one of the few sites with continuity

¹⁷² It should be noted that all the material excavated was stored by unit in order to keep the data of the find context.

¹⁷³ Mycenae has in fact provided the second largest quantity of HBW discovered, after the site of Tiryns (*I.I.I.I.I*).

from the LH IIIB2 to the LH IIIC period, with detailed analysis of IIIC Early levels, as mentioned in: WBM 16/17 (vii-viii).

Another factor which enabled this study to be started at the present time was the fact that the study of the stratigraphy and history of the site from the LH IIIB to the Post-Mycenaeen period, that has not been fully published yet, has been kindly provided to me. I was granted, not only access to unpublished forthcoming WBM publications, but also, access to part of the archive of the excavation notebooks, to the chronological and depositional information of all units excavated and authorisation to see and study the material at the Mycenae Museum.

4.1 Methodology of research

For this initial study, it was decided that only part of the HBW corpus would be studied in detail. The selection of excavation records was done by French taking into consideration the trenches where the largest quantity of HBW had been found. This resulted in a selection of nine Archive notebooks, which are detailed in: [Figure 4.2], including references to the areas, the quantity of units in total, then the quantity of units seen, and, of those, the ones containing HBW and the quantity of HBW sherds counted. The location of the selection of excavated areas studied (G23, G32, GMB and GMBW) can be seen in: [Figure 4.3].

4.1.1 Mycenae Archive notebooks

These notebooks, arranged by area and year of excavation, give the data about the pottery collected. Each notebook is categorised by Unit: corresponding to a basket which has its own chronological phase and precise depositional context.

From each unit seen, I recorded all the information available¹⁷⁴ concerning the HBW found (quantity, description, shape, dimensions, drawings and photographs) and the associated pottery. The detail of data can be found in the ‘Mycenae contextual list of units with HBW’, *CD-ROM: Excel table 4.1*.

It should first be noted that the identification of HBW specimens was done by French at the time of the excavation and recording of the material. This identification was not always straightforward and consequently a distinction had to be made between sherds that were definitely of HBW type and sherds that could either be HBW or of a type belonging to an

¹⁷⁴ *Excel table 4.1*: Column C refers to the unit reference numbers and column K to the BE number of each unit: used for the Mycenae Museum storage. Column O includes the exact data collected in the Archive notebooks concerning the HBW material. The information available varies between units mainly due to the size of the HBW specimens; that is why the information is sometimes fragmentary.

earlier period, especially the MH period. This distinction has been kept in my recording of the HBW¹⁷⁵. An attempt to determine the type of the uncertain sherds has been included in the objectives of this research.

4.1.2 Excel files of Mycenae phasing and context

In addition to these Archive notebooks, Excel tables detailing the phasing and depositional context of each unit excavated were provided to me, and these data, including the “pot range”¹⁷⁶, were added to: *Excel table 4.1*¹⁷⁷.

The detail of the meaning of the Mycenae phasing system and meaning of the context numbers can be found in [Figure 4.4]. A re-assessment of the LH IIIC levels has recently been published and the outline of the period is presented in: WBM 16/17 (1-11).

In the excel list of the chronological and depositional contexts, it was noted that in some of the units which I have not seen, the mention “HBW” was included in the “Pot range” column. Consequently I have also added those units in: *Excel table 4.1*¹⁷⁸: G3&4’60, 2 units with HBW mentioned; G23’62, 1 unit; G31’66, 2 units; G32’64/66, 3 units; G21/22’68, 5 units; GMBW’69, 10 units.

The list of units with HBW provided here does not form an exhaustive account of the HBW corpus on the site. In the Archive notebooks, which I have not seen, there is more material which has not been mentioned in the “Pot range” section¹⁷⁹.

¹⁷⁵ *Excel table 4.1*: Column D represent the quantity of HBW identified with certainty by French and Column E the quantity of HBW which might possibly, but not surely, be of this ware.

¹⁷⁶ *Excel table 4.1*: Column F corresponds to the chronological range of pottery in each unit. The ones written in blue were established by French and the ones in black are from the information I collected from the Archive notebooks. I have highlighted in blue the units for which the latest pottery found is of LH IIIB period, in green if the latest pottery found is of LH IIIC period, but only for units which have less than 10% earlier material, and in grey if there is Post-Mycenaean pottery.

¹⁷⁷ *Excel table 4.1*: Columns A (phase) and B (depositional context). When written in blue it comes from the excel list provided by French and Wardle. However in some of the depositional context, words have been added in black in order to clarify the location, on the suggestions made by French.

¹⁷⁸ These can be distinguished from the ones I have seen as the unit number is written in blue.

¹⁷⁹ It has been noted that, in many of the units I have seen where HBW has been identified, its presence is not mentioned in the “Pot range” section.

4.1.3 Wares count

Another aspect of the work undertaken with these Archive notebooks related to the quantitative analysis of the different wares present in the units seen. The quantity of each ware¹⁸⁰ has been recorded for the following Archive notebooks:

- for units with HBW only: 3090 (G23'64), 3090 (G23'66), 3091 (G23'68).
- for all units: 3095 (G32'69), 3096 (G32'69), 3097 (G32'69), 3098 (G32'69), 3099 (GMB'68), 3100, 3101 (GMBW'68).

First, this analysis has helped in providing a precise pottery context of each unit, especially concerning the proportion of earlier material¹⁸¹ in order to identify whether the units were likely to contain residual material of a previous period (in case of a high percentage).

Of all the units seen and counted, about a quarter have more than 10% earlier material, and out of the 195 units seen with HBW, only about a fifth of them have above 10% earlier material, rather evenly distributed in all phases (*Excel table 4.1*: column G). This shows that there is not more residual material in units with HBW than in those units without HBW.

Secondly, the proportions of unpainted and painted pottery¹⁸² needed to be addressed in order to determine whether the units assigned to phases of the LH IIIC period do correspond to material from this period or if the material is in fact residual from the LH IIIB period.

¹⁸⁰ Coarse Ware, Unpainted, Monochrome, Patterned (total and per period), EH/MH, Post-Mycenaean

¹⁸¹ *Excel table 4.1*: Column G corresponds to the percentage of EH, MH and LH I/II pottery, all together, found in each unit. I have highlighted in grey the units which have more than 10% of earlier material.

¹⁸² *Excel table 4.1*: Columns H and I represent the percentage of respectively unpainted (excluding Coarse ware) and painted pottery (including Monochrome, Linear and Patterned) in each unit. I have highlighted in green the units which have a pattern representative of the LH IIIC period: high percentage of unpainted and low of painted.

Indeed, as established by Sherratt (1981; WBM 16/17: 59-80, CD-ROM 826, graph 4), the percentage of unpainted pottery decreases over time whereas the one of painted pottery increases [Figure 4.5].

It can be seen in: *Excel table 4.1* that, as a matter of fact, the percentage of unpainted pottery is higher in phases VII and VIII (often above 55%) and the percentage of painted pottery rather low (below 25%), whereas it is the other way around in phases X and XI (with exceptions). However, concerning phase IX the situation is much less obvious. Such an analysis is useful in trying to determine whether the HBW found in units belonging to the LH IIC period is residual or not. Additional information concerning the context, which was collected in the Archive notebooks, is also included in: *Excel table 4.1* (Column J).

4.1.4 Small finds associated

The Excel lists of small finds per unit were provided to me by Wardle. The items found in the units containing HBW were added to: *Excel table 4.1*. This kind of information is only indicative, due to the fact that many HBW specimens are probably not found in situ; it is difficult to be sure about the artefacts with which they can actually be associated. That is why they are not discussed in detail in the present chapter. However, there are a few characteristic items, which need to be considered as they might have a link with HBW. They are discussed more thoroughly in: 5.2-3.

4.1.5 Published and unpublished data

In addition, the following study was undertaken using already published information¹⁸³ from WBM 10 (The Temple Complex, Moore, Tylour) and WBM 13 (The Service Areas of the Cult Centre, French, Tylour) as well as Sherratt's thesis (Sherratt

¹⁸³ *Excel table 4.1*: When units and/or specimens have been mentioned in previous publications, it is indicated in Column L.

1981), the forthcoming WBM 11 (The Room with the Fresco Complex, Moore, Taylour), preliminary drafts and final version of WBM 16/17 (The LH IIIC Levels of the Cult Centre, French) and unpublished information provided by Shelton (regarding Tsountas House Area), French and Wardle.

4.2 Chronological and depositional analysis

Firstly, I want to underline the problem of analysing the find context of the HBW at the site of Mycenae: most of the HBW found comes from secondary deposits or disturbed contexts. This does make it more difficult to have a clear understanding of both the chronological lifespan of HBW and its depositional context as well as its quantitative evolution. However, the phase attribution of each unit was the work of French and is therefore reliable. Adding to this the quality of the excavation and post-excavation analysis, it allows a clear and detailed study of the chronological evidence.

The first point to be discussed here is the five registered and published HBW specimens, which are well preserved and with a secure context (French pers. comm.): ranging from LH IIIB Middle to LH IIIC Middle 2 periods. However, none of them comes from a floor deposit.

The earliest restorable HBW vessel¹⁸⁴ is an almost complete collared jar which comes from the ramp area in the area of Tsountas House, dated to LH IIIB Middle (Shelton pers. comm.; forth. WBM 14). A photograph was published in French 1989 (fig. 3). This is the only HBW specimen found in this area (Shelton pers. comm.).

A HBW cooking pot jar¹⁸⁵ (WBM 16/17: fig. 17), with a full profile, has been found in phase IX, corresponding to the LH IIIC Early 1, in the initial collapse of Room xxxiii at the end of the phase.

Two other HBW specimens¹⁸⁶ (French 1989: fig. 1-2; WBM 16/17: 65, CD-ROM 588-591) have nearly full profiles of wide-mouthed jars. They come from levels dated to the end of phase X or the beginning of phase XI, which corresponds to the LH IIIC Early 2-

¹⁸⁴ Reference number: 60-461. From unit: 44. Phase VIII or IX (Shelton pers. comm.)

¹⁸⁵ Reference number: 66-480. From unit: G31'66/034. Phase: 0932

¹⁸⁶ Reference numbers: 64-455, 64-456. From unit: G'23'64/126. Phase: 1035/1111

Middle 1 period. They were found in a previous collapse or in the fill below Room li (French pers. comm.).

Belonging with certainty to the end of Phase XI, the LH IIIC Middle 2 period, and found in the upper fill, in the area of the Hellenistic Room at East, was a shattered HBW collared jar¹⁸⁷ (French pers. comm.; French 1989: fig. 4; WBM 16/17: CD-ROM 671-672).

4.2.1 Depositional context per period

The second aspect to be analysed is the context and development of the distribution of HBW throughout the periods and the site. Even if some of the HBW found is very fragmentary and/or from secondary or disturbed contexts, an overall view of its distribution gives clues on the prominence of HBW in this part of the site.

Since the general aspect of the site changed quite dramatically after the ‘1200 destruction’ (French 2009), the following section is divided between LH IIIB (Phases VII-VIII) and LH IIIC (Phases IX-XII) periods and then by phase.

The details of the find context of each unit containing HBW are mentioned in: *Excel table 4.1*. Here is a summary of the main points which deserves attention.

4.2.1.1 LH IIIB period

During the LH IIIB period, apart from the collared jar from Tsountas House Ramp Area mentioned earlier, HBW was identified in three groups of buildings of the Cult Centre: the Temple Complex, the Service Areas and the Room with the Fresco Complex [Figure 4.6a].

¹⁸⁷ Reference number: 68-423. From units: GMB’68/004, 005, 006. Phase: 1134/1149

The **Room with the Fresco Complex** is one¹⁸⁸ of the few areas where HBW was potentially found in phase VII. However, in only three of the eight units concerned, have the HBW fragments been identified with certainty as HBW¹⁸⁹ (G32'69/109, 225, GMBW'68/555).

At most six HBW fragments (G32'69/042, 106, 109, 112, 225) were found in the floor deposit of Room 31 and four (GMBW'68/550, G32'69/166) from the floor deposit of Room 32. These two rooms were built at the beginning of phase VII and were in use solely during this phase (forth. WBM 11).

It is mentioned, in forthcoming WBM 11, that there are doubts about the actual dating of the floor deposits of these rooms as some LH IIIB2 pottery and even some LH IIIC pottery has been found there. It has been suggested that part of the material found with the floor deposits of these rooms might in fact come from the intentional backfill of the rooms, at the beginning of phase VIII.

Indeed, it can be seen in the pot range column (*Excel table 4.1*) that LH IIIB2 pottery was found in four of the units containing HBW and assigned to phase VII, two other units (G32'69/225, 166) contain much earlier material and another one (GMBW'68/555) should be assigned to the destruction level of phase VIII (French pers. comm.).

Nonetheless, it was mentioned to me that, according to French, there are more HBW specimens definitely found in phase VII than can be seen in the present sample. But it was not possible before the period of my study at Mycenae to obtain the details of quantity and units concerned. This means that there seems to be little doubt about the presence of HBW already in phase VII at Mycenae.

¹⁸⁸ One HBW specimen was found in the Service Areas (see later on) and one in Tsountas House Area (see earlier on).

¹⁸⁹ Unfortunately it has not been possible to see the material in order to clarify this problem. This should be one of the first aspects to study in further research on HBW.

More HBW specimens were found in the level immediately after the destruction (units assigned to phase 0731/0805)¹⁹⁰ and in the destruction fill of Room 31 (units assigned to phase 0832: nine units with HBW).

In addition, HBW was found in fourteen units assigned to phase 0805 which possibly correspond to destruction debris which came from **Area 36** as well as from Room 31 (French pers. comm.). Some more HBW material comes from the later infill and wash levels (units assigned to phase 0835). Then there are three possible HBW sherds from the destruction debris of Room 32 and possibly some also from the destruction debris of **Room 38**¹⁹¹.

It can be added that most of the units have a low percentage of earlier material and proportions of unpainted and painted pottery consistent with the usual picture of the LH IIIB period. This reinforces the fact that, in the present sampling, HBW occurs at least from the very beginning of phase VIII.

Since the units associated with the use of the **Temple Complex** in phase VII, in Room 19 and in the Alcove of Room 18 are not part of the sample studied, it is not known whether HBW was present. It can only be said that no mention of HBW is made in the publication of the area for this phase (WBM 10)¹⁹². It should be mentioned that the contents of the other rooms (18 and IX) were cleared when the new floors of Phase VIII were built and this material was sealed in Room 19 and in the Alcove of Room 18 (WBM 10: 17).

Two certain HBW fragments (G23'66/125) come from the floor deposit of **Room XI** phase VIII. It has, however, been emphasised in the publication that these sherds as well as some LH IIIC pottery also found in the floor deposit might more likely have been deposited during the destruction at the end of phase VIII, either as destruction debris or as accumulated

¹⁹⁰ The material from the units assigned to phase 0731/0805 is very similar to the one from phase 0731 (French pers. comm.), that is why it is designated this way but it does in fact belong to the beginning of phase VIII.

¹⁹¹ Archive notebook not seen.

¹⁹² Though not all HBW specimens which I have found in the Archive notebooks are mentioned in WBM 10.

litter (WBM 10, CD-ROM:116-118). There might be more HBW material, which comes from the burnt destruction debris of the end of the phase: seven or more body sherds might possibly belong to HBW.

There is a possibility that HBW was found with the floor deposit of **Room 18** phase VIII but the unit is also associated with the initial collapse of the room at the end of the phase (GMBW'69/069¹⁹³). Thirteen certain HBW fragments from one unit (GMBW'68/240) were found in the destruction debris of the Alcove area. They come from the lowest layer above the floor deposit. However, this unit is much disturbed, with a large proportion of MH pottery. In the publication, it was also mentioned that some HBW was found in the later destruction level of this area¹⁹⁴ (WBM 10, CD-ROM: 157).

In addition, some more HBW specimens (at least seventeen sherds) were found in seven units belonging to the collapse, destruction debris and infill of Room 18 at the end of the phase. A bronze violin-bow fibula was also found in one of these units. Another nine certain HBW fragments (from three units) come from a mixed layer of wash over Room 18 and terracing undertaken at the beginning of phase IX.

It can be seen that the material from the Temple Complex area was found in units with mixed material: including important quantities of earlier material (at least for the units seen).

The presence of HBW in the **Service/Ancillary Areas** of the Cult Centre in Phase VII is only hypothetically represented by a single unit (G23'68/068¹⁹⁵) belonging to **Room xxiv**. The context is certain (French pers. comm.) but the attribution of the sherd to HBW is still open to question. No more HBW was found in this room until the re-use of the room in Phase IX.

¹⁹³ Archive notebook not seen.

¹⁹⁴ However, it is not part of the present sample and is consequently not included in the Excel table 4.1.

¹⁹⁵ Archive notebook not seen.

At least nine HBW fragments were found in four units of various areas of **Passage 34**. It is mentioned in the publication that during Phase VIII, this area was only an infill, which was partially blocked and consequently not in use (WBM 13, CD-ROM: 132). All specimens (but one: GMBW'69/151) come from the later part of phase VIII.

Three HBW fragments were found in the **Small Court 35**: one on the floor deposit and two on the upper fill at the end of phase VIII. None are however mentioned in the publication (WBM 13). A bronze fibula was also found there.

4.2.1.2 LH IIIC period

The history of the site during this period has been studied by French and the final results are now available in: WBM 16/17. The beginning of this period (Phase IX) corresponds to a phase of rebuilding after the major LH IIIB2 destruction. This phase also ended with a destruction. It was followed by a phase of gradual alterations and new buildings (Phase X). The latter parts of the LH IIIC period (Phases XI-XII) are more difficult to analyse as later Hellenistic terracing and levelling disturbed most of the Late Mycenaean and Post-Mycenaean levels (French 2009: 151). Some areas were abandoned but in other areas, construction took place during Phase XI which can be divided into several stages. Concerning Phase XII, only some wash levels have been recovered.

- **Phase IX:** [Figure 4.6b]

Most of the complexes from the previous period were destroyed and very few rooms were reused in Phase IX. Two new Complexes and a Courtyard were built on the ruins of the previous buildings¹⁹⁶ (WBM 16/17: 1-4, 11-20).

¹⁹⁶ The plan of the site which corresponds to Phase IX has changed and is now plan 5 of WBM 1, previously assigned to Phase X (WBM 16/17: 1). This plan however only includes rooms from the South Complex; a complete version can be found in: WBM 16/17 (fig. 1).

About half of the HBW corpus of Phase IX comes from late collapse, fills and terracing of the collapsed buildings from over two complexes of the LH IIIB period (Service Areas and Room with the Fresco Complex). As it can be seen (*Excel table 4.1*), most of the material from these units might in fact be residual from phase VIII, judging from the pot range and the proportion of unpainted and painted pottery. Other units are mixed with much early material over the Small courtyard and later material in the upper fill of Room 33.

However, some HBW specimens were found associated with the new buildings of Phase IX, in both complexes: the South complex (in two rooms out of eight) and the West Complex (in two rooms out of three) and in the Courtyard area which separated the two complexes.

In **Rooms xxi**¹⁹⁷ of the **South Complex**¹⁹⁸, at least six HBW sherds were found in the upper fill of the room at the end of the phase. They come from four units¹⁹⁹: one unit (G23'66/020) is mixed with pottery from Phase VII and from the Hellenistic period (WBM 16/17: CD-ROM 118), another unit with pottery from the Archaic period (G23'66/037²⁰⁰) and the last two with earlier material.

Room xxiv²⁰¹ (belonging to the Service Areas of Phase VIII) was re-used in Phase IX possibly as a rubbish area (WBM 16/17: CD-ROM 135). Three certain HBW sherds (including a kylix stem: *Chapter 4.3.1.2*) were found in the terracing below the floor. Few HBW specimens come from over **Area xxvii** (for which the function is unknown: WBM 16/17: 17), from units dated to the end of the phase.

¹⁹⁷ This is the main room of the Complex, it is associated with Room xxii which has two hearths and which might be an open area (WBM 16/17: 14). The room's function might have been related to the storage of pots on the ground floor and a living or 'functional' quarter above (WBM 16/17: CD-ROM 112). A bin of unbaked clay, a built bench, many bone and antler items as well as a clay pestle and loomweight (WBM 16/17: 50) were found.

¹⁹⁸ Built over the Temple Complex and the Passage and re-using Rooms xxiv, xxviii and xxv (WBM 16/17: 11).

¹⁹⁹ GMBW'69/178 is in fact residual of Room xxi (French pers. comm.).

²⁰⁰ A Mycenaean carinated cup was found in this unit.

²⁰¹ In one of the units (G23'68/040), a knife and a fibula (with a plate incised with an ivy leaf design) were also found (WBM 16/17: 15, 51).

Concerning **Room xxxii**²⁰² of the **West Complex**²⁰³, HBW was recorded in one unit belonging to the fill below the floor of the room, one HBW body sherd was found on the floor deposit (G32'69/365) and HBW (including a carinated vessel) has also been reported from the collapse and fill of the room at the end of the phase. However two of those units contain residual material from the LH IIIB period, judging by the pot range.

A HBW cooking pot jar well preserved (and a carinated vessel fragment) has been reported from the collapse of **Room xxxiii**²⁰⁴, at the end of the period as mentioned earlier.

Eight units containing HBW come from the **Courtyard area**²⁰⁵ (labelled Rm xxx and Rm xxxi in: *Excel table 4.1*), they include at least twelve certain HBW, but four units belong to the fill below the floor and might be residual.

In three areas of phase IX, units containing HBW include LH IIIC pottery and a proportion of unpainted and painted pottery consistent with the LH IIIC pattern. All this indicates that HBW was most probably being used in this phase:

- _ one unit from over Rooms 31/32 (GMBW'68/170),
- _ one unit from Area xxvii (GMB'68/104), and
- _ possibly two units in Courtyard area (GMBW'68/167B and G32'66/026).

- **Phase X:** [Figure 4.6b]

Phase IX ended again in a destruction, possibly caused by an earthquake (French 2007). Other buildings were erected at the beginning of **Phase X**²⁰⁶. But again, the largest

²⁰² Built using walls of the South House and the Citadel wall (WBM 16/17: 18). A cultic function of the room has been mentioned (presence of 'altar', unbaked clay basin, hearth). A crucible (burnt on the inside) and a clay conulus were also found there (WBM 16/17: 50).

²⁰³ Built over the Service Areas (WBM 16/17: 11).

²⁰⁴ Built using walls of the South House (WBM 16/17: 19). Similar cult features as in the other room have been found.

²⁰⁵ Built over the Room with the Fresco Complex (WBM 16/17: 11).

²⁰⁶ The plan which corresponds to Phase X is plan 4 of WBM 1, assigned to Phases XI and XII, but it is incomplete. The final version can be found in: WBM 16/17 (fig. 2).

part of the HBW assigned to this phase comes from fills of destroyed buildings (especially from above the Courtyard area of phase IX: 14 units) from the previous periods as can be seen in: *Excel table 4.1*. Most of these units come from the end of the phase.

HBW was also found in relation to the new building of phase X, especially in the area of the **Tower complex**²⁰⁷ and in the area of **Rooms 15, 16 and 17**. Whereas the Tower complex was built in the early part of phase X, Room 17 was a later addition, overlaying another room (WBM 16/17).

Ten HBW sherds at least were found in five units belonging to the removal of the **Tower** (G32'69, 004, 006, 007, 008, 009). These had been deposited before the construction of the Tower and consequently belong to the early stage of the phase.

One other HBW sherd, belonging to the early stage of the phase, was found below **Room 17**²⁰⁸ (but over the previous Area xxvii of the South Complex, Phase IX) and three others belong to the collapse of the room at the end of the phase. Eleven certain HBW fragments (from four units) were found in the destruction debris of **Rooms 15 and 16**.

Most of the units with HBW from phase X have a secure LH IIIC Early context and seem to show that HBW was in use at the time.

- **Phase XI:** [Figure 4.6c]

Not much architecture was found for phase XI: only a few rooms and wash levels (WBM 16/17: 22). Concerning units containing HBW, which are associated with Mycenaean structures, very few (five units) belong to the beginning of the phase and these might be residual from the previous phases: they come from foundation levels.

In fact, most units of this phase come from wash levels at the end of the phase and a large proportion of them come from areas to the east of the site, especially from areas around

²⁰⁷ Built over the West Complex and the Courtyard (WBM 16/17: 21).

²⁰⁸ Built later on during the phase, over Room xxix (WBM 16/17: 22).

wall 'me' (seventeen units). The units belonging to the end of the phase (including at least fifty HBW specimens) have a LH IIIC Advanced or Late context.

Proportionally the largest quantity of HBW for any period was found in the leveling and terracing debris of the later Hellenistic constructions, but are assigned a possible phase XI date. Part of these deposits is mixed including: as well as Mycenaean pottery, Post-Mycenaean artefacts, from the Geometric to Classical periods. HBW specimens have been found in all four terraces, but especially the third one down:

_ upper terrace, below courtyard Q: one unit containing several fragments from the same vessel, discussed earlier (BE 16476). Other sherds from this jar were also found in 'the room to the E'.

_ second terrace, in Room J: three units containing nineteen certain HBW fragments.

_ third terrace, Below Room G where the largest quantity of HBW was found: forty-four units containing at most 194 HBW fragments.

_ lower terrace, in area FF: one unit containing two certain HBW fragments.

This material was presumably incorporated in these terraces in the Hellenistic period.

- **Phase XII?** [Figure 4.6c]

Three units containing nineteen HBW fragments (including two rims) have been classified as belonging to **phase XII**²⁰⁹. They all come from over Room 16 (GMB'68/038, 039, 040). The material from these units is mixed (French pers. comm.).

The question whether the HBW material identified in units of phases XI to XIV belongs to the same phenomenon as the HBW material from the LH IIIB and IIIC periods is still, at this stage, difficult to determine. As mentioned in: *1.1.3.1*, it has been suggested that the HBW identified elsewhere in the later part of the LH IIIC period should in fact be

²⁰⁹ Another two units might also belong to this phase (G3'60/069, GMB'68/074).

associated with EIA-related handmade pottery. Whether it is possible, at this stage, to differentiate between the HBW material from the earlier and later periods at Mycenae is discussed later on (4.2.2.4).

4.2.2 Quantity and evolution

An important aspect, which the study of the site of Mycenae has enabled is a quantitative diachronic analysis of HBW. This study has been detailed in: [Figure 4.7], which was created using data from Archive notebooks.

It should be mentioned here that a similar analysis was undertaken by Sherratt (1981), published for the first time in outline: WBM 16/17 (CD-ROM 827, graph 6), which gives some slightly different results as discussed later on. However, this might be due to the fact that her study was done on a different sample of units [Figure 4.8a]. Three main differences can be seen: my sample is much larger than Sherratt's; it consists of material from four different areas of the site (whereas hers concentrated on one area only); and it also includes material from the LH IIIB period. The results of both sets of samples are presented in [Figure 4.8b].

Certain limitations of the present analysis need to be mentioned. This study is only based on part of the total corpus of Mycenae HBW (as discussed in: 4.1). In addition, there is an uneven quantity of units studied for each period and this might have an influence on the results, since reliability is improved with a larger quantity of units studied (see the problem of phase XII).

Another problem is related to the assignation of units to a phase. As discussed previously (4.2.1), there is an element of doubt in several cases, which is why some units are assigned to two phases.

4.2.2.1 Proportion of present sample [Figure 4.7a]

In [Figure 4.7a], the total quantity of units recorded during the excavation is noted, along with the quantity of units for which I have been able to see the Archive notebooks and count the sherds and within those, the quantity of units, which contain HBW specimens.

Even though there is a variability in the total quantity of units per phase as well as in the amount of units seen (from under ten units up to more than 150), the information related to the quantitative evolution of HBW gives some interesting results, as detailed below. For the analysis, I have not taken into account the units which are in two phases (unless stated otherwise), as they are not representative and often include a very small amount of units.

The next row of [Figure 4.7a] gives an idea of the proportion of available material represented by my sampling, which is quite variable. Nevertheless, for the units corresponding to a single phase, the sampling often includes between a third and half of the units, for the major part of the periods considered. The later phases, which only include a limited amount of units were all counted.

The following two rows represent the proportion of HBW in relation, first, to the total amount of units for the phase considered, and secondly, in relation to the amount of units seen, in order to give an idea of how common the ware is.

Concerning the last row, it can be seen that the proportion of units with HBW increases steadily: from 20% (in the LH IIIB period) up to more than 50 % (during the LH IIIC Middle period). The fact that the area selection includes the ones where HBW is the most common might influence the results of this row, but the row above also shows a steady increase of HBW presence, even though it is in a more limited quantity at the beginning of the period considered: from 10% up to more than 50% (if we do not take into account the phases XI/XIV and XIV).

4.2.2.2 Proportion of HBW in relation to the total quantity of pottery kept [Figure 4.7b]

In [Figure 4.7b], the quantity of HBW is divided into three rows, due to the problem of identification of HBW, as discussed earlier. The quantity of certain HBW is nearly always much higher (more than 80%) than the uncertain HBW group, except for the earlier phases.

The total quantity of pottery only includes units with HBW (for which I have counted the total quantity of sherds). This gives an idea of how small the quantity of HBW sherds is in comparison to the total amount of pottery found in the various trenches.

The following two rows present the information about the proportion of HBW in relation to the whole corpus of pottery found in the phase. The proportion of HBW in the whole corpus never exceeds 3.8% at best. It increases slightly over time: around 0.60-0.70% in the LH IIIB period and reaching 1.80- 2.40% in the LH IIIC period.

The case of phase XII (HBW represents 11% of the total amount of pottery found) cannot be taken as representative of the phase, as it concerns only three units and under 200 pottery sheds in total.

If we compare these results with the ones presented by Sherratt (1981) [Figure 4.8b], we can notice two differences: the percentage of HBW is higher in my sample (reaching more than 1% from Phase X, whereas hers never attains 1%) and the fact that in her sample the proportion of HBW decreases dramatically in Phase XII. However, her sample for this phase is larger than for mine and might be more representative.

In [Figure 4.9a] is presented the results for the whole of the period my sample refers to and it can be seen that there is a more or less steady increase in HBW proportion in relation to the total quantity of pottery of each phase, from Phase VII to Phase XI and beyond.

There is only one phase where there seems to be a slight decrease or stagnation: Phase IX. It is often mentioned in publications that HBW is representative of the earlier part of the LH IIIC period where the largest quantity is usually found (1.3.4). This is not, however, the pattern at Mycenae.

4.2.2.3 Chronological evolution of HBW [Figure 4.7b]

The last two rows of the table [Figure 4.7b] indicate the evolution of HBW per period in relation to the total quantity of HBW found. The quantity is very low in phase VII and increases dramatically in phase VIII (from 1 to 16%). The decrease which seems to appear at the beginning of the LH IIIC period (to less than 10%) might in fact be due to the sample selection.

In the graph [Figure 4.9b], three aspects have been included in order to check how the present sample selection might affect this result. The percentage of HBW sherds on total quantity of HBW over all periods is compared with the percentage of units seen per period, which varies significantly, and with the calculation of the average quantity of HBW sherds per unit and period.

From this graph, it can be concluded that the HBW quantity over time seems to be constant from phase VIII onwards: between 16-18%.

4.2.2.4 Discussion

It seems quite evident from this study that the HBW proportion is constant from the LH IIIB2 to the end of LH IIIC. In addition, even though some of the units containing HBW and assigned to the LH IIIC period might be residual from LH IIIB, there are many units containing HBW, which date to LH IIIC (4.2.1.2). From this information and from the fact that the present sample is large enough (except for phase XII), it can be deduced that HBW

was still being produced and used through to the end of the LH IIIC period and is not just residual.

However, one crucial point, which this study brings to light is whether the increase of HBW through the whole of the LH IIIC period means that HBW is a long-term phenomenon and was still being made and used even at the end of the period, or whether this trend means, as it has been suggested for other sites (Lis 2009), that there is another group of handmade pottery included here, which in fact, is not related to HBW, but to handmade pottery from the EIA, which would have started sometime in LH IIIC (*1.1.3.1*).

Trying to determine whether there are indeed two wares within what has been until now grouped as a single one at Mycenae, is a very difficult task. The main point of distinction between these two phenomena is their chronological difference (*1.1.3.1*), typology and fabric being less obvious and more subject to personal opinion. Indeed, collared jars, the main characteristic shape of EIA-related pottery's typology, are also found in the HBW corpus in most sites (*2.2.1.7-2.2.4*), and at Mycenae in particular, as detailed in the next section.

The question of phase XII and phase XIV will need to be addressed in future work as the material from these phases has not been included in the present analysis.

4.3 Typological analysis

The present study of the Mycenae HBW shape range is essentially based on drawings, made to scale by French, extracted from the Archive notebooks seen²¹⁰. They have been slightly modified (addition of the other half of the profile). I also have verified and modified the drawings of nine specimens and drawn two specimens for which I have done the preliminary fabric analysis (4.4).

The full list of the HBW specimens for which the shape has been identified (more or less precisely) is presented on: *CD-ROM, Excel table 4.2*. For each of the eighty specimens presented, the following information is indicated (when available): unit²¹¹, whether the specimen is classified as certain or uncertain HBW, shape type, rim diameter, quality of burnishing, whether it has been drawn, phase, depositional context, pot range, quantity of certain and uncertain HBW specimens found in the same unit and whether it has already been published.

In addition, there are two columns used to give reference information to similar HBW specimens from other sites and to similar Mycenaean specimens from Mycenae of the LH IIIB2 or IIIC periods.

The decision to create another excel table to present the typology results first from the fact that only a portion of the units seen include HBW with an identifiable shape and secondly because many units contain more than one HBW specimen and it seemed preferable to separate each identifiable shape to be able to compare the material more easily.

²¹⁰ In addition, I have used the illustrations of four of the registered specimens mentioned in: 4.2 and published in: WBM 16/17. Ten other specimens are not drawn but the shape was mentioned in the Archive notebooks.

²¹¹ The units in green correspond to the ones I have seen for the preliminary fabric analysis and for which I have checked the shapes myself at the museum.

4.3.1 Mycenae HBW shapes

The typology used here is based on the one established in: 2.1 whenever possible. However there are a few specimens which do not match any of the ones found in other sites, as detailed below.

Some specimens are quite small and sometimes difficult to identify with precision. In this case, I tried to use distinctive elements either of the shape (rim, decoration...), which I compared to other better preserved HBW specimens²¹², or of the burnishing quality. Indeed, as discussed later on and in: 3.4.2, it appears that the size and shape of the vessel and the burnishing are related, at least as far as small pots are concerned.

4.3.1.1 Carinated vessels T1 [Figure 4.10]

Carinated vessels of a common shape (as presented in: 2.2.1.1) have been mentioned by Sherratt (1981; with possible illustration in: fig. 26²¹³), but in the present sampling, only unusual specimens have been found; they do not compare to any of the characteristic types found in the other Mycenaean sites.

Amongst the ones studied by Sherratt, the first reliable Mycenae HBW specimens seem to come from phase IX (LH IIIC Early), as in most other sites. However, in the unusual specimens recorded, some come from phase VIII.

One of them is classified as uncertain HBW [Figure 4.10: GMBW'68/240 HBW1]; it has a small diameter (9 cm) and a strong everted upper body and is very angular.

Two other specimens might in fact belong to other shape types. One could possibly be a lid [Figure 4.10: G32'69/107 HBW1]. It does bear similarities with some types of

²¹² The most striking example is the cooking pot jar. Many Mycenae HBW specimens have a neck which could easily be compared with some Tiryns HBW specimens identified as cooking pot jars in the latest publication (Kilian 2007).

²¹³ There is no reference to the units the specimens illustrated come from.

Mycenaean lids (the upper body is straight and the rim flat and square) but is fragmentary (base missing) and its burnish is said to be better inside than outside, aspect unusual for lids.

The other specimen [Figure 4.10: GMBW'68/156 HBW1] has impressed decoration on the rim and carination (a feature never seen on HBW carinated vessels from other sites) and is said not to be well burnished. It has in fact been interpreted as a Mycenaean lamp (FS 321) by Sherratt (1981: 51). The specimen comes from phase X. However it has a similar body shape as a specimen from Tiryns (Kilian 2007: no. 298) and a similar decoration to another Tiryns specimen (Kilian 2007: no. 271).

4.3.1.2 Small vessels T2-T3 [Figures 4.11-12]

I have grouped the types of small vessels together (cups, bowls, kylix), as specimens are sometimes fragmentary and differences are consequently not always easy to make.

There are four types of bowls (one of which could perhaps classify as a type of cup) in the present corpus. Two correspond to types established in: 2.2.1.3: with a rounded body without handles (T3 C1) and with a conical body (T3 C4). The other two do not really find close matches in the HBW corpus of other Mycenaean sites: cups or dippers and bowls with T-shaped rim.

The first type [Figure 4.11a: T3 C1], which is the most common, could also, in some cases, belong to the lid category (T8 C1, 2.2.1.8). Since the quality of burnishing was recorded in the Mycenae Archive notebooks, it has been possible for a certain number of specimens (including the ones studied in the fabric analysis, 4.4), to classify them as either bowls or lids on the ground of the quality of finish. In addition, it seems that, in some cases, the bowl would fit quite well as a lid on a jar (diameters matching), as for example: bowl G23'66/111 HBW1 and jar G32'69/105 HBW1.

The second type is only represented by a single specimen [Figure 4.11a: GMBW'68/006 HBW1] of a conical body shape (T3 C4), but could also belong to a kylix (2.2.1.3). It has a thin wall. This specimen is classified as uncertain HBW. This suggestion is reinforced by the presence of a kylix stem²¹⁴ [Figure 4.12] found in phase IX Early.

The third type [Figure 4.11b] has a rounded body and lip, possibly with handle(s). These specimens could instead possibly be included in the cup category, as they have similarities with Mycenaean cups (FS 215). However they have been classified as bowls here because the specimens are wider than deep, unlike the usual HBW cup type T2 (2.2.1.2) and have a slightly rounded and everted rim, another uncommon feature in the HBW cups.

In fact, they could also be compared to Mycenaean dippers/ladles (FS 236) and to some HBW specimens from Tiryns T8 C3 (2.2.1.8). However, since the handle and base are absent on the present sherds, this identification cannot be corroborated. They come from varied contexts: phases VII to IX. Another similar specimen [Figure 4.11b: GMB'68/052 HBW2] is very small (5 cm diameter) with a thin wall and comes from a later phase (XIV), it has been classified as certain HBW but is very unusual.

The last types include a single specimen [Figure 4.11b: GMB'68/028 HBW1] which has a very thick T-shaped rim, unlike any other HBW specimen published.

4.3.1.3 Basins T4 [Figure 4.13]

There are two specimens which are possibly large enough to be basins. The first one has the common conical shape known from other sites (2.2.1.4), whereas the second [Figure 4.13: GMBW'68/133 HBW1] one has a thick round rim a thick wall and is much larger. It could be suggested that it might be a stand; only further analysis might help determine this.

²¹⁴ Other HBW specimens were found at Mitrou (2.2.1.3).

4.3.1.4 Buckets T5 [Figure 4.14]

Most of the buckets are straight-sided and of medium size, corresponding well to T5C C4 (2.2.1.5). However, only the rims are preserved and other features (like handles) have not been identified.

There also are two other types which are only represented by a single specimen: a conical bucket (T5A C1) and possibly a situla (T5B). The latter shape [Figure 4.14: G23'64/221 HBW1] is uncertain but the specimen has a start of a horizontal handle on the rim. All these specimens bear resemblances with ones from Tiryns.

4.3.1.5 Wide-mouthed jars T6 [Figure 4.15]

The specimens identified as wide-mouthed jars correspond only to T6A, the most common type (2.2.1.6). They are also fragmentary and often it is impossible to know if handles were present.

There are, however, three specimens which indicate that lug and horn-shaped handles were also present at Mycenae [Figure 4.15b], as well as plastic decorations: such as plain or finger-impressed cordon [Figure 4.15a: GMBW'68/154 HBW1, 147 HBW1]. Most are rather large vessels (up to 44 cm diameter) but there are three smaller specimens of a slight different rim shape (everted): [Figure 4.15b]. Variations are indeed a feature of the HBW T6A.

4.3.1.6 Collared jars T7 [Figure 4.16]

Collared jars are by far the best represented shapes at Mycenae. They can be divided into two main categories according to the evidence or not of the presence of handle(s).

Many specimens are fragmentary (rim and neck only) and are consequently categorised in T7A C1 (2.2.1.7). They have a simple flaring rim with a rim slightly down-sloping, tapered or rounded [Figure 4.16a]. There are three specimens, however, which have

more distinctive features [Figure 4.16b]: one (68-423 has an angular body with a knob on it, another one (GMB'68/039 HBW2) has a very short incurving neck and the last one (G32'69/105 HBW1) has a long neck with pronounced shoulder and might correspond to T7A C3.

Then there are possibly three types of collared jar with handle (T7B) which show strong similarities with Mycenaean types: cooking pot jars (FS 65, 66), amphorae (FS 70) and jugs (FS 110). It can be noted, however, that no other types of handles (T7C) were found in the collared specimens from Mycenae, unlike from other sites.

Within the five specimens identified as cooking pot jars [Figure 4.16b], there are at least two identifiable types:

_ with a single handle: 66-480²¹⁵ and possibly G23'64/173 HBW2 (which has a similar fabric as the previous one: 4.4). The former belongs to phase IX and the latter to phase XI Early.

_ with two handles: GMB'68/108 HBW, belonging to phase XI.

Then there are another two specimens (no handle is preserved) with a rim somewhat similar to the previously mentioned specimens. They come from earlier phases (phase VII to IX Early).

One specimen [Figure 4.16c: GMB'68/087 HBW1] has been identified, by French, as resembling a Mycenaean LH IIIC amphora type. Another specimen bears a similar shape of rim (rectangular) with the start of handles [Figure 4.16c: GMB'68/055 HBW1]. They both belong to phase XI Late.

Three specimens of possible jugs have been found [Figure 4.16e]:

_ one (60-461) has a round base²¹⁶ and possibly from phase VIII.

_ two others with a long neck (one of them with a vertical strap handle), similar to some Tiryns specimens and to FS 110. They belong to phase XI Late and XII.

²¹⁵ Identification made by French.

²¹⁶ Identified as a jug by French.

In addition, there are a five specimens which are very fragmentary and/or unusual (very thin wall, grooved lip) and which have been classified here (for lack of closer matches) but they might not all belong to collared jars [Figure 4.16f].

4.3.1.7 Utensils T8 [Figure 4.17-18]

Amongst the utensils (2.2.1.8), apart from possible types of lids rounded or conical [Figure 4.17], which could also be bowls (as discussed earlier), there are four specimens of possible different kinds of stands [Figure 4.18] but they are all very fragmentary and it is rather difficult to identify them.

One specimen (GMBW'68/133 HBW2) seems to have a rim similar to some of the Tiryns stands and another one (GMBW'68/051 HBW1) has a similar end as the Menelaion stand. The last one might be a tripod stand for which only one of the foot was found (GMBW'68/016²¹⁷).

In addition it should be noted that a HBW small bowl, identified as a possible crucible, was found²¹⁸. Unfortunately, it is out of context.

4.3.2 Relation to pottery from Mycenae

It has already been noticed above that there seems to be some shapes in the present HBW corpus which imitate Mycenaean shape types: like HBW specimens of cooking pot jars, possible amphorae, jugs, specimens of cups or dippers, the kylix stem and possibly a lamp. It can be noticed that some of those specimens come from an early phase: phase VIII for the cups/dippers, phase IX Early for the kylix, though most of them come from phase XI.

It should also be remarked that there are specimens (like 60-461) which are similar to EIA cooking pots, as mentioned by French (1989: 40). It can also be added that some of the

²¹⁷ I have not seen the material from this unit and there was no illustration in the archive notebooks.

²¹⁸ I have not seen the material from this unit.

collared jars from Mycenae bear similarities with specimens of EIA-related handmade pottery from Asine, Kalapodi and Mitrou [Figure 2.2].

Conversely, there seem to be several features suggesting the influence of HBW on Mycenaean pottery. Concerning the carinated vessel phenomenon previously debated (2.3.1.2), it should be mentioned that at Mycenae, the first Mycenaean wheelmade carinated specimens (FS 240) start appearing in Phase X (WBM 16/17: 69). However, there is a specimen (WBM 16/17: 66-443), which comes from Phase IX, though there is no consensus on whether it actually belongs to this date or if it is an earlier or later specimen. Concerning the HBW versions, it can only be said that the most certain specimens seem to appear in Phase IX, as seen earlier (WBM 16/17: CD-ROM 327).

In phase VIII, a wide-mouthed jar of Mycenaean wheelmade fabric was found (Wardle 1973: fig.15:111); and in phase X, a specimen of cooking pot jar of standard Mycenaean wheelmade fabric has a plastic cordon with indentations near the rim (Wardle 1973: fig. 21: 266). These two specimens have wrongly been interpreted as HBW (Rutter 1975:25, note 21; Kilian et al. 1981: 170, note 71; Pilides 1994), due to their shape, even though they were classified as Mycenaean ware (Wardle 1973; Sherratt 1981: 51).

In addition, it has been noticed, in phase IX, that there are specimens of Mycenaean unpainted pottery and coarse ware with similar traces of burnishing as in HBW. They are softer, rougher and less well fired: sometimes with a dark core and surface (WBM 16/17: 67). Indeed, amongst the units I have looked at during the fabric analysis, there are three specimens wheelmade and burnished, one of them with plastic decoration (G32'69/007, 026, 068²¹⁹).

²¹⁹ HBW were also found in those units: two come from phase IX (Room xxxi) and one from phase X (removal of the tower).

Lastly, there are Mycenaean carinated vessel specimens with a handle decorated with bull's head protome (WBM 16/17: CD-ROM 652, 654) and one with a knob on the handle (WBM 16/17: 69, G32'66/6 #8), features present on some HBW carinated vessels (2.2.2).

Whether these features can be taken as representing a HBW influence on Mycenaean pottery is still to be debated, as either there might not be any link between the various phenomena, or it could also be postulated that some of these features represent HBW makers' attempts at making wheelmade pottery. This is suggested due to the fact that it has been observed, in Italy, that attempts were made to create wheelmade Impasto ware specimens (Vagnetti 1999a: 148).

4.3.3 Comparison with HBW from other sites

This section discusses the Mycenae HBW corpus in comparison to the material studied in: 2.2.

4.3.3.1 Shape variations

As shown earlier, it is, in some cases, difficult to identify or classify some of the specimens, especially concerning certain shape types. This is in part due to the fact that they are fragmentary but it is also linked to the differences in shape with the HBW corpus from other sites.

Most of the buckets, wide-mouthed jars and bowls/lids are easily identifiable with specimens from other sites. On the contrary, some of the carinated vessels, some of the small vessels and some of the utensils are uncommon shapes which cannot really be matched with HBW from other sites.

4.3.3.2 Proportion of shapes

The quantity of specimens per shape type has been presented in [Figure 2.10]. Concerning Mycenae, it can be observed²²⁰ that most of the main types (except T2) are present but with great differences in popularity. There is a wide variety of sub-categories (eighteen types represented) which is common to the other sites studied (2.2.4).

What is surprising is that the largest quantity of specimens is found in T7 collared jars (35%) and then T8 utensils (18%), as can be observed in [Figure 4.19], whereas in most sites studied (2.2.4), T6A wide-mouthed jars (20 to 40%) is the first and then T5 buckets and T7 collared jars (13 to 20%). At Mycenae, T6A wide-mouthed jars only represent about 14% and T5 buckets less than 10%.

4.3.3.3 Discussion

The various observations made above tend to show that, as noticed earlier (2.2.4), there are important differences between sites and even between geographically close sites like Mycenae and Tiryns. Some specific shapes only appear at one site and the proportions of shapes are variable.

This, of course, could be due to the accident of excavation but, in some cases, there are important differences which might be related to other reasons, such as the diversity of origins of the makers or the diversity in function of the pottery.

It could also relate to the fact that some of the specimens included in the present corpus should instead be seen as linked to the EIA-related handmade pottery, as discussed earlier.

²²⁰ Taking into consideration the remark made above, studying the quantity of specimen per shape type is rather difficult and can be misleading. It will consequently need to be corroborated by further study of the material (from units not yet analysed).

4.3.4 Chronological distribution

The details of the phasing and find loci of HBW with identifiable shapes are included in: *CD-ROM, Excel table 4.2*. The information presented below is an analysis of the overall picture.

As it can be seen in the table [Figure 4.20a], there seems to be a pattern in the chronological distribution of the HBW shapes present at Mycenae. In all the phases, collared jars are present, often including at least two specimens in each phase (and this as early as Phase VII/VIII).

If we divide the phases into three groups: LH IIIB, LH IIIC Early and LH IIIC Middle to Late, we can observe that collared jars are always the most prominent shape type quantitatively. There are also three other types which are often present: rounded or conical bowls or lids, carinated vessels and wide-mouthed jars.

There seems to be little chronological evolution in the types of shapes present²²¹. Whereas bowls or lids and carinated vessels are important in the whole sequence, wide-mouthed jars are found in larger quantity only during the LH IIIC Early period.

In addition, there seems to be a wider range of shapes in the LH IIIC than in the previous period (basins and utensils) but this might only be due to the quantity of specimens found and identifiable: only twenty for the LH IIIB period and fifty-three for the LH IIIC period. The type of cup/dipper seems to be only restricted to the LH IIIB and LH IIIC Early periods.

Even though, as mentioned previously (4.2), most HBW at Mycenae was found in contexts with residual material, it can be observed [Figure 4.20b] that there is a specimen of collared jars in almost all the areas where identifiable HBW was found for Phases VII/VIII and XI/XIV.

²²¹ The following remarks about the chronological evolution are only suggestions which might need to be confirmed by the study of more material.

In addition, in the LH IIIB period, collared jars and bowls or lids seem to be associated (when looking at the areas where there are several identifiable HBW). In the LH IIIC period, it seems that collared jars and wide-mouthed jars are never or very rarely found together and wide-mouthed jars seems to be only restricted to the earliest part of the period.

In relation to the problem, mentioned previously (4.2.2.4), about the possible presence of another ware (related to the EIA handmade pottery) at the end of the Mycenaean period, it seems, at present, that there is no positive evidence for it.

The corpus of EIA-related pottery known from other sites includes mainly collared jars (1.1.3.1), and here, we can see first that collared jars are present in a constant quantity throughout the whole period of existence of HBW and secondly, the shapes present at the end of the period are also varied, though the other shape types are perhaps less widely distributed than collared jars. However, additional studies of the material will be needed to further clarify this problem.

4.4 Preliminary fabric analysis

This preliminary visual examination of the fabric of Mycenae HBW was undertaken after the pilot study presented in: 3.4 and using the same methodology, established in: 3.2.2.1 and *Appendix B*.

It consisted of the study of the five registered, published and well preserved pots and thirty-eight fragments from thirteen units (all from trench Gamma 23²²²). The units were selected according to two criteria: the presence of rims and/or other interesting features and the chronology (selection of material from various phases in order to compare them).

The objectives of the study were to:

- _ undertake a preliminary fabric analysis of the Mycenae material²²³.
- _ try to identify fabric types such as the ones established in the pilot study of Korakou HBW (3.4.2) and compare the two groups.
- _ try to determine whether some specimens which were not identified as HBW with certainty were HBW.
- _ try to assess if there is a chronological difference in the fabric types identified.
- _ check the drawings found in the Archives and draw the other specimens when possible²²⁴.

The details of the context, chronology, publication, shape and decoration description, state of preservation and dimensions, fabric analysis, archive information and various comments, for each specimen²²⁵, is presented on: *CD-ROM, Excel Table 4.3*.

²²² It was only possible to select specimens from this trench which was the first studied. Two more units were included in the selection but no HBW-looking sherds could be identified in the bags at the Mycenae Museum (G23'64/180, G23'66/111).

²²³ which has not been studied in detail before, apart from the unpublished petrographic analysis of a few specimens by Riley (3.3.1.1).

²²⁴ Only specimens large enough and with a feature were drawn. They are presented in: [Figures 4.11-17].

²²⁵ I have classified the fragments together when they seemed to belong to the same vessel.

Concerning the problem of identification of some specimens as HBW or MH pottery, in the sixteen uncertain HBW fragments selected, it seemed that ten of these had strong HBW characteristics and are consequently included in the corpus. Six other specimens are still a problem as they are very small body sherds²²⁶. It can be added that, in most cases, the recognition of HBW specimens, in the bags, amongst both Mycenaean pottery and earlier material was straight forward.

4.4.1 Observations related to the fabric used by the potters²²⁷

The first aspect to be noticed, when observing the fabric of the samples selected, was the relative homogeneity of the corpus in comparison to the Korakou material (3.4.2). It was not possible to create distinctive groups based on the types of inclusions present.

Instead, it seemed more meaningful to determine the coarseness of each specimen, according to the size and quantity of inclusions observed and whether they were visible on all surfaces, only on one surface or not visible at all.

The occurrence of two main types of fabric coarseness and an “in between” type could then be deduced from this analysis:

- _ **Fine fabric**²²⁸ (nine specimens): they do not have any large or medium inclusions, only few very fine ones, which are not really visible on surfaces.
- _ **Coarse fabric** (seven specimens): they have many large inclusions often visible on all surfaces.
- _ **Medium fabric** (fifteen specimens): they have been classified apart from the other two because they are either slightly coarser than the finer fabric or slightly finer than the coarse

²²⁶ The details are mentioned in: *Excel table 4.3*.

²²⁷ For more details: *CD-ROM, Excel table 4.4*.

²²⁸ This definition is made according to the HBW corpus only and what is identified as fine here, is in the relation to the other coarser specimens and in no way it relates to the fine fabrics of Mycenaean pottery.

fabric. Some of the specimens might in fact belong to vessels which could belong to one of the other fabric groups but since they are very fragmentary it is not always straight forward to classify. It seemed, however, quite clear that there are specimens which do have an in between medium fabric.

The specimens from the finer fabric do not have any large or medium inclusions, only few very fine ones, and contrary to the fine fabric of Korakou specimens, there is no glittering flake. In the two other fabric groups, however, several types of medium to large inclusions and voids were observed:

_ Rounded reddish/orange inclusions [Figure 4.21]: found in about thirteen specimens; in only three cases²²⁹, they are found in noticeable quantity. They might be similar to the ones found at Korakou (in fabric groups 1 and 4) but here they are lighter-coloured.

_ Dark red to brown angular inclusions [Figure 4.22]: they are of a different kind to the ones mentioned above. They are only found in three specimens, in rather large quantity in two of them²³⁰. They have not been noticed at Korakou.

_ Large rounded or elongated voids (3 to 7 mm) [Figure 4.23]: found in nine specimens; in one vessel (collared jar 68-423), they are very common and large. In this vessel, are found also large white platy striated inclusions (shell-like?) [Figure 4.24], feature also found at Korakou.

_ White rounded powdery inclusions [Figure 4.25]: found in eight specimens; but in only three specimens²³¹, are these inclusions present in quantity. They are somewhat similar to, but smaller than, inclusions found at Korakou in fabric group 3, where they appear in greater quantity.

²²⁹ Wide-mouthed jar 64-456, collared jar 68-423, wide-mouthed jar G23'64/173 HBW1 rim

²³⁰ Cooking pot jar 66-0480, collared jar G23'66/110 HBW2 rim

²³¹ Wide-mouthed jar 64-455, bucket G23'64/135 HBW1 rim, possible collared vessel G23'68/152 HBW1 bs

- _ Very large angular inclusions (5 to 10 mm) of varying colours [Figure 4.26]: found in eleven specimens; they are quite rare but so voluminous that they often are visible on the surface and might sometimes be responsible for cracks.
- _ Long voids, sometimes blackened inside²³²: they are difficult to identify, only two have been recognised with certainty. Similar voids have been observed in the Korakou material.
- _ Long voids, sometimes blackened inside²³³: they are difficult to identify, only two have been recognised with certainty, contrary to the Korakou material where they are more abundant and easily recognisable.

In most of the corpus, these inclusions/voids were mixed together randomly²³⁴. In addition, it was very rare to observe a high concentration of a particular type of inclusions/voids in a specimen as was the case at Korakou. There are a few exceptions where there is a slightly higher concentration than in the other specimens but only a petrographical analysis could determine whether this is meaningful.

At present, it can only be deduced that no selection was undertaken by the potters in respect to the addition of tempering material. It can be postulated that the presence of different types of inclusions might be due to the use of different clay beds.

4.4.2 Observations related to the firing conditions²³⁵

Five main types of firing groups have been distinguished according to the colour of the surfaces and the core:

²³² No photograph taken could give a precise illustration of these voids.

²³³ No photograph taken could give a precise illustration of these voids.

²³⁴ It can be observed in: *Excel table 4.4*

²³⁵ For more details: *CD-ROM, Excel table 4.5*

_ **Firing group 1** [Figure 4.27]: four specimens, homogenous light-coloured reddish/orange surfaces, only associated with a medium type of fabric. This group is somehow similar to Korakou Firing Type 2.

_ **Firing group 2** [Figure 4.28]: four specimens, homogenous black surfaces, only associated with the finer type of fabric. One specimen has a margin of different colour (G23'68/080 HBW1 rim). This group is similar to Korakou Firing Type 1B.

_ **Firing group 3** [Figure 4.29]: eight specimens; multicoloured surfaces, usually mottled, with a grey core, present in all types of fabrics, but slightly more in the finer one. One specimen has a margin of different colour (G23'64/198 HBW1 rim). This group is similar to Korakou Firing Type 1A.

_ **Firing group 4** [Figure 4.30]: eight specimens; dark exterior and red interior surfaces, present in all types of fabric, but less in the finer one. This group is probably a variation of the previous one. Two specimens have a margin of different colour (G23'64/221 HBW1 rim and /173 HBW1 rim).

_ **Firing group 5** [Figure 4.31]: seven specimens; homogenous brown-coloured surfaces with a grey core, only found in medium to coarse fabric. This group might also be a variation of the above Firing group 3.

There is a wide range of colours which is consistent with what is generally observed in HBW from other sites (3.1.3), including Korakou, with the most common feature being multi-coloured surfaces and a grey core (Mycenae Firing groups 3 to 5). It is linked to the use of an open fire and possibly the fact that there was no much control over the firing process. In addition, other features related to problems resulting from firing, similar to the ones observed at Korakou, are present: fireclouds, mottled surfaces, cracks [Figure 4.32].

However, there are two other firing types which suggest planning and decisions of the potter to fire certain pots in a different way to others. It concerns specimens with a fabric reduced to dark grey or black (Mycenae Firing group 2), which are generally found in HBW (3.1.3) and also observed at Korakou. This firing type is only used for vessels of a fine fabric, as was the case at Korakou.

Another firing type can be related to a deliberate choice of the potter: Mycenae Firing group 1, which does not have a grey core and has a very light (creamy to orange) colour. As far as I am aware, it has not been mentioned in any publication related to the fabric analysis of HBW, but a somewhat similar type has been observed at Korakou (Firing Type 2), it is darker than the Mycenae specimens (being terracotta red colour) though.

4.4.3 Observations related to the quality of craftsmanship²³⁶

It was first noticed that, compared to the Korakou material, the present corpus seemed less bulky. There are specimens with thick wall but there also are many specimens with thinner walls. In addition, the quality of finish of the exterior surface is often rather high²³⁷. This was also observed at Korakou.

Indeed, very few specimens have a low quality exterior burnish (only two specimens²³⁸). In fact, nearly two-thirds of the specimens are highly burnished on the exterior surface. The quality of the interior surface is also rather good, with only slightly more than a quarter of the specimens having a low quality interior finish.

Three groups have been formed in relation to the quality of the interior surface (which is the most important surface for vessels used for food or liquid storage, preparation or consumption):

²³⁶ For more details: *CD-ROM, Excel table 4.6*

²³⁷ As detailed in: *Excel table 4.6*, where the degrees of burnishing of interior and exterior surfaces have been recorded for each specimen.

²³⁸ Two wide-mouthed jars 64-456 and 64-455

_ **Finish group 1** [Figure 4.33]: eight specimens; interior burnish low and exterior burnish medium to high: most specimens in this group are body sherds, except for a wide-mouthed jar and a collared jar.

_ **Finish group 2** [Figure 4.34]: ten specimens; interior burnish medium and exterior burnish medium to high: mainly related to jars either wide-mouthed or collared.

_ **Finish group 3** [Figure 4.35]: thirteen specimens; interior burnish high and exterior burnish high: mainly related to small vessels (like bowls) but also to jars (wide-mouthed and collared).

This tends to show a link between the size of vessels and the burnishing quality at least to some extent. However, there might be other reasons. At this point, it is difficult to understand those reasons though, it can only be suggested that it might have been related to the use of the vessels for specific contents (like liquid) and/or for serving.

It should be added here that, in the Archive notebooks, it was mentioned on several occasions that there are HBW specimens that were not burnished at all or only burnished on the exterior surface (G32'69/007, 009, 015, 155, 359, G23'68/051)²³⁹.

The burnishing process seems to have varied, as can be seen on the surface: traces go from long and thin (use of grass or some kind of stick?) to wide and indication of burnishing while still wet is present [Figure 4.36].

Concerning the forming process, it was possible to identify three possible methods of construction: by coil (wide-mouthed jar 64-455; G23'68/080 HBW4 bs), by slab (wide-mouthed jar 64-456) and perhaps by mould, at least for the lower rounded part of the body (collared jar 60-461).

²³⁹ It has not been possible to verify this information during this study since these bags were not included on the sample studied.

4.4.4 Discussion and comparison

Further analysis of a large sample of specimens would help determine whether the observations presented above can be corroborated.

Chronologically, there does not seem to be any evolution or pattern in the fabric used or the production: nearly all types of fabric and firings are present in all phases²⁴⁰. However, such an analysis is difficult when the quantity of specimens per phase is limited to seven to nine specimens.

By correlating the fabric, firing result, quality of finish, size and shape of the vessels together, it was possible to observe patterns and to identify three categories²⁴¹:

_ **Small vessels:** mainly made of a fine fabric without many large inclusions visible on the surfaces. Both the interior and exterior burnish is of high quality and mainly the firing types 2 and 3A have been observed. The vessels included only bowls and a possible carinated shape. They seem to only belong to Phase VIII and/or Phase IX Early.

_ **Medium vessels:** mainly made of a medium fabric, sometimes coarse. There is an important presence of rounded red/orange inclusions, very large angular ones and possibly long voids. Both interior and exterior burnish is medium to high. The main firing types are 4 and 3, but 2A and 1 are also present. The specimens mainly include wide-mouthed and collared jars but there also are some bowls and the kylix. They are found in all phases.

_ **Large vessels:** made of a medium to coarse fabric including an important quantity of very large angular inclusions and possibly long voids. The interior burnish is mainly of medium quality and the exterior ranges from medium to high quality. The firing types used are mainly

²⁴⁰ For the detail of the phasing of the specimens and their correlation to the fabric and techniques features, see: *CD-ROM, Excel tables 4.7.*

²⁴¹ As detailed in: *Excel table 4.7.*

5, but also 1, 3A and 4A. The specimens only include wide-mouthed jars/buckets and collared jars. They are found in all phases.

One more remark should be mentioned: the comparison between the HBW cooking pot jar (66-0480) and a Mycenaean version of the same shape (68-453) both found at Mycenae in phase IX. They are almost identical, having both the same shape and fabric characteristics, as illustrated [Figure 4.37]. The only differences are the fact that the Mycenaean version is wheelmade, the surface was left unburnished and it has a ring base.

In conclusion, the characteristic features of the Mycenae HBW sample studied are:

- related to the fabric:
 - _ presence of three fabric coarseness (different from Korakou)
 - _ not many inclusions stand out (different from Korakou)
 - _ no use of tempering material (to be verified) (different from Korakou)
- related to the firing process:
 - _ most specimens have a grey core
 - _ presence of very light-coloured and homogenous specimens (different from Korakou)
 - _ presence of black homogenous specimens
 - _ presence of features that seem to relate to a little knowledge of firing consequences
 - _ some possible control over firing
- related to the quality of finish:
 - _ variation in forming and surface finish quality
 - _ material not always very bulky (different from Korakou)
 - _ rarely specimens have a low finish quality on exterior surface (different from Korakou)
 - _ some specimens have no burnish

- concerning the overall quality:

_ relative homogeneity of the fabric (different from Korakou)

_ relation between fabric, firing, surface finish and vessel size and shape (different from Korakou)

4.5 Discussion

The first point to mention here is that HBW first appears at Mycenae in phase VII (and not phase VIII, as stated in: French 1989), before the level of the major destruction in phase VIII (4.2.1.1). This implies that HBW makers were already present in the Palatial period and consequently that the HBW phenomenon begins in this period.

The second point is related to the problem of the lifespan of HBW. From the present corpus and analysis, it seems that HBW at Mycenae is present all through the Post-Palatial period and consequently that pots continue to be made and used (4.2.2). In addition, the proportion of HBW vessels in the total quantity of pottery, though small, increases steadily from phase VII to phase XI and the proportion of HBW vessels per phase in the total quantity of HBW is constant from phase VIII onwards. Unlike Tiryns, there is no quantitative peak at the beginning of the LH IIIC period (Kilian 2007).

The typological analysis of the material shows that whereas there are several shapes identical to those in the corpus established in chapter 2.2.1, there also are some uncommon shapes (especially the carinated vessels and small vessels : 4.3.1). It should be added that several specimens are similar to Mycenaean and even EIA types (4.3.1.6). Moreover, there is an unusually large quantity of collared jars in proportion to the wide-mouthed jars which are most common in other sites (2.2.4). The analysis of the spatial distribution (4.3.4) shows that collared jars and wide-mouthed jars are rarely found together and whereas collared jars are found constantly all through the period of my study, wide-mouthed jars are mainly found in the LH IIIC Early period.

Consequently, the hypothesis that EIA-related handmade pottery existed amongst the corpus of Mycenae HBW cannot at the moment be corroborated (4.3.4). Indeed, shapes (such as collared jars) which are characteristic of the EIA-related pottery are also found in the

HBW corpus, from the beginning of its appearance at Mycenae in the Palatial period, and onwards, and there doesn't seem to be a chronological gap or a typological evolution which would mark the initiation of this group (4.3.4).

Concerning the fabric analysis (4.4), it could be observed that even if there is a variation in fabric types, it is much less prominent than at Korakou, with less obvious or characteristic inclusions. Similar observations as the ones made for Korakou (3.4.2) concerning the link between fabric, firing type and quality of finish and vessel size were identified.

The last point to be made is the question of the interpretation of the large quantity (in proportion to the quantity of HBW found at other sites) of material found in the Cult Centre of the Mycenae citadel. Even though only limited deductions can be based on the present corpus, since most is fragmentary and not in primary contexts (4.2), the possible relationship between HBW makers/pots and cult- or craft-related activities has to be considered further, since there are some possible clues (like one complete HBW specimen found in a room which was possibly related to cult activities, 4.2.1.2).

Chapter 5:

HBW makers as foreign artisans: a working hypothesis

My aim in this chapter is to discuss particular aspects of interpretation which, according to the intrinsic and extrinsic features characterising HBW (as established in the previous chapters), might be the most relevant, in the present state of our knowledge, to understand who are the makers of this ware and what is their place within the Mycenaean society.

The interpretation of HBW makers as foreign artisans is a working hypothesis which requires the analysis of a range of aspects: these include the problem of the foreign or local development of HBW, the question of whether HBW makers can be related to other types of artefacts, whether there is evidence to support their link to craftwork and finally the debate over the existence of travelling craftsmen in the Mediterranean LBA.

5.1 HBW: a product of foreign population(s)?

This section deals with aspects, which have been discussed in previous publications, and which the present detailed analysis of the HBW material was able to confirm.

5.1.1 Foreign versus local development

One of the first debates to arise when HBW was first identified was related to whether it is the product of a foreign population (French 1969; 1989; Rutter 1975; 1976) or of Mycenaean people themselves (Walberg 1976; Sandars 1978: 191-195; Sherratt 1981: 590). Whereas the former theory interpreted HBW makers as representing a non-Mycenaean population, “northern intruders”, the latter theory identified HBW as a Mycenaean household production, which appeared in response to the changing social and economic conditions²⁴² at the end of the 13th and beginning of the 12th centuries, as discussed in: *i.i.*

It was Small (1990; 1997) who formed the most detailed argument (partly based on ethnographic parallels) of a local development of HBW, seen as a Mycenaean “household commercial production”²⁴³, initiated as a result of political and economic “stress”²⁴⁴. This theory has been studied and argued against first by Rutter (1990), in the same year, and since, in several summaries, with further evidence (as outlined below) and arguments presented to discredit this theory, including: Pilides 1994: 1-9; Schnapp-Gourbeillon 2002: 76-81; Strack 2007: 73-81.

From the analysis conducted in the present thesis, several aspects seem to reinforce the theory of the presence of foreign populations.

²⁴² Following the palace destructions, with the end of the palatial organisation and with it (amongst other aspects) the decrease in workshops of large-scale production.

²⁴³ Meaning that HBW was “produced on a part-time basis for market exchange” by a rural population (Small 1990: 8).

²⁴⁴ Identified by Small (1990: 17-18) as: the increase of expenditure (to build fortifications) by the palaces and then their destruction.

First, it is now clear that HBW appears, first, well before the destructions at the end of LH IIIB period and that the largest proportion comes from two of the most important palatial sites of the period, as well as the site of Khania, which has been interpreted as an administrative centre, where there is an important Mycenaean presence (1.3.1; A.1). This seems to contradict the theory that HBW would have been used by peasants to supplement their agricultural resources (Small 1990: 18), as in that case, it would be expected to see HBW appear, first and mainly, in small rural settlements. Although it can be argued that small settlements are not being excavated as much as large ones (implying that HBW might also be found in small sites), it is a fact that a large quantity of HBW comes from important palatial or administrative centres and this, in itself, contradicts the argument of peasant production.

In addition, it remains to be proven that, at the time of appearance of HBW, there was indeed a need for a household production of pottery. The percentage of HBW compared to the Mycenaean ware is, as demonstrated in: 1.3.4, 4.2.2, very small (contra Small 1990: 5) and stays nearly constant over time, whilst Mycenaean pottery continues to be produced and used in large quantity, all through the Post-Palatial period. This indicates that, even if some changes in Mycenaean pottery production occurred (*i.i*), they weren't necessarily such major changes that would trigger the need for a household production. It can be added that palatial sites would be the place where pottery production would be the least affected by shortage.

Other important aspects are the specificities of the typology (2.2) and fabric(s) (3.1, 3.4) of HBW. These show how different HBW is from Mycenaean ware in shape (with the exception of few specific examples²⁴⁵) and manufacturing processes. It is also the use of specific elements which inexperienced potters would not have developed by themselves (new

²⁴⁵ It could be seen in: 2.3.1, that the few specimens that resemble Mycenaean shapes are rarely identical. In addition, the shape types concerned are mainly related to cooking types of common shapes, also present in other regions, such as the Central Mediterranean.

shapes like carinated cups and their decorated handles or the use of specific techniques like the addition of grog in the fabric) that tend to indicate the foreign origin of HBW making tradition(s).

The other argument which could be brought forward concerns the hypothesis that HBW pots could have been made by Mycenaeans themselves, copying a foreign tradition, as it has been suggested in reverse (though not wholly accepted by Italian archaeologists²⁴⁶: Vagnetti 1999; Bettelli 2002) for Mycenaean-inspired pottery found in the Central Mediterranean (Vianello 2005).

Even though theoretically HBW seen as the imitation by Mycenaeans of foreign pottery is a possibility, it is difficult to understand why Mycenaean people would have wanted to make pots of a much lower quality, unless HBW has a very specific value or function. Indeed, what has generally been observed, in other contexts, is that local populations imitate foreign pottery most commonly for their prestige value or to fulfil a specific role: whether prestigious, as the case of Mycenaean pottery imitations produced in Central Mediterranean or practical, as for the Dolio pottery produced in Italy (Vagnetti 1999a: 149; Borgna and Cassola Guida 2005).

However, HBW is most commonly associated with general household functions, food storage and preparation mainly (2.2.3). It can be noticed, though, that if we take into consideration some specific shapes and/or decoration (2.2.3) as well as the properties of the HBW pots (3.4.2), it can be postulated that, possibly, at least some of the HBW vessels might had a specific function (5.3.2.3): religious or craft-related, though more work is needed to further develop this argument. Even in this case, the production of HBW by Mycenaean potters is dubious.

²⁴⁶ A more complex process seems to have taken place, as discussed in: 5.4.3.

It is now widely accepted that HBW is not an autonomous indigenous production but the product of "a new and foreign population" in Mycenaean society (Deger-Jalkotzy 1998: 117; Hallager, Hallager 2000, 2003; Schnapp-Gourbeillon 2002; Eder, Jung 2005; Guzowska, Yasur-Landau 2005; Jung 2006: 21-39; Dickinson 2006: 52; Kilian 2007: 80; Strack 2007:99; Catling 2009;; Iacono 2009; Lis 2009: 155; Karageorghis, Kouka 2010). The first problem that arises from this is related to the debate of associating pots with people: can we equal pots with an ethnic population?

It is currently seen as questionable to correlate material culture (in this case pottery) with foreign populations because, on the one hand, it can lead to misleading assumptions about the identification of ethnic groups²⁴⁷ (and its dangerous political implications), and on the other hand, it can hide possible alternative explanations, such as trade and/or imitations by the local population (as noted in: Sherratt 1992).

Indeed, it is often preferable to interpret the presence of foreign artefacts as evidence for trade/exchange activities, as, for example, with the presence of metal artefacts of foreign inspiration²⁴⁸, in the Aegean in the LH IIIB-IIIC period²⁴⁹. In the present case, however, I have shown that HBW is not the product of long-distance trade as it is virtually always made locally (as shown by clay analysis, 3.3.1) and its own nature is unsuitable for long-distance travel as discussed in: 3.1.2 (since it includes mainly bulky and heavy pots).

²⁴⁷ Aspects related to the problem of the use of the concept of ethnicity in archaeology, as discussed in: Hall 1997.

²⁴⁸ I have chosen to use the term 'inspiration' rather than 'origin' as these specific artefacts are often made in the Aegean and are therefore not imported, their foreign origin being related to an inspiration factor: either copy of an imported piece or made by a foreign craftsman, as discussed further in: 5.4.

²⁴⁹ Although this is not necessary always the case and other interpretations need to be considered, as discussed in: 5.4.3.

5.1.2 Theoretical considerations on models of migration

Thus the presence of locally made ‘foreign’ pots may be plausibly associated with the presence of migrants, which raises the question of the reasons and modalities for the movement of a population to a foreign land. There are varying theoretical models for defining the concept of migration, which, depending on scholars, include more or less specific aspects as discussed in: Chapman and Hamerow 1997.

For the present analysis, it is useful to separate this concept into two different processes: the invasion model and the immigration model. In my view, the main point of difference lay in the fact that the former model induces a level of warfare (on large or small scale) whereas the latter is more likely to be peaceful. In both cases, changes might result from it, whether profound or not.

Most importantly, with the second concept should be included the simple mobility of people for varying reasons, including “economic migration” or “coerced migrations”, in the case of slaves or refugees (Anthony 1997: 27). These aspects are often not included in migration models and consequently often forgotten.

The invasion model was the first to be associated with the HBW phenomenon due to the particular historical context in which this material appears (Mycenaean palace destructions) and the favoured explanations for the palatial collapse at the time (Bouzek 1969; Deger-Jalkotzy 1977; Drews 1993; Eder 1998). However, as discussed in: *i.i.*, both the way these destructions are interpreted and our knowledge of the contexts of HBW have changed since the publications of papers supporting the association of HBW with invasions.

It is consequently the latter theory of immigration, which has to be considered here. This theory, however, encompasses several different aspects which have to be considered:

- _ small versus large population
- _ differential status
- _ single or multiple source(s)
- _ permanent versus temporary settlement
- _ motivation for movement
- _ variety of occupations of the migrant population

From the analysis of the ware made in the previous chapters, it can be deduced that HBW is the product of a small population, since it only represents a very small percentage of overall pottery in all the sites published (1.4). In addition, it has been suggested earlier (2.5) that this population might have come from various areas of origin. It can also be deduced that this population is of inferior or equal status to the Mycenaeans, since there is no sign of it being of superior status: so far no material was found in the higher-class area of the palaces (1.3.7) and there is no intrinsic features which could suggest a prestigious or an elite-related purpose (being mainly made crudely and of basic shapes and manufacturing techniques). This population could have settled permanently and/or temporarily in the Mycenaean region, as HBW is found in some sites over a long period of time and in other sites for a very short period (1.3.2). The last two aspects concerning the reason(s) for migration and the occupation(s) of the immigrants, which can sometimes be interrelated, are the ones which are discussed in the present chapter.

5.2 The identity of HBW makers: other characteristic products?

On an archaeological level, several aspects of the material culture should be taken into consideration when trying to identify a group of people (as discussed and defined in: Hall 1997). These features encompass: burial customs, architecture and a repertoire of artefacts²⁵⁰.

However, only the latter aspect can be discussed here, as the population it represents was possibly living in the same buildings as Mycenaeans, since HBW pots are always found in Mycenaean buildings. In addition, very little (if any) HBW pottery was found in funerary contexts which are in any case of Mycenaean type²⁵¹ (1.3.5).

The HBW vessels studied in the previous chapters might not in fact be the only markers of their identity. It is necessary to consider here other categories of artefacts which have been more or less precisely linked with HBW in previous publications (Harding 1984; Bouzek 1985; Hallager 1985; Pilides 1995; Schnapp-Goubeillon 2002; Belardeli 1999; Bettelli 1999; 2002; Jung 2005; 2006; Lis 2009; Iacono 2009).

My concern is to try and determine whether these categories of artefacts might help understand the HBW phenomenon, *whether* they are linked to it and *how* they are linked to it. This link can be of a twofold nature: as possible markers of the HBW people's identity (being part of their material culture) and/or as signs of the HBW people's occupations.

5.2.1 Theoretical considerations

In this section, the analysis concentrates on trying to identify this link, by studying specific categories of new and foreign-inspired artefacts, made of clay, metal or stone. Three aspects can suggest the interpretation of these artefacts as related to HBW makers: the social

²⁵⁰ The identity of a group can be defined using a wider range of cultural features (such as: kinship, language/dialect, religion and material culture). However, several of these aspects are rarely, or not at all visible, when dealing with the Aegean LBA (where written sources are very limited) and in the specific case of HBW.

²⁵¹ The single graves once thought to be innovative have in any case been shown to be a normal feature of the Mycenaean record (Lewartowski 2000).

significance of the objects (as everyday personal items: tools and dress accessories), their context (found in the same depositional areas as HBW vessels) and, in the case of clay artefacts, their technological aspects (similar fabrics to HBW).

This is no easy task: trying to identify a small group of people living in a foreign place is very difficult as it is not known how prehistoric cultures saw themselves and defined themselves as groups with shared characteristics and differences from other groups. In addition, this identification of self and others is not static but exposed to transformation and discontinuity (Hall 1997: 26-33). This might be even more accentuated when a foreign group is living in a different cultural environment, as possibly in the case of HBW makers, meaning that archaeological evidence is even scarcer and most probably difficult to interpret.

These aspects might provide a possible explanation for:

- _ the small amount of evidence found: whether concerning other possible elements of the HBW makers' material culture or concerning their occupation(s),
- _ the possible fact that HBW makers integrated into the Mycenaean society: by living amongst the local population and possibly using their material culture and
- _ the changes that occurred during the period of HBW presence in the Aegean: such as the imitation of Mycenaean vessels types in HBW fabrics.

5.2.2 Clay artefacts

There are several types of clay artefacts, which have to be considered here since they may be linked to HBW, and it has been suggested in several recent publications (Deger-Jalkotzy 1983; 2003; Kilian 2007) that they are made in a similar way, using the same fabric.

Some of them are often associated with textile production (whorls/spindle whorls/conuli²⁵² and spools/loomweights) and others are more closely related to personal items (beads) or to other aspects more difficult to interpret (figurines). However, since the distinction between spindle whorls and beads is not always straight forward, they are discussed together.

5.2.2.1 Spindle whorls and beads

Possible textile implements and/or personal adornments (spindle whorls²⁵³ and beads), made with HBW fabric, have been mainly reported from the site of Tiryns (Kilian 2007: 39), although a single specimen from Aigeria has also been published (Deger-Jalkotzy 1983: 163, abb. 1c; 2003a: 465); it comes from a LH IIIC context.

Fifty-two spindle whorls found at Tiryns are said to have been made in the same fabric as HBW (Kilian 2007: 43, taf. 28). They vary both in shape (long or short, rounded or straight-sided, conical, biconical, triangular, round) and size (from 1.2 cm to 5.7 cm at the greatest width). They are all pierced through the centre, except two specimens (no. 469 and 470), which are pierced not quite the whole length. Most of them come from LH IIIC levels except four from LH IIIB levels²⁵⁴ (one of which, no. 450, might come from the same context as one HBW specimen, cooking stand no. 266).

Two aspects need to be considered first: the direct association of these objects with HBW makers and the problem of identification of their function:

_ Were they made by HBW makers? Are they different from the Mycenaean specimens?

²⁵² Depending on the publication, a different name is used; this is mainly due to the problem of identification of the function of these small perforated artefacts, as discussed later on. Here the term “spindle whorl” is used, because it is the one chosen in the publications related to HBW, even though their function is uncertain.

²⁵³ Definition: “A spindle whorl is a small object that is usually round in section (although many forms are possible in section) with a more or less central hole pierced right through it to accommodate a thread. A spindle is a rod that is generally slightly thicker near the centre and tapers toward each end. Spindles, being almost always made of wood, seldom survive”. It forms “a simple piece of machinery for twisting fibres” (Carington-Smith 1992: 674).

²⁵⁴ And also five from Post-Mycenaean levels and six from unknown context.

_ What is the function of these artefacts: textile implements or personal items or both? What does it imply for the interpretation of the HBW makers presence in Mycenaean society?

- **Belonging to HBW?**

The first aspect concerns the identification of these spindle whorls as being made by HBW makers. It should be noted that Kilian (2007: 40-42) interpreted these items as related to economic hardship rather than as representing the presence of a foreign population.

In the Aegean, coarse clay spindle whorls have been produced from the EH-MH periods onwards²⁵⁵. It seems, however, that they were more widely used in the Early Mycenaean period, until LH IIIA. Thereafter, whilst they are found in smaller numbers at some sites (Nichoria), in others, they are not found until the LH IIIC period (Mycenae). Instead new types seem to be used: made of finer clay or stone (WBM 16/17: 50).

At Tiryns, it seems that clay specimens are found during the Palatial period (in LH IIIA-IIIB) as well as in Post-Palatial contexts; two types have been identified: Mycenaean and HBW (Kilian 2007: 43). The HBW specimens have been compared with Mycenaean specimens of the earlier period (LH IIIA) from the site and from various periods in other sites and with Italian Impasto specimens (Kilian 2007: 40-44) and are said to be made of “Impasto” fabric (Kilian 2007: see catalogue).

At Mycenae, some clay specimens found in LH IIIC levels (WBM 16/17: 50) are made of a dark-coloured fabric and are burnished²⁵⁶ (French pers. comm.).

Concerning other sites where HBW vessels have been found, apart from Aigeira, two specimens²⁵⁷ of dark-grey fabric (one of which is coarse and burnished) come from the LH

²⁵⁵ Spindle whorls from the Aegean have been studied in detail by Carington-Smith (1975; 1992: chapter 11) and for Crete in particular by Crewe (1998).

²⁵⁶ Two specimens are decorated with impressed designs. They will be published in forth. WBM 25 (French pers. comm.).

²⁵⁷ No. 2643 and 2651 (McDonalds, Wilkie 1992: 703)

IIIB2 levels at Nichoria. One of them was found in the same deposit (K25 Ibc) as the HBW carinated vessel (A.4).

At Lefkandi, about forty-six clay spindle whorls have been discovered in the LH IIIC period. They all are handmade and irregular, of varied colours, often burnished or simply smoothed, pierced, large and weighting between 30-50 gm (Evely et al. 2006: 299-302, fig. 5.18). Twenty-eight are conical in form, six biconical and one domed. One is decorated (small impressed holes in a circle). However, only two specimens were found in the same context as HBW vessels (A.4). They are widely distributed all over the site and phases.

Only future detailed fabric analyses of the specimens mentioned and comparisons with both HBW vessels and Mycenaean spindle whorls might help determine whether they can be related to HBW²⁵⁸.

- **Textile implements or personal adornments?**

The second issue is concerned with a wider problem encountered in the study of small artefacts found in Mycenaean sites: the interpretation of the function of these artefacts, which are often of a similar shape:

"General studies discussing spindle whorls (Barber 1991 and Liu 1978) recognise that distinguishing between whorls and other perforated artefacts (especially beads) is problematic, and often inconclusive, unless the find context of the artefact provides extra evidence, such as spindles or fibre remains" (Crewe 1998: 9).

There are, however, certain general rules and criteria to differentiate spindle whorls from beads (like the size, weight and the diameter of the suspension hole²⁵⁹), which have

²⁵⁸ This analysis wasn't possible due to time constraints.

²⁵⁹ The size and weight are linked to the spinning property: it should have a diameter greater than 2 cm and weight more than 10 gm. The hole should be large enough to hold the spindle: with a diameter greater than 4-5 mm. It is however said to be usually around 7-8 mm.

been discussed in detail in: Carington Smith 1975 (339-350); 1992 (674-694); Barber 1991 (51-55); Crewe 1998 (5-14). The weight of the Tiryns HBW specimens is not indicated in the publications, but the diameter of the suspension hole varies: twenty-seven specimens have a diameter greater than or equal to 6 mm and twenty-three specimens have a diameter less than 3 mm²⁶⁰, meaning that both spindle whorls and beads might be present in the corpus.

Another important element is the attractiveness of the objects which would play a role in one case (beads for adornment) and not in the other (spindle whorls as implements). Beads are often made of stone and when they are made of clay, it is often interpreted as a cheaper and more easily available alternative, as at Khania where clay beads were possibly black-slipped to imitate steatite (Bruun-Lundgren and Wiman 2000: 178).

It can then be conjectured that most of these artefacts made with a coarse dark HBW fabric might be more likely to be related to their use as implements. However, the use of clay beads of a dull colour and irregular shape, for example, is attested in Crete at Knossos (Evely 1984: 249). Consequently, it cannot be excluded that, at least, some of the small specimens or some with a specific shape might possibly be beads.

It should also be noted that these small perforated artefacts could, as well as being spindle whorls or beads, also be buttons or dress weights. In fact, they might have had several functions either changing over time (a worn-out bead then used as a dress weight or spindle whorl) or at the same time (spindle whorls can be seen as part of the personal equipment, carried around at all times) (Bruun-Lundgren and Wiman 2000: 175).

²⁶⁰ These are my own measurements made using the published illustrations from: Kilian 2007 (taf. 28).

5.2.2.2 Figurines

Six fragments of figurines, also found at Tiryns, are reported to have been made in HBW fabric²⁶¹ (Kilian 2007: taf. 28: 472-476, 484). Most of them seem to be animal figurines. Four are said to come from LH IIIC Fortgeschritten levels (two of these are from Room 127 where a large quantity of HBW vessels was found: A.2) and two from LH IIIB Entwickelt.

Another specimen (from a LH IIIB Fruh context) is mentioned and used as evidence for the early appearance of HBW at Tiryns. This specimen is said to be an imitation of a Mycenaean shape (psi-figurine with polos) in HBW fabric (Kilian 2007: 75-78).

No other finds of figurines of HBW fabric are reported from other sites²⁶² but figurines made of a coarser fabric than the usual Mycenaean types have been found at Lefkandi and Nichoria.

At Lefkandi, two animal figurines are said to be different from the usual Mycenaean figurines found (French 2006: 258). They are unpainted and made of heavy coarse “oatmeal” clay. They come from the LH IIIC phase 1b (no. 88) and phase 2b (no. 87). It is said that it seems unlikely that they might be EH residuals because they are coarser and unusual. It might be possible then to suggest that they might belong to the HBW phenomenon, though none of was associated with the HBW vessels published.

At Nichoria, an unpainted miniature female figurine made of “gritty clay” was found in the same deposit (K25 Ibc) as the HBW carinated vessel (McDonal, Wilkie 1992: no. 2132, fig. 10-10, p. 632,659). It was suggested that it had been made by a child. It is dated to the LH IIIB period.

²⁶¹ In a recent conference, material from Post-palatial levels has been discussed (Vetters 2010).

²⁶² At Mycenae, the presence of unpainted figurines is attested but they are not made in a similar fabric to HBW (French pers. comm.).

5.2.2.3 Spools/loomweights

Another type of implement, the clay spool, possibly associated with textile production (as loom weights²⁶³), is new²⁶⁴ in the Post-Palatial period in Mycenaean contexts and in the Eastern Mediterranean (Rahmstorf 2003). They have, very recently (Rahmstorf 2010), been considered as “Barbarian elements” in the Eastern Mediterranean²⁶⁵ and associated with HBW.

The LH IIIC spools (which are different type than the ones present in an earlier period²⁶⁶) are usually cylindrical in shape with straight sides and rounded ends and with no holes (Rahmstorf 2003: figs. 5-17), but other types exist (some are more disk-like with concave or convex sides). They are usually made of a coarse, friable and rough fabric with a reddish-brown surface colour and are either not fired or fired at low temperature, this indicates a similar fabric and manufacturing technique as for HBW (3.1), though not necessarily burnished.

It is often reported that they might not have appeared before the LH IIIC Middle period, however, some specimens from Lefkandi belong to the LH IIIC phase 1 (LH IIIC Early) (Rahmstorf 2003: 400). At Mycenae, where the first specimens come from phase XI (LH IIIC Middle), it is suggested that their absence from earlier levels might in fact be coincidental: either being due to the specific function of the objects or of the rooms (WBM 16/17: 33-34).

They have been found in many sites in Mainland Greece and Crete, including sites where HBW has been found and in the Eastern Mediterranean.

²⁶³ Definition: “Loomweights ... were used to weigh down and therefore hold taut the warp threads of a semi-vertical loom” (Carington-Smith 1992: 675).

²⁶⁴ They were common in Neolithic, EH and MH periods but seemed to go out of use until the LH IIIC period (Rahmstorf 2003: 397-400).

²⁶⁵ Whereas in the previous publication, the possibility of diffusion from East to West was proposed (Rahmstorf 2003: 406).

²⁶⁶ For descriptions and illustrations of the variety of earlier specimens: Rahmstorf 2003: 397-400.

At Tiryns, spools were found in Room 127 where a large quantity of HBW specimens have also been found (A.3). At Lefkandi, only a few specimens were found with HBW (A.2), the largest concentration comes from Room 3 where HBW is absent. At Khania, some were found in several areas with HBW (A.1). They are also reported from Mycenae, Aigeira, Asine, Teichos Dymaion, Nichoria, Volos, Cyprus (Kition and Maa-Palaeokastro), and also from sites where no HBW was found (Rahmstorf 2003: 400).

The function of these artefacts is still disputed: many functions have been supposed (used to wind up yarn, used in pottery kilns for separating pots...), but it seems that their relation to textile production is the most likely as the contextual analysis of Tiryns specimens seems to show (Rahmstorf 2003:402-403).

Since this type of object has been found in many regions, including Europe and Central Mediterranean, it has been postulated that it could be seen as linked to the same phenomenon of diffusion of other artefacts of foreign origin or inspirations which appear in the Aegean during the period (Rahmstorf 2003: 403-406).

Again, only further published analysis of the material and comparison with HBW will provide a clearer timeframe of their appearance, a better understanding of the meaning of their presence in this context and whether it is linked to HBW.

5.2.3 Metal and stone artefacts

There are many categories of artefacts (several new types of weapons, tools, adornments and dress accessories)²⁶⁷ which appear in Mycenaean sites during the middle of

²⁶⁷ Concerning information related to these artefacts, I have used information collected from my Masters thesis entitled: European artefacts found in the Aegean in the Second half of the Second Millennium BC, 2005, University of Paris I, under the direction of G. Touchais and P. Ruby.

the LH IIIB period and in LH IIIC, which have been assigned a foreign origin or influence, being part of the so-called “koine metallurgica”²⁶⁸.

The aim here is not to discuss in detail the possible locations of the origin of the various artefacts, as this has been thoroughly studied several times (Harding 1984; Bouzek 1985; Jung 2006 to name a few). The origin of this material lies somewhere between the Central Mediterranean and Central Europe, as possibly does the origin of HBW makers (2.4).

However, in the present chapter, the focus is directed mainly on links with the Central Mediterranean region²⁶⁹, for two reasons: principally because the most recent analyses of HBW have linked it to this area (2.4) and also because the amount of published information on the relationship with regions north of Greece is too limited to be meaningful in the current analysis²⁷⁰.

Since it is debated whether these artefacts are imported or locally made (5.4.3) and it has been considered that they might be linked to HBW (Bouzek 1985; Jung 2006), it seems necessary to discuss them. In this section, I am only concerned with artefacts which seem to appear more or less at the same time as HBW and in similar depositional contexts²⁷¹.

5.2.3.1 Dress accessories

What I want to underline here is that some of the specimens of dress accessory (bronze fibulae in particular), which appear first in Mycenaean sites at the end of the LH IIIB period (Kilian 1985b), have been found in the same depositional context as some HBW vessels.

²⁶⁸ Similarities of forms, shapes, types of some metal artefacts between Central Europe, Adriatic regions, the Aegean and Eastern Mediterranean: Carancini and Peroni 1997. They are sometimes called “Urnfield bronzes”.

²⁶⁹ Contacts with the Italian peninsula and surrounding islands were established as early as the Italian MBA (LH I-IIIa periods) and continued during the RBA and FBA (LH IIIB-IIIC, 1.2.6: for chronological correlations) but with variations in intensity, geographical locations, quantities and categories of products exchanged (as summarised in: Smith 1987; Bettelli 2002; Vianello 2005).

²⁷⁰ Definition of the links with the Mycenaean area is still being debated, but seems less strong than with the Central Mediterranean: Wardle 1993; Laszlo 2003; Touchais 2002; Bolohan 2005; Harding 2007.

²⁷¹ Many of these artefacts are in fact found in funerary or cultic contexts. For full lists of the Aegean sites where specimens of similar types have been found: Bouzek 1985; Sherratt 2000: 96-98.

The appearance of **fibulae** represents a new distinctive fashion style, related to the way people dressed: Mycenaean and Minoan clothes were traditionally sewn and/or tied whereas the introduction of fibulae might indicate that clothing was instead pinned, possibly on the shoulders (Desborough 1964: 56; Bouzek 1985: 152; Dickinson 2006: 158-159).

It should be added that this new style, which is found in other regions (from Central Mediterranean to Eastern Europe²⁷²) becomes common amongst Mycenaeans of the Post-Palatial period and continues into the EIA: fibulae are found in many tombs.

The earliest specimens of fibulae have been found at Tiryns in late LH IIIB contexts, before the destruction (“violin-bow” type) and in Crete (Malia), before the end of the LM IIIB period (“leaf-bow” type) (Kilian 1985b; Hallager, Hallager 2000: 179; Dickinson 2006: 170). It should be noted that, at Mycenae, two fibulae have been found in the same units as HBW specimens²⁷³. In both cases, they come from a LH IIIB2 context.

In addition, fibulae were found in other settlements where HBW was present: Teichos Dymaion²⁷⁴, in Achaea (Kanta 2003), possibly in Lefkandi²⁷⁵ and in Cyprus, on the site of Maa-Palaeokastro (Karageorghis 1998: 128).

The earlier specimens of fibulae found in the Aegean are very similar to the ones found in the Adriatic region whereas, during the LH IIIC period, specimens of fibulae found in Greece often have differences in decoration from the European fibulae found and published. There is also the case of new types, which appear simultaneously in all regions

²⁷² The fibulae types that are the most similar to the ones found in the Aegean, come mainly from the Alps area, along the Adriatic, in the Balkans and in the Italian peninsula. For a discussion of the various regions where similar types are found: Harding 1984: 137-140; Bouzek 1985: 152-160; Kilian 1985b.

²⁷³ one violin-bow type found in unit: GMBW’69/037 (upper fill of Room 18) and another one found in unit: G23’68/152 (floor deposit of small Courtyard) (4.2.1; CD-ROM: Excel table 4.1). The second one is, however, less complete and therefore its type a little less certain (D. Wardle pers. comm.).

²⁷⁴ Along with a Peschiera type dagger and a lead ornament in the shape of a six-spoked wheel, both of Italian inspiration (Harding 1984: 137, 143; Eder 2003: 45).

²⁷⁵ But only the pin part was found (A.2).

such as for the arched fibulae²⁷⁶ (Bouzek 1985: 159). This is often seen as indicating the presence of several local workshops (Dickinson 2006: 169).

It is often postulated that early fibula specimens were direct imports, possibly of Italian origin (Kilian 1985b; Dickinson 2006: 169). This is, however, a matter of debate which is discussed later on: 5.4.3.

A bronze violin-bow fibula (with rhomboid plate, spiral loop and needle) from Khania, which was found with HBW specimens (*A.1*), was scientifically analysed²⁷⁷ and is said to be of Sardinian origin (Hallager, Hallager 2000: 179). Three other bronze objects, one of which (a needle) was also found with HBW (*A.1*), were analysed and also identified as of Sardinian origin²⁷⁸ (Hallager, Hallager 2000: 211). This, however, only indicates the provenance of the raw material used and whether the artefacts were made there or the metal was imported as raw material and then transformed in Khania is difficult to determine.

It could be added here that a **long bronze pin** with a swollen bulb head was found at Lefkandi. It is said that the origin of this type “... is held ultimately to be sought in south and central Europe” (Evely et al. 2006: 285), as discussed by Harding (1984: 134-137) and Bouzek (1985: 160-167).

5.2.3.2 Tools

Bronze tools of foreign inspiration have been discussed in detail by Harding (1975). There are, however, a few examples of true likeness found in the Aegean which could be interpreted as imports from Europe.

²⁷⁶ End of LH IIIC in Greece.

²⁷⁷ By lead isotope analysis (Hallager, Hallager 2000: 206-212)

²⁷⁸ Metal artefacts (analysed) of Sardinian origin have also been found at Kommos and Nichoria (Stos-Gale 2000: 66).

Most of these have been found in funerary or cult contexts (mainly in Crete, the Ionian Islands and Achaea). However, there are specimens of bronze knives and stone tools which have been found in the same settlements as HBW.

Two of the four specimens of **knives** which have been found in the settlement of Lefkandi, and said to be of “new or unusual forms” (Evely et al. 2006: 282), might have a link with the Central Mediterranean:

_ one with an elaborated hafting arrangement: a stop-ridge, a M-tail end and flanges at the sides (Evely et al. 2006: fig. 5.10: 1). The stop-ridge element is a novelty, four others are have been found in the Aegean: including one from Mycenae, but it has a ring handle (Harding 1975: 197).

_ one made of a square rod: with a twisted handle of spiral appearance (Evely et al. 2006: fig. 5.10:2). This type is discussed by Harding (1975: 198) who mentions other specimens (most from funerary or cult contexts) and suggests that they might have been razors.

It should also be added here that a **stone weight** found in phase 2a (Evely et al. 2006: fig. 5.5.4), is said to be very similar to Italian specimens of the Terramare culture: “pesi con apicagnolo” (Iacono 2009).

In addition, two types of tools of foreign inspiration have been found at Mycenae. Four specimens of **small knives or razors** with thin handles, like the one found at Lefkandi: one of which comes from north of the South House, from a LH IIIB2 context (Bouzek 1985: 149) and another from an area of houses on the south-west of the acropolis, of LH IIIB-C period (Harding 1975: 198). They have parallels in Italy and Central Europe.

The other type of tool to cite is the frequently mentioned **winged-axe mould** from Mycenae (Harding 1975: 187-188; Jung 2006), found in Room 4 of the House of the Oil Merchant and dated to the end of LH IIIB1. This type is characteristic of the Italian RBA period.

5.3 HBW makers: possible occupations

It has been suggested in several publications that HBW makers might represent foreign traders in metals (Hallager 1983; 1985), “guest workers” (Kilian 1988: 133) or specialised craftsmen (Kilian 2007: 80): especially bronzesmiths (Bettelli 1999: 469; Belardelli 1999: 460; Eder, Jung 2005: 486), but also possibly involved in textile production (Sandars 1978: 192), or even mercenaries (Deger-Jalkotzy 1977: 75; Bouzek 1985: 222; Bellardelli and Bettelli 1999), who travelled to the Aegean.

However, these interpretations are never really analysed in detail and this is one of the reasons why evidence to support them is still limited. Consequently, in publications dealing with general studies on the Mycenaean period, discussion of HBW makers is summed up as “... small groups of (specialised?) immigrants” (Dickinson 2006: 52).

5.3.1 HBW makers: their place in the palace economy and its aftermath

The link with the palace organisation is discussed initially due to the fact that HBW appears during the 13th century when the palatial system is still operating, and in at least three cases, before the main destructions which brought an end to this system (*I.3.1*). In addition, HBW appears within at least three Mycenaean citadels: Mycenae (Cult Centre), Tiryns (lower citadel) and Midea (*I.3.5*).

Kilian²⁷⁹ (1988: 133) saw the HBW makers as either shepherds from the mountains, mercenaries or a workforce, which the palaces might have needed for the important projects that took place at the time, like the construction of fortifications (such as the ones found at Mycenae, Tiryns or Teichos Dymaion). The appearance of HBW might indeed correspond to the period when the fortifications were erected. However this interpretation does not explain

²⁷⁹ However, Kilian’s view changed later (2007: 80) and the HBW makers are said to be foreign craftsmen, which are unattached to the palace authority.

why HBW makers continue to be present, in increasing quantity, in Mycenaean sites after the palatial collapse.

I want to discuss here three possible interpretations: the question of the use of foreign mercenaries, the question of the presence of foreign slaves and/or low class dependants in Mycenaean palaces and the question of the presence of hired foreign specialist craftsmen: involved in textile production or bronzework.

However, as mentioned above, since HBW does continue to occur after the palaces are destroyed and, in other sites, it only appears during the Post-palatial period, the link with the palaces has often been minimised. Here, in each section, the problem whether the interpretations presented are valid for a Post-Palatial context is discussed.

5.3.1.1 Mercenaries

It is regularly mentioned (Deger-Jalkotzy 1977: 75; Sandars 1978: 93-94; Bouzek 1985: 22; Bettelli 2002; Eder, Jung 2005: 486) that HBW makers could include mercenaries brought by the Mycenaean palaces to help with defence. However, only indirect evidence has been brought forward, including: signs of troubles perceived by the Mycenaeans, as possibly²⁸⁰ seen in the Linear B tablets from Pylos (Schnapp-Gourbeillon 2002: 38-44), the construction or extension of fortifications, the creation of protected access to water supply (as at Tiryns and Mycenae) and the fact that palaces in the Near East or Egypt might have used the services of foreign soldiers²⁸¹ (Eder, Jung 2005: 486).

Another element was used: the appearance of new types of weapons which were interpreted as belonging to the HBW makers (Bouzek 1973: 172; Hiller 1984: 17). However this theory is no longer valid since these weapons are also found in Mycenaean funerary

²⁸⁰ It should be noted that doubts and alternative hypotheses have been published concerning this aspect (Sherratt 2001: 235; Dickinson 2006: 41-43).

²⁸¹ Possible evidence (including frescoes and presence of Aegean type weapons) for Minoan and Mycenaean mercenaries in Egypt and the Near East is summarised by Cline 1995 (270-273). This evidence is nonetheless subject to diverse interpretations.

contexts²⁸²: they are part of the Mycenaean Post-palatial symbolism of power and they are also said to represent economic communications between the Mycenaeans and Central Europe (Eder 2003; Eder, Jung 2005), as discussed in: 5.4.3.1.

Consequently, there is no direct evidence either for the presence of foreign mercenaries in the Mycenaean palaces or for interpreting HBW makers as mercenaries.

This theory has nonetheless even led to explaining the presence of HBW makers in the Post-palatial period and in Cyprus and the Near East as small groups of raiders or pirates, linked to the Sea Peoples (Bouzek 1969; Hallager 1988: 99-100; Drews 1993; Deger-Jalkotzy 1998; Badre 2003: 84; Yasur-Landau 2003) who are often associated with Mycenaeans and also with Sardinian population movements eastward.

Aside from the whole problem of the identity and role of the Sea Peoples²⁸³ in general (which is not resolved), and in the context of Post-palatial Greece in particular, the largest quantities of HBW continue to be found in the same two sites as before the destructions: Mycenae and Tiryns. It is always found in Mycenaean habitations and in very small proportions compared to Mycenaean pottery (1.3). In the other sites, it is found in such minute quantities that it would relate to a very small group of people, hardly representing a threat.

In Cyprus and the Near East, HBW is also always found amongst the local pottery, in very small quantity (1.1.2) and mainly in sites which are still occupied (after destructions) by the same population (for Kition, Cyprus: Astrom 1998: 81; for Tell Kazel: Badre et al. 2010: 1686). In the Near East in particular, HBW is in fact only reported from one or at most two sites.

²⁸² Although the first specimen (the hilt plates made of ivory) comes from the Room with the Fresco Complex at Mycenae in a LH IIIB Middle context (Wardle, Wardle 2001; WBM 24: CD-ROM 157, Room 32, phase 0731).

²⁸³ The bibliography on the subject is extensive, with varied hypothesis, from: Sandars 1978 and Drews 1993 to Yasur-Landau 2010; and with cautions about such interpretations: various papers in Ward and Joukowsky 1992; Sherratt 2005; Dickinson 2006: chapter 2.

The fact that it is possible that a few HBW makers went eastwards does not necessarily mean that they were involved in the destructions of sites in the Eastern Mediterranean, and if they were, the nature of such involvement would have to be discussed in more detail²⁸⁴.

In fact, there are now different interpretations for the movement and presence of Mycenaean population eastwards after the major destruction of 1200 (a movement which had actually already started before these troubles), as discussed in: Dickinson 2006. In particular, if we take into consideration the considerable evidence for the strong involvement of Cyprus in trade activities in the Eastern Mediterranean²⁸⁵ (Sherratt and Sherratt 1991: 374-375) and in the Central Mediterranean area as well (Vagnetti 1999b²⁸⁶; Lo Schiavo 2003), economic factors should be considered.

All this makes it possible to see how the presence of HBW in the Eastern Mediterranean need not be related to the Sea Peoples, especially if we take into consideration the hypothesis presented in this chapter, which is developed later on.

5.3.1.2 Slaves

This aspect relates to the possible indications of the presence of foreign “slave” women in Linear B archives, especially from the palace of Pylos (Chadwick 1973: 123-124; 1976: 80-81).

Several papers (Hiller 1988; Tournavitou 1997; Nosch 2003; Michailidou and Voutsas 2005) have discussed all the implications of the problem of interpretation of these “slaves”:

²⁸⁴ It might be possible that HBW people were involved in these troubles for the simple reason that they happened to be there at the time and they might just have had no other choice than to take part in it and to choose one side.

²⁸⁵ One of the Cypriot sites where HBW has been found (Maa-Palaiokastro) is a new site and has recently been interpreted as a possible ‘port of trade’ (Dickinson 2006) and not anymore as a Mycenaean refugees site.

²⁸⁶ Who notes the presence of Cypriot artefacts (imported and locally made imitations) found in Italian and Sardinian sites. Amongst other aspects, she mentions the presence of an ivory comb of Italian type (from the site of Frattesina) found at Enkomi (Cyprus) which could imply either the transfer from East to West of the raw material and the reverse transfer of the finished product or that an Italian craftsman travelled to Cyprus to produce there.

including the problem of defining what “slave” (*do-e-ro*) meant in the Mycenaean society (degrees of dependency towards the palace), how they arrived (forced or by choice), whether and how they were integrated into Mycenaean society including comparison with textual sources in the Eastern Mediterranean.

There are two problems of using such evidence: it is not known whether the presence and use of foreign people is also true for other Mycenaean palaces, and there is the problem of the definition of “foreign” in this context. It is mentioned in: Michailidou and Voutsas 2005 (17), that it should be understood as: “outside the kingdom’s frontiers”, hence not necessarily meaning outside the Mycenaean region. It can also be added that in the Linear B Archives, these slaves (when any information is provided) are always associated with regions to the east of Mainland Greece (Aegean islands or Asia).

However, since the Linear B tablets found are often fragmentary and only survived accidentally²⁸⁷ and thus represent only a small proportion of the ‘last year’ records (Landenius-Enegren 2000: 29), they should be taken as indicative of only part of the story²⁸⁸. There might have been more types of information recorded than have survived²⁸⁹. This would leave some space for discussing the possible association of HBW makers with “slaves” or dependants²⁹⁰ in some sense of the palaces.

It has indeed been suggested that HBW might be linked to the presence of slaves, using comparisons with a ceramic ware produced by slave people of different origins in

²⁸⁷ These tablets, made of unbaked clay, were not for long-term storage purpose.

²⁸⁸ As an example, the detailed study of the information found in Linear B tablets on the organisation of the textile production, by Nixon (1999), has revealed many still unknown aspects and questions still to be tackled (like the possible link between weavers and shepherds).

²⁸⁹ Adding to this, the problem of interpretation of deciphering what is written in the tablets (Sjoberg 1995: 26-28).

²⁹⁰ The varying degrees of dependency of people involved in the palace organisation have been discussed in: Tournavitou 1997. These include: owned/slaves, dependants/state-workers, semi-dependent and independent/state-less workers.

America during the 17th-18th centuries AD, and showing similarities in technological aspects (Bankoff et al. 1996: 201-204).

Two analogies were used: the mode of production (basic household production) and the fact that HBW makers might have come from diverse regions of the Mycenaean periphery, as it seems impossible to pinpoint one place of origin (as discussed in: 2.4).

In addition, it can be argued that the largest proportion of HBW is found in citadels (1.3.5). HBW seems to be absent from the higher-class houses in the palace area at Tiryns but it is found in rooms with official functions, and at Mycenae it is found in the Cult Centre (1.3.7, 4.2).

Objections were made, however, regarding the fact that HBW does continue to appear in the Post-palatial period where there is no positive or negative evidence for the presence of slaves in Mycenaean society (Genz 1997: 109). In addition, since slaves seemed to have been directly linked with the palaces during the previous period, it was mentioned that it might be unlikely that this situation would have continued after the destructions. It can be argued though that, after the palatial collapse, the slaves could have stayed to continue to live in Mycenaean sites, but with a different social status (since there was no strong administration control anymore).

Another objection, made by Genz (1997: 110), is the possible relationship of HBW to the new foreign metal artefacts (which appeared at the same period), a fact which, according to him, would indicate that their users were not slaves. This leads us to the problem of whether these artefacts are indeed linked to HBW and if so, what the nature of this link was. Genz (1997) sees the foreign metal artefacts as personal items belonging to the HBW makers, yet the question whether these artefacts have indeed travelled with these people or whether they were locally made needs to be addressed. As discussed later on (5.4.3), the latter possibility is the most likely in most cases and this leads to another aspect. If we consider

these metal artefacts to be associated with HBW, it should be discussed whether they were the craftsmen who produced them. This aspect points toward the problem of the use of slaves/dependants as craftspeople in the Mycenaean palaces.

Indeed, the exact status of the foreign people mentioned in the Linear B archives is unclear (Nosch 2003: 66; Michailidou and Voutsas 2005) and might correspond to several different situations: “captives” *ra-wi-ja-ja* (perhaps prisoners of war), “slave” *do-e-ro* (which does not necessarily have the same meaning as it has nowadays), refugees (perhaps from troubled regions), “exchanged commodities” (bought from trading posts) and/or specialised craftspeople (associated with textile production in particular; but it was additionally noted that these people could also be working in bronze production as well as in a wide variety of other occupations; Hiller 1988: 54-57). It has however been suggested, more recently, that the interpretation of these bronze worker, which appear in the Linear B tablets from Pylos, should be revised and seen as “agent of the state”: high-status individuals who undertake various duties, including shepherd (Nakassis 2006). How this is actually possible, in practical term, remains, in my opinion, still to be debated. Bronze-smithing is a highly specialised activity and shepherd is time-consuming, combining the two would have been possible for a small home production, but seems unlikely for a palatial economy, especially if the individual also has administrative responsibilities.

It can be concluded from this overview that, even though it is a possibility that HBW makers were slaves, this theory alone does not take into consideration the association of the new foreign artefacts with HBW. It seems necessary to take into account the possibility of HBW makers as artisans, whether dependent, semi-dependent or independent to the elite.

5.3.1.3 Artisans

The Linear B tablets do provide lists of specific specialised craftspeople related to the palace involvement in a certain range of crafts (Papadopoulos 1997; Landenius-Enegren 2000: 34-35), amongst them two (textile workers and bronzesmiths) can tentatively be connected with HBW, since, as seen earlier, artefacts related to both textile and bronze-working have been found in association with it.

The connection between female textile workers and HBW was first evoked by French (as reported in Sandars 1978: 192). This theory derives mainly from lists in the Linear B archives from Pylos of possibly foreign women involved in textile production²⁹¹, as discussed earlier.

Some tablets from Pylos, also provide a list of bronzesmiths²⁹² who have been interpreted as semi-dependent: spending “... part of their time working for the palace-controlled bronze industry...” (Tournavitou 1997: 37). However, as mentioned above, these individuals have recently been re-interpreted as multi-task palatial administrators by Nakassis (2006). In this case, there would be no reason to relate HBW makers with these bronzesmiths. However that latter theory does not explain how these Mycenaean administrator/bronzesmiths would have produced new types of artefacts²⁹³. It seems, in my opinion, that whether the list of bronzesmiths from the Linear B tablets refers to slaves/dependants or to administrators does not prevent the possibility of the presence of itinerant craftsmen, which is a possible interpretation for the occupation of HBW makers.

Another aspect is the reference to “missing workers”, in the Linear B tablets from Pylos and Knossos, which could possibly refer to the mobility of craftsmen (Papadopoulos 1997: 459-460). However, it is not sure whether the word *a-pe-e-[si]* means “absent”, “to be

²⁹¹ This is only one aspect of the people involved in textile production. For example, both women and men are mentioned in the Knossos tablets (Landenius-Enegren 2000: 30; Nixon 1999: 564).

²⁹² About 400 smiths are mentioned in the Pylos tablets (Gillis 1997: 506).

²⁹³ For further discussion on the diffusion of foreign styles, see: 5.4.3.

away” or “far from”, how permanent this situation is and whether it could imply something else²⁹⁴.

One last aspect is the fact that some HBW specimens have been found in cult contexts or in areas to some extent related to such activities, at Mycenae, Khania and possibly Tiryns (1.3.7, 4.2.1). If we take into consideration the possible relationship between some craftsmen and the cult activity, as discussed in: Lupack 2007²⁹⁵, there is the possibility that the presence of HBW in cult areas could hint at the interpretation of the makers as related to these craft activities, as religious dependants.

5.3.1.4 The question of the status of artisans

There are several aspects to point out concerning the status of craftsmen and their relationship to the palaces. Not all categories of craftsmen are mentioned in the Linear B tablets and there seem to be several different production systems with varying degrees of palace control (concerning smiths: Gillis 1997; concerning textile production: Nosch 2000) and remuneration systems (Gregersen 1997). Adding to this the fact that the tablets only deal with the palace involvement in the economy, it has been postulated that there might have been craftsmen somehow independent from the palaces, in particular potters. It can also be postulated that other groups of craftsmen might not have been recorded in the tablets, such as itinerant craftsmen, since their mobility would have certainly made it difficult to keep track of them.

It was also suggested that craftsmen attached to the palaces are concerned with the production of prestigious and high-value items (Voutsaki 2001) and any products required by them, whereas independent craftsmen might have produced a wider range of items, but

²⁹⁴ In addition, possible clues for the presence of Minoan and Mycenaean weavers (possibly women) in the Near East and Egypt have been noticed (Barber 1991: 351; Cline 1995: 275-276).

²⁹⁵ It has been noticed that in several sites (including Mycenae: though there is no direct evidence for it) cult areas and craft areas are found in close association and that there also are indications in the Linear B tablets of such a relationship.

mainly utilitarian (Tournavitou, Sugerman 2000: 65). The presence of independent craftsmen has been discussed in several papers, some using comparative analysis with the situation in the Eastern Mediterranean (Cline 1995: 278-279; Tournavitou, Sugerman 2000: 69-75), others to interpretations of Linear B tablets (Gillis 1997, especially concerning bronzesmiths; Shelmerdine 2007: 43-44). However, the existence of a class of independent craftsmen in the Mycenaean area is still a debated problem (Tournavitou 1997; Muhly 2005) as it is linked to the interpretation of the Mycenaean society as a whole and how involved the palaces were in the economy, as mentioned in: *i.i.*

Concerning the present subject, one of the objections raised against the link between HBW makers and the palaces (as slaves, but it is the same problem if we consider them as dependent craftsmen) is the fact that HBW continues to appear after the destruction of the palaces and their political system.

However, the recent suggestion that the contacts between the Mycenaeans and the Central Mediterranean societies might in fact not have involved the Mycenaean palaces directly but only local officials, who were possibly involved in metalwork production²⁹⁶ (Eder, Jung 2005: 485) and metal trade (Gillis 1997: 512), should be considered further here. Indeed, this point, combined with the possibility that these local officials established themselves as local elites during the LH IIIC period: as *basileus* (Maran 2006; Deger-Jalkotzy 2006: 175), could indicate that, if HBW makers were indeed somehow dependent or semi-dependent on these local Mycenaean elite and linked to bronze working, it could explain their continuing presence in the Aegean during the Post-palatial period.

²⁹⁶ The *qa-si-re-u* discussed by Carlier (1995) and also mentioned by Gillis (1997: 52) who are in some instances associated with bronze workers, and also with religious aspects, and manage a network of relations, independent from the palace.

5.3.2 HBW makers as specialised craftsmen?

We have seen earlier that there might be some links between HBW and some metal artefacts of foreign design, at least on a personal level. My objective here is to discuss the possible evidence for the identification of the occupation(s) of the HBW people and how conclusive this is. It is often mentioned that there might be a link between HBW and these artefacts due to their possible common origin²⁹⁷. However, the nature of this link is never really examined.

5.3.2.1 Problem of identifying crafts activities

This topic is related to the identification of workshop evidence. It should be noted though that such identification is very difficult, first, because a combination of several aspects of craftwork evidence (in-built structures like hearth, kiln, workbench, specialised and general tools, raw materials, unfinished objects, debris) have to be detected and secondly, these areas were often multi-purpose, including several crafts taking place at the same location (Evely 1988; Tournavitou 1988).

All this implies that workshops are rarely identified unless there is a large quantity and diversity of evidence, which is consequently often restricted to palace-controlled workshops which by being large scale production facilities and highly specialised areas are easier to identify.

However, it can be noted that there still are diverging opinions on the identification of palatial workshops, as in the case of Mycenae and the problem of the possible identification of a workshop in the Cult Centre²⁹⁸, as detailed in: Voutsaki 2001: 196-197.

²⁹⁷ The list is extensive, to name a few recent ones: Pilides 1994; Bettelli 1999; Eder, Jung 2005; Jung 2006.

²⁹⁸ It concerns Area 36 in the Service Areas, where a jewellery mould and partially worked pieces of ivory, bone, antler, jewellery were found but no debris material. The latter aspect is often taken as necessary to identify the area as a workshop (Evely 1988; Tournavitou 1988).

Concerning less controlled or uncontrolled workshops (like household industry or even individual workshops), where craft activities would have been undertaken on a smaller scale, the identification is even more difficult and often, in excavation reports, restricted to vague speculation.

In addition, some of this evidence for craftwork (like hearths or some tools, as well as pots) could also have had very diverse uses (including non-craft activities such as cooking, in the case of domestic workshops: Tournavitou 1988: 447) making it even more difficult to interpret.

This raises the question of whether some of the HBW vessels might have had other purposes than food-related: as vessels (like basins and vats) are needed in textile production for washing fibres or dyeing (Alberti n.d.). Such a hypothesis though is not at the moment possible to corroborate. It can only be noted that the low quality of finish of the interior of certain HBW specimens (3.4.2, 4.5.3) could point toward a different use.

However, concerning HBW depositional contexts, it is often (though not always) found in areas associated with domestic functions (1.3.7), which is normal since this ware's primary purpose seems to be related to food storage, preparation and consumption (2.2.3).

It should also be noted that, as seen in: 1.1 and *Appendix A*, many sites with HBW are not fully published and some published ones do not give precise details on the find context either of HBW or of small finds, which makes the following analysis even more difficult.

5.3.2.2 Textile workers

In the Mycenaean palatial context, there are several possible categories of textile production (Nixon 1999: 564-567): the industry under palace control, as the Linear B tablets show (with varying degrees of dependency²⁹⁹), and independent household production or

²⁹⁹ From royal cloth-worker to dependants or slaves (Nixon 1999: 565).

household industry and use: spindle whorls are found in a variety of depositional contexts unrelated to workshop locations³⁰⁰.

As seen earlier (5.2.2), textile evidence directly related to HBW is scarce and possibly represents home production and use. None, or very few HBW specimens, were found in the context of textile workshops: only possibly in Khamia (A.1), where “large-scale fabrication of textile” is said to have taken place at the site during the LM IIIB2 and IIIC periods (Bruun-Lundgren and Wiman 2000: 175).

It can be added that trade in raw materials related to the textile industry (murex shells for purple dye) is said to have possibly taken place between the Cretan site of Khamia and the Central Mediterranean (Hallager 1983: 115) and that some of these materials, which are reported from the LM IIIC levels (Bruun-Lundgren and Wiman 2000: 178) were found in the same contexts as HBW (A.1).

Concerning the possible involvement of HBW makers in palatial production of textiles, only speculation is possible in respect of the actual presence of HBW in palaces and the possible mention of foreign textile workers in the archives, as discussed earlier, but there is no direct evidence.

5.3.2.3 Bronzsmiths

The clearest link between HBW and other products can be made in the case of copper and bronze-working, as it is these metals which are used for the new types of artefacts mentioned earlier (5.2.3).

The technology involved in this craft includes mainly casting in moulds or working on cast blanks or sheets of metal by hammering or cutting and making incisions. The features which help with the identification of this type of work space consist of structures (open fire),

³⁰⁰ As Hughes-Brock (1999: 279) writes: “Women must have taken up their spinning at any odd moment they had their hands free...”

various tools (crucible, tongs, anvils, hammers, moulds...), raw materials (ingots) and debris³⁰¹.

There are three possible pieces of evidence which, if taken together, might hint at a link between HBW and metal-working:

- _ the presence of HBW vessels in areas related to metal-working, in particular smelting of copper, at Khania: in two areas (A.1), perhaps at Lefkandi: possibly in one area (A.2) and perhaps in Cyprus, at Kition, in three areas (Pilides 1994: 109).
- _ tools found in association with HBW: at Lefkandi, a crucible (A.2), at Khania and Mycenae, a crucible and a group of bronze and stone tools (A.1; *CD-ROM: Excel table 4.1*).
- _ raw material found in association with HBW, at Khania: two pure copper ingots³⁰² and haematite used as flux for copper-smelting (A.1)
- _ metal artefacts of foreign origin or inspiration found in association with HBW, at Khania: a violin-bow fibula, associated with the bronze and tools mentioned above (A.1), at Lefkandi: bronze knife and pin associated with the crucible mentioned above (A.2) and at Mycenae: two fibulae, mentioned earlier (5.2.3.1).

In addition, as mentioned earlier (5.2.3.2), there are, from Mycenae, a stone mould for an axe of foreign design and, from Khania, two more bronze or copper artefacts made with raw material from Sardinia: a fragment of copper rod and a bronze nail³⁰³ (Hallager, Hallager 2003: 207, 70-M 017 and 77-M 064). To this can be added the possible find, at Mycenae, of a crucible made in HBW fabric (4.3.1.7).

Even though evidence related to the find context associations between artefacts needs to be treated with caution, as discussed in: *Appendix A*, there are several aspects which seem

³⁰¹ I am not sure though that debris should be expected in large quantity since metals were not very easy to obtain and scrap metal can easily be melted and re-used.

³⁰² Of Cypriot origin (Hallager, Hallager 2003: 207). These are the only two ingots found at the site.

³⁰³ Neither find context has yet been published so it is not known whether they were found with HBW specimens.

to reflect some link between HBW and metal-working activities, at least for the sites mentioned.

5.4 Travelling artisans?

If we evoke the hypothesis that HBW makers could be specialised craftsmen, especially bronzesmiths, of foreign origin, we have to discuss the problems and possible evidence of the existence of travelling artisans in the Aegean LBA.

5.4.1 Theoretical models

As mentioned by Tournavitou (1997: 38), from a theoretical point of view, the existence of travelling craftsmen in the Aegean LBA is possible. Even if there is no direct mention of them in the Linear B archives, there are several possible hints (5.3.1) and the range of possible status of LBA Aegean craftsmen (5.3.1.4) allows room for the possibility of their mobility.

Several theoretical models (using different terminologies) have been discussed in previous publications related to the possible existence of Aegean craftsmen abroad (Cline 1995; Tournavitou 1997; Bloedow 1997; Papadopoulos 1997). These include a range of possibilities, for example: multi-tasks officials (possibly also involved in diplomatic affairs, Cline 1995: 278), women waivers in Egypt (Cline 1995: 275 referencing Barber 1991: 351) permanently resident or not, relocation of potters due to marriage (Papadopoulos 1997: 455), dependent or slaves in Ugarit and Egypt (Tournavitou 1997: 33).

As noted in the publications mentioned above, there are two main aspects to discuss when studying the model of travelling artisans. The first point to consider is the nature of their mobility, which can be of two types:

_ mobile/itinerant: who either move from one place to another (on a more or less regular basis) or travel to a foreign land and then return home. This could be the case for sites where HBW is only found in a very small quantity in a single phase (*1.3.2*).

_ sedentary/stationary: in the case of a foreigner, who has moved overseas once and has settled there, often associated with the idea of small foreign enclave “colonies” (Cline 1995: 277) but it could also involve individual foreign residents amongst the local population, the latter being a better option in the case of HBW makers, judging by the depositional context and quantities of pots (*1.3*). This could correspond to the continuing production of HBW at some sites, throughout the LH IIIC period (*1.3.2*).

The other point concerns the artisans’ relation to the local authority, which has been discussed in more detail earlier (*5.3.1*):

_ owned/slave and/or dependant/hired/state-worker³⁰⁴: workers required by the palace authority, such as the foreign textile workers in the Linear B tablets (*5.3.1.2*). This could also include the possibility of artisans as being part of a gift exchange between elites, as exemplified in the Near East (Niemeier 1991).

_ independent/state-less worker: possibly workers not directly related to the palaces but perhaps to other local elites (*5.3.1.4*).

5.4.2 A debated concept

The existence of travelling craftsmen in the Mediterranean LBA is still the subject of much debate. There have been several attempts at establishing evidence for their existence, which have involved very varied range of data such as:

_ references to archives in the Near East and Egypt (Zaccagnini 1983; Cline 1995),

³⁰⁴ In the Mycenaean context, the distinction between these two categories is difficult, and perhaps impossible, to make from the evidence available.

- _ studies of the diffusion of certain styles and techniques, like frescoes of Aegean style in the Eastern Mediterranean (Niemeier 1991; Brysbaert 2008), local use of oriental faience and glass-making techniques in Crete (Panagiotaki 1999),
- _ possible evidence for travel of jewellers in the Aegean by comparing artefacts (embossed gold sheets and cast faience items), which were made using the same moulds (Laffineur 1995: 190-192), or
- _ interpretations of the finds of many metal artefacts, as well as tools and scrap metal, on the Gelidonya shipwreck as the presence of bronzesmith(s) on board (Sherratt 2000: 87).

However, foreign-looking objects are often seen as imports without questioning this primary assumption (as can be seen in the catalogue of ‘imported’ objects called: ‘orientalia’ and ‘occidentalia’ presented in: Cline 1994³⁰⁵). This is mainly related to economic perspectives in the LBA Mediterranean area, where trade and/or exchange is seen as the main (and sometimes the only) option for the diffusion of artefacts, styles and techniques.

“The presumed existence of an “elusive class of ... Aegean craftsmen... actively pursuing their chosen vocations in area outside their native lands” obviates the need to consider such problems [related to ethnicity] or the alternatives [such as trade]” (Knapp 1998: 202, citing Cline 1995).

When looking at the bibliography of the question of the development of similar techniques, styles and iconography in various regions of the Mediterranean and Europe in the LBA, it seems that it is in fact the other way around: archaeologists have been focusing mainly on the movement of goods³⁰⁶ rather than ideas.

³⁰⁵ As a striking example: many specimens of HBW figure in the list of ‘occidentalia’, which are of local origin, as seen in: 3.3.1.

³⁰⁶ Conferences being directly related to this aspect include: Gale 1991; Scarre, Healy 1993; Gillis et al. 1995; 1997; Aegaeum 18; Aegaeum 25.

My purpose is not to deny this aspect of an exchange system, as there are many situations in which it is correctly applied. I want to discuss here the possibility, at least in small scale and in particular regarding the relationships between the Mycenaeans and the Central Mediterranean, that there might be possible evidence for the existence of travelling artisans in the LBA and that it is a plausible interpretation for HBW makers.

This does not imply in any way that travelling artisans or HBW makers played an important role in political or economic developments or that we should see them as representing ethnic groups, implanting their traditions. Instead, it might be seen as a mode of travel of skills, techniques and styles in flesh.

Two aspects might be relevant for the present subject due to the similar timeframe and the link in the possible origin of HBW to these areas. The first concerns the presence in the Central Mediterranean of locally made Aegean and Cypriot pottery and metal artefacts. The second relates to the presence in the Aegean and Eastern Mediterranean of the previously mentioned foreign metal artefacts of European/Italian types, for which the hypothesis of a diffusion related to itinerant craftsmen has already been conjectured several times (as summarised in: Sherratt 2000: 85 and adding to this: Vagnetti 1999b: 148; Bettelli 1999: 469-471; Eder, Jung 2005: 486).

This debate is directly related to the question of the “mode of dissemination”³⁰⁷ or transfer of artefacts: importation of objects or movement of artisans? This problem needs to be considered (or re-considered) by focusing on these artefacts which principally include:

_ The **dress accessories** (including fibulae and long bronze pins) and **tools** (including knives and the winged axe mould) discussed above. The relation between HBW and these artefacts is already possibly attested on a personal level (5.2.3) and on a craft production level (5.3.2).

³⁰⁷ In reference to the paper by J. Papadopoulos (1997): “Innovations, imitations and ceramic style: modes of production and modes of dissemination”.

_ Some types of **weapons**³⁰⁸ which are associated with the above artefacts, including: swords of Naue II types³⁰⁹ (a cut-and thrust sword with flanged hilt), Pertosa/Peschiera type daggers³¹⁰ and possibly various types of spearheads³¹¹. They appeared in Greece for the first time before the end of the LH IIIB period³¹² and are also found in regions of Central Europe, Northern Italy and the Adriatic³¹³.

5.4.3 Modes of transfer of metal artefacts: a preliminary study

First, it should be noted that whether a metal object was imported cannot be deduced from scientific analysis of the metal composition (and correlation to various possible sources of the raw materials used).

Indeed, metals have been traded over long-distances as raw materials and the origin of the metal might not correspond to the origin of the design, unless both the origin of the raw material and the shape/design are foreign in character and proven to be of similar source. Consequently, the problem of whether a metal artefact is imported or locally made has often had to rely on theoretical models and hypotheses.

The ways that designs and techniques travelled from one place to another can theoretically be of three main kinds:

³⁰⁸ New types and possible regions of origin are discussed in: Bietti Sestieri 1973; Harding 1984; Bouzek 1985; Jung 2006.

³⁰⁹ Also called Sprockhoff IIA type and related to the Italian Cetona and Allerona types. Catling 1956; 1961; Bouzek 1985: 119-132: various derivative types of Naue II swords found in the Aegean; Jung 2005; 2007: fig. 3.5-6, for the chronology of the Naue II type.

³¹⁰ Bouzek 1985: 132-135; Papadopoulos 1998: for discussion of the various types of daggers in the Aegean; Jung 2007: fig. 3.7

³¹¹ For the various types of foreign design found in the Aegean: Bouzek 1985: 134-140.

³¹² The earliest specimen of Naue II sword found in Greece comes from the Cult Centre at Mycenae (as mentioned earlier) and the earliest specimen of Pertosa dagger from Nemea-Tsougiza (Jung 2005: 477).

³¹³ It has been argued that the source of inspiration for the specimens found in Greece was Italian (Jung 2005: 476-477; 2007: 209-213).

- _ As imported objects: in the form of trade or gift exchange³¹⁴
- _ As ideas, imitations: Mycenaean or foreign travellers (like traders for example) importing personal items which were then copied locally. This may also include influence through other media rather than the simple copying of the same type of artefact³¹⁵.
- _ As skills, technology transfer: travelling craftsmen, whether local ones who have learnt their craft abroad or foreign ones who have come from afar.

The first model is the one that has received the greatest attention where the artefacts listed above are concerned. It is assumed that they are related to the exchange system and relationship that developed between the Central Mediterranean and the Aegean: based on small scale trade (with Mycenaeans travelling westward to collect raw materials³¹⁶) and/or on gift-exchange³¹⁷.

For the Post-palatial period, this system is said to have continued in the trade activities amongst local elites who shared similar values and ideologies, based on: “social and demographic bonds such as alliances and kinship” (Borgna and Cassola Guida 2005: 501), reciprocal gift-exchange and communal meals (Eder, Jung 2005: 491).

However, it is necessary to reconsider this scenario in trying to re-assess to which mode(s) of transfer³¹⁸ these artefacts are related, since only a handful of the artefacts found in

³¹⁴ The main difference between a traded object and gift exchange is that in the first case, the relation is purely economic (like the need for raw materials) whereas in the second case the products exchanged have a social value (with prestige high-value items).

³¹⁵ In a similar way as suggested by Sherratt (1992: 338): “Stylistic influences on pottery may also have spread by means of other indirect media, such as metalwork, textiles or even glyptic”.

³¹⁶ Including metals (copper and tin), amber and also possibly perishable materials (purple dye from murex shells): as discussed in several papers in: Gale 1991; Hallager 1988. The possible reason(s) for the Mycenaean involvement in the Central Mediterranean and its intensity are summarised and debated in: Vianello 2005.

³¹⁷ There are divergent theories about the type of contacts within the Mediterranean during the LBA, which vary according to the areas involved (differences between the Mycenaean and Near East contacts and with the Central Mediterranean) or to the existence of trade or only of exchange in the Mycenaean period. The different views are summaries in: Sjöberg 1995; Sherratt 2001.

³¹⁸ It might be that these artefacts are related to several modes of transfer, either concerning the same type of artefact or different types.

the Aegean are direct imports, whilst most can be attributed to local manufacture (Bouzek 1985: 241).

In addition, the relationship which was established between the Aegean (and Cyprus) and Central Mediterranean is certainly not restricted to the exchange of goods, whether prestige items or raw materials, as there is the appearance, during the RBA (corresponding to the end of Mycenaean LH IIIB) in the Central Mediterranean, of locally made Mycenaean pottery³¹⁹ and partially Aegean-inspired pottery³²⁰, and a marked decrease in actual imported Mycenaean pottery, especially in the FBA, in Southern Italy (Jones et al. 2005; Vianello 2005). This has been interpreted as the presence of Mycenaean traders and potters in the Central Mediterranean³²¹ (Vagnetti 1999a: 148; Bettelli 2002).

Furthermore, Aegean or Cypriot-type metal artefacts have also been found in Italian sites, some of which might be imports whereas others are made with local material, as deduced from scientific analyses (Lo Schiavo 2003: 24-27). It has been suggested that it might represent the presence of Cypriot metalworkers, especially in Sardinia (Vagnetti and Lo Schiavo 1989: 227). This might also be indicated by the appearance during the same period of new craft techniques in the Central Mediterranean: the introduction of the lost-wax technique in bronzework, particularly in Sardinia, and of glass-production in northern Italy (Vagnetti 1998: 71)³²². To this can be added the development of sheet bronze working in Central Europe where the use of complex casting techniques had long since been their tradition (Sandars 1978: 89-90; 1983: 60).

³¹⁹ "... the majority of the [Mycenaean] pottery examined [by scientific analyses] was produced in Italy..." (Jones et al. 2005: 540).

³²⁰ Such as Grey ware and Dolio: technological features are discussed in: 3.3.2.2.

³²¹ Additionally, analyses of the types of offerings in tombs, on the site of Thapsos in Sicily, have led to the hypothesis of the presence of foreigners (possibly Mycenaean people) buried there (Alberti, Bettelli 2005: 557).

³²² The site of Frattesina (northern Italy) was a large centre of crafts production, including work in metal, amber ivory and glass, during the LBA (Bietti Sestieri 1982; Iacono 2009).

This leads to two hypotheses, which need to be considered in the present case: whether the metal artefacts discussed earlier were imported or locally made, or whether they were made by local craftsmen copying imported objects or by foreign mobile craftsmen. To try to determine this, it is useful to analyse first the functional and social implications of these artefacts and then specific technical aspects of their manufacture.

- **Their functional and social implications:**

Study of the functional and social implications may reveal the mode of transfer, as it is often suggested that foreign artefacts were acquired for prestige and power purposes:

“Elites generally seek to make manifest their personal and political status [...] by adorning themselves with the most exotic goods, [...] produced by the most skilled artisans” (Knapp 1998: 201).

The paper this sentence is extracted from refers to very specific types of objects, ones which are of exotic value because of the distance from which they were obtained and/or of the high-value of the materials used or the complex techniques required to produce them.

In the present case, the presence of these metal artefacts of foreign inspiration should not be seen as ethnic elements or exotica (in relation to either the use of precious material or the far distance of origin) but as technical and functional elements, their prestigious value being in this latter sense.

In addition, the artefacts discussed here should be classified into two very different aspects: prestigious goods versus functional items, with distinct social implications: status and/or religious symbol versus everyday and/or craft use. Prestigious items are more likely to be related to gift exchange (import of objects) whereas everyday items are more prone to be made locally (import of skills).

Concerning the weapons mentioned above, they have been interpreted as follows: in the case of the Naue II swords, as prestige items, either symbolising the ruling elite (with military prowess) of the Post-palatial period (in relation to the ‘warrior tombs’³²³), or, for other items (knives and Pertosa type daggers), as possible religious symbols, reflecting the transfer of Italian cult to Crete, indicated by the presence of different types of metal artefacts of foreign design in the Dictaeon Cave³²⁴ (Bettelli 1999: 472).

This has led to the conclusion that these prestige goods were part of a gift exchange system between Mycenaean and Italian elites (Eder, Jung 2005: 487), an interpretation said to fit in with the type of relationship which existed in Greece and Italy during the Post-Palatial period, as discussed earlier.

However, it is the social implications, in the case of tools and dress accessories discussed earlier (which can be found either in tombs or settlement context), that might be different, being related to the possible introduction of new techniques (the use of new tools could imply the use of new or altered techniques) and/or new styles (fibulae being a new fashion in costume). These are everyday items.

Moreover, the fact that the type of weapon mentioned earlier, as well as fibulae, became quite common in Mycenaean society and that these include both locally evolved as well as completely new types, indicate that at least some, perhaps the majority, were made locally in the Aegean (5.2.3.1).

This leads to the two other modes of transfer mentioned above and to the question: how did ideas of design and the required skills travel? It could also be supposed that objects

³²³ Definition: “... funerary monuments containing burials that are distinguished from other interments by a pronounced military character and symbolism of their burial gifts” (Deger-Jalkotzy 2006: 152, with further analysis of the phenomenon: find context, social and political implications and related bibliography).

³²⁴ Including fourteen knives of foreign types, five Pertosa type daggers, eight arched fibulae, three spearheads. Boardman 1961; Bouzek 1985: 132, 148-149.

were exchanged (in trade or as gifts) or brought back by expatriates and that these were then copied by local craftsmen. However, as questioned by Cline (1995: 267):

“Is it sufficient to attribute the spread of artistic styles, conventions, and techniques to merchants and travellers wishing to reproduce that which they had seen in foreign lands?”

- **Aspects related to their manufacture:**

As cited and discussed by Papadopoulos (1997: 449), the statement made by Vitelli³²⁵, needs to be considered in this case: it is doubtful that copying an artefact of new design was possible just by looking at, as it would in all probability require the learning of specific skills and processes.

For example, this does apply to the locally made Mycenaean pottery found in Italy (Vagnetti 1999a: 148; Jones et al. 2005: 543): which involves the use of a series of specific technologies (such as the fast wheel and the use of kiln firing...) unknown to the local potters whose pottery was made in a very different way. It does also indicate that such processes of technology transfer were evolutionary:

“... leading from the arrival in Italy of potters practising the wheel-based traditions common throughout much of the Mycenaean world, to the co-existence of those traditions with the indigenous ones in Italy, and finally to their eventual fusion at the end of the Bronze Age” (Jones et al. 2005: 543).

³²⁵ “In my experience, to see a pot, or handle it, or even discuss how it is made, is not sufficient experience to be able to reproduce it. There must be some actual experience of the process if one is to enter the tradition of the medium” (Vitelli 1977: 30).

This means that, in other contexts, it might be difficult to identify the different stages and that only one of them might be recognised by archaeologists, leading to misconceptions about the whole process.

It has been suggested that the mode of transfer of artefacts could be determined by studying specific technical aspects. This was applied, in other contexts, to other types of artefacts from other periods (various examples of possible evidence for movements of potters: Papadopoulos 1997; for the origin of Minoan faience and glass-making: Panagiotaki 1999).

It might then be worth considering this possibility with the metal artefacts discussed here. From the two studies mentioned above, I have noticed two aspects related to the technology, which might give possible hints, for the present subject, about the possibility that these objects were made by foreign artisans:

_ Fundamental difference(s) from the local production whether stylistic or technical: such as the foreign types of spearheads which are attached in a new way (Sandars 1983: 53) or the use of repousse/embossed technique for decorating defensive armour or personal items (Bouzek 1985: 116-117).

_ Simultaneous technological developments between different regions: as observed for the Naue II swords and its later developments³²⁶ (Bouzek 1985: 119-132; Eder, Jung 2005: 487) and for spearheads: various studies have shown that specimens found in different sites of the Aegean can be closely matched with specimens from different regions of Europe (Sandars 1964: 53-55; Harding 1984: 165-168).

These are general preliminary aspects which it might be useful to look into. More work is needed though to determine whether they are really significant and whether there are other sources of information which might help resolve problems.

³²⁶ Like the addition of a central tang in the middle of the fishtailed hilt.

5.5 Discussion

As discussed at the beginning of the chapter (5.1), the analysis of evidence related to various aspects of HBW (from its chronology and quantity to its typology and fabric characteristics) has helped reinforce first the foreign identity of the HBW makers³²⁷ who in all probability had no direct link to the collapse of the palaces and second that they only represent a small element in the population, albeit one which remained identifiable over a period of around 200 years from the middle of the LH IIIB period to the end of the Bronze Age and perhaps even beyond.

In the quest to understand the reason for the presence of HBW makers in Mycenaean sites and their possible occupation(s), it was necessary to consider other types of new artefacts of foreign origin or inspiration which appeared at the same time as HBW and whose general areas of origin seem to match that of the HBW.

Four functional classes of artefacts could be differentiated (personal items, figurines, textile implements and tools, 5.2). For each of these, two questions were asked: whether these artefacts are indeed related to HBW makers and, if so, how they are linked to them, as possible markers of their identity and traditions, or as signs of their occupation. Even though it proved difficult to answer the first query with confidence, it can be observed that many of these artefacts have been found in the same depositional context as HBW and that, since their areas of possible origin seems to coincide (at least for metal artefacts), it can be postulated that they are related.

The second question, which concerned the occupation of HBW makers, was discussed in light of the previously published suggestions, detailed in: 5.3. From the three theories analysed (HBW makers seen as mercenaries and/or Sea People, seen as slaves/dependents of

³²⁷ Against the theory of a local development which corresponds in fact to the EIA-related pottery group, discussed in: 1.1.3.1.

the Mycenaean palaces, or seen as bronze- or textile-related craftsmen), it seemed that only the latter two (which could also be inter-related) might correspond to the HBW situation. This result, in turn, brought us back to the problem mentioned above, of the kind of link between HBW makers and the new foreign artefacts, and the possibility of identifying HBW makers as specialised foreign craftsmen. This aspect was analysed from two angles: the extent of the link between HBW and craft-related activities and workshop spaces (5.3.2), and the strong probability of the existence of travelling artisans in the Mediterranean LBA (5.4).

The former question, even though partially impaired by the problem of identifying craft-related spaces within Mycenaean sites (especially concerning medium to small scale workshops), could provisionally be answered positively, (particularly in relation to concerning bronze-smithing), since some contexts with HBW specimens might possibly be defined as craft-related areas due to the presence of several defining aspects (5.3.2.3).

The latter question touched upon a wider debate related to the variety in modes of transfer of new and foreign artefacts³²⁸ which should not only take into account imports or copies by local craftsmen but also the movement of craftsmen themselves (5.4.3) since there are many aspects of manufacturing technologies in pottery and metalworking where the necessary skills cannot be learnt simply from inspection of the end-product. It can be seen that, even though there are still archaeologists who are sceptical, there are many signs in the Mediterranean LBA of the presence of itinerant craftsmen in adjacent regions - the Near East, Egypt or the Italian peninsula - and there is no reason why the same should not be true of the Aegean region and Greek mainland (5.4.2). The details of their involvement with the elite, their status and their mobility varies, in my opinion, in relation to each situation, since different regions have different degrees of political involvement in the social and economic structure of the community.

³²⁸ Such as the three types identified earlier: imported objects, imitations of foreign artefacts or technology transfer through itinerant artisans, 5.4.3.

For these reasons, I believe that the best explanation for the presence of HBW at Mycenaean sites, is the presence of foreign craftsmen, principally from the Central Mediterranean, who brought both their specialised skills and their own 'household' pottery production (2.2.3, 3.5). At sites such as Mycenae it can clearly be seen that this 'foreign' population element preserved aspects of their identity at household level, even if the nature of the specialised products they created for their 'hosts' changed over time (4.3, 4.4). At other Mycenaean sites (such as: Menelaion, Dimini, Korakou, Thebes, 1.3.2, 5.4.1), the phenomenon is much more short-lived and may reflect only a temporary presence of a group of craftsmen in response to some local, perhaps even ephemeral, requirement. Such groups might, of course, by the 12th century, be drawn from amongst those larger groups already settled at Mycenae or elsewhere, just as much as from more remote, non-Mycenaean regions, with which, in any case, the dynamics of the relationship had changed as a result of the collapse in Greece of Palatial centres of administration.

Chapter 6: Conclusion and further research

The purpose of *Chapters 1* (contextual analysis), *2* (typological analysis) and *3* (fabric and manufacturing process analysis) has been to try and determine the characteristics of the HBW phenomenon in order to establish a framework of definition and identification of the ware. *Chapter 4* (Mycenae HBW analysis) was a practical application of this framework so as to study unpublished material, and *Chapter 5* (social implications of HBW makers) was aimed at using the results of the characterisation of the HBW phenomenon obtained in the present work to interpret the people behind the pots.

6.1 Summary of results

It was first established, in: 1.1, that not all the sites previously involved in the debate on HBW should be viewed as being part of a single phenomenon, since three groups (imported Sardinian pottery, EIA-related handmade pottery and HBW) had already been differentiated in previous publications (1.1.3). It was decided that only one (HBW) would be studied in detail in the present thesis, as it is the one that has received the least attention.

6.1.1 Methodology of HBW study

The realisation of the lack of previous detailed study of HBW characteristics (*i.iii*) led to the foremost necessity to establish a methodology of analysis of the ware, which was achieved in: 2.1 with the HBW typology and in: 3.2 with the fabric and technological process analysis (focusing mainly on initial visual examination but with insights into petrographic and compositional analyses as well).

These methods were then applied to both previously studied and published material (2.2, 3.4) and to unpublished material (4.3-4).

6.1.2 HBW intrinsic aspects

The first intrinsic aspect studied was the HBW **typology** and its comparison amongst sites where HBW was found (2.2, 4.3). It could first be noticed that there are many variations in shapes and sizes overall, and that there are specific shapes and decorations which are only found at single sites. This is linked to the fact that HBW is not standardised, in the way that Mycenaean ware is, but it also implies that there are important differences between sites.

This was also noticed when comparing the proportions of characteristic shape types between sites. It could be seen that there are variations, with the possibility of distinguishing three groups (2.2.4, 4.3.3), the implications of which still need to be debated.

The second aspect studied was the **fabric and manufacturing technology** used to produce HBW vessels (3, 4). Several features were already noticed in previous publications (3.1) and corroborated in the pilot study (3.4, 4.4) with the addition of more precision concerning specific points: always handmade, often with thick walls, coarser and darker fabric than Mycenaean ware, but with variations, possible intentional addition of inclusions, mostly burnished finish (but sometimes other finish types) with variations in quality, fired at low temperature (unlike Mycenaean ware), but with some control over the process since there are important variations. It was clearly established in the pilot study that the variations observed seem to be related to each other and to the size of the vessels (at least at Mycenae) and possibly to their function.

It was also shown that previous scientific analyses of the ware have established that most specimens analysed were made locally (3.3). Some additional interesting aspects were also noted: these include the possibility that some specimens might be imported, that others might have been made of clay from another region and that grog inclusions were used, a technique which is not part of the Mycenaean tradition.

In addition, the analysis of the intrinsic aspects also tells us:

- _ about the household mode of production of the ware: lacking standardisation of shape and use of basic manufacturing techniques,
- _ about its functions: food-related, but it might also have had other functions: craft-related (2.2.3, 5.3.2),

- _ that it is unsuitable for long distance transportation : bulky, heavy vessels (3.1.2),
- _ that it is unlikely that it was sold for itself: as most often not much care was taken in forming or finishing (3.4.2), and
- _ that it is of foreign tradition (2.4).

6.1.3 HBW extrinsic aspects

The first extrinsic aspect to mention is related to the **geographical distribution** of HBW, which is characteristic of the Mycenaean area, within its core (Peloponnese in particular, where the largest quantity of material has been found) and in its periphery: north as far as Thessaly and south as far as Crete (1.1-3).

It was also noticed that the HBW phenomenon extends toward the Eastern end of the Mediterranean in Cyprus and in Tell Kazel in Syria (1.1.2). The study and comparison of intrinsic aspects of the corpus from those areas with the HBW from the Mycenaean area has enabled confirmation of this (typology: 2.3.2; fabric and techniques: 3.3.2).

Concerning the foreign handmade Trojan wares of phase VIIb, the present picture shows that it is related to a different phenomenon, as shown by the comparison of several extrinsic aspects in particular (1.1.2.3) but also intrinsic aspects (2.4.1).

Turning now to the **chronological aspects** (1.3, 4.2), it is well established that HBW appears first in the LH IIIB2 period, before the major destructions of Mycenaean sites. However, there are strong clues indicating that its appearance might in fact be even earlier, in particular at Khania, Tiryns and Mycenae, though there are still chronological problems, which need to be solved.

HBW continues with certainty until the middle of the LH IIIC period. It is less obvious whether it is still present in the LH IIIC Late and Submycenaean periods, but there

may be some evidence for Tiryns and Mycenae. This is, however, in part linked to the problem of the relationship between HBW and EIA handmade pottery (1.3.3, 4.2.2).

The **quantitative evolution** of HBW is difficult to establish due to chronological synchronisation difficulties between sites (1.2) and to the problem mentioned above (concerning the link with EIA-related handmade pottery). It is often stated in publications that HBW is mainly found in the LH IIIC Early period (except at Khania) when, for example, it has its highest proportion in Tiryns. From the present analysis, this is not the case at Mycenae where there are two peaks: one in LH IIIB2 and one in LH IIIC Middle (4.2.2). In any case, HBW is always found in very small quantity in proportion to the total amount of pottery per site, around 1-4% (1.3.4, 4.2.2).

Last, the **depositional context** of HBW (1.3.5-7, 4.2.1) is always a settlement whether large (palace) or smaller. The presence of HBW in funerary contexts is not at present supported by strong evidence (1.3.5). In addition, HBW is, mainly but not exclusively, found in domestic contexts linked to food preparation, consumption and storage, and also possibly in official, religious and craft-related contexts, especially at Khania, Tiryns, Lefkandi and Mycenae.

6.1.4 Problem of origin of HBW

The debate concerning the local versus foreign development of HBW has been discussed in: 5.1, and it is now widely accepted that HBW is the product of a foreign population. What is still more controversial is the area of origin of the makers.

Even though, as seen in: 2.4, amongst the many possible areas of origin, the Central Mediterranean is the most favoured at present (preliminary fabric comparison with HBW seems to tend towards this as well: 3.3.2), there are still several problems.

Some shapes, decoration and/or technical features of HBW are not very closely related to Italian Impasto ware and might in fact be linked to handmade wares from other regions. In addition, the Italian ceramic assemblage includes many different types of wares which are not, or rarely (if we include Grey ware here), found in Mycenaean sites. It might consequently be postulated that the makers of HBW might come from several different regions.

6.1.5 The role of HBW makers

Two main aspects seem to be, at present, the most important for discussion in order to interpret the place and role of HBW makers: their relationship to and position within Mycenaean society and the extent and nature of possible links with specific types of artefacts of foreign origin or inspiration, as discussed in: 5.2-3.

There are several aspects of HBW which tend to show that the makers were trying to become integrated to Mycenaean society to a certain extent: there are many imitations of Mycenaean shapes in HBW, especially cooking vessels (2.3.1, 4.3.2) and, most if not all, HBW is found in Mycenaean habitations (1.3.6), one possible exception still to be debated: Aigeira.

However, there are very few imitations of HBW in Mycenaean ware (2.3.1) with the possible exception of the carinated vessels: a topic which needs further study.

Another important point is the fact that HBW appears in the Mycenaean area during the Palatial period in the citadels areas. That is why I have postulated that HBW makers

might be related to the palatial system as slaves/dependants or textile- or bronze-workers (5.3.1).

Whereas I have suggested that the two former hypotheses seems less likely, the latter one was considered further, although the status of the artisan in the Mycenaean society, comprises a range of possibilities (some more likely than others) which include those who have some kind of slave or dependant status as well as independent craftsmen (5.3.1.4). The fact that HBW continues to be present after the palace destructions was also considered in relation to this hypothesis.

Hypotheses of the possible association of HBW makers with textile workers or bronze-smiths were related to the fact that several types of foreign clay, metal and stone artefacts have been linked to HBW, in previous publications, including textile implements, personal items and tools (5.2).

In the present work, it was decided to analyse how closely related these artefacts are with HBW: from a depositional point of view (in the same find context) and from a technical point of view (eg. for clay artefacts: the use of similar fabric and techniques).

The nature of this relationship was also considered: was it simply on a personal level, as part of the material culture of the HBW makers, or on a professional level, as part of their occupation as artisans. The latter aspect was discussed in: 5.3.2 and it was noticed that even though the evidence is slim, it was possible to detect clues of the occupation of HBW makers as bronze-smiths. However this possibility will need further work for corroboration.

The last point discussed was consequently related to the debate over the existence of travelling artisans in the LBA Mediterranean, especially between the Aegean and the Central Mediterranean (5.4). It was mentioned that there are several aspects which show that this hypothesis is tenable in such economic and political contexts and that further research should be undertaken to explore and, hopefully, confirm this.

6.2 Suggestions for further research

There are at least four main aspects of the study of HBW which, in my opinion, are necessary to consider further.

6.2.1 Study and publication of Mycenae's entire HBW corpus

The present preliminary study of the HBW from Mycenae has shown that this site is important in the present debate on HBW for several reasons (detailed in: 4), but mainly due to specific problems which arose from the present HBW analysis and which are discussed below.

Consequently, a full study of the material from Mycenae, including, typological, technological, depositional, chronological and quantitative analyses is necessary with the aim of detailed publication.

6.2.2 Further analysis of the HBW chronological framework

The first aspect which will need further analysis is the determination of the first appearance of HBW: does it appear in the LH IIIB Middle period at Tiryns and Mycenae? Does it appear first at Khania? Is there a "Pre-Mycenaean" phase of HBW only at Aigeira?

The second aspect concerns the problem of the continuation of HBW at the end of the LH IIIC period: Does HBW continue to occur in the later part of the period? Is it still present at Tiryns and Mycenae in the LH IIIC Late period, and in the Submycenaean period?

This is directly linked to the problem of the relationship between HBW and EIA-related handmade pottery: Are both wares present at Tiryns and Mycenae, as it has been postulated for Asine and Mitrou? Are the two wares linked?

6.2.3 HBW production: how local?

It has previously been determined that HBW is produced locally. However, the question of how local is the clay used, whether the same clay beds for Mycenaean pottery are used and whether HBW from nearby sites might be from a similar clay bed are aspects which should be considered further.

In addition, more scientific analyses of provenance studies should be undertaken in order to determine if there are indeed some specimens which are imported, since some studies previously done have implied this without being able to be completely affirmative.

Lastly, more studies of the details concerning the manufacturing process (firing temperature, types of inclusions used) should be undertaken so as to be able to undertake comparative analysis of HBW with Mycenaean coarse pottery, EIA handmade pottery and Italian Impasto ware.

6.2.4 HBW makers as travelling artisans?

The hypothesis of HBW makers as travelling artisans, which was developed in: 5 is only preliminary and more work needs to be undertaken. It should include a detailed analysis and comparison of the other types of clay artefacts to determine whether they are made of the same fabric as HBW and whether the similarity of their depositional context is real or a matter of chance.

An important aspect of the HBW study should be a close analysis of its find context in order to determine, in sites where it has not been done, whether there is additional evidence for the presence of HBW in official, cultic or craft-related areas. Another aspect is to try to learn more about the function of HBW by studying the properties of the vessels, the analysis, if possible, of traces of wear, use or residues.

On a wider point of view, an analysis of further possible evidence for travelling artisans between the Aegean/Cyprus, Central Mediterranean and Europe in the LBA period could be undertaken.

Appendix A: HBW find context per site

The information concerning the find context of HBW has rarely been mentioned or analysed in great detail in previous publications. The only general deduction made is that HBW is found in domestic contexts.

However, a close look at the detail of the depositional context and associated artefacts can lead to interesting observations and interpretations of the role of HBW makers, as discussed in detail in: *Chapter 5*.

Obviously, the data provided by the analysis of the find context and objects associated needs to be undertaken with caution as HBW specimens can be fragmentary, not in situ or in a disturbed or secondary context.

It should be noted that such an analysis is limited to the amount and quality of the excavation reports published and as it can be seen there are varying degrees of details presented here.

In fact, only two sites have been published in sufficient detail to be useful: Khania and Lefkandi. The information from the other sites is either not yet published (Thebes, Aigeira) or not published in enough details (Menelaion, Tiryns).

In addition, the small finds list from the Mycenae excavation was kindly provided to me and is presented in: 4.2.1, 5.2-3.

A.1 Khania:

Khania was a very important site in Crete in the LM III period and, even though the presence of a palace is not attested, many features³²⁹ prove that it might have been an administrative centre with a strong Mycenaean influence during the periods LM IIIA2 and IIIB (Hallager 1987: 183).

HBW was found during both the LM IIIB and IIIC periods along with Grey ware. Both wares are said to be associated to the same group of foreigners from the Italian peninsula (Hallager 1985; Hallager, Hallager 2000; 2003).

The LM IIIB1 settlement was destroyed completely and then rebuilt immediately but only three rooms were re-used. Then, at the end of the LM IIIB2 period it was destroyed again by fire and rebuilt (Hallager, Hallager 2000: 286). It seems that part of the settlement was already given up after the destruction at the end of LM IIIB2. Evidence indicates that the inhabitants might have moved with their belongings to other sites (Hallager, Hallager 2000: 286). The habitations were deserted during the LM IIIC, until the Late Geometric period.

- **LM IIIB2 period:**

In this period (main period of appearance of this ware), HBW is concentrated in three areas: Building 1, Courtyard Area and Rubbish North Area, but mainly in the latter one.

Building 1:

This building only consists of habitation. There is no evidence of large-scale storage or craft activities. The presence of Mycenaean features and artefacts are well attested (Hallager, Hallager 2000: 297).

³²⁹ For a detailed analysis of evidence: Gremmler 2002.

Two HBW specimens³³⁰ have been found in a deposit and on the floor of **Room E** which is linked to food preparation and consumption. Amongst the artefacts found there are: Minoan pottery (tripod cooking dish, pithoi), a circular hearth of Mycenaean style, imported Mycenaean pottery³³¹, a figurine of Mycenaean type, a Linear B tablet³³², many tools (2 KS whorls, loom weights, percussion stone, razor, pair of bronze tweezers, a possible hilt of a small knife, obsidian objects), jewellery (steatite beads, bracelet), bits of bronze, obsidian, quartz, animal bones and shells. A foetus burial, below the floor near the hearth, was also found³³³.

A HBW carinated cup was found in a deposit, in **Space D**, identified as a pit or dump of LM IIIA-B objects from a demolished construction.

Four HBW³³⁴ specimens (two of which are complete vessels) were found in **Room A** associated with small-scale food storage and also possibly food preparation. It was found with ten Minoan vases, pithoi, an imported Mycenaean vessel³³⁵, tools (whorl, whetstone, flint), fragments of bronze, ivory, obsidian and animal bones. Judging by the types of vases it seems to be a food preparation area rather than a dining area (Hallager, Hallager 2000: 257): containers for fresh and dried provisions and maybe the obsidian objects were cutting tools. However, there is no fireplace.

³³⁰ One wide-mouthed jar and one open vessel.

³³¹ The vessel was scientifically analysed (Hallager, Hallager 2000: 32).

³³² Not in situ. Inscription number: KH X3 (Hallager, Hallager 2003: 275).

³³³ It is the only evidence of "intramural burial" from the Bronze Age in Khania. It is mentioned that this practice is known in other parts of the Aegean as well as in the Near East and Anatolia (Hallager, Hallager 2000: 32).

³³⁴ One carinated cup, two wide-mouthed jars and an uninventoried sherd.

³³⁵ The vessel was scientifically analysed (Hallager, Hallager 2000: 32).

Courtyard Area:

There is evidence of metal-working and other craft activities like smelting of copper ingots and maybe bronze production, jewellery fabrication, small-scale textile activities, pottery manufacture, stone-bead production (Hallager, Hallager 2000: 267).

Two HBW open vessel fragments were found in the **upper floor**.

In the **Related deposits**, three HBW³³⁶ specimens were found along with Grey ware vessels (cup, kylix), a Cypriot import (milk bowl), Mycenaean imports (two kylikes, stirrup jar, closed vessel, cup), irregular piece of almost pure copper (maybe fragment of ingot?) from Cyprus (analysed), bronze needle, KS whorl, loom weight?, clay bead/button, two grinders, two pestles, percussion stone, many obsidian objects. It is mentioned that the presence of many of these objects seem to indicate workshop activities (Hallager, Hallager 2003: 109).

In the **Southeast area**, a HBW conical vat was found in a deposit with Mycenaean and Cycladic imports, a bronze ear-ring or a finger-ring for a child, fragments of bronze, KS whorl, obsidian bits, animal bones and shells.

Rubbish Area North:

This is a large open area with pits and dumps, without any architecture. The content is believed to be "waste from a nearby public (?) shrine" (Hallager, Hallager 2000: 287). Indeed many features present³³⁷ seem to indicate that this area was use for a specific matter³³⁸. Also this is where most of the HBW was found: 91% of all the HBW and Grey Ware. HBW has been found in six different pits:

³³⁶ Two wide-mouthed jars and an open vessel

³³⁷ Large amount of Knossian pottery, small decorated stirrup jars, wild animal bones, figurines, low percentage of tools and raw material but the small objects either bronze, stone or bones are most of the time complete.

³³⁸ For a detailed analysis of the material found in the Rubbish Area North: Hallager 2001 (175-180)

- _ 16-pit E is a rubbish pit: there is a high percentage of HBW and Grey wares (12%) and of burnt pottery (26%)³³⁹.
- _ 22-pit B is large rubbish pit. Nine HBW and nine Grey ware specimens were found with a bronze pin and a bronze needle³⁴⁰.
- _ 1/2-pit: p. 147 is also very large rubbish pit, containing four HBW, one Grey Ware and a large quantity of pottery, including a crucible.
- _ Central Dump: thirty-one HBW³⁴¹ and forty-six Grey ware have been identified as well as a pure copper ingot of unknown origin³⁴².
- _ Southern dump: six HBW, five Grey ware and human bones have been excavated.
- _ 21-Dump is under Building 2, Room A, but still part of the Rubbish Area. Six HBW and three Grey ware have been identified.

- **LM IIIC period:**

Most of LM IIIC HBW comes from two areas: Building 1 and Rubbish Area North.

Building 1:

This room is said to have possibly been used for industrial activities such as metal-work and maybe textile (Hallager, Hallager 2000: 132).

One HBW open vessel was found on the floor deposit of **Room M**³⁴³, along with a spindle whorl (of fine and hard fabric), loom weight or bobbin, pumice stone, flint, grinder, obsidian objects. A hearth and oven were present.

³³⁹ Nineteen HBW and eight Grey ware fragments were identified.

³⁴⁰ Made from copper of Sardinian ore, analysed by lead Isotop Analysis (Hallager, Hallager 2003: 207).

³⁴¹ Most of them are fragmentary.

³⁴² Lead Isotope Analysis was carried out but the composition didn't match any known sources (Hallager, Hallager 2000: 211)

³⁴³ Not completely excavated.

Seven fragments of HBW³⁴⁴ were identified in the lower part of pit D/E (pit above a LM IIIB2 oven), in **Courtyard F**, associated with large scale storage (presence of many large pithoi). It was found with KS whorl, two loom weights, stone vase, whetstone, percussion stone, polisher and many obsidian objects.

Building 2:

Six HBW body sherds were found in construction in **Room A** along with one Grey ware, Minoan pottery, bronze ear or finger ring for child, piece of bronze, pumice stone, polisher or percussion stone, obsidian, shells and animal bones. These artefacts might belong to the LM IIIB2 Rubbish Area North (Hallager, Hallager 2000: 93).

Open Areas:

One HBW fragment of an open vessel with a knob was found in 19-Pits E/F in **Courtyard Area**, right next to one of the walls of Room A. This is not a closed context (LM IIIB/C) and very little was found inside³⁴⁵ (Hallager, Hallager 2000: 96).

One HBW closed vessel was found in the levelling of **Space A/D**, associated with cooking activities (Hallager, Hallager 2000: 133). Again this is not a closed deposit (LM IIIA/B1) and no small finds were present.

Rubbish Area North:

The content of this pit has been interpreted as waste from a shrine because of the large quantity of deer bones and that there seems to have been a cult of Demeter in the historical period (Hallager, Hallager 2000: 111).

³⁴⁴ A straight-sided bucket, a situla, two wide-mouthed jars and a carinated vessel.

³⁴⁵ Only eight pot fragments.

Ten HBW³⁴⁶ were all found in a single pit (22-pit B) with two Grey ware, a great quantity of pottery: cooking dish and pithoi. The presence of tools is also attested (bronze nail, bronze hook, bronze arrowhead, polishers, percussion stones, loom weight, pumice stone, obsidian blades). A deer antler cut and a probable polisher could be associated with the fabrication of objects from deer antler (Hallager, Hallager 2000: 178). A bronze violin-bow fibula of probable Sardinian origin was also found.

In addition, there are thirteen vessels identified as HBW that are **unstratified**, coming either from clearings or later periods.

A.2 Lefkandi:

On the residential settlement of Xeropolis at Lefkandi, only the LH IIIC and later periods (EIA) have yet been published (Evely et al. 2006). However, the site was occupied as early as the MH with the existence of a fortification until the LH IIIC period. The LH IIIC is divided in three phases mainly according to the architectural and plan layout modifications but also by different pottery styles. The beginning of the LH IIIC period shows an increase in population and the transformation of the fortification wall into a house wall. The settlement was destroyed in this early period and it was rebuilt in a different layout.

The HBW does not appear before the earliest phase of the LH IIIC period³⁴⁷ and is in fact mostly found during Phase 1 which is divided in two due to destruction either by earthquake or men in the middle of the period (Evely et al. 2006: 13). The area excavated is composed of three houses separated by passages.

³⁴⁶ Including several body sherds, a situla, a collared jar and three carinated vessels.

³⁴⁷ Wardle, who is in charge of publishing the material from the LH IIIB levels of Lefkandi, informed me that no HBW was found in this period.

LH IIIC Phase 1a:

Yard or passageway 8/13:

Associated with one HBW carinated cup fragment³⁴⁸, a few other artefacts were found like fragments of Mycenaean pottery and nine figurines. It is worth noting the presence of a handle with an animal protome attachment, probably from a carinated cup. Two others were found in phase 1a and 2a (Evely et al. 2006: 183). These bear similarities with some HBW from other sites such as in Tiryns (2.2.2).

Additionally there is a certain quantity of metal (bronze or copper) artefacts: shaft/tip, needle for sewing for home use, stud (maybe affixed to cloth, leather or wood for decorative or protective reasons, this one different from the others), fragment of sheet, rods (some kind of tool for small-scale graving and modelling or part of fibula?), a rod (pin?), bronze ring (slightly flattened and circular section) and other fragments. A clay biconical spindle whorl was also found. This area was interpreted as "domestic in character - casual losses or disposed of rubbish" (Evely et al. 2006: 10).

The other specimen of HBW carinated cup³⁴⁹ also comes from phase 1a but no indication of the precise context is given. Mycenaean wheelmade specimens of carinated vessels also first appear during this period.

Trial P (Rubbish pit):

The single HBW wide-mouthed jar³⁵⁰ comes from the surface disturbance and was associated with Mycenaean pottery: carinated cups, cooking dishes, and an antler pick (Evely et al. 2006: 96).

³⁴⁸ [69/P72]

³⁴⁹ [8/13]: Fig. 2.42:3

³⁵⁰ [69/P73]

Northwest Room (fill):

A HBW cup or bowl fragment with knobs³⁵¹ was associated with a Mycenaean crater, a serpentine whorl or bead and a bone pin (Evely et al. 2006: 125).

A HBW rounded cup³⁵² with broken attachment on the handle is said to belong to phase 1a but no information is given about the context. What is worth noting, however, is the comparison made between the broken attachment which was on the handle and other Mycenaean vessels with handle attachment: in particular the one mentioned earlier, found with a HBW carinated cup. Another suggestion is a ring attachment which also appears on some Mycenaean vessels.

LH IIIC Phase 1b:

North Room (floor deposit):

The function of the room is interpreted as domestic with the presence of a hearth, a clay-built oven, pithoi, cooking dishes: storage, food preparation, cooking. Worth noting is the presence of a ceramic crucible (connected with working of copper/bronze: Evely et al. 2006: 288) and nine clay reels of which three have no hole and are of newly invented or foreign design³⁵³ and a clay biconical spindle whorl. The so-called "Italian" cup³⁵⁴ was found near the oven (Evely et al. 2006: 118).

³⁵¹ [98/P91]

³⁵² [69/P90]

³⁵³ This type appears in 1200 BC in the Aegean, Levant and Cyprus (Evely et al. 2006: 296).

³⁵⁴ [65/P107]

Southern Area (destruction floor):

The HBW jar³⁵⁵ was found with a pyranus or firebox, a stone mortar and a human clay figurine. From this it was suggested that the function of the room is for food preparation and cooking (Evely et al. 2006: 124). A fragmentary bucket³⁵⁶ is said to belong to phase 1b but no detail of the context is given (Evely et al. 2006: 218). A bronze knife with flanged fishtail hilt and stop-ridge and a bronze pin of a probable Alpine or Italian origin was discovered in this phase. Concerning the HBW found in phases 2b and 3, it is suggested that they might not belong to the same ware/phenomenon.

LH IIIC Phase 2:

The settlement was burnt down and reconstructed differently in phase 2. Phase 2a ended again in destruction but not much is known about the end of phase 2.

North House, Room 7 (pit):

A HBW jar³⁵⁷ came from a pit, which might in fact have been dug in the PG period. Consequently the date of the vessel cannot be determined with certitude. Room 7 has a hearth, storage vessels, two pounders, weights and several querns.

A few uninventoried fragments³⁵⁸ were found in phase 2a without a closed context (Evely et al. 2006: 218).

LH IIIC Phase 3:

This phase consists of a small settlement but with a continuation from the previous period. The site is deserted gradually at the end of the phase.

³⁵⁵ [69/P27]

³⁵⁶ [Plate 49.4 bottom right]: there is no reference number.

³⁵⁷ [69/P92]

³⁵⁸ No details of the find context.

South House, Room 5:

A HBW rounded jar ³⁵⁹ came from Room 5 which is the largest room in the building and includes a hearth and a pit. Very few artefacts were found in and around this room. With the HBW jar was found a pithos and an amphora (Evely et al. 2006: 82-83).

A.3 Tiryns:

Tiryns was one of the most important settlements and palaces until the end of the LH IIIB2 period. After the destruction, the site was rearranged and continued to be inhabited through to the end of the Mycenaean civilisation and beyond.

HBW is reported to have been found in various locations of the site from at least the LH IIIB Middle:

- _ It was mainly found in the Lower Citadel³⁶⁰: in the LH IIIB2, LH IIIC Early to Late periods (Kilian 2007: 46).
- _ It was also discovered in several underground water cisterns ("syringes"): without a chronological context. About fifteen specimens are mentioned (Kilian 2007).
- _ It was found in sparse quantity in the Upper Citadel (Kilian 2007: 50-51).
- _ Finally, it was present outside the citadel in the north-west settlement: exclusively in LH IIIC Early period; only six specimens are mentioned (Kilian 1978).

A figure presented in the final publication indicates the chronological evolution of HBW (on the overall total quantity of HBW) found per period (Kilian 2007: 46, fig. 1). It can be seen that HBW is mostly present in very small quantity during the LH IIIB Middle: around

³⁵⁹ [69/P17]

³⁶⁰ Possibly due to the fact that it was the part of the site the most occupied during the Post-palatial period along with the Lower Town.

1.2% of the total HBW found on the site. However, there is a slight increase during the LH IIIB2 (around 5%) and, after the destruction, at the beginning of the LH IIIC period, it reaches approximately 30%. It then decreases suddenly until the Submycenaean period where it seems to increase again.

Kilian mentioned that HBW does only represent approximately 0.9% of the total pottery found at Tiryns (Pilides 1994: 13). However the precise stratigraphical distribution of the material is not always precise or reliable (*1.2.3*) and will need to be re-analysed.

It has always been found associated with Mycenaean pottery. The final publication does not give much detail on the exact context of discovery of the corpus presented and in particular on whether the specimens come from primary or secondary contexts. Consequently, the information given here is incomplete. However, it does provide an idea of the kind of context HBW was related to.

- **LH IIIB period:**

The site reached its peak during the LH IIIB (Palatial) period when evidence for building is attested all over the settlement. It is during this period that HBW seems to appear for the first time on the site, in the Lower Citadel (Kilian 2007: 46-47). It was mentioned that this area may have been part of the palace system and was used for domestic and cult activities, with storage rooms for offerings (Müchlenbruch 2007: 244). During the LH IIIB2, a Cyclopean fortification was built around the Lower Citadel.

The earliest HBW specimens reported belong to the LH IIIB Early period (Kilian 2007: 44). It is apparently a Mycenaean-type figurine (psi-figurine with polos hat) made in a HBW fabric (5.2.2.2). This is the only specimen mentioned and, in my opinion, until it can be confirmed with more material associated with a reliable context, it might be safer to identify the first appearance of HBW at Tiryns to the LH IIIB Middle period at the earliest.

Indeed, even in this latter case, not much information is available on the exact location of these early specimens, with the exception of one specimen (no. 165) found in Room 210. Some of the specimens associated with the LH IIIB Developed period were found in Rooms 192 and 233. Another specimen was found in the fortification, in casemate west 7, a space identified as a place of official cult activities (Kilian 2007: 50-51). The vessel (no. 187) found is interpreted as an imitation of a Mycenaean shape (amphora).

Specimens belonging to the LH IIIB Final were found in various places (Rooms 120, 121, 226) as well as in Building VI, also called "House of the Priestess" (no. 65, 291). This space is said to have had an official function due to the presence of Linear B archives. One specimen (no. 117) was also reported from the Corridor, on the west side of the Upper Citadel. It is, however, also noted that HBW is absent from the upper-class houses of the palace area during this period (Kilian 2007: 74).

At the end of the period, the site is said to have been destroyed by an earthquake (Kilian 1985a: 75). Then the Lower citadel went through a "squatting phase" where some temporary buildings were erected (Müchlenbruch 2007: 244). It is also suggested that it was rebuilt by the same people in charge during the previous period. During this transitional phase (LH IIIB2/C Early), one specimen (no. 64) was found in Room 10a which are interpreted as "squatting" habitations, built just after the destructions.

- **LH IIIC period:**

Even though it can be seen in the final publication's list of specimens how widespread the finds are, it is possible to identify several areas of particular concentration: especially in and near Room 127 but also around Rooms 112 and 119.

In the LH IIIC Early, HBW has been identified in Rooms 84 and 94. In the LH IIIC Advanced it was found in Room 127 and in the LH IIIC Late its presence was noted in

Chamber 14, in the West Citadel Wall and in Chamber 2, in the East Citadel Wall (b et al. 1981, 1982; 1983). HBW specimens dated to the LH IIIC period are also attested in Building 2 (Avila 1980).

HBW from Room 127 belongs to a LH IIIC Advanced context, in which the complex was built. This is the largest room in the post-palatial Lower Citadel and contains several hearths. Room 127 was later on modified to create two rooms 127a and b. This complex has been interpreted as being used for "the storage of valuable substances and the quantity of drinking-vessels points to significant feasting activities" (Müchlenbruch 2007: 245). It is associated with the presence of an important group of people, a new elite "that gained prosperity in the early post-palatial period" (Müchlenbruch 2007: 245).

A study of the important concentration of HBW in the area of Room 127 and the courtyard next to it has been published (Belardelli 1999; Bettelli 1999). It presents the depositional distribution of HBW and Grey Ware in this area and the type of shapes found. It should be mentioned though that only twenty-one HBW fragments (out of which four are spindle whorls and two are fragments of figurines) are reported from the catalogue of the final publication (Kilian 2007) to belong to Room 127. Five Grey Ware fragments come from the room and nine from the courtyard (Belardelli 1999: 458, fig. 1)³⁶¹. Out of the fifteen HBW vessel specimens, only three have a partially preserved profile: a conical bucket (no. 17), a large jar (no. 183) and a carinated vessel (no. 305). The other specimens are small rim fragments which could possibly be of secondary context. Until the detail of the function of the courtyard is published it cannot be determined whether HBW or Grey Ware had a function in this area.

HBW has generally also been reported in other parts of the Lower Citadel during the LH IIIC (Kilian 2007):

³⁶¹ Only nineteen HBW specimens are represented for Room 127 and 20 for the courtyard (Belardelli, Bettelli 1999: fig. 1).

_ Complex including Rooms 84-89: presence of a kiln in Room 86 and a hearth in Room 87 (fourteen specimens³⁶² found in the various rooms).

_ Room 224 and casemate 14 are linked: twenty specimens in total were found (four in the LH IIIC Early, nine in the LH IIIC Advanced, seven in the LH IIIC Late).

_ Room 119: first room to be built by the survivors in the LH IIIC Early period. Inside there is a shrine and a kiln (Müchlenbruch 2007: 244). One specimen is mentioned (no. 86).

_ Room 115: identified as "the hall for the cult of the elite" (Müchlenbruch 2007: 246). Two specimens are reported from this room (no. 31, 218).

It is however mentioned that no HBW was found in official cult context during the period (Kilian 2007: 50-51).

In two other locations, HBW was present during the LH IIIC period:

_ Chambers in the underground water cisterns (fifteen specimens³⁶³).

_ North-West settlement (six specimens³⁶⁴).

- **Submycenaean period:**

The presence of HBW in the Submycenaean period remains uncertain for the time being. As far as dated and published specimens go, a single specimen has been assigned a Submycenaean date by Kilian (et al. 1981: 151), although no other pottery was found with the specimen to corroborate the dating.

In the final publication, four HBW vessels are assigned a "Post-Mycenaean" date without any further details (Kilian 2007: no. 54, 166, 171, 208) as well as three spindle whorls (no. 447, 451, 458). A single spindle whorl is dated to the Submycenaean phase (no. 456) but no vessels are assigned to this phase.

³⁶² No. 16, 61, 73, 79, 79a, 192, 200, 202, 211, 223, 268, 369, 457, 480

³⁶³ No. 10, 66, 82, 102, 104, 111, 119, 145, 149, 179, 183a, 199, 271, 279, 288

³⁶⁴ No. 60, 71, 98, 105, 168, 176

However, this does not seem to correspond to the graph representing the percentage of HBW comparatively to the amount of Mycenaean pottery over the whole period LH IIIB Middle to Submycenaean (Kilian 2007: 46) where it looks like the percentage of HBW increases during the Submycenaean period.

In addition, it was reported that HBW continues to appear until the Geometric period (Dickinson 2006: 127), although it is mentioned that the features of the ware evolves into a fine fabric, unburnished and similar to the fine plain handmade Geometric ware.

A.4 Nichoria:

The site of Nichoria, in Messenia, was occupied since the Neolithic period and then it was abandoned at the end of the LH IIIB2- beginning of Early LH IIIC period. It has been deduced that the town was under the administration of Pylos (McDonald, Wilkie 1992: 766-767).

The excavation shows an occupation of about twenty houses during the LH IIIA-IIIB periods. There is a break in occupation in LH IIIB2 but it is not associated with any destruction. No LH IIIC pottery was found and there seems to have been an important gap before the reoccupation of the site in the EIA as the houses were in a very advanced state of ruin. However, it is mentioned that some pottery classified as DAI (Dark Age I) could be in fact related to LH IIIC Late ware (McDonald, Wilkie 1992: 767).

The single HBW specimen found is dated to the LH IIIB2 period according to the Mycenaean pottery found with it³⁶⁵ (McDonald, Wilkie 1992: 512). This sherd of a carinated

³⁶⁵ Pottery found in the same deposit includes: coarse (pierced tripod vessel, wide-mouthed jar, alabastron and more sherds), plain (bowl with trap handle, kylikes) and decorated vessels (alabastron, piriform jar, collared jars, jug, kraters, stemmed bowl, deep bowls, kylix).

vessel was found in a deposit³⁶⁶ which is situated near a building (Unit II-6) composed of four rooms and a courtyard, the largest and most centrally located house in Area II (McDonald, Wilkie 1992: 368, fig. 7-6). Modifications and new constructions were made at the end of the period. Small finds from the house include: a stone pestle or weight, few steatite whorls and conuli, clay whorls and beads, bits of metal (lead and bronze) and clay figurines³⁶⁷ (McDonald, Wilkie 1992: 369-371).

A.5 Menelaion:

HBW has been identified in varying quantities in three areas excavated: more than half of the total HBW was discovered in the Erosion Gully of Prophitis Elias Hill (61.5%) and around 20% of the total HBW was found both in the South Slope and the Stone Mound of the Aetos (Catling 2009: 382). All HBW specimens come from the transitional LHIIIB2/IIIC phase, as it is called in the final publication. At the end of this period the site was destroyed and partially abandoned but a squatter occupation continued until the LH IIIC Early period when the site was completely abandoned.

HBW from the erosion gully on the south flank of the **Prophitis Elias Hill** probably comes from occupation debris from destroyed LH IIIB2-IIIC Early buildings which were further up the hill (Catling 2009: 169). It is associated with the reoccupation phase after the collapse. Much Mycenaean pottery was also found there. Thirty-two HBW specimens have

³⁶⁶ Deposit K25 Ibc consists of debris from later re-arrangements of the area and it includes both Pre- and Post-Mycenaean pottery. However it is mentioned that the majority of the pottery is of LH IIIB2 period (McDonald, Wilkie 1992: 509).

³⁶⁷ Unusual unpainted miniature female figurine made of “gritty clay” (McDonald, Wilkie 1992: no. 2132, fig. 10-10, p. 632,659). It is dated to the LH IIIB period. It is said to possibly have been made by a child.

been discovered: all but one have previously been published in: Catling 1981 (nos. 3-12, 14-28, 30-35). There are only fragments of rim, body or base.

HBW found in the **Aetos South Slope** comes from three areas:

- _ Building B (Catling 2009: 198-212)
- _ Great terrace wall destruction (Catling 2009: 215-223)
- _ floor level of the final squatter occupation: after the major destruction at the end of LH IIIB2 (Catling 2009: 236-243)

Ten HBW specimens (only one is catalogued but not illustrated: ABT 13, several fragments of a jar) belong to the sub-topsoil over Building B. One HBW (ABT 12: small rim) was found in the foundation trench and wall fabric of the second phase of Building B. These specimens are said to belong to mixed stratigraphy levels where most Mycenaean pottery is of LH IIIB2 period but where there also are some LH IIIC Early specimens. This is also the case of a HBW handle (not catalogued) which comes from the LH IIIB2/C disturbance and occupation. Another four HBW (AM 5-7, AL 14) come from areas around the building: no detailed information is given.

One HBW (AD 43: a small rim) has been found in the destruction debris of the Great Terrace Wall. It is said that the material is probably related to a rubbish area. Mycenaean pottery of LH IIIC Middle period was found there.

The Squatter building is the last structure constructed in the area. It was erected after the LH IIIB2 collapse of the Great Terrace Wall which is believed to have fallen because of structural failure rather than attack or earthquake (Catling 2009: 216-117). Six HBW (AO 49-50a, 50b-53) were found along with Mycenaean pottery mainly of LH IIIB2/IIIC Early date. Only one was previously published in: Catling 1981 (no. 1): it is the most complete vessel

(only partial profile) in the whole corpus. More uncatalogued HBW was found: twenty-nine fragments (0.610 kg).

Ten HBW specimens were found in the **Aetos Stone Mound** (A265-273), a hole in the ground filled with stones and pottery. This structure is difficult to identify and various suggestions have been made amongst which the two favoured ones are: a natural cause created a hollow in the ground which was man-filled, or structures were erected on top which had been destroyed by a storm and the foundations filled up later on (Catling 2009: 244-263). The date of the deposit is linked to the reoccupation phase of the squatter building. LH IIIB2 to LH IIIC Middle pottery has been found.

The method of presenting the excavation results prevents identifying with precision where the small finds were located, only a general area is given. The only element that can be said is that they were metal-working activities in one of the areas mentioned above: the Aetos South Slope (Catling 2009: 265).

A.6 Korakou:

HBW from the site of Korakou is mainly associated with the Early LH IIIC settlement: out of seventeen, twelve come from a LH IIIC Early stratum. Five other specimens do not have a precise stratification but are said to come as well from LH IIIC contexts. However, one of them could be of an advanced LH IIIB context: floor 3 in Trench P (Rutter 1974: 538). It should be noted that the information on the precise location of the material is incomplete.

Ten specimens³⁶⁸ come from **Trench P** (levels III to V: Rutter 1974: 109, 396). They were found with an important amount of Mycenaean pottery as well as cooking pots and pithoi (Blegen 1921: 129).

One or possibly two complete specimens (CP 130: level I and CP 336, level II) were found in **House L**, close to a hearth, along with cooking pots, pithoi and Mycenaean pottery (Rutter 1974: 112-113). It comes from the phase of abandonment. Another complete specimen (CP 337) comes from **Area K** (level II): Mycenaean pottery and a bronze pin were found there. Finally, three specimens (CP 2928, CP 2930, CP 2929) have no context information.

A.7 Aigeira:

The small Mycenaean settlement of Aigeira, situated on the hilltop of a small plateau, was first occupied in the LH IIIC period. However, as mentioned before, HBW has first been found in a "pre-Mycenaean" level along with prehistoric pottery³⁶⁹ but there is no sign of structure. Eleven specimens of HBW belonging to this phase have been published so far (Deger-Jalkotzy 1977: fig. 14; 2003: fig. 7.1-6, fig. 8.1-3, 5).

HBW was also found in the other successive phases along with Mycenaean pottery. There are three Mycenaean habitation phases (Ia, Ib and II), all belonging to the LH IIIC period. The history of the site is given in various publications (Deger-Jalkotzy 2003a; Alram-Stern 2003) but the Mycenaean pottery and the HBW still remain unpublished.

³⁶⁸ CP 2775: level IV-V; CP 2921: level V-VI; CP 2919 and CP 2920: level V; CP 2922: level V-IV; CP 2923: level IV-III; CP 2924, CP 2925 and CP 2926: level III; CP 2927: House P: Northeast room, northwest section level I-II.

³⁶⁹ Published in: Alram-Stern, Deger-Jalkotzy 2006.

The chronological correlation of the phases from Aigeira is not completely admitted³⁷⁰. According to Mountjoy, Phase I is LH IIIC Early and Phase II is LH IIIC Late, which means that there is a hiatus in between the two phases (Mountjoy 1999a: 399). However, according to Deger-Jalkotzy (2003b: 67), Phase I is assigned to LH IIIC Early at least for phase Ia, but it has been suggested that phase Ib could be dated to the LH IIIC Middle/Developed. Phase II is LH IIIC Advanced according to Deger-Jalkotzy (2003b: 67-73)³⁷¹.

- **LH IIIC Phase Ia:**

Two building complexes with several rooms each and divided by a passage were discovered. A hearth and some pottery were found on the floor deposit inside one of the houses. However, because of the destruction by fire, almost no small finds were present in this first phase.

- **LH IIIC Phase Ib:**

After the destruction, the same layout of the settlement is preserved, although one of the houses was destroyed and a pottery kiln was built on the ruins. This indicates a change in the use of the building. Two storage rooms, one of which contained clay bins filled with carbonised food, were also found as well as a bread oven or grill in the courtyard.

In addition, metalworking activity (presence of a forge, many bronze artefacts and a mould of a spearhead) and wool production (spindle whorls, high proportion of ovicaprids) were identified. The interpretation of the finds consists in the identification of two different parts of the settlement: one for living and one for production and storage (Alram-Stern 2003: 19). This phase was also destroyed by fire.

³⁷⁰ For the detail of the discussion of the phasing of Aigeira: Deger-Jalkotzy 2003b (67-73).

³⁷¹ For a chronology correlation with other sites: Alram-Stern, Deger-Jalkotzy 2006 (Beilage 1).

Seven HBW published have been found in phase I, four of which are said to come from phase Ib (Deger-Jalkotzy, Alram-Stern 1985: fig. 13; Deger-Jalkotzy 2003a: fig.6, fig. 9.1-3).

- **LH IIIC Phase II:**

The settlement has a different layout: larger building units and a circular wall have been found and interpreted as the mansion of a local lord. It has been deduced that this might correspond to the arrival of a new population (Alram-Stern 2007: 16).

Three buildings, probably connected, have been found, one of which is the largest with a large central room. However the settlement was disturbed by later activities consequently most of the finds are unstratified and mixed (Deger-Jalkotzy 2003a: 458). There is evidence of weaving activities though. The site was again destroyed by fire. A single HBW from this phase has been published (Deger-Jalkotzy 2003a: fig. 8.6).

Because of the lack of water supply nearby, it is mentioned that the site was probably only used in a period of instability or insecurity. It has also been mentioned that this small site might have been inhabited only by two families during the Late Mycenaean period (Deger-Jalkotzy 2003a: 66). In any case, the HBW quantity is small compared to the Mycenaean pottery.

A.8 Dimini:

The Mycenaean settlement of Dimini, in Thessaly, was continually occupied from the Neolithic to the LBA (Adrimi-Sismani 2006b: 465). The settlement was prosperous during the LH IIIB2 with evidence of "a complex, well-organised community with central planning and craft specialisation" (Adrimi-Sismani 2006b: 467).

Two house complexes, including many rooms and courtyards, were excavated: Megara A and B. They include habitation and storage rooms as well as workshops (metalworking, jewellery). It has been interpreted as an administration centre³⁷² (Adrimi-Sismani 2006b: 467).

Megara A and B, along with the storage rooms and workshops, were destroyed at the end of LH IIIB2-beginning of LH IIIC Early. The cause is still unknown. Only some parts of Megaron A were re-occupied and modified. This reoccupation was on a small area and lasted for a short period (Adrimi-Sismani 2006b: 474). The site was then abandoned in the LH IIIC Early period.

HBW has only been found on the reoccupation strata (Adrimi-Sismani 2006b: 471). It was found together with Mycenaean pottery dated to the LH IIIB2-IIIC Early and another type of pottery, which appeared at the same time as HBW on the site: the Grey pseudo-Minyan wheelmade polished ware. This phenomenon was interpreted as the possible arrival of a new population on the site (Adrimi-Sismani 2006b: 471).

As can be seen on the published map (Adrimi-Sismani 2006b: fig. 25.2), HBW and Grey Ware were found in four areas: mainly in Megaron A (in several rooms and in open courts³⁷³) but also in a room in Megaron B³⁷⁴ and in two houses situated further away (Houses F and Z³⁷⁵). No more information is available on the context of the other specimens as well as the other artefact associated with HBW since the site is still under excavation and only preliminary reports are available.

A.9 Thebes:

³⁷² Specific architecture (Megaron, propylon), presence of Linear B inscriptions, altar (Adrimi-Sismani 2006b)

³⁷³ Specimens no. 11k and 13g, in: Adrimi-Sismani 2006a

³⁷⁴ Specimen no. 13c

³⁷⁵ Specimen no. 11i

Concerning the site of Thebes, in Central Greece, only site 6, Odos Pelopidou, of the Kadmeia hill has been fully published (Andrikou et al. 2006) but probably more HBW material will be mentioned in later publications (especially concerning site 12). The site was occupied since the LH IIIA2 but HBW has only been identified in the LH IIIC Early phase, in the rebuilding of the houses, which had been destroyed at the end of the LH IIIB2 phase, by an earthquake (Andrikou et al. 2006: 54).

There is, however, one specimen of HBW (no. 383: partial profile of a wide-mouthed jar) which comes from the deposit 1a, dated to the LH IIIC Middle period. It was mentioned that this specimen might, in fact, be linked to a disturbance of the layer.

The study of the depositional context is altered by the fact that the site was in continuous use until the Byzantine times. Consequently, not much information is available. Part of the HBW corpus comes from small deposits and the other part from small patches of floors.

Two HBW specimens (nos. 339, 343: a possible straight-sided bucket and a jar with two vertical handles) come from **deposit 1b** and three others (nos. 340-342: two possible conical buckets and a jar with lug handles) from **deposit 1c**. They are assigned to the LH IIIC Early period. The distinction between those two deposits is only based on the different frequencies of some pottery shapes (Andrikou et al. 2006: 36).

Four other HBW specimens have been found in association with three different patches of floors (Andrikou et al. 2006: 49-50):

- _ No. 246: a rim of a wide-mouthed jar with lug comes from the under layer of **Floor 2b**.
- _ No. 250: a rim of a bucket with lug handle comes from a pit (caused by later intervention) of **Floor 4**. It contains LH IIIC Middle pottery.
- _ No. 255: a wide-mouthed jar (nearly full profile) comes from the layer of dense pottery fragments coated with clay also of **Floor 4**.

_ No. 270: a rim of a conical basin comes from the construction of **Floor 5**.

A.10 Midea:

The HBW reported from the Mycenaean citadel of Midea, in Argolid (Demakopoulou et al. 2003: 25) is dated to the LH IIIB2. This is the final phase when the site is destroyed by an earthquake.

Fragments coming from two jars have been found in the two areas excavated: one in the destruction deposit of a room near the West Gate and the other one in debris from a complex of rooms on the plateau of the South-West slope area. They were both associated with fine and coarse Mycenaean pottery as well as MH and Early Mycenaean ceramics.

A.11 Athenian Agora:

The HBW jar found in the Athenian Agora and included in the corpus by Rutter (1975: 29) comes from a well (Well V 24:1) which is the earliest water supply for the area (LH IIIA-B-C). The fill is unstratified, but it is said to contain dump material from nearby LH IIIB houses, on the North Slope (Immerwahr 1971: 258). It has been noted that there is no other occurrence of HBW in the Late Mycenaean layers of the North Slope (Gauss 2003: 94).

A.13 Mitrou:

The site of Mitrou, in Eastern Locris, was occupied as early as the end of the MH period but with an important destruction in the LH IIIA2 Late phase. In the following period, the occupation had very scanty activity until the end of the Palatial period. Then the

settlement was rebuilt during the LH IIIC Early period (Van de Moortel 2009). The site was occupied during the whole of the period.

Two of the three specimens (a straight-sided bucket and a kylix stem) identified as HBW, come from either the surface or a mixed context (Rutter 2007; Lis 2009: 156) and consequently their chronological context is uncertain. The other one (LN784-028-015), a cup with high-swung handle, comes from a LH IIIC Early unit (Lis 2009: 156).

A.14 Other Cretan sites:

The excavators of Khania (Hallager, Hallager 2000: 166) have noted that most HBW found in Crete comes from LM IIIB2 context: from Khania mainly, but also from **Tylissos** and **Ayia Pelagia**: one vessel each. HBW has rarely been reported from other LM IIIC sites in Crete, except for Khania (much less quantity than in previous period) and few specimens from **Knossos**. The HBW specimens from these three other Cretan sites are not yet published.

Appendix B:

Framework of fabric analysis for pilot study

Fabric features were recorded with the aid of a hand lens (x10) and using some previously published charts related to four aspects of the fabric analysis, as detailed below (the texture of the surface, the frequency of inclusions, the rounding of inclusions and the tentative identification of inclusions). Concerning pots that have been analysed before, I recorded the information already published onto the form in order to compare them with my own examination.

Here is a detail of the information documented on the *CD-ROM*, *Excel table 4.3*, of recording forms of Mycenae fabric analysis (for a sample: [Figure B5]):

Context information

For each specimen (sherds from the same vessel have been grouped together), information concerning the identification number, as indicated in publications, the chronological phase, the find spot as well as the reference to the publication and the illustrations, if available, were mentioned.

Shape and decorations

A description of the shape and the type it corresponds to, using the typology established in: 2.3, was indicated as well as the description of the decoration, handles and other features.

State of preservation and dimensions

The dimensions of the vessel (diameter, heights and thickness of wall) were recorded when available. Concerning fragmentary specimens, the quantity and size of the fragments associated to the same vessel were noted. A template (Rice 1987: fig. 7.9) was used to measure the percentage of the circumference of a rim sherd and also, if necessary, to try to determine the diameter of the vessel.

Feel of surface

This is done by rubbing the surface with the thumb to identify the presence of irregularities of the surface, using the table below.

Harsh: feel abrasive to the finger Rough: irregularities can be felt Smooth: no irregularities can be felt

Hardness

It is defined as the resistance to mechanical deformation occurring on the surface and depends on several factors: firing conditions (temperature, atmosphere), porosity, grain-size distribution, burnishing and also post-depositional environment (Rice 1987: 354).

The most useful method is Mho's hardness scale (Rice 1987: table 12.1) but, for the pilot study, a simpler version was used (Sanders 1999: 478, table 4; and as indicated in the table below) due to lack of expertise in this matter and time constraint.

Very soft: fingernail scratches easily Soft: fingernail scratches Medium hard: penknife scratches Hard: penknife just scratches Very hard: penknife will not scratch

Texture

The texture of the fracture gives an indication of the amount and size of inclusions as well as an idea of the firing temperature. Pottery with many inclusions or that has been fired at low temperature produce a rough texture with large and angular irregularities: "hackly" fracture.

It should preferably be done on a fresh break, as suggested in Orton et al. 1993 (136), but it was not really an option during the pilot study, in order not to damage the specimens. However, since all specimens were fragmentary, it was possible to analyse the fractures already made, using a chart illustrated in: [Figure B1] (from: Sanders 1999: 478, fig. 19.1).

Colour

The colour of the vessel and its distribution across the section of the sherd give a general indication of how pottery was fired:

_ Core: part the least exposed to the kiln atmosphere. A black or dark grey core contains carbon derived from the incomplete burning of organic material in fabric either due to a reducing environment or if it is a shot-firing.

_ Margins (if any): zone between the core and the surfaces. If there is no difference between margin and core, it may mean a very short firing (with grey and black fabrics). If the inner and outer margins are different, the pot was closed either by being fired inverted or stack of vessel.

_ Surfaces: if it is different from the margin, there was a short-lived change in the firing conditions: perhaps the kiln was opened while still hot for the oxygen to rush in, which produces a browner or redder surface.

It is still debated, amongst archaeologists, whether a Munsell chart should be used to record the skim of colours observed and it has been used in the case of HBW from Korakou (Rutter 1975; 1979) but not for HBW from Menelaion (Catling 1981) or Thebes (Andrikou et al. 2006). I decided not to use it in my pilot study because of the great variability of the colours present on a single sherd, let alone on an entire pot. Verbal description of the colour seemed to me more appropriate to associate the specimens into firing groups, in a more easily understandable manner.

Inclusions

The description of the inclusions was made using previously published charts on the frequency ([Figure B2], from: Sanders 1999: 478, fig. 19.2), the sorting ([Figure B3], from: Orton et al. 1993: fig. A6) and the rounding ([Figure B4], from: Orton et al. 1993: fig. A5). The size of the inclusions was adapted to the coarseness of HBW fabric and the values proposed in: Sanders 1999 (478, fig. 19, here [Figure B2]) were changed:

- | |
|--|
| <ul style="list-style-type: none">_ Very fine: up to 0.1 mm_ Fine: 0.1 to 0.5 mm_ Medium: 0.5 to 1 mm_ Coarse: 1 to 3 mm_ Very coarse: larger than 3 mm |
|--|

The identification of the inclusions in the pilot study is tentative given the limitations of accurate characterisation under macroscopic conditions. However a table of identification of inclusions has been elaborated in: Peacock 1977 (p. 30-32) and was used here to give

provisional suggestions (especially the presence of organic inclusions, mica, calcium carbonate matter, grog and shells).

Surface treatment

The surface treatment was recorded on both the interior and exterior surfaces. The criteria chosen for this classification are based on a comparison of the HBW only³⁷⁶. Then the burnishing technique was mentioned: the direction and shape of the marks observed, the presence of slip.

_ **Left rough or lightly smoothed:** no or very few traces of smoothing/finishing marks, rough surface feel, uneven and bumpy, possible traces of finger marks visible.
_ **Medium burnishing:** irregular rather smooth surface, but still uneven and a bit rough.
_ **Relatively high burnishing:** smooth surface, with a faceted effect, left by the tools used, and lustrous in places.

Quality of forming and finishing

During my literature review on the previously made HBW fabric studies (3.2), I realised that some elements were lacking in the publications: especially elements linked to the forming process and quality and also the quality of the finish of the different parts of the pot (rim, handle, base, walls, decorations). These data were consequently added in this study.

I also included the use of photography to illustrate descriptions and to serve as evidence for interpretations either in the description process or in the classification into fabric types. Photographing using a macro setting gives a clear idea of the fabric texture and colour as well as evidence of the quality of forming and finishing. It seems quite a good way of conveying subtle or subjective information. Indeed, description is somehow subjective and

³⁷⁶ The different degrees of quality are related to the HBW studied only and definitely not related to other wares. This means, for example, that high burnished HBW would certainly be less well burnished than another cooking ware highly burnished but comparatively to the other HBW specimens they have a better finish.

depends on the appreciation of the archaeologist. So by being able to show on a picture what the words used mean concretely, it might attenuate the misunderstanding between archaeologists working on the same type of pottery.

Also, in my opinion, the use of coloured photographs is more suitable when dealing with fabric analysis than black and white. However, the actual colours of the sherd do not always match the ones illustrated on the photographs but it does give an idea of the distribution of the patches and the range of colours³⁷⁷.

There are, in fact, several obstacles in the photographing process, especially if the work has to be done in the museum and not in a studio. First, it is the representation of the scale that was difficult to solve. Photography on such a small scale would require a very small scale, at least down to the millimetre or half millimetre. This was not possible so I had to use a scale down to five millimetres.

Then there is the problem of lighting conditions, which are very important in the study of surface texture and treatment. Photographs were taken under artificial ceiling light, without the use of flash or any additional lighting, which affect the picture too much by producing shadows. The same lighting conditions were applied for specimens from the same museum but whereas Corinth (for Korakou and Corinth material) and Mycenae museums were quite dark, Eretria museum (for Lefkandi material) was much lighter.

In the case of Corinth and the Agora (Athens) museums, the ISO setting was used manually to lighten the photographs but this affected the quality of the image texture (grainy). Since the most important aspect of the study related to the colour, was to identify the presence of a core and margin, and lighter versus dark fabrics, the differences in lighting conditions are not an obstacle and comparison between sites was not affected.

³⁷⁷ It was suggested to me later on that I should have used a colour scale.

The other problems are the distortions and the restrictions of the focus. To convey information on the texture it is sometime necessary to take a picture at an angle which can distort the image slightly. This is not very important if the reason for the use of the photograph is to illustrate the fabric texture or the quality of execution and not the shape of the pot.

General comments:

This section includes elements particular to the specimen which seemed important to notice, whether it is related to the fabric and techniques used or other aspects, including strong similarities with other specimens from same or different site.

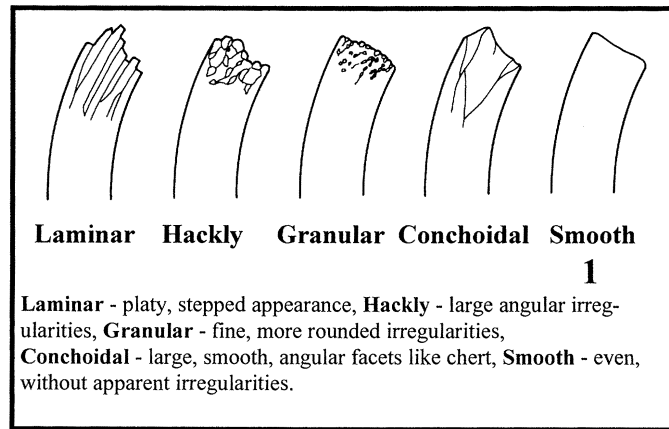
It includes the decoration, handle type and other features of the shape (base, body and rim) and the forming technique:

_ coil-built: observation of the wall (uneven, joints visible?)

_ slab-built: observation of the base of the vessel (broken into a central disc?), the wall forming (straight) and the breakage (into square fragments?).

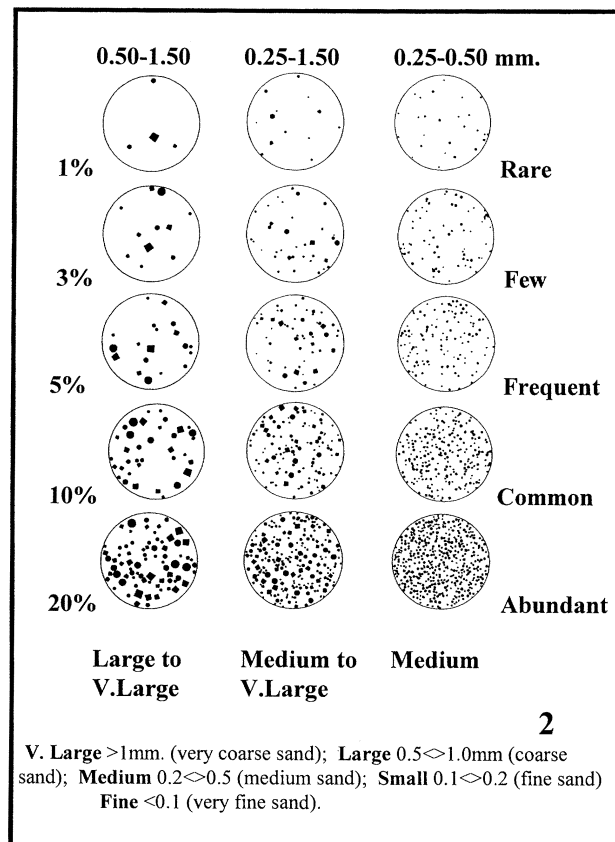
Concerning the Mycenae study, there is another column which indicates the comments reported in the Archive notebooks concerning the specimens in question. The purpose for providing the first impression noted is that they are the ones on which the identification of HBW is based (*CD-ROM, Excel table 4.3*).

Figure B1: Break profile



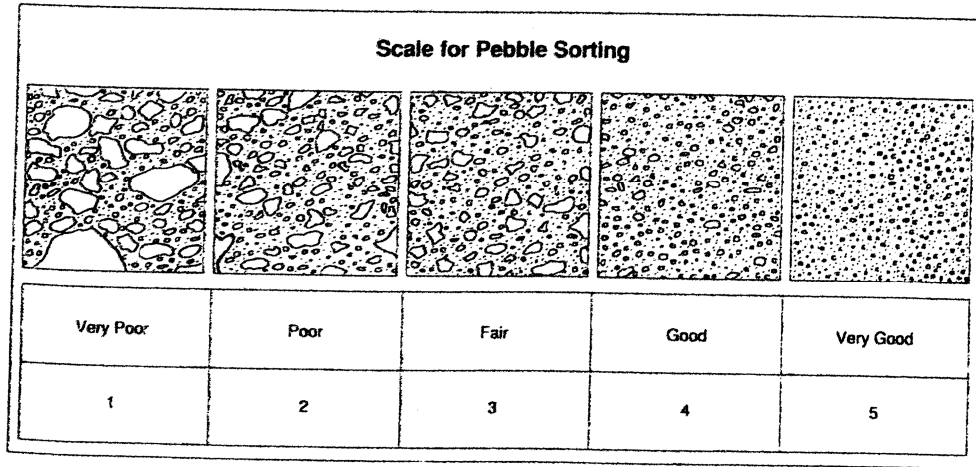
(After: Sanders 1999: 478, fig. 19)

Figure B2: Size and percentage of inclusions



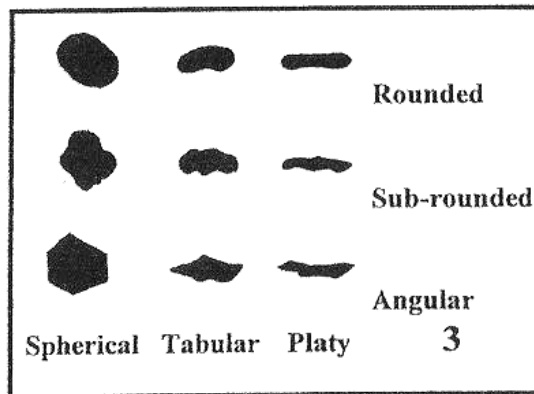
(After: Sanders 1999: 478, fig. 19)

Figure B3: Inclusions sorting



(After: Orton et al. 1993: 239, fig. A6)

Figure B4: Inclusions rounding



(After: Orton et al. 1993: 239, fig. A5)

Figure B5: Example of recording form

Site:		Identification number:	
Level:		Publication reference:	
Phase:		Shape and decoration:	
State of preservation:		Nb. and size of fragments:	
<u>Type of fabric:</u>	<u>Feel:</u>	<u>Hardness:</u>	<u>Texture:</u>
Range of colour:			
<u>Exterior</u>	<u>Core</u>	<u>Margins</u>	<u>Interior</u>
Inclusions:			
<u>Description</u>	<u>Size</u>	<u>Frequency</u>	<u>Comments</u>
Quality of forming/finishing:		Burnish technique:	
Surface treatment:			
<u>Exterior</u>		<u>Interior</u>	
Dimensions			
Diameter (rim):	Heights:	Thickness:	
Diameter (base):	Diameter max:	Handle:	
General comments:		Photographs comments:	
Drawing			

Appendix C: Selection of scientific techniques used for fabric analysis

Petrographic analyses:

Thin-section analysis, used to analyse the HBW fabric of five sites (Mycenae, Lefkandi, Khania, Menelaion and Aigeira: 3.4.1), follows a systematic description which includes criteria of texture, colour and optical activity and analysis of the non-plastic inclusions (Whitbread 1995: 379-396). It can help identify the nature (plastic and aplastic inclusions) and the processing of the raw material (levigation, mixture of clays, addition of temper), the forming of the vessel (distinguish between different techniques used, vessels made of several pieces), the firing conditions (temperature, atmosphere) and the post-depositional effects on the fabric (filling of the voids by secondary inclusions).

The first step is the sampling preparation, which has to be done carefully. A full description of the process as well as the material needed is available in: Hunt, Griffiths 1989 (166-171). It is a destructive method since a small slice³⁷⁸ of the pot is cut and ground to fit on a glass microscope slide but the sample can be kept and re-analysed (Orton et al. 1993: 140).

There are two main problems that the thin-section analysis can help solve in the HBW context. The first and most obvious one is the determination of the origin of the clay. This is only possible after the preliminary analysis which is the study of the composition of the clay.

³⁷⁸ About 2 cm long and 4 mm thick

The samples are grouped according to shared similar characteristics and then compared with known locally produced ceramics or raw clays.

The other aspect is the identification of temper. The main materials used as probable tempering in HBW are: argillaceous (grog), organic (straw or grass) and calcium carbonate (limestone, calcite or shell) (3.2.2, 3.4.1).

The analysis of the distribution of the grain size, roundedness, shape, optical density, internal and external features, constituents and colour can reveal whether the clay was naturally coarse or if inclusions were added on purpose. However it is not always straight forward to interpret the visual information which allows the suggestion of the presence of temper, as similar looking inclusions might be of natural origin (Rice 1987: 406-412).

Grog is one of the four argillaceous types³⁷⁹ of inclusions that can be found in the fabric of pottery and can be either made of the same clay paste or it can be another type of clay paste. A descriptive table has been created to try to identify those various types and find out whether the argillaceous inclusions have been added intentionally by the potter (Whitbread 1986: table 1).

In the case of the analysis of the Menelaion HBW, it was possible to see that the grog used was crushed HBW pottery by comparing the matrix of the inclusion with the surrounding matrix (Whitbread 1992: 306). The naturally occurring inclusions are described as rounded in shape with a lack of preferred orientation contrary to grog which is brown coloured, angular in shape and has preferred orientation (Whitbread 1992: 306).

Two other types of inclusion can also be of natural origin or added by the potter: organic inclusions and calcium carbonate. The size and quantity of these inclusions can help identify if they have been added intentionally by the potter.

³⁷⁹ Two other types can also be associated with tempering method: argillaceous rock fragment (composed of clay, mud and silt) and clay temper (unfired clay). The other one (clay pellets) are naturally occurring clay inclusions (Whitbread 1986: 82).

The method of **heavy mineral analysis** has been used for Mycenaean and HBW specimens from Aigeira (3.4.1.6). The technique focuses on very rare minerals, called "heavy mineral": small grains of accessory mineral of dark colour and high density (Peacock 1967: 97). Those grains are filtered and then identified by petrological analysis. This technique is used to answer specific questions related to the source of the clay. The information provided by the specimens is compared with local clay sources.

Selection of compositional analyses:

A table summary of most of the following methods comparing the sample size, preparation and destructiveness, the components analysed, the accuracy, the cost, speed and the applications is presented in: Rice 1987, table 13.1.

Optical emission spectroscopy, OES (used on HBW at Lefkandi):

This technique has been extensively used in Aegean pottery (Jones 1986a: 17) but it is limited to a certain type of elements (Scourtelli 1983: 14). It does work best for minor constituents. It is mentioned that even though this type of analysis is inexpensive and quite easy, the results are not always of a high standard (Rice 1987: 474). Indeed, it can be observed in the analysis made on HBW from Lefkandi (3.4.1.2).

Atomic absorption spectrometry, AAS (used on HBW at Lefkandi, Mycenae, Khania, Cyprus):

This technique is similar to OES in the type of elements to be analysed but is more accurate (Rice 1987: 474). It is also mentioned (Jones 1986a: 17) that the AAS has a good sensitivity towards the trace elements.

Neutron activation analysis, NAA (used on HBW at Mycenae, Thebes, tell Kazel):

This technique is the most widely used in recent pottery analysis for provenance studies. It has a very high sensitivity in terms of range and number of elements that may be determined (Jones 1986a: 16) and has the capability of detecting elements at a very low concentration (Scourtelli 1983: 22).

The analysis by NAA concerns the element concentrations which gives information of the geochemical composition of the clay used. However as it is mentioned in: Badre et al. 2005 (16) "the element concentrations also depend on the refinement procedures which the potters used to homogenize their clay". It will be influenced by the levigation of the clay, the addition of temper, the mixing of clays, that means that not only the source of the raw clay used can be determined but also the "recipe" of the potter.

A study done by NAA has three other advantages. It can differentiate the clays of an area of homogeneous geological structure and it can also show with certainty whether or not potters were seeking special clays for pottery of different types and varied functions (Scourtelli 1983: 32). These directions of research might be worth exploiting with the comparisons of the clay sources of the HBW from a same region, like Tiryns and Mycenae: has the HBW from Tiryns and Mycenae been made of the same clay source? Did they use one clay source or several? In addition, it was mentioned for the study of pottery from Tell Kazel that the precision of the technique and the study of 30 minor and trace elements made it possible to identify each "production series" of the workshop: "... all wares made of the same paste produced by the same 'recipe' can be recognized by chemical analysis..." (Badre et al. 2005: 16).

Radiography, X-ray:

This technique indicates the general distribution and size of inclusions which enable the classification of the pottery according to these inclusion parameters. Besides the orientation of inclusions can suggest how the vessel was formed (Rye 1977: 205). Images of the inner structure of the sample compared with surface traces is said to help find out the method of manufacturing (Levi et al. 1999: 175-202)³⁸⁰.

Xeroradiography:

This technique used for the identification and localisation of unusual inclusions, such as organic ones, and to distinguish between natural and tempered inclusions, such as grog (Foster 1985). It can also be used to identify the forming process used, like coil-made pots (Rice 1987).

X-ray fluorescence spectroscopy, XRF:

It only provides an analysis of the surface, unless the sample is crushed (Peacock 1970: 378). It has a very high sensitivity in the detection of elements of a very low concentration but the range of elements that can be analysed is limited (Scourtelli 1983: 22). It is used to identify mineral composition of the matrix and the inclusions and can help determine groups (Bishop et al. 1990: 539).

Radiography diffraction, XRD:

This technique identifies a certain type of elements in the clay but not the way the minerals are distributed in the paste (Peacock 1970: 380). It can also help finding out about firing temperature and degree of vitrification when it is combined with other techniques such

³⁸⁰ This method has been used for Impasto ware from Italy.

as differential thermal analysis or thermal expansion measurements which can help estimate the firing temperature (Tite 1969: 131).

Scanning electron microscopy, SEM:

The image of very high magnification obtained can give information of the firing conditions: atmosphere in the kiln and the stage of vitrification and because of the change in the microstructure of the clay (Jones 1986a: 754) information on the physical properties of the clay (hardness, strength, permeability) can be assessed, hence information on the function of the pots (Tite, Maniatis 1975: 122). Depending on the firing atmosphere and the content of calcium in the clay the stages of vitrification will be at different temperature (Jones 1986a: 757).

Appendix D: Some thoughts on pottery properties

Properties of ceramic = choice of the potter?

An important aspect of the study of ceramics, and especially of coarse pottery, is the properties the vessels have, which are linked to the function of the vessel: strength and toughness for the longevity of the pot, thermal shock resistance and thermal conductivity for performance in cooking, in permeability for storing liquids. As far as I am aware, these aspects have not been studied in great detail in any of the HBW analyses published. Since some of these properties can be identified by simple visual examination, this is an aspect that I have included in my study of HBW.

The only reference to the properties of the HBW pots concerns the fact that the fabric is often described as soft and porous (3.2.2), a consequence of low firing. This enables the fabric to expand and contract more easily than a fine and hard fabric, which is an important aspect for pots used for cooking as it prevents damage, like cracks.

The various physical properties of ceramics are obtained via the material used and the techniques of manufacturing (Van der Leew, Pritchard 1984: 66). In a study of the determination of mechanical and thermal properties of ceramics (Tite et al. 2001), it was stressed that forming aspects, amount and type of temper and firing temperatures do influence certain properties of the pot (strength, toughness, thermal shock resistance, heat effectiveness, forming effectiveness). In [Figure D.1], the table presents the information deduced from this

study (Tite et al. 2001: 319-320). It gives an idea of how the various techniques used by potters would have affected the qualities of the vessels³⁸¹.

It shows that in the case of a low temperature firing, such as with HBW, a high concentration in temper and thick walls help improve the three main properties of the clay: strength, toughness and thermal shock resistance. Both these features³⁸² have been observed in the pilot study of the material from Korakou (3.5.2).

It is also mentioned that limestone and shell temper added to the clay also increase the thermal shock resistance (Tite et al. 2001: 301). Even though the identification of calcium carbonate inclusions have not been discussed in detail in the HBW publications, its possible presence has been suggested³⁸³, which is why it seems necessary to understand its possible function as a temper.

One main reason for the use of calcium carbonate inclusions in the making process has been analysed in: Tite et al. 2001 (319). It is related to enhancing the properties of the vessels in order to produce high quality cooking pots. This study concluded that the best temper for use in cooking pot production is coarse temper, and especially crushed shells as they stop crack propagation better than quartz or grog inclusions and this gives the pot a high thermal shock resistance which is necessary when a vessel is used for cooking purposes (Tite et al. 2001: 319).

Another aspect related to the making process of cooking pots that is important to mention here concerns the particular addition of inclusions on the lower part of the vessel to increase the thermal shock resistance (Hoarda et al. 1995: 825). This feature might be visible on at least one HBW specimen from Korakou (3.5.2) and another one from Lefkandi (3.5.5).

³⁸¹ However the strength of the vessels also depends on the shape of the pot, the thickness of the walls and the method of manufacture (Tite et al. 2001: 304).

³⁸² However the identification of the use of temper by the potter is still hypothetical at this stage, for this site. But it has been mentioned in publications of other sites such as Menelaion (3.4.1.4).

³⁸³ At Khania: Hallager, Hallager 2000: 165 ; and at Korakou (3.5.2)

Although it is well known that cooking pots, generally, are made of a high concentration of temper and fired at low temperature to increase the thermal shock resistance during the successive re-firing involved in the cooking process (Tite et al. 2001: 301), it is difficult to know if the parameters chosen by the potter were intentional. One would think that it depended on several aspects including the level of experience of the potter, his degree of involvement in the craft, the weight of traditions...

The interpretation of a potter's choices and actions is an important aspect in the study of HBW because of the wide variety of the fabrics and techniques used.

"It is generally inappropriate to view ancient potters as struggling to cope with the various negative effects of their environment and, thus, needing to undertake a series of systematic experiments to establish the technological choices appropriate to achieving the performance characteristics required in use" (Tite et al. 2001: 317).

This should be kept in mind when studying HBW: were the makers of this ware inexperienced potters, in need of many experiments before finding a suitable way of making pots, or were they knowledgeable enough to make their own choices according to the qualities they wanted to achieved, to some other parameters they had.

In addition, questions related to the effects of tradition and cultural identity should also be evaluated. As mentioned, ethnoarchaeological studies have presented examples of potting techniques selected on a cultural rather than efficiency basis (Tite et al. 2001: 320-321).

Figure D.1: Summary table of properties of ceramic vessels

Quality properties of the vessel		Strength	Toughness	Thermal shock resistance	Heating effectiveness	Forming effectiveness
Techniques used by the potter						
Firing temperature	High	High				
Concentration of temper	Low			Low if below 20%		
Wall thickness	Thick	High			Low	
	Thin	Low		High	High	
Concentration of temper	High		High	High	Low	
Firing temperature	Low					
Amount of quartz	Low			High		
Amount of crushed shell	High					
Amount of limestone	High					High

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