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A Geoarchaeological Analysis of Ground Stone Tools and Architectural Materials from Mitrou, East Lokris, Greece

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To the Graduate Council:

I am submitting herewith a thesis written by Lee Bailey Anderson entitled "A Geoarchaeological Analysis of Ground Stone Tools and Architectural Materials from Mitrou, East Lokris, Greece." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Anthropology.

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Abstract

Important but seldom asked questions in the study of practice in Bronze Age Aegean society (ca. 3100-1100 B.C.) pertain to the acquisition and usage of stone material in architecture and ground stone tools. My main research questions are, “How did people’s choice of stone material change over time?” and “Why did stone usage change over time?” During the 2013 and 2014 study seasons at Mitrou, I studied the stone inclusions in clayey architectural materials, as well as stone types used in the site’s architecture, and stone types used for ground stone tools at the site. My geological identifications allowed me to first determine whether stone materials used at the site were obtained locally or were imported; then to understand how practices of Mitrou’s inhabitants changed over time with respect to stone materials; and lastly how these practices varied within the settlement of Mitrou. My research indicates that during times of socio-political change at Mitrou (Van de Moortel and Zahou 2012), the availability of various stone resources changed, as did practices with regard to these artifact classes.

Even though the production of architectural materials and ground stone tools is not well understood in the context of Bronze Age society in the Aegean, my work shows that they cannot be assumed to be completely local activities nor completely standardized activities. At Mitrou, people’s use of architectural materials changed drastically at the beginning of the Prepalatial period, and the use of ground stone tools also changed at several points during Mitrou’s 1500-year-long occupation, especially at the beginning of the Prepalatial period and during the Postpalatial period. These changes occurred in conjunction with the changing socio-political dynamics of the settlement.

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Chapter 1

Introduction

Among the material culture of Bronze Age and Early Iron Age Greece, ground stone tools and architectural materials have the potential to inform archaeologists on daily life and practices of prehistoric peoples, but they are generally under-studied compared to other items from the archaeological record such as pottery or animal bones. However, these materials are just as important because, with archaeologists asking the right questions, they reveal much about decision-making in the past pertaining to their selection and manufacture.

In this paper, I apply a geoarchaeological analysis to ground stone tools and architectural materials from the site of Mitrou (Figures 1 and 2) in East Lokris, Central Greece, in order to determine patterns in the usage of stone materials over time. If patterns in their usage can be determined during various time periods, then the argument can be made that there were common behaviors in stone usage at the site, and if these common behaviors changed at various points in time, that could indicate significant changes in society, its external contacts, or even the makeup of the population. These types of changes are attested in artifacts, architecture, and burials and can vary in their geographical scope. In the next chapter, I present a general history of Greece during the Bronze Age and Early Iron Age and the societal changes that occurred, without going into too much detail on all of the competing theories for those changes. Here it suffices to say that in prehistoric Greece, people changed their behaviors sometimes within a short time span and that by looking at the singular site of Mitrou, a settlement with a long, uninterrupted occupation and evidence for all of these transitional periods, we might learn more about the causes of these important changes.

The Mitrou Archaeological Project (2004-2008) is a cooperative project directed by Aleydis Van de Moortel of the University of Tennessee, Knoxville, and Eleni Zahou of the Ephorate of Antiquities of Phthiotida and Eurytania, which is part of the Greek Ministry of Culture and Sports. The project is also conducted under the auspices of the American School of Classical Studies at Athens. I carried out field research at Mitrou during the 2013 and 2014 summer study seasons. Mine is the first geological analysis of architectural materials and ground stone tools at the site. In this first chapter, I will discuss the theory on which this paper relies, give a brief history of Mitrou, and lastly introduce the materials that I studied.

Theoretical Considerations

In order that the reader may understand the relationship between rocks and human behavior at the site of Mitrou, I shall first discuss the theoretical aspects of this study. The theoretical perspective adopted for this study is practice theory. A basic tenet of anthropology, and more specifically, practice theory, is that humans are subject to societal norms, whether consciously or unconsciously. These societal norms are inculcated into individuals over the course of their lifetimes by the "structure" of the society and more concretely through education and social interaction. Sewell offers a simpler explanation of structure, saying that they are "constituted by mutually sustaining cultural schemas and sets of resources that empower and constrain social action and tend to be reproduced by that action".[1] An understanding of this interplay between the actions of individuals and the structure of society is the aim of practice theory,[2] which essentially holds that humans maintain certain behaviors that become habit from generation to generation, but with individual or localized variation. These behaviors at their roots usually serve a practical purpose.[3] This does not mean, however, that they always serve some material purpose. Many behaviors also serve to reinforce social cohesion, particularly symbolic behaviors. These behaviors are also shared within the "community of practice," which is a "social learning system".[4] Wenger reinforces the notion that practice might have structural "constraints, impositions, and demands", but at the same time it "reflects the meanings arrived at by those engaged in it".[5] In other words, individuals generally continue the practice which they have been taught only if they themselves believe it is the best way to behave.

Practice theory can explain behavioral patterns across long periods of time in the archaeological record because of its focus on the most basic, material aspects of human societies, for example, the functions and associations of objects in the household, the spaces in which people spend their time, and the sources of utilized natural resources, their retrieval, and utilization.[6] By investigating the habits of people and the differences

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[1] Sewell 1992, 27. For a more in-depth discussion of structure, see Giddens 1984, 16-28.
[2] Ortner 1984, 144-157.
[3] With this comment I depart slightly from practice theory to cultural materialist theory, of which Marvin Harris was the chief proponent. Cultural materialism holds that all aspects of human culture have their basis in the need to meet the physical needs of humans: the need to survive and the need to maintain a viable population number. See Harris 2001, specifically pages 51-58.
[4] Wenger 2010, 179.
[5] Ibid, 180-1.
[6] Pauketat (2001, 81-83, 86-88) gives an example of how to derive practice from the data of the archaeological record in his study of Mississippian, shell-tempered pottery.

in these habits within communities or changes in these habits over time, archaeologists are able to deduce the cultural structures that were at play and determine when a departure from the standard practice occurred. Therefore, by studying the extent to which there was a common practice in a particular aspect of a past culture, archaeologists can begin to understand the level of cultural homogeneity in that society and the political structures of the society that made it so. Conversely, if archaeologists see divergent communities of practice within one society, they may further investigate the reasons for the existence of these different groups.

Understanding change in past societies is paramount to the archaeologist, but this is never a simple task. Archaeologists have to examine many strands of evidence in order to begin to theorize about change in a past society. Ultimately, change happens because an individual or group of individuals acts in contrast with the existing practice, or sets of practices, of a society. Larger-scale changes in the "structure" of society therefore result from these contrasting actions compounding and becoming more popular. Explaining change in the archaeological record is difficult because these actions stem from a space-and-time-specific set of circumstances facing the individual(s) and also stem from their responses to those circumstances, the whole intricacy of which archaeologists will never be able to understand in the archaeological record.[7] It would be defeatist, however, to say that archaeologists do not understand changes in past societies, as can be observed through artifacts, because archaeologists do not fully understand the actions of people in the past. Archaeologists are able to study the direct results of human actions, and through

[7] Giddens 1984, 256-61.

practice theory we can gain a deeper understanding of human agency.[8] For example, if an archaeologist encounters mud bricks (i.e., unbaked clay bricks) from different households of a settlement and finds that their compositions are similar, he or she can assume that either one individual was making the mud bricks, or the individuals making the mud bricks of different houses were part of the same community of practice. On the other hand, if the archaeologist encounters mud bricks from different households of a settlement and finds that their compositions are very different and that these variations are not random, he or she can assume that there are multiple communities of practice at the settlement.

The interpretation of these multiple communities of practice depends on several factors. In an example relevant to the narrative of this thesis, if an elite faction of a community wants to set itself apart from the rest of society, it would probably establish some sort of elite ensemble of artifacts to distinguish itself materially from the others. In this case archaeologists should investigate whether the community of practice it encounters with respect to mudbrick manufacture is marked by other material correlates of elite status. Another possible explanation is that one of the communities with a different practice in a society represents an immigrant group. In that case, we would expect that the households with the different practice of making mud bricks would also exhibit different practices with regard to other classes of artifacts. In order to determine the immigrants' geographical origin, the archaeologist would look for similar practices at

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[8] Giddens (1984, 2-16) discusses at length the reasoning behind human actions and their ramifications in society.

other sites and in other regions. If human bone remains can be linked to this immigrant group, biodistance studies in combination with stable isotope and DNA analyses would be applied as well. A third possibility is that multiple communities of practice are of comparable social status and do not include obvious migrant groups. In that case, archaeologists must investigate for what reason some of the population wanted to set itself apart.

To turn back from the theoretical to the concrete, the aim of this study is to help shed light on the causes of societal changes observed at different time periods at Mitrou, which I will ascertain from studying changes in the practices of Mitrou's inhabitants with regard to three related categories of artifacts: clayey architectural materials, stone architectural materials, and ground stone tools.

The proxy for practice theory discussed in this paper is stone usage, specifically, establishing which types of rocks the ancient inhabitants of Mitrou used for which purposes, where the sources of these rocks were, and whether or not these locales and stone use changed over time. The selection of geological materials to use for ground stone tools or in architectural elements is a choice by individuals but is influenced by learned cultural notions of what works well or best and by what resources are available to the society. Ultimately, through the present geoarchaeological study I hope to reveal more about the daily practices of Mitrou's inhabitants and what they tell us about individual agency, social differences, and changes in society as well as external contacts. In this way I want to demonstrate how a geological analysis in combination with the application of practice theory can provide new insights into a prehistoric society.

The Archaeological Site of Mitrou

The tidal islet of Mitrou, a prosperous settlement during prehistory, is situated on the Northern Euboean Gulf, a major trade route in central Greece. The site is located approximately 140 kilometers northwest of Athens. In the course of five years, only approximately 2 percent of the islet has been excavated, and about 25 percent of the islet has been intensively surveyed.[9] Even though there remains much more to learn from the site, there is a basic understanding of the site's history and of the nature of the settlement from what has already been uncovered. Compared to other prehistoric sites in the Aegean, Mitrou has the rare quality of having been continuously occupied from the Early Helladic (EH) IIB phase until the Late Protogeometric (LPG) phase, ca. 2400 B.C. to 900 B.C. It even was occupied during the Late Helladic (LH) IIIC period, that is, the Post-palatial period, and during the transition from the Bronze Age to the Iron Age, when waves of abandonments have been attested at most other sites in Greece. There is evidence for the presence of an elite at Mitrou during the EH IIB phase as well as during the LH I-IIIA1 period, a.k.a. the Prepalatial period—a time of increasing social complexity and inequality on the Greek mainland which led to the creation of Mycenaean palatial states; such increasing inequality has also been observed in Prepalatial Mitrou. Conversely, there is evidence for the collapse of complex societies and a reversion to simpler societies at the transition from the EH IIB to the EH III phase and at the end of the Palatial period. Due to Mitrou's long continuous occupation and detailed

[9] Van de Moortel and Zahou 2012, 1131.

stratigraphic sequence, it is an excellent site for studying the rise and decline of social complexity throughout Greek prehistory.

These significant changes experienced by the population of Mitrou are attested by major changes in the material record of the site, as will be discussed in chapter 2. In my thesis I will examine whether and how the construction of clayey architectural elements and the use of stone building materials and ground stone tools changed during these periods of major societal shifts, and I will investigate possible explanations for those changes. In this way I hope to contribute to a better understanding of those major changes in society.

The two primary materials to be addressed are the architectural materials and the ground stone tools recovered during the excavation at Mitrou between 2004 and 2008. The former category will be subdivided into the non-plastic inclusions of clayey architectural materials and building stones. My work relies on the typology of Mitrou's clayey architectural materials developed by Kyle Jazwa[10] and the typology of ground stone tools developed by Hannah Fuson.[11] Specifically, I want to establish which types of rocks the ancient inhabitants of Mitrou used for which purposes, where the sources of these rocks were, and whether these locales and stone use changed over time and for what reason.

Since the construction of walls and the manufacture or acquisition of ground stone tools are technical activities that served specific practical purposes, we may expect that

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[10] Jazwa 2013, 2015a, 2015b.
[11] Fuson 2012.

the selection of their geological materials was influenced to a major extent by learned cultural notions of what worked well or best. Indeed, the first studies of these materials by Fuson and Jazwa indicate that there was much consistency in the use of stones for those purposes, suggestive of learned behavior.[12] Of course, stone use also was influenced by the resources that were available to the people of Mitrou, and to some extent it may also have been a matter of individual choice. In the following sections I will give a brief overview of the three categories of finds that were the focus of my thesis research: clayey architectural materials, stone walls, and ground stone tools.

Clayey Architectural Materials

The first category of finds to be discussed is clayey architectural fragments, which include pieces of mud bricks, fragments of ceiling/roofs or second story floors, clay ovens, ground floors, and utilitarian trays, which are not architectural *sensu stricto*. In all, the excavators recovered some 3000 architectural fragments from all habitation levels at Mitrou. Jazwa took these fragments and distinguished eight groups of architectural fragments based on morphology, macroscopic fabric characteristics, and function. These categories include the five categories I just mentioned, as well as roof tiles, hearths, and wall plaster, which are excluded from this study. My goals are 1) to provide geological identifications of the inclusions in mud bricks, fragments of roofs or second story floors, clay ovens, ground floors, and utilitarian trays; 2) to determine whether Mitrou's inhabitants had specific fabric "recipes" for specific functional groups; and 3) to understand the significance behind any variation within functional groups; for instance,

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[12] Fuson 2012, 29-35; Jazwa 2013, 4, 14-15; Jazwa 2015a, 4-5.

Jazwa noted macroscopical shifts in mud brick composition at times of major societal changes at Mitrou: in EH III, LH I, and LH IIIC/PG. While Jazwa has looked only at the shape, size, color, frequency, and distribution of non-plastic inclusions, I will determine the identification of the rock inclusions in order to test whether the changes he observed also pertain to stone choice. Any such changes will be interpreted from the standpoint of function and practice.

Even though one may expect the non-plastic inclusions in the architectural fragments to have come from the local area of Mitrou, I will investigate whether there are meaningful shifts in the exploitation of specific local geological resources. I will also examine whether there are changes in the types of local inclusions added to clayey architectural elements over time, and whether these may relate to the influx of new population groups or the development of a socio-political elite. At the same time, I will investigate whether there was much room for individual ingenuity and variation.

Stone Architectural Materials

My second category of finds, building stones at Mitrou, has not been examined in detail because the site had been backfilled before I began my study. Excavation photos show that stone wall socles, support bases, lintels, and other building stones consisted almost exclusively of local, hard gray limestone. The main exceptions are the carefully cut sandstone slabs that lined elite chamber tomb 73, which was used from the latter part of LH I through LH IIIA1. I investigated the possible provenience of this sandstone and its significance in the construction of elite status.

Ground Stone Tools

My third category of finds are the ground stone tools from Mitrou. Unlike the non-plastic inclusions of architectural fragments, these can be expected to have been local or imported from elsewhere. Ground stone tools were examined with several goals in mind: 1) to identify their materials and geological provenience and document changes therein over time; 2) to evaluate the suitability of the chosen stone types for each tool type and investigate how choices of stone types changed over time as Mitrou gained access to new sources; and 3) to highlight any differences between stone types used in elite versus non-elite contexts. With respect to the third goal, I hope to learn if some households were using exotic stone tools in an attempt to distinguish themselves from the rest of the population. As with the mineral inclusions of clayey architectural materials, I intend to examine, wherever the data allow it, the possibility of individual preferences for specific stone types.

Before these analyses are presented, a brief introduction to the general history of Bronze Age and Early Iron Age Greece and Mitrou is necessary in order to set the stage for my research results.

Chapter 2

Historical Background

The Early Bronze Age in the Aegean (ca. 3100-2000 B.C.) was a time of social and technological change from the previous Late Neolithic and Final Neolithic periods (Table 2, full timeline). There is not much that distinguishes the Early Helladic (EH) I phase from the Final Neolithic period, and at Mitrou, there does not seem to be a distinct EH I phase.[13] During the Early Helladic II phase (ca. 2650-2200/2150 B.C.), a higher level of social complexity, variously identified as a chiefdom or a "Big Man" society, was attained on mainland Greece.[14] This society is known as "Corridor House" society, named after a number of large civic buildings flanked by corridors found in southern and central Greece; these probably served as redistribution centers, as archaeologists have deduced from the fairly large number of stored goods, storage spaces, and seals associated with them.[15] During the EH IIB phase at Mitrou, the existence of an elite is suggested by the relatively thick walls of Buildings M and N in trench LX784 at the eastern edge of the site and the presence of roof tiles in those buildings. Both represent sophisticated architecture similar to that of the Corridor Houses.[16] The discovery of

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[13] Van de Moortel and Zahou 2012, 1132.

[14] At the risk of unnecessarily assigning a classificatory term to EH II complex society, I would like to point out that scholars, when they use any specific term to describe the complex society at this time, tend to use the term "chiefdom", e.g. Pullen 1986, Wiencke 1989, and Pullen 2003. See following note for more information.

[15] In his 1986 article, Pullen puts forth the idea that Corridor House society was comprised of chiefdoms, in which the heads of lineages controlled access to certain resources. Similarly, in her 1989 article, Wiencke presents evidence that the latter part of the EH II phase saw the evolution of a simpler ranked society into "the more sophisticated, aggressive, and hierarchically defined system in which the expanded elite ('chief' and entourage) acquired more genuine power, more prestige, more control of actual wealth or of what was then perceived as actual wealth" (508).

[16] Van de Moortel and Zahou 2012, 1132.

many fine clay drinking vessels and stone grinding tools in these two buildings further supports this interpretation.[17] Not much more is known about Mitrou during the EH IIB phase, because all excavation of EH IIB levels occurred in one 30-sq. m. trench, LX784, but there is more that could be learned in future excavations at the site.[18]

At the end of the EH IIB phase, the Corridor House society collapses,[19] and in the subsequent EH III phase there is a reversion to a simpler societal structure accompanied by major changes in pottery and architecture, although the significance of the changes varies from region to region within Greece.[20] This simple settlement organization continues into the Middle Helladic (MH) period (ca. 2000-1700 B.C.), the least-known period of the Bronze Age on the Greek mainland; it is not well-known because few Middle Helladic sites have been excavated thoroughly. The number of occupied settlements decline in EH III and MH I, as does the population.[21]

During the Middle Helladic period, the settlement of Mitrou likewise appears to revert to a simpler organization. As with other Middle Helladic sites, not much is known about Mitrou at this time. In fact, only 80 square meters of the settlement have been excavated that date to the Middle Helladic period, mostly in the northwest excavation sector and eastern scarp of the islet.[22] The site has many MH superimposed occupation

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[17] Ibid.
[18] Ibid.
[19] See Forsén (1992) for a discussion of the timing and extent of the widespread destructions toward the end of the Early Helladic Period. Forsén examines Caskey's (1960) theory of widespread invasion of the Greek mainland at the end of the Early Helladic II phase and makes the argument that destructions of EH II settlements were neither widespread nor concurrent.
[20] Rutter 1993, 763-6.
[21] Wright 2008, 232-4.
[22] Van de Moortel and Zahou 2012, 1132.

levels,[23] which have made it possible for Chris Hale to develop a refined pottery chronology of seven different phases during the Middle Helladic period.[24] One fact about the settlement which will be of importance later in this paper is that during MH II Early (ca. 1900 B.C.), pottery from Aegina begins to be imported.[25]

During the MH III phase, and in some settlements even as early as the MH II phase, evidence for increasing social inequality appears in mainland Greece, primarily in the form of contrasting burials between individuals of different social rank, both in the type of burial and in the quality of burial goods.[26] At this time, the number of sites increases in mainland Greece, as does the population. The number of exotica increases as well. The presence of weapons and boar's tusks cut and pierced for boar's-tusk helmets in richer graves and elite contexts suggests that elite males wanted to be identified as warriors and that warfare was essential to the spread of this culture, which in the Late Bronze Age would become the Mycenaean elite culture.[27]

At Mitrou, the emergence of an elite is attested at the beginning of the Late Bronze Age, in the Late Helladic (LH) I phase, ca. 1700/1600 B.C. This marks the beginning of the Prepalatial period at the site, which continues into the Late Helladic IIIA2 Early phase (early 14th century B.C.).[28] A much larger area has been excavated of this period, and much more evidence has been unearthed than for the Early and Middle

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[23] Ibid, 1132-3.
[24] Hale, forthcoming.
[25] Hale 2015, 2.
[26] Wright 2008, 238-9.
[27] Davis and Bennet 1999, 114-8.
[28] Maran and Van de Moortel 2014, 535-540.

Helladic periods. The emergence of the Prepalatial elite is marked by the construction of two large elite complexes (Buildings D and H), the development of an orthogonal network of carefully-made, long, wide roads in the settlement that may have been used only by the elite, and the building of an unusually large cist grave as well as of an even larger, monumental built chamber tomb (Tomb 73) lined with sandstone slabs and surrounded by a large funerary enclosure wall.[29] The elite complexes and Tomb 73 contained the remnants of *Murex*-dye production (an activity carried out in courtyard of Building H) as well as objects of gold, silver, amber, and faience, fragments of boar's-tusk helmets, and much imported pottery.[30] Building H contained a horse bridle piece with Carpatho-Danubian connections indicative of the use of a war chariot.[31] This elite increases in prominence over time and from the LH IIA phase onwards increasingly adopts the elite culture of the Mycenaean heartland of southern Greece.[32] In the LH IIIA2 Early phase (early 14th century B.C.), the process of Mycenaeanization at Mitrou ends in widespread destructions from fire, possibly in conjunction with an earthquake.[33] Because these two elite centers had gone out of use during the subsequent period, Van de Moortel and Zahou propose that Mitrou was ruled by an outside power at this time.[34]

The Palatial period on mainland Greece (LH IIIA-B, ca. 1400-1200 B.C.) was characterized by the presence of several large polities governed by palaces, such as those

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[29] Ibid, 535-8.
[30] Ibid, 536, 539-40.
[31] Ibid, 530-5.
[32] Vitale 2012, 1151-2.
[33] Van de Moortel and Zahou 2012, 1136; Vitale 2008, 229.
[34] Van de Moortel and Zahou 2012, 1137.

excavated at Mycenae and Pylos. These palaces were responsible for far-reaching trade and monumental architectural and infrastructural projects; they exerted control over part of the regional economies using Linear B script as well as a system of sealing.[35] This was the first state-level society on mainland Europe, and it was a period of the greatest cultural homogeneity on the Greek mainland up to that point in prehistory.

At Mitrou, little is seen in the way of architecture during the Palatial period.[36] However, an abundance of pottery (some of which is similar to that of palatial sites) and other artifacts have been recovered that date to this period, as well as a few roof tiles, which are generally attributed to monumental architecture, so it can be reasonably assumed that Mitrou was part of a Mycenaean palatial polity during the Palatial period.[37]

Palatial society on the Greek mainland fell apart sometime around the end of the 13th century B.C. The palaces were destroyed, some after attempts to increase their fortifications.[38] Many other sites were destroyed or abandoned.[39] Contacts with Egypt and the Near East from the Palatial period were lost for a generation or so. Scholars debate whether this breakdown was due to internal strife within the palatial system or because of an external threat, for instance, by the Sea Peoples.[40] After the collapse of palatial society, in the early phase of the LH IIIC period, Mitrou was rebuilt along the lines of its Prepalatial settlement pattern.[41] In the LH IIIC Middle phase, people

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[35] Eder 2007, 37-40; Galaty and Parkinson 2007, 3-9; Shelmerdine and Bennet 2008, 290-308.
[36] Van de Moortel and Zahou 2012, 1137.
[37] Ibid.
[38] Deger-Jalkotzy 2008, 388.
[39] Ibid, 387.
[40] Ibid, 390-1.
[41] Van de Moortel and Zahou 2012, 1137.

apparently tried to restore a semblance of the Prepalatial leadership system, as Building B was constructed on top of Building D and with roughly the same plan; Building B had thicker walls than all other contemporary buildings that have been excavated thus far.[42] However, in the LH IIIC Late phase, shortly before the end of the Bronze Age (ca. 1100 B.C.), the character of the site changed from an urban to a more rural settlement, with isolated, irregularly-shaped, and much more flimsy houses.[43]

This rural character continued in the Early Iron Age, until the end of the Late Protogeometric (LPG) phase (ca. 900 B.C.), when the settlement was abandoned.[44] A study of the surface survey finds and geophysical prospection done at Mitrou indicate that in the Early Iron Age, the site may have had five distinct households.[45] It is possible that there was a leading household residing in apsidal Building A, which was larger-than-average in size.[46] During the Early and Middle Protogeometric phases, burials at Mitrou are relatively poor, whereas by the LPG phase, there is again evidence for purple-dye manufacture in connection with Building E, the successor of Building A, and burials are richer.[47]

This period after the fall of the Mycenaean palatial society and before the rise of the Greek *poleis* and the use of a new writing system has traditionally been termed the "Dark Age" of Greece, because of the scarcity of evidence and apparent lack of the social

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[42] Van de Moortel and Zahou 2011, 288-9.
[43] Ibid, 289.
[44] Van de Moortel and Zahou 2012, 1137-8.
[45] Rückl 2008, 31; Van de Moortel and Zahou 2012, 1138.
[46] Van de Moortel and Zahou 2012, 1137-8. The destruction debris from Building A contained numerous drinking and pouring vessels, five large kraters as well as a large bronze ring.
[47] Van de Moortel and Zahou 2012, 1138.

order that the preceding and following periods enjoyed. However, more data are coming to light concerning the LH IIIC period and the Early Iron Age. We now know that at some sites, people were trying to restore the order of the Palatial system, for example, at Tiryns.[48] At other sites, such as Mitrou, people tried to restore the Prepalatial system.[49] There was a memory of the attributes of the former elite society, on which the leaders of the LH IIIC period were trying to capitalize, and some aspects of society, like religion, seem to have been maintained. In summary, the level of societal complexity at Mitrou follows the general trends of complexity in central Greece and the Peloponnese, but its continuous occupational history is rare in mainland Greece.

[48] Maran 2001, 119-121.
[49] Van de Moortel and Zahou 2012, 1137.

Chapter 3

Methodology

The material record clearly shows that the settlement of Mitrou underwent several drastic societal changes throughout its life time. Archaeologists want to understand the causes behind these changes by studying the changes seen in material culture (see discussion of practice in Chapter 1). For my research, I seek to learn how the inhabitants of Mitrou used stone resources by investigating three different archaeological materials: the non-plastic inclusions of clayey architectural materials, stone architectural materials, and ground stone tools. Essentially, I want to determine if there were patterns of use for stone materials during the six distinct phases of Mitrou's occupation (the "Corridor House" period [EH IIB]; the early "village" period [EH III-MH I]; the late "village" period [MH II-MH III]; the Prepalatial period [LH I-LH IIIA2 Early]; the Palatial period [LH IIIA2 Middle-LH IIIB2 Late]; and the Postpalatial period and Early Iron Age [LH IIIC-LPG]) and if these patterns of use (practices) changed over time. I focus on the geological identification and provenience of those finds, my specific questions varying with each class of material.

Clayey Architectural Materials

Previous Research

In his research of ca. 3000 samples of clayey architectural materials from Mitrou, Jazwa has distinguished eight categories of fragments, the latter five of which are included in this study: roof tiles; hearths; wall plaster; clay fragments with impressions of organic material like straw and reeds, which formed part of the superstructure of buildings (Table 3); fragments of ground floors (Table 4); mud bricks (Table 5); oven fragments (Table 6); and utilitarian trays (Table 7). "Utilitarian trays" were originally assigned as architectural fragments but are probably parts of low-fired built features of an unknown household function.[50]

Jazwa pointed out that mud bricks and other architectural elements were created by prehistoric people on the basis of established practices reflective of mental templates.[51] He has found that at Mitrou several major changes took place in the manufacture of these architectural materials. For example, in contrast to the EH IIB mud bricks, whose stone inclusions were coarse and came in many colors, mud bricks in the EH III and MH phases included a "substantial amount of very coarse straw temper" and a clay matrix that was "significantly darker red and coarser".[52] Another major change was seen in LH I, concomitant with the rise of the Prepalatial elite. At this time mud brick producers adopted an even and fine straw temper and well-sorted, medium-coarse grog and shell inclusions.[53] Another change in mud bricks occurred after the end of the Palatial period, in the LH IIIC/PG period, when the sizes of inclusions varied much more than before.[54] Jazwa also noted changes in roofing practices after the fall of the Corridor Houses, with the disappearance of tiled roofs, and at the beginning of the Prepalatial period, when the appearance of clay fragments with impressions of organic material

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[50] Jazwa 2013, 8-10; 2015b, 6.
[51] Jazwa 2015a, 1, 4-5.
[52] Ibid, 1.
[53] Ibid, 2.
[54] Ibid, 2.

indicate the introduction of either a second floor or of flat roofs, replacing the hipped roofs of the MH period.[55]

Since these kinds of changes occurred uniformly across the site, they cannot be the results of random decisions by Mitrou's inhabitants, but they are symptomatic of changes in practice. Noting the occurrence of simultaneous changes in the other classes of clayey architectural elements, Jazwa attributes these architectural changes during the EH II-EH III transition to the influx of a new population at Mitrou, whereas those of the MH III-LH I transition are ascribed to "intense interaction with new groups and emulation of their practices", and the changes in the LH IIIC/PG period to changing interactions with other population groups or the changing practices of those groups.[56]

Whereas Jazwa's study was based only on macroscopic observations of the fabric morphology of the architectural elements, it is my aim to identify and provenance the non-plastic inclusions of all those architectural elements in order to determine whether the type of inclusions changed significantly over time in accordance with the other changes in the materials. I will also investigate whether there are differences in the type and frequency of inclusions between the categories, reflecting specific "fabric recipes" applied by the manufacturers. The manifestation of different "recipes" for different architectural elements would reflect a skilled, thoughtful approach to the manufacture of clayey architectural materials, which can be assumed to be the results of generations of refining this craft.

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[55] Ibid, 2.
[56] Ibid, 4-5.

Selection of Samples of Clayey Architectural Fragments

Out of the circa 3000 architectural fragments recovered from Mitrou and studied by Jazwa, 73 architectural fragments were selected by me for my present petrographic study. From each category I chose the samples that were the most substantial in size. I excluded Jazwa's category of wall plaster, because the plaster did not contain any visible inclusions, and thus could not be the subject of petrographic analysis. I also omitted Jazwa's built hearths category due to the paucity of samples.

Stone Architectural Materials

To judge by excavation photos and excavators' reports, wall stones at Mitrou were routinely made of limestone and do not exhibit site-wide diachronic changes in terms of their stone type. Instead, I examined the use of different stone types for walls from the perspective of social practice on the part of Mitrou's emerging elite during the Prepalatial period. More specifically, I investigated the provenience of the greenish sandstone uprights slabs (or orthostates) that were uniquely used for the interior lining of elite chamber tomb 73 at the site.[57] It is a brittle coarse sandstone that could be cut with relative ease along its layers. Since most of the limestone blocks used to build stone wall socles were probably chosen for their ideal size and only roughly cut to size, this manipulation of a completely different kind of material says much about the changing practice of the Prepalatial elite community of Mitrou.

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[57] These sandstone slabs were recommended to me for analysis by Aleydis Van de Moortel.

Selection of Samples of Stone Architectural Materials

During my fieldwork I analyzed the samples of the sandstone slabs lining Tomb 73, which had been taken by the excavators, primarily from one excavation unit: Trench LN783, Stratigraphic Unit 491. I judged these fragments to be substantial enough to be representative of what the intact sandstone slabs would have looked like. The limestone used for rubble wall socles had been left in situ at the site. The backfilling of the site at the end of the excavation rendered them unavailable for direct study.

Ground Stone Tools

Previous Research

The total number of ground stone tools recovered from Mitrou is estimated to be about 500. Of these, 224 tools have been catalogued and studied by Fuson (2012). Nearly all of these came from A. Van de Moortel's list of significant contexts at the site, and a few derived from miscellaneous contexts. Fuson studied the morphology and use-wear of these tools and grouped them into functional categories: "cutting tools (axes, adzes, and chisels), abrasive tools (rubbers, burnishing stones, grinding stones, pestles and scrapers), percussive tools (hammer stones), and surface tools (mortars, querns, whetstones, anvil stones)".[58]

My research adds the geological identification of the ground stone tools and the perspective of practice theory to Fuson's study of their function. The ground stone tools

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[58] Fuson 2012, 8. These typologies were adopted from Eitam (2007) and Karimali (2008).

can be studied from several angles. First, I want to determine whether specific stone materials had been selected for specific tools or tool functions and whether these choices changed over time. I want to learn whether there was a common mental template for the use of ground stone tools throughout the settlement or whether elites had a different mental template from non-elites or whether it was a matter of individual preference. The choice of stone types would obviously be dependent in part upon the availability of stone materials, which is my second perspective. Mitrou's population also is likely to have had a shared understanding of which materials worked best for certain tasks. Over time, people may have chosen to use different materials as they became available or unavailable. By comparing how people used different materials across the site, even when new materials are introduced, we can speak to "practice". My last perspective is that of considering whether certain exotic/"non-local" rocks were seen as prestige items. To this end I will compare the stone types used for tools from elite settings versus those from non-elite settings.

Selection of Samples of Ground Stone Tools

In all I studied the geological identification and provenience of 153 ground stone tools. I was able to examine 141 of the 224 ground stone tools studied by Fuson. In addition, I decided to include twelve other stone tools that were not in Fuson's catalog because their material looked different. In this way I attempted to learn more fully the extent of the variety of stone types used for ground stone tools at Mitrou.

Study of the Local Geology

In order to determine which geological materials were local and which were imported, I spent a good portion of my time during the summers studying the geology of the region of Mitrou as well as of various parts of Greece that were in contact with Mitrou in order to get a sense of the accessibility of their rock types. I consulted geologic maps of the local area and the areas farther away, but geologic maps were not always specific enough to inform me of the variety of rock represented in a particular formation. Therefore, it was imperative that I travel to all those areas and inspect them myself. Either by car or on foot, I intensively covered much of the local area of Mitrou within an approximately 4 km radius of the site, and I more extensively covered a surrounding area of ca. 130 sq. km in the triangle formed by the towns of Arkitsa, Kyrtone, and Malesina, lying along the Euboean Gulf. Having determined during the 2013 season that certain materials of Mitrou's stone tools, such as basalt, andesite, and schist, were not local and were moreover relatively rare in Greece, I traveled during the summer of 2014 to several Greek islands and other locations in Greece (southern Euboea as well as the islands of Melos, Naxos, Paros, Antiparos, Santorini, Aegina, and Poros, and the southern Greek area of Methana) to ascertain if they may have been sources of Mitrou's stone tool materials. These trips gave me a good basic understanding of the stone resources of those areas, even though it was not possible within the scope of this study to thoroughly examine all of the geological formations that were of interest to me.

Tools Used for Study

During the 2013 and 2014 study seasons at Mitrou, I studied my samples in hand specimen with the aid of a Dino-Lite Premier Digital Handheld Microscope AM413ZTAS that allowed up to approximately 220x magnification and a Dino-Lite AM4113MZTL that allowed up to approximately 90x magnification, for the purpose of basic geological identification of the rocks; both microscopes had a polarizing feature. I also frequently relied on a 10x magnification hand lens. In order to conclusively identify limestone and marble, I applied drops of 5-10 percent dilute hydrochloric acid. Using these tools, I was able to identify the specimens at a basic level, designating them as "basalt", "limestone", "marble", "serpentinite," etc. A more detailed identification was not necessary for the purposes of determining the variation within the stone tools and the general provenience of the stone tool materials.

Chapter 4

Analysis

This chapter begins with my findings on the local geology as well as the geology of other areas of Greece that participated at one time or another in the same exchange networks as Mitrou. Then I discuss the identifications of non-plastic inclusions in clayey architectural materials (Tables 3-7), paying special attention to changes over time. The next section addresses the stone materials used in wall construction, and specifically the provenience of the sandstone slabs from elite Tomb 73, and its political repercussions (Table 8). Lastly, I present the ground stone tools (Tables 9-15), discussing first the identifications of rocks used, rock types as they relate to tool function, chronological changes in the use of stone materials with their significance for informing us about shifting exchange networks, and a comparison of rocks found in elite settings with those from non-elite settings.

Results of Geological Study

Before discussing my geological analysis of the artifacts from Mitrou, I want to first address my findings on the local geology, as well as the geology of other areas of Greece with which Mitrou may have been in contact, as a framework for the discussion. Since I am interested in the availability of various rock sources to Mitrou's inhabitants, I want to briefly state what I mean by the terms "local" and "non-local" stone materials. "Local" refers to rock sources that were close enough for individuals from the settlement to walk to and access on their own, areas that may have lain within the political boundary of the settlement (Figure 3). This is an area of an approximately 3.5-kilometer radius around Mitrou and encompasses the modern towns of Tragana, Kyparissi, and Proskynas, located between the Kallidromos mountain range and the sea. "Non-local" therefore refers to rock sources that were located further away and may have required trade or crossing into the territory of another settlement. Whereas few Bronze Age and Early Iron Age settlements in northwestern East Lokris, called Epiknemidian Lokris, are known, two Bronze Age settlements near Mitrou have been excavated: Pyrgos Livanaton—which often is identified with the Homeric settlement of Kynos—and Proskynas (Figure 4).[59] The settlement hierarchy of the region, however, is unclear and may have changed throughout the Bronze Age, meaning that access to certain materials may not necessarily have been restricted, even if a settlement lay between Mitrou and the source of stone.[60]

Like much of Greece, the areas of East Lokris and the Northern Euboean Gulf lie along geological fault lines. Tectonic uplift is responsible for the creation of the Kallidromos and Knemis mountain ranges separating East Lokris from Phokis, while tectonic subsidence is responsible for the creation of the Malian and Euboean Gulfs.[61] The local geology of Mitrou's area is comprised mostly of hard gray limestone, soft whitish marl, and serpentinite (Figure 5). Since there have been varying amounts of metamorphism in the geologic past, this limestone in some places close to the site was metamorphosed into a low-quality, dark-colored marble. The islet of Mitrou itself is mostly composed of hard gray limestone and soft, whitish marl; there is also a small

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[59] Van de Moortel 2007, 244.
[60] Van de Moortel 2007. For example, the history of the settlement of Pyrgos Livanaton (Kynos) is similar to Mitrou's history, except for the Palatial-period destructions that occur at Pyrgos Livanaton. In short, the relationship between the two sites is unclear.
[61] González et al. 2013, 58.

serpentinite outcrop on the north side of the islet, where the land has been uplifted.[62] Serpentinite outcrops (Figures 6 and 7)—as well as limestone outcrops—are found in the hills approximately two and a half kilometers to the south of the site, limestone is found on Donkey Island (Gaidaronisi) one kilometer to the west (Figure 8), and limestone and poor-quality marble are found across the bay to the east within two kilometers (Figure 9).

Chert is also found several kilometers to the south of the site, only a couple-hours walk from the site. It does not appear to be the same variety as the stone tools in this study, but with chert being a fairly common rock around the world in general, all of the chert used at the site was probably easily accessible. The study of chipped stone tools is ongoing, and therefore information on their source(s) is not currently known. It is my argument, then, that these are the only "local" stone materials available to Mitrou's inhabitants, due to their proximity. It is not surprising that they were widely employed at the site both as ground stone tools and as architectural materials.

Other materials used for stone tools are obviously imports. Multiple stone tools from Mitrou were made of andesite from the island of Aegina in the Saronic Gulf—approximately 250 kilometers by boat from Mitrou—and the settlement's obsidian came from the Cycladic island of Melos, approximately 300 kilometers by boat from Mitrou.[63] Other materials used for stone tools were clearly non-local as well: basalt, schist, and marble. These tools could have come from elsewhere in the Saronic Gulf or even the Southern Aegean. I spent one month in the summer of 2014 traveling around various

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[62] Karkanas and Van de Moortel 2014, 199.
[63] I am deeply indebted to Salvatore Vitale for showing me a sample of andesite that he had collected from Aegina, to which I could compare Mitrou's samples of andesite.

islands in the Southern Aegean to determine the provenience of Mitrou's stone tool materials. Rather than detailing the geology of each of the places I visited, I will discuss in the following paragraphs each of the stone materials that I tried to provenance.

I had supposed that the basalt could have come from Thera. In the summer of 2013, I happened to encounter a piece of pumice, not included in this study, that was recovered from the surface survey of Mitrou, which may have come from Thera as well, further encouraging me to investigate that island as a possible source of basalt. My macroscopic observations, however, showed that the basalts on Thera did not have the same vesicular texture or the same phenocrysts—the macroscopic crystals of igneous rock—as the kind used at Mitrou. Dr. K. Vouvalides and Dr. G. Syrides, geologists from the University of Thessaloniki who were visiting Mitrou, told me that there was basalt on Lichadonisia—a small group of volcanic islets at the northern end of the Euboean Gulf, some 42 kilometers from Mitrou (Figure 10)—although they were unsure if it matched Mitrou's stone tools. After seeing a sample from there and traveling there myself, I realized that Lichadonisia was the source of basalt for Mitrou, because it had the same macroscopic texture and phenocrysts as the stone tools.[64]

Excavations at Mitrou also produced several whitish marble tools that did not resemble the local, dark-colored, fine-grained marble. Since Mitrou's tools were made of fine-grained marble, I speculated that they could have originated in the Cyclades, and especially on the island of Paros, which has been famous throughout history for its white, fine-grained marble. Macroscopically, Parian marble indeed resembled closely the

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[64] I am grateful to Calla McNamee for bringing me several samples of basalt from her visit to Lichadonisia.

marble of a grinding stone/pestle from Mitrou (Figures 11-14). However, Scott Pike, an Aegean marble specialist from Willamette University, informed me that the tool could not have been made of Parian marble because of its foliation, a feature which Parian marble lacks.[65]

Schist is another material I had assumed to have come from a very distant source. Unfortunately, schist, although not very common, is common enough in Greece and can vary significantly within one location so that finding the source of Mitrou's schist tools has proven difficult. The closest schist source that I encountered was in Southern Euboea. I was unable to explore Northern Euboea, where according to Higgins and Higgins, there is a lot of schist as well (Figure 15).[66]

There are two somewhat distinct kinds of sandstone represented in Mitrou's archaeological materials. The sandstone used for the elite chamber tomb 73 is a brittle, coarse-grained, yellowish sandstone that displays lamination (Figures 16-19), while the sandstone used for ground stone tools varies in color, is fine-grained, and does not display lamination (Figures 20-25, for example). No sandstone is found in the immediate vicinity of Mitrou; the closest source that I encountered in the region is found at Arkitsa, situated on the coast about 20 kilometers northwest of Mitrou (Figure 10). There the sandstone is fine-grained and varies in lithification. Clastic sediments, including sandstones, are found in Epiknemidian Lokris, a few kilometers inland and running parallel to the Malian and Northern Euboean Gulfs (Figure 26).[67] Since sandstones can

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[65] Stable isotope analysis needs to be performed on this tool to determine its provenience.
[66] Higgins and Higgins 1996, 75.
[67] González et al. 2013, 24.

vary significantly even within a small region, it is quite possible that the sandstone used at Mitrou for Tomb 73 and ground stone tools came from Epiknemidian Lokris. Since this location could be some 30 to 80 kilometers from Mitrou, following ancient routes, it is a material that probably had to be obtained through trade.

Non-Plastic Inclusions in Clayey Architectural Materials

The clayey architectural materials included in this study consist of clay fragments with small stone inclusions and impressions of organic material that functioned as roofs or second floors; ground floor fragments; mud bricks; oven fragments; and utilitarian trays. Before discussing each category of architectural material, I will address two common features of their manufacture. One obvious trend is that the inclusions in Mitrou's samples always vary from angular or subangular to rounded or subrounded. This is remarkable because angular and rounded fragments normally do not occur together in nature. The closer pebbles are to their source bedrock, the more angular they will be, but the farther away they are—due to the action of water transporting them—the more rounded they will be. Rounded inclusions are the product of weathering and are found naturally, while angular inclusions either can be found naturally or can be produced artificially by humans crushing rock. The presence of rounded to angular inclusions in clayey architectural materials could therefore be due to humans choosing inclusions from two different sources or humans taking inclusions from a single source but crushing some of them.

The second obvious trend I noted in the clayey architectural materials is that they were made entirely from local materials. Serpentinite dominates the inclusions used in every category. The rare inclusion of white or gray marble or red chert can be explained as litter from human action that made its way into the serpentinite inclusions that were to be used. Although limestone dominates the immediate area of Mitrou, serpentinite is overwhelmingly more common in architectural materials. This is surprising because serpentinite inclusions offer no better adhesion to the dried, unbaked clay of mud bricks than limestone inclusions.

Several explanations are possible to explain the dominance of serpentinite. It may have been more readily available in this coastal area in the form of pebbles, hence its preferred use in clayey architectural materials. If the serpentinite was found naturally in the clay source, then this would have been another reason for its dominance in the samples. Furthermore, if part of the serpentinite inclusions had been crushed artificially (see above), it would have been easier to break the serpentinite cobbles into smaller, angular pieces, because serpentinite is more brittle than the hard gray limestone. Finally, it is important to keep in mind that sea level has risen by at least three meters since antiquity, which means that the original source of clay and stone inclusions may currently be underwater.[68] A likely candidate for this source, therefore, is the serpentinite outcrop located at sea level at the northern end of Mitrou islet, which would have been more extensive in antiquity when sea level was lower. The complexity of this issue proves that there is much more to understand about the particulars of the manufacture of architectural materials at Mitrou. No matter what the explanation is for the prevalence for serpentinite inclusions in clayey architectural materials, we may assume that the people of Mitrou had

[68] Tsokas et al. 2012, 384.

a mental template in their heads that made them choose serpentinite as their preferred material for non-plastic inclusions.

Clay Fragments with Impressions of Organic Material from Flat Roofs or Second Floors

Only five samples belong to this category (Table 3, Figure 27).[69] The clayey architectural fragments with impressions of organic material show a fair amount of variation with respect to their stone inclusions. These fragments are interpreted by Jazwa as coming from superstructures of buildings, either from flat roofs or from second story floors.[70] The amount of inclusions in a fragment varies from essentially none to about ten percent. It is difficult to determine the angularity of the inclusions for all of the samples, but in one sample the angularity varies from subangular to subrounded, which is indicative of human processing or choice of different sources of inclusions, as I discussed above. With such a small sample size (five) and such a narrow chronological range for this type of architectural material, it is very difficult to determine any changes in their manufacture over time or any differences between social contexts. In fact, all five samples fall within the Prepalatial period at the site (LH I phase 1 to LH IIIA1), and they come from only two buildings: an elite building (Building H) and a non-elite structure (Building S, located at the eastern edge of Mitrou islet). Though unrelated to the non-plastic inclusions, the straw impressions of these materials also vary from virtually none to comprising about 20 percent of the fragments. This apparent lack of standardization in

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[69] Many thanks to Aleydis Van de Moortel for providing the dates and contexts for these and my other samples.
[70] Jazwa 2013, 5.

the recipe of these architectural materials, whether they come from elite buildings or non-elite buildings, and even within a single building, suggests that there was not a common practice for the manufacture of the materials comprising the flat roofs/superstructures of buildings.

Ground Floor Fragments

Again only five samples were analyzed. Similarly to fragments of roofs and upper floors, ground floor fragments (Table 4, Figure 28) show a fair amount of variation in their non-plastic inclusions. In spite of the small sample size, these samples show a greater chronological spread and a significant change. There are not many differences in the floors over time. Among the two EH III/MH I and MH I Early samples, the amount of inclusions vary from about 5 to 20 percent. Later, during the Prepalatial period, the amount of inclusions range between 15 and 20 percent, which represents significantly less variation. Even though there are only three samples from the Prepalatial period, all three come from elite contexts, and they seem to be too similar in composition to have been randomly manufactured. This could mean that by the Prepalatial period, there was a fairly specific recipe for making floors. Since all three samples came from elite or possible elite contexts, the standardization of floors might have been strictly an elite feature.

Mud Bricks

Fragments of mud brick (Table 5, Figure 29) comprise the largest portion of architectural elements that I studied. The breakdown of mud bricks per time period is as follows:

Table 1. Number of mud brick samples per period.

Period	**Number of mud brick samples**
EH IIB (Corridor House period)	3
EH III-MH I (Early "village" period)	3
MH II-MH III (Late "village" period)	4
LH I-LH IIIA2 Early (Prepalatial period)	11
LH IIIA2 Middle-LH IIIB2 Late (Palatial period)	1?
LH IIIC-LPG (Postpalatial period and Early Iron Age)	10

During EH IIB, non-plastic inclusions comprise less than ten percent of the brick. The inclusions range in angularity, suggesting the use of particles that are not found immediately together in nature. During EH III to MH I, the inclusions do not comprise more than 15 percent of the brick, and they also vary in angularity, which suggests a mud brick-making practice similar to that of the previous period. Mud bricks from the following period, MH II to MH III, also follow the same recipe but with more inclusions, which now make up roughly between 15 and 25 percent of the brick; the angularity of the inclusions still varies.

A change is seen in the Prepalatial period, LH I to LH IIIA2 Early. In this period the stone inclusions in mud bricks vary from hardly any to as much as 33 percent of the brick. The variation in angularity is still constant, though. Frequencies of inclusions are bimodally distributed, with many of the samples having roughly five percent inclusions and others having between 15 and 20 percent inclusions. This bimodal distribution suggests that there are two different practices of making mud bricks at the site. It is conceivable that the mud brick fragments with five percent inclusions were used for second-story walls, while the mud brick fragments with greater amounts of inclusions were used for first-story walls. This, of course, assumes that some buildings had second stories. Since structures with two stories would have cost much more to build and maintain, it is likely that multi-storied buildings were "elite" residences. The evidence from Building H supports this hypothesis. The six mud brick samples from Building H, which is thought to have been an elite complex,[71] show a bimodal distribution in their composition, with two mud brick fragments having roughly five percent inclusions, three fragments having 15-20 percent inclusions, and one fragment having ten percent inclusions. The data from the other elite complex at the site, Building D, are not as conclusive. Only one or two samples come from that complex: One sample from within Building D has less than 5 percent inclusions, and the second sample, recovered from Road 2 north of Building D and possibly fallen from that building, has about 33 percent inclusions. Even though these two samples follow the same trend, their small sample size and the uncertain provenance of the second sample do not allow a firm interpretation.

The data on mud bricks from Prepalatial non-elite residences are limited to one building, Building S, which has a consistent amount of inclusions in its mud bricks (roughly five percent). If Building S was only one story high, then making mud bricks with only five percent inclusions might have been the practice for those living in one-

[71] For a discussion on the elite nature of Building H, from which the horse-bridle piece comes, see Maran and Van de Moortel 2014, 535-7.

story houses. Those residing in (elite) multi-story houses might have made mud bricks with more inclusions for added stability on the ground floor while making mud bricks with fewer inclusions for a lessened load on the second floor.

The limited data set is not conclusive enough to determine for certain if there was a difference in the manufacturing practice of elite buildings versus non-elite buildings, but the possibility should be considered. At the very least, there appear to be two different recipes of mud bricks across the site during the Prepalatial period, whereas previously there was only one.

With less than five percent inclusions, the one sample from a questionably Palatial-period context from Mitrou does not stand out from the pattern that was seen during the Prepalatial period. Finally, during the Postpalatial period and Early Iron Age, we see again a single recipe for mud brick composition, with non-plastic inclusions comprising as a rule less than ten percent (maybe as much as 15 percent in one sample) of the mud bricks. The mud bricks from Building A, dating to the Middle Protogeometric phase, encompass this entire spectrum, ranging as a rule from almost none to 10 percent, which suggests that this was the practice of mud brick making at Mitrou during this period. The decrease in the maximum percentage of inclusions compared to the Prepalatial period may indicate that mudbrick walls were no longer carrying the weight of second floors.

An aspect of mud brick manufacture that is important to keep in mind is that recipes may have remained consistent for long periods of time because mud brick rubble from old houses was reused in new structures. The person making the new mud bricks could then add more clay or inclusions to adhere to his or her mental template.[72] This may explain why some aspects of manufacture remain the same throughout the history of the site. Serpentinite remains by far the most common type of inclusion used. The inclusions vary from angular to rounded but are generally consistent in their variation. In other words, there are no mud bricks that have only angular inclusions or only rounded inclusions. The co-occurrence of rounded and angular fragments is not natural and represents intentionality on the part of the original mud brick manufacturer: The manufacturer either crushed some pieces of serpentinite or obtained angular and rounded fragments from two different sources (see above, pp. 32-33).

If there were two practices of mud brick making occurring at the site, the question must be addressed whether buildings at Prepalatial Mitrou were now constructed by specialized builders. Since manufacturing mud bricks is so labor-intensive, it is indeed reasonable to assume that the construction of large architectural complexes such as Buildings D and H—which covered areas of more than 230 and 600 square meters, respectively[73]—would have involved the employment of people outside of the immediate family group. Since these buildings had elite status, one may suggest the presence of builders, or at least overseers, with special expertise. The use of two different mud brick recipes in Building H, and perhaps also in Building D, supports this notion of specialized knowledge. It is quite possible that in this growing Prepalatial economy, there was a place for part-time architectural specialists. These specialists may have gained their

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[72] Jazwa 2013, 4.
[73] Van de Moortel and Zahou 2012, 1135.

specialized knowledge from other sites, but since we do not yet have information on mud brick composition from other sites, we do not know whether such an exchange network of information existed. Even though we do not have mud brick samples from the Palatial period at Mitrou, it is likely that these standardized mud brick recipes continued at that time, because we see that the Postpalatial period and Early Iron Age also had a standardized mud brick recipe.

Oven Fragments

Not as much can be said about ovens as about mud bricks (Table 6, Figure 30). Most of the oven samples come from the two ovens of LH IIIC Late Building G and can thus be expected to have similar fabric. However, the two other samples, coming from a MH I Early oven in Building K, have a similar fabric as far as the non-plastic inclusions are concerned. In all of the oven samples, rocks comprise less than approximately two percent of the fragments. This is the same for oven fragments from MH I Early and LH IIIC Late, which means that the practice for making ovens did not change for about 800 years, in spite of the many societal changes that took place in that period. This is a remarkable case of continuity of practice. As expected, serpentinite is the most common material for inclusions. As in mud bricks, the angularity of the inclusions in ovens also varies from angular or subangular to subrounded or rounded, indicating human intentionality (see above, pp. 32-33).

Utilitarian Trays

As previously stated, utilitarian trays (Table 7, Figure 31) are not architectural *per se* but since they have been made of clay and non-plastic inclusions, they provide the same information as clayey architectural elements. As with the fragments of clay roofs or second story floors, the earliest sample of utilitarian trays in my study dates to LH I, phase 1, although Jazwa has found utilitarian trays dating as early as MH II.[74] There are no samples in my study dating to the Palatial period, and in his report on utilitarian trays, Jazwa does not mention any found in Palatial-period contexts.[75] During the Prepalatial period, there is a fair amount of variation in the fabric. Inclusions comprise between roughly 0 and 15 percent site-wide, and even within one building, Building H, this variation is found. There does not appear to be any distinction between elite and non-elite contexts. In the Postpalatial period, the inclusions in all of the samples comprise around five percent or less of the fragment, except for one sample with a very questionable date, which possibly dates to the very end of the Prepalatial period and has 20 percent inclusions. If we disregard this one sample, it is clear that in the Postpalatial period, in contrast to the Prepalatial period, there was a common practice in the manufacture of utilitarian trays, using only small amounts of non-plastic inclusions in the fabric. This reduction in the amount of inclusions is comparable to the trend seen in mud brick manufacture during the Postpalatial period. In all periods, serpentinite again is by far the most common inclusion, and as with the categories of architectural elements, the

[74] Jazwa 2015b, 3.
[75] Jazwa 2015b.

inclusions vary from angular to rounded, again revealing intentionality on the part of the manufacturer (see above, pp. 32-33).

Stone Architectural Materials

Table 8 broadly presents the identification and use of stones for wall construction at Mitrou. Local limestone was the predominant building material (Figure 32). Across the bay to the northeast, slightly more than one kilometer from the site, is a limestone quarry of unknown age (Figures 33 and 34). Although the limestone from this quarry does not exactly match the limestone used at the site, it does support the notion that local stone material is of architectural quality. The limestone used at the site, as best as I can determine from the excavation photographs, more closely resembles the limestone from either Donkey Island to the west or from rock outcrops just across the bay to the east (Figures 8 and 9).

The one anomaly in this architectural use of stones, which was brought to my attention by Aleydis Van de Moortel, is the sandstone orthostates used to line the chamber and dromos of elite Built Chamber Tomb 73 (Figure 35), located within Building D, which has been interpreted as an elite complex during the Prepalatial period.[76] As previously mentioned, this sandstone is a brittle, coarse-grained, yellowish sandstone (Figures 16-19) that is probably found in Epiknemidian Lokris. This location, probably some tens of kilometers away, would have been in an area controlled by another settlement, such as Kynos or another, yet unexcavated settlement further along the coast. Thus this sandstone probably had to be obtained through trade. Although the locations of

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[76] Van de Moortel and Zahou 2012, 1135-6.

Bronze Age settlements in the area of Epiknemidian Lokris are unknown, seven are currently known on the basis of cemetery finds (Figure 36): Tachtali, Alponus/Alpenus, Knemides/Neochori, Naryca, Pournarotsouba near Thronium, Kastri Agnantis/Kritharia and Zeli (Gvela/Kvela and Agios Georgios).[77] All of these were occupied during the Late Helladic period.[78] Perhaps the settlement of Mitrou was trading with one of these for this sandstone material.

This yellowish sandstone is significant because it was used only twice for an architectural purpose at Mitrou, and both times it was used in elite tomb 73. As described in chapter 2, the elite that arose at Mitrou during the Prepalatial period distinguished itself by instituting changes in the settlement layout and in the possession of unique objects.[79] The sandstone would have been noticed by residents of Mitrou when the large chamber tomb was being constructed and, since it also lined the dromos of the tomb, open to Road 1, would have been seen by passers-by afterwards. Thus this sandstone must have been a prestigious material in the eyes of the rest of the community.

Ground Stone Tools

Moving from building materials to ground stone tools, Tables 9-14 list all of the ground stone tools in chronological order; Table 15 lists the ground stone tools with uncertain dates. I examined 153 ground stone tools in total.

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[77] Pascual 2013, 186.
[78] Pascual 2013, 74, 154, 176; Pascual and Papakonstantinou 2013, 554.
[79] Van de Moortel and Zahou 2012, 1133-6; Maran and Van de Moortel 2014, 535-40.

Rock Types Represented in the Stone Tools at Mitrou

Figure 37 shows the breakdown of the tools by rock type. Among the stone tools, sandstone was most common, followed closely by serpentinite, each comprising about one-fourth of the stone tool assemblage. The third largest category is marble (16 percent), most of which appears to be the local variety, and the fourth is basalt (11 percent). Less than six percent of the tools were made of limestone, and less than five percent were made of andesite.

As I have already suggested earlier in this chapter, the sources of these rocks vary. The serpentinite, limestone, and most of the marble tools are from local sources. The provenience of all the sandstone tools has not been determined. Since I have explored much of Mitrou's immediately surrounding area without encountering sandstone, it was probably a material that had to be acquired through trade. As with the sandstone used for Tomb 73, I suspect that the sandstones used for ground stone tools also came from somewhere in Epiknemidian Lokris, although they differ in texture and color from the sandstone from Tomb 73.[80] This is my assumption based on the large size of the area in which one might encounter sandstone (again, see Figure 26). The sandstone ground stone tools are more similar to one another than to the sandstone from Tomb 73, which means that the sandstone used for stone tool material possibly came from an entirely different site than the one supplying the sandstone used for Tomb 73.

The source of the basalt tools is the small group of volcanic islets of Lichadonisia in the Northern Euboean Gulf, roughly 42 kilometers from Mitrou (Figure 10). Even

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[80] See previous section for discussion on the sandstone provenience.

though this location would have been easily accessible by boat for Mitrou's inhabitants, it is far enough away so that one can assume it was in the territory of another settlement, possibly Knemides in Epiknemidian Lokris, due to its proximity to Lichadonisia (Figures 10 and 36). However, the settlement with which Mitrou traded for basalt could also have been located in Northern Euboea, as the islets are situated much closer to Euboea than to Lokris.

A common source of ground stone tool material in prehistoric Greece was andesite from the island of Aegina in the Saronic Gulf (Figure 10).[81] Andesite stone tools from Aegina were also used at Mitrou. The dates of these tools range from Late Helladic IIA to Late Helladic IIIB2. Interestingly enough, the use of Aeginetan pottery at the site reaches its peak during the LH II phase, although the importation of Aeginetan pottery had been occurring since Middle Helladic II Early.[82] Kolonna, located on the northwest coast of Aegina, was a prosperous settlement throughout the Bronze Age, likely due to its strategic location within the Aegean trade network, and was a prolific exporter of pottery beginning in the Middle Helladic period.[83]

At Mitrou, there are also roughly twenty tools made of various rocks whose source has been undetermined. These include gabbro, granite, quartzite, schist, presumably non-Aeginetan andesite, and non-local marble. In short, roughly 45 percent of the ground stone tools in this study were made from local materials, while about 55 percent of the ground stone tools were made from non-local materials.

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[81] Runnels 1981, 114-7.
[82] Lis 2012, 1205.
[83] Rutter 1993, 776-80.

Tool Function

Figure 38 displays the stone tools grouped by function, i.e. tool type, although there are four tools that were not studied by Fuson that I included in my analysis. The original use of each tool is represented, since many tools were repurposed. Thirteen of the 39 tools listed as “other or unknown” were multipurpose tools, e.g., grinding stones and hammer stones or grinding stones and pestles.

As Figure 38 also shows, the main trend one can see is that at Mitrou, people used a variety of rocks for a variety of tools. It is difficult to judge just by the numbers the popularity of a particular material without an in-depth understanding of how prehistoric people would have perceived the usefulness of a certain rock type for a certain task. Nevertheless, our own understanding of rock properties tells us that some rock types do not work well for certain kinds of tools.

Serpentinite was used in every tool category. I do not think this is so much due to the physical properties of serpentinite—since it does not have a particularly rough surface and is not very durable—but because it was readily available as large cobbles or small boulders, perhaps in a more workable size than the local limestone. Sandstone was similarly used in every tool category except for hammer stones, most likely due to the weakness of its cementation. Of all the tool categories, marble was used more for rubbing stones (five out of the 14 rubbing stones), but it was used in every category except for saddle querns and quern slabs, probably because of its smoothness. Marble was apparently not preferred for adzes, axes, and celts (one specimen), undoubtedly due to its softness. Among the tool functions for which limestone was used, limestone was most popularly used for saddle querns and quern slabs (five out of the 42 saddle querns/quern slabs). There are four limestone tools with other functions. Andesite was also used most popularly for saddle querns and quern slabs (five) and less popularly for grinding stones (one) and for rubbing stones (one). Basalt was predominantly used for saddle querns and quern slabs (ten) and less popularly for grinding stones (one), hammer stones (one), and other functions (five). The preference for its use as saddle querns and quern slabs must be due to basalt's relative hardness and rough surface. Some of the other rock types also seem to have been deemed suited to particular tool types. For example, three of the four granite tools were used for saddle querns and quern slabs, and two of the three (presumably) gabbro tools were used for grinding stones, while the third gabbro tool was used as a grinding stone/pestle.

Changes over Time in the Use of Materials

Throughout Mitrou's history, changes are seen in the use of certain materials over time, as specific rock types may have become available or unavailable. Figures 39 through 44 show the changes in ground stone tools over time.

As may be expected, serpentinite, the primary local material, is used in every period. The same thing could also probably be said for marble, another local material, although marble is not represented during EH III-MH I, probably due to the low number of tools dating to those phases (6). The marble tool dating to the Palatial period (LH IIIA2 Middle-LH IIIB2 Late) does not resemble the local marble, but its origin is unclear. Definitively local marble may not be represented in this period again because of the small sample size (7).

As for sandstone and basalt, two non-local rocks with sources that are within the same general region, these materials are seen in every time period except the Palatial period. Their absence in the Palatial period may be due to the scarcity of contexts of this date excavated at Mitrou, but sandstone and basalt tools are so prevalent in other time periods that their absence among the seven stone tools of this time period may reflect a real change. There is another qualifier to this trend of sandstone and basalt being found in all six major time spans at Mitrou: The only Middle Helladic basalt tool at Mitrou (Figures 45-48), occurring during MH II Early, does not resemble the basalt from Lichadonisia, as it seems to have a higher olivine content. The lack of basalt from Lichadonisia among the MH stone tools at Mitrou could be due to the low number of stone tools recovered from this period during excavation.

With respect to andesite, the earliest known use of this material at Mitrou occurs during MH II Early, when Mitrou begins to import its first Aeginetan pottery.[84] However, this sample (Figures 49-52) does not resemble Aeginetan andesite, as it has a higher olivine content. The similarity of this stone tool to the basalt stone tool with the higher olivine content mentioned previously and their very close date (both date to MH II Early and come from two successive architectural phases) suggest to me that they derived from the same general area, although I do not know where that might be. There is another non-Aeginetan andesite tool from Mitrou with an unknown date found in the modern plow zone in the northeast excavation sector at the site, from where most of the andesite tools come.

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[84] Hale 2015, 2.

The earliest definitive use of Aeginetan andesite occurs much later, during LH IIIA2 Early. A stone tool made of dacite (Figures 53-56), a volcanic rock also found on Aegina that is similar to andesite but contains more quartz, dates to LH IIA, which means that stone importation from Aegina occurred at least by this time period. Aeginetan andesite is used in the Palatial period but no longer occurs during the Postpalatial period. Runnels has similarly noticed a decrease in the use of Aeginetan andesite for stone tools in the Argolid during LH IIIC.[85] Undoubtedly, this is due to the societal disruptions that occurred in the Postpalatial period, which I briefly described in chapter 2.

As I mentioned earlier, there are about 20 tools made of non-local materials from undetermined sources. It is not as easy to determine a pattern in them. The earliest occurrence of one of these is a schist stone tool from EH IIB. The next occurrence of one of these exotic materials does not occur until around LH IIB/LH IIIA1. Then they show up again during the Palatial period and the Postpalatial period.

Any major changes in practice as it is seen in ground stone tool use can best be studied in the categories of grinding stones and saddle querns and quern slabs, because these two categories have the largest number of samples. From EH IIB to MH I, sandstone was the most common choice for grinding stones, and basalt was the most common choice for saddle querns and quern slabs. Then the picture becomes less clear. Nothing can really be said about the MH II and MH III phases, because there are only one grinding stone and one saddle quern from these phases. During the Prepalatial period, the choice of rock becomes more varied, both in the grinding stones and in the

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[85] Runnels 1981, 114, 185-6.

saddle querns and quern slabs. Sandstone is still the most common choice for grinding stones, but sandstone and limestone replace basalt as the most popular choices for saddle querns and quern slabs. The few samples from the Palatial period are not very telling. Neither sandstone nor basalt is used for grinding stones and saddle querns and quern slabs, respectively, but the types of rocks used for these categories had been used before, except for one new type of rock in each category. By LH IIIA2 Early and through the Palatial period, only about one-third of all the stone tools are made from local materials, which suggests the introduction of new trade partners and greater access to exotic materials.

The biggest change in practice occurs in the Postpalatial period. Mitrou's inhabitants experiment with more rock types for the grinding stones and saddle querns and quern slabs. For the grinding stones, marble and sandstone, traditional materials for grinding stones, were used, as well as basalt, which had never been used for grinding stones before, serpentinite, which had not been used for grinding stones since EH IIB, and gabbro and quartzite, which are exotic materials. For the saddle querns and quern slabs, many materials were experimented with, andesite being noticeably absent and schist being used in one case.

Stone Tool Imports at Mitrou

Having examined all of these pieces, it is now possible to reconstruct a tentative history of practice with respect to ground stone tool use and also the history of accessibility to the various materials. From its earliest excavated occupation, Mitrou had trade relations along the Northern Euboean Gulf, with Lichadonisia for basalt, Epiknemidian Lokris possibly for sandstone, and still another source—perhaps northern Euboea—for schist. The importation of pottery from Aegina beginning in MH II Early also opened up the possibility for importation of andesite and dacite from Aegina, although there could have been a delay of several centuries for this to have occurred. During the Prepalatial period, several new rock types are imported, presumably as the result of spreading trade networks stimulated by the emergence of local elites. Then during the Palatial period, when Mitrou is under the control of a palatial power and fully incorporated into a palatial trade network,[86] more rock types become available and there is less of a dependence on local materials. In fact, the former trade partners along the Northern Euboean Gulf seem to have been abandoned, as can be deduced from the lack of basalt and sandstone at Mitrou during this time. After the demise of the Palatial society at the end of LH IIIB, the inhabitants of Mitrou began to use many different types of rocks for different functions. Some of these rocks were obtained through existing trade partners established during the Prepalatial and Palatial periods, although the trade connection with Aegina was apparently lost by this time. There was also a return to the use of local materials and the materials from along the Euboean Gulf. Tools are of similar sizes as before, and there is no indication that people in the Postpalatial period were simply recutting tools that had been imported in previous periods.

[86] Van de Moortel and Zahou 2012, 1137; Vitale 2012, 1150-2.

Rock Use among Elites and Non-Elites

One last aspect of the ground stone tools to be discussed in this paper is whether elites had access to any rock types to which non-elites did not have access, as I demonstrated with the sandstone used for Tomb 73. One might expect elites to use certain exotic rock types in their households. This is not the case, however. The data for the Prepalatial period, during which time the evidence for inequality is greatest, are unclear. While exotic materials do appear in elite contexts, for example, dacite, gabbro, and diorite all appear in Building H during the Prepalatial period, the households of Buildings H and D employed plenty of local materials as well. Because of the dearth of stone tools from non-elite contexts during this period, I cannot say with any certainty that there is any differential access to stone materials between elites and non-elites at Mitrou. During the Prepalatial period, Building S, thought to be a non-elite residence, has two sandstone tools, so certainly non-elites were not limited to strictly local resources. It is doubtful that people in different households ever really saw the stone tools of another household, so elites probably did not consider them an important enough medium for displaying their wealth or distinguishing themselves. More simply, there is no evidence to say that rock choice varied between elites and non-elites.

Chapter 5

Conclusions and Recommendations for Further Research

In this study, I have attempted to combine a geoarchaeological analysis with practice theory to shed light on the use of three different archaeological materials from the Bronze Age and Early Iron Age site of Mitrou in East Lokris, Central Greece: stone inclusions in clayey architectural materials, stone wall materials, and ground stone tools. In his study of clayey architectural fragments, Kyle Jazwa already had noticed changes in their composition during periods of major societal change: after the demise of the Early Helladic Corridor House civilization; at the beginning of the Prepalatial period; and after the fall of the Mycenaean palaces.[87] He had linked these changes to shifts in practice during those periods of major societal change. My petrographic study has confirmed his results, but I have further shown that one class of architectural materials, namely ovens, acquired a highly standardized fabric recipe possibly as early as Middle Helladic I Early and was resistant to change, whereas mud bricks, ground floors, and clay roofs/second floors acquired more standardized recipes in the Prepalatial period and possibly afterwards. Utilitarian trays became more standardized in the Postapalatial period.

Hannah Fuson’s study of ground stone tools focused on typology and function. My identifications of those stone materials and their provenience have given insight into the existing trade networks during Mitrou’s history, and my geological studies have provided a better understanding of the suitability of and people’s preferences for certain

[87] Jazwa 2015a.

stone materials. For all the categories of materials presented here, I hope to have added a useful perspective of the thought processes behind their creation.

Throughout its 1500 years of known occupation during the Bronze Age and Early Iron Age, Mitrou underwent several drastic changes in the organization of the settlement. These societal changes led to changes not only in the layout of the settlement, but also changes in practice, that is, the everyday behaviors of individuals which are replicated from generation to generation and reinforced by the structure of the society although subject to change. Any change in practice is therefore reflected in the artifacts that people create.

Summary of Stone Inclusions in Clayey Architectural Materials

It is clear from my study that each category of clayey architectural material had its own fabric recipe in every period, as Kyle Jazwa had already observed. Perhaps the most useful information produced by my study of these materials is a better understanding of which architectural materials show more evidence for standardized practice in their manufacture. Although the samples of oven fragments are limited in number (only 11) and in temporal distribution, there is a remarkable consistency in their fabric from MH I Early to LH IIIC Late, a period of roughly 800 years which saw the development and decline of the Prepalatial elite and the Postpalatial resurgence of the settlement. In both periods, samples of oven fabrics have a fine texture, including less than two percent inclusions, and they are essentially the same kinds of inclusions.

In other categories, it is possible to discern a common practice in their manufacture even though their composition is more varied. The five samples from second story floor or flat roofs, that is, clay fragments with impressions of organic material, show some consistency in the frequency and type of non-plastic inclusions. All of the samples date to the Prepalatial period and may indicate the existence of a standard fabric recipe. However, the varying amount of straw in them might be used as evidence against such standard recipe. The most numerous category that I examined was that of mud bricks (32). From EH IIB to MH III, the percentage of non-plastic inclusions in the fabric fluctuates widely from five to 25 percent, but in the Prepalatial period, two more standardized and distinct methods of mud brick manufacture occur, which apparently differ between elite and non-elite residences and may represent two different fabric recipes for mud brick walls of first and second stories, bearing light and heavy loads, respectively. As for clay floors, it is difficult to determine any patterns in their construction because of the low number of samples (5), but a common practice in their manufacture may have been developed in the elite contexts of the Prepalatial period. Lastly, although they are not strictly architectural in function, utilitarian trays have the lowest consistency in their fabric in the Middle Helladic and Prepalatial periods, whereas in the Postpalatial period, they show a remarkable degree of homogeneity. The reasons for this change are as yet unclear.

Summary of Stone Architectural Materials

With regard to stone architectural materials, the practice at Mitrou was to use the local limestone for building material. The one break from this tradition was the use of sandstone from Arkitsa or Epiknemidian Lokris for Built Chamber Tomb 73, the elite tomb in Building D dating to the Prepalatial period. Clearly, the very restricted use of this sandstone and its association with an elite context reveal its high prestige. This in turn further reinforces the notion of elites expressing their higher status through the display of unique objects and materials.

Summary of Ground Stone Tools

The ground stone tools at Mitrou vary considerably over time with respect to the use of specific stone types for specific functions. Slightly more than half (55 percent) of the ground stone tools were made from non-local materials. I hypothesize that most of these non-local materials came from the Northern Euboean Gulf and Malian Gulf, but the inhabitants of Mitrou also had access to Aeginetan andesite at least from the LH IIA phase onwards, so it is possible that some of the other stone imports came from somewhere along the Southern Euboean Gulf or areas farther away.

There are definite changes in practice with regard to the choice of rock types. In the Prepalatial period there is an increase in the number of rock types used for various tools, which one can see particularly when comparing this period to the Corridor House period (EH IIB), the other period during which Mitrou had an obvious elite. It seems that during the Prepalatial period, people had access to new kinds of materials and were open to experimentation with the materials to which they already had access. During the Palatial period, nearly all stone tools were made of non-local and non-regional materials. In spite of the low number of stone tools recovered from that period, this suggests that there was a reorganization of the trade network in which Mitrou participated. There were no sandstone or basalt imports from the area of Epiknemidian Lokris and the Malian Gulf. This finding may indicate that Epiknemidian Lokris and the Malian Gulf were under the control of a different palatial polity than Mitrou. In the Postpalatial period and Early Iron Age, there is again an increase in the number of rock types used for stone tools, but local and regional types (specifically sandstone and basalt) reappear, which suggests that the Prepalatial-and-earlier, regional trade network with Epiknemidian Lokris and the Malian Gulf was re-established.

In conclusion, my research shows that Mitrou's inhabitants had developed fairly specific practices with respect to the choice of raw materials. They had circumscribed notions of what materials worked well for certain functions, but they were also flexible in using other materials when preferred materials were seemingly scarce. Unlike the previous two categories of artifacts discussed, there does not appear to be any differential use of ground stone tool material between elites and non-elites at Mitrou.

Future Research

Overall, the state of preservation of the clayey architectural fragments that have been excavated at Mitrou in 2004-2008 does not allow further study, although there are some samples not included in this study that could still be studied. However, Kyle Jazwa's work (and hopefully mine) should inspire other researchers, first of all, to save clayey architectural fragments and then to study them closely. At the same time, these new studies may give scholars some new questions to ask pertaining to 1) changing (and standardization of) fabric recipes in various architectural elements in the Prepalatial period; 2) differences between first-story and second-story mud bricks; and 3) differences between elite and non-elite architecture, specifically in floors and walls.

With regard to the stone architectural materials, the precise source of the sandstone used for Built Chamber Tomb 73 should be found, if possible. Then it would be possible to hypothesize with which settlement in Epiknemidian Lokris Mitrou was trading. Furthermore, it would be interesting to discover whether this settlement or any neighboring settlements used the sandstone for mortuary architecture and/or domestic architecture.

It goes without saying that there is much more research to be done on the ground stone tools. Of prime importance is discovering the source of the sandstone tools and all of the tools made of miscellaneous rock types, such as the granite, gabbro, quartzite, and non-local marble. This will further illuminate Mitrou's trading practices over time.

Finally, it would be useful to conduct an experimental study to understand the effectiveness of rock types for specific tool uses. Calla McNamee's current analysis of starch grains and phytoliths from saddle querns and grinding stones will greatly supplement our understanding of the uses of ground stone tools in food production.[88] Once it is known what rock types were chosen to grind various types of food or other materials, then the choice in stone material may appear to be less arbitrary.

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[88] McNamee 2015.

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Appendix

Table 2. Timeline of Bronze Age/Early Iron Age Greek Mainland.

Cultural Period	**Absolute Date**	**Cultural Phase**
Early Helladic	3100 – 2700 B.C.	EH I
	2700 – 2400 B.C.	EH IIA
	2400 – 2200 B.C.	EH IIB
	2200 – 2000 B.C.	EH III
Middle Helladic	2000 – 1900 B.C.	MH I
	1900 – 1750 B.C.	MH II
	1750 – 1700 B.C.	MH III
Late Helladic	1700 – 1600 B.C.	LH I
	1600 – 1490 B.C.	LH IIA
	1490 – 1430 B.C.	LH IIB
	1430 – 1390 B.C.	LH IIIA1
	1390 – 1300 B.C.	LH IIIA2
	1300 – 1200 B.C.	LH IIIB
	1200 – 1100/1070 B.C.	LH IIIC
Early Iron Age	1100/1070 – 1020/1000 B.C.	Submycenaean
	1020/1000 – 975 B.C.	Early Protogeometric
	975 – 950 B.C.	Middle Protogeometric
	950 – 900 B.C.	Late Protogeometric

Timeline based on Shelmerdine (2008, 3-7) and Toffolo et al. (2013, 26 December).

Table 3. Stone inclusions in clayey architectural materials: fragments of clay roofs or second floors with straw or reed impressions. For identifications of their function, see Jazwa 2013, 3-12. Each Mitrou find number consists of three parts: trench number (e.g., LX784), stratigraphic unit (e.g., 024), and object number (e.g., 012).

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-024-012	Fragment of clay roof or second floor with straw or reed impressions	LH I phase 1	Building S destruction of second phase with third floor on top	No	Circa 10% rock inclusions; angularity varies between subangular and subrounded; serpentinite
LX784-021-018	Fragment of clay roof or second floor with straw or reed impressions	LH I phase 2	Building S destruction of third phase with fourth floor on top	No	Ca 2% rocks; difficult to ascertain angularity; mostly serpentinite
LG790-026-012	Fragment of clay roof or second floor with straw or reed impressions	LH IIA with later contamination up to LH IIIA2	Building H	Yes	No rocks of notable size (largest inclusion under the microscope is about 0.1 mm in length, at 215X magnification)
LG789-008-015	Fragment of clay roof or second floor with straw or reed impressions	LH IIA? With later material up to PG	Building H	Yes	Ca 3%; difficult to ascertain angularity; mostly serpentinite
LE795-036-038	Fragment of clay roof or second floor with straw or reed impressions	LH IIIA1	Building H	Yes	Negligible amount of rock

Table 4. Stone inclusions in clayey architectural materials: ground floor fragments with straw impressions. For identifications of their function, see Jazwa 2013, 3-12.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-090-017	Floor fragment with straw impression	EH III/MH I	Building L	No	Ca 20% rocks (difficult to determine); difficult to ascertain angularity; mostly serpentinite
LX784-081-023	Floor fragment with straw impression	MH I Early	Building K first phase	No	Ca 5% rocks; moderately sorted; angularity varies between angular and rounded; serpentinite
LP783-093-011	Floor fragment with straw impression	LH I phase 3 or 4	Building D	Yes	Ca 10-15% rocks; very poorly sorted, seem to be more exposed on the bottom of one fragment than on the other side; angularity varies between subangular and rounded; serpentinite
LP784-168-011	Floor fragment with straw impression	LH I	Road 2 north of Building D	Yes?	Ca 20% rocks; poorly sorted, seem to be more exposed on the top surface than on the bottom; angularity varies between angular and rounded; mostly serpentinite
LH792-023-012	Floor fragment with straw impression	LH IIB? LH IIIA2 Early (floor deposit)? MH II Final/MH III (pottery date)?	Building H?	Yes	Ca 15-20% rocks; poorly sorted, evenly distributed; angularity varies between subangular and subrounded; mostly serpentinite

Table 5. Stone inclusions in clayey architectural materials: mud bricks. For identifications of their function, see Jazwa 2013, 3-12.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-107-037	Mud brick	EH IIB with EH III contamination	Building M	Yes	Ca 5% rocks? (difficult to determine); difficult to ascertain angularity; mostly serpentinite?
LX784-125-004	Mud brick	EH IIB with EH III contamination	Building M	Yes	Percentage of rocks undetermined; angularity varies between angular and rounded; mostly serpentinite but some marble
LX784-125-030	Mud brick	EH IIB with EH III contamination	Building M	Yes	Ca 10% rocks; very poorly sorted, evenly distributed; angularity varies between angular and rounded; serpentinite
LX784-143-012	Mud brick	EH III/MH I	EH III or EH III/MH I floor below Building L	No	Ca 15% rocks; somewhat poorly sorted, evenly distributed; angularity varies between angular and rounded; serpentinite and some marble?
LX784-129-011	Mud brick	MH I Early (EH II Late-MH? pottery)	Building K first phase	No	Ca 10-15% rocks; moderately sorted, evenly distributed; angularity varies between sub-angular and sub-rounded; mostly serpentinite
LX784-072-020	Mud brick	MH I Late	Building K second floor and debris of first phase below	No	Ca 5% rocks; moderately sorted, evenly distributed; difficult to ascertain angularity; mostly serpentinite
LX784-041-029	Mud brick	MH II Late	Debris on top of Building R, second floor	No	Ca 15% rocks; poorly sorted, evenly distributed; angularity varies between angular and rounded; serpentinite

Table 5 (continued). Stone inclusions in clayey architectural materials: mud bricks.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-057-022	Mud brick	MH II Final/MH III	Kiln 034	No	Ca 20-25% rocks; moderately sorted, evenly distributed; angularity varies between angular and rounded; mostly serpentinite but some possible chert and quartzite
LX784-057-023	Mud brick	MH II Final/MH III	Kiln 034	No	Ca 15-20% rocks; moderately sorted, evenly distributed; angularity varies between sub-angular and rounded; mostly serpentinite but some possible quartz
LX784-038-014	Mud brick	MH II Final/MH III to LH I phases 1 or 2	Kiln 034 debris cut into by LH I cist grave 56	No	Ca 15% rocks; poorly sorted, evenly distributed; angularity varies between angular and sub-rounded; serpentinite
LG790-089-013	Mud brick	LH I phase 1	Building H	Yes	Ca 15-20% rocks; poorly sorted, evenly distributed; angularity varies between angular and rounded; mostly serpentinite, but also chert and some unidentified beach rock
LE792-025-013	Mud brick	LH I phase 2	Building H	Yes	Ca 15-20% rocks; moderately sorted, evenly distributed; angularity varies between sub-angular and rounded; mostly serpentinite but some possible chert
LF790-011-021	Mud brick	LH I phase 3	Building H	Yes	Ca 5% rocks; angularity varies between angular and rounded; serpentinite

Table 5 (continued). Stone inclusions in clayey architectural materials: mud bricks.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-015-048	Mud brick	LH I phase 4 with LH IIIC/PG contamination	Building S fourth phase	No	Ca 5% rocks; poorly sorted, somewhat evenly distributed; difficult to ascertain angularity; serpentinite
LX784-016-011	Mud brick	LH I phase 4 with one LH IIIA2/B contamination	Building S fourth phase	No	Ca 5% rocks; moderately sorted, evenly distributed; angularity varies between angular and sub-rounded; serpentinite
LX784-017-012	Mud brick	LH I phase 4 with LH II and LH IIIA2 contamination	Building S fourth phase	No	Ca 5% rocks; well sorted (very small inclusions); difficult to ascertain angularity; serpentinite
LP784-124-011	Mud brick	LH I	Road 2 (possibly from Building D)	Yes?	Ca 33% rocks; poorly sorted, evenly distributed; angularity varies between angular and rounded; serpentinite
LE795-048-012	Mud brick	LH I-LH II floor	Building H Room 1	Yes	Ca 15% rocks; moderately sorted, evenly distributed; angularity is between sub-angular and sub-rounded; serpentinite
LG790-025-058	Mud brick	LH IIA with LH IIB and later material	Building H	Yes	Ca 10% rocks; moderately sorted, evenly distributed; angularity varies between angular and sub-angular; serpentinite
LP783-018-011	Mud brick	LH IIB	Building D3 destruction, possibly contaminated by plow	Yes	Less than 5% rocks; poorly sorted, somewhat evenly distributed; angularity varies between angular and rounded; mostly serpentinite with some possible marble

Table 5 (continued). Stone inclusions in clayey architectural materials: mud bricks.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LE793-011-011	Mud brick	LH IIIA1 destruction with some PG contamination, lying over LH IIB or LH IIIA1 destruction level	Building H Room 2	Yes	Ca 5% rocks; moderately sorted, evenly distributed; angularity varies from angular to sub-rounded; mostly serpentinite, but possibly some chert
LO784-835-011	Mud brick	LH IIIB2/LH IIIC	Under Building J? (contaminated)	No	Less than 5% rocks; moderately sorted (very small inclusions), evenly distributed; angularity varies between angular and sub-rounded; serpentinite
LM783-019-012	Mud brick	LH IIIC Middle (pottery LH IIIA)	Road 1, adjacent to Building B	No	Ca 10% rocks (difficult to determine); moderately sorted, evenly distributed; difficult to ascertain angularity; mostly serpentinite
LN784-018-032	Mud brick	LH IIIC Late	Building C destruction	No	Less than 5% rocks; well-sorted (very small inclusions), evenly distributed); angularity varies between angular and sub-rounded; serpentinite
LX784-018-012	Mud brick	LH III	Cleaning of eastern sea scarp	No	Ca 5-10% rocks; moderately sorted, evenly distributed; angularity varies between angular and rounded; serpentinite
LO784-876-013	Mud brick	EPG mixed	Disturbed NE area of grave enclosure Tomb 73, Building D	Yes?	Ca 10% rocks; poorly sorted, evenly distributed); angularity varies between angular and rounded; serpentinite

Table 5 (continued). Stone inclusions in clayey architectural materials: mud bricks.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LN783-022-069	Mud brick	MPG	Building A second phase	Yes	Less than 5% rocks; somewhat poorly sorted, evenly distributed; angularity varies between angular and rounded; mostly serpentinite
LN783-022-070	Mud brick	MPG	Building A second phase	Yes	No substantial visible rock fragments
LN783-022-071	Mud brick	MPG	Building A second phase	Yes	No substantial visible rock fragments
LN783-442-011	Mud brick	MPG context (LH IIB - LH IIIA pottery)	Building A second phase	Yes	Ca 10-15% rocks; poorly sorted, evenly distributed; angularity varies between angular and sub-rounded; mostly serpentinite but possibly some marble
LN783-022-027	Mud brick	MPG	Building A second phase	Yes	Less than 5% rocks; relatively well-sorted, evenly distributed; difficult to ascertain angularity; mostly serpentinite?
LN783-283-011	Mud brick	LPG (early)	Building A second phase	Yes	Ca 5-10% rocks; moderately sorted, evenly distributed; angularity varies between angular and rounded; serpentinite

Table 6. Stone inclusions in clayey architectural materials: oven fragments. For identifications of their function, see Jazwa 2013, 3-12.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-063-020	Oven fragment (Oven 063)	MH I Early	Building K first phase	No	Ca 2% rocks; difficult to ascertain angularity; mostly serpentinite
LX784-084-011	Oven fragment (Oven 063)	MH I Early	Building K first phase	No	Ca 2% rocks; difficult to ascertain angularity; serpentinite
LM782-021-022	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Only one visible rock of notable size (about 11 mm in length, subrounded, marble?)
LM782-047-021	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Ca 1-2% rocks; angularity varies between angular and rounded; mostly serpentinite, but also some possible mica
LM782-047-023	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Ca 2% rocks; angularity varies between angular and rounded; serpentinite
LM782-047-029	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Ca 1% rocks; poorly sorted (inclusions of different sizes; angularity varies between angular and subrounded; serpentinite
LM782-047-035	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Ca 1% rocks; very small fragments; difficult to ascertain angularity; serpentinite
LM782-047-036	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	No rocks of notable size
LM782-047-037	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Less than 1% rocks; very small fragments; mostly subangular fragments, but difficult to determine; serpentinite
LM782-047-038	Oven fragment	LH IIIC Late	Upper layer of cobbles over Building G	No	Less than 1% rocks; very small fragments; angularity varies between angular and rounded; serpentinite
LM782-060-011	Oven fragment	LH IIIC Late	Building G	No	Ca 1% rocks; poorly sorted; angularity varies between angular and rounded; serpentinite

Table 7. Stone inclusions in clayey architectural materials: utilitarian trays. For identifications of their function, see Jazwa 2013, 3-12.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LX784-027-017	Utilitarian tray	LH I phase 1	Building S second phase with third floor	No	Ca 5-10% rocks; poorly sorted; angularity varies between angular and rounded?; serpentinite
LE795-070-018	Utilitarian tray	LH I phase 1	Building H	Yes	Ca 10% rocks; poorly sorted, evenly distributed; angularity varies between angular and rounded; serpentinite and some marble
LE792-017-037	Utilitarian tray	LH I phase 3	Building H	Yes	Ca 2% rocks; angularity varies between angular and subrounded; variegated serpentinite and possibly some marble
LE792-018-015	Utilitarian tray	LH I phase 3	Building H	Yes	Ca 15% rocks (difficult to determine); difficult to ascertain angularity; mostly serpentinite
LX784-016-012	Utilitarian tray	LH I phase 4 with one LH IIIA2/B contamination	Building S, fourth phase	No	Ca 15% rocks; moderately sorted; angularity varies between angular and subangular; mostly serpentinite
LP784-069-012	Utilitarian tray	LH I	Road 2	Yes?	No rocks of notable size
LG789-016-015	Utilitarian tray	LH IIA	Building H	Yes	Ca 1% rocks; difficult to ascertain angularity; mostly serpentinite?
LG790-025-057	Utilitarian tray	LH IIA with LH IIB and later material	Building H	Yes	Ca 2% rocks (difficult to determine); difficult to ascertain angularity; serpentinite
LG790-024-022	Utilitarian tray	LH IIB with later contamination up to LH IIIC/PG	Building H	Yes	Ca 1-2% rocks; difficult to ascertain angularity; mostly serpentinite

Table 7 (continued). Stone inclusions in clayey architectural materials: utilitarian trays.

Mitrou Find No.	Function	Date	Building Context	Elite Context?	Geological Identification
LM782-021-024	Utilitarian tray	LH IIIC Late	Upper layer of cobbles over Building G	No	Ca 3% rocks; difficult to ascertain angularity; mostly serpentinite
LO784-768-012	Utilitarian tray	LH IIIC Late	Disturbed area over Building B including possible LH IIIC Late child's grave	No	No rocks of notable size
LH792-008-020	Utilitarian tray	Pottery very mixed with latest LH IIIC Middle/Late; possibly part of LH IIIA2 Early floor deposit, including cooking pot -011	Building H?	Yes?	Ca 20% rocks; poorly sorted; angularity varies between angular and rounded; mostly serpentinite
LM782-027-015	Utilitarian tray	LH IIIC Late (with PG contamination)	Building G	No	Ca 3% rocks; moderately sorted, seem to be concentrated more on the bottom side; angularity varies between angular and subrounded; mostly serpentinite
LM782-044-011	Utilitarian tray	EPG-MPG mixed with earlier material	Plow zone over Building G	No	Ca 3% rocks; difficult to ascertain angularity; mostly serpentinite?
LN783-022-072	Utilitarian tray	MPG	Building A second phase	Yes	No more than 5% rocks; well-sorted, evenly distributed; angularity varies between angular and subrounded; mostly serpentinite, but some possible marble

Table 7 (continued). Stone inclusions in clayey architectural materials: utilitarian trays.

Mitrou Find No.	**Function**	**Date**	**Building Context**	**Elite Context?**	**Geological Identification**
LN783-136-011	Utilitarian tray	MPG (no pottery)	Building A second phase	Yes	Ca 5% rocks; poorly sorted, evenly distributed; angularity varies between angular and subrounded; mostly serpentinite
LO783-008-029	Utilitarian tray	MPG	Building A second phase (possibly also Building E)	Yes	Negligible amount of rock
LG789-006-020	Utilitarian tray	LPG mixed	Plow zone over Building H	Yes?	No rocks of notable size
LN784-011-016	Utilitarian tray	PG	Disturbed area N of Building A	No	Ca 2% rocks; difficult to ascertain angularity; mostly serpentinite
LN782-188-011	Utilitarian tray	Mixed, up to PG	Plow zone, between (L)PG Building I and LH IIIC Late Building G	No	Less than 5% rocks; difficult to ascertain angularity; serpentinite

Table 8. Stone building materials.

Date	**Context**	**Elite Context?**	**Rock Type**	**Source**
EH IIB - LPG	All contexts	Mixed	Hard gray limestone	Local
LH I late (construction) - LH IIIA1 (last interment)	Tomb 73 within Building D:	Yes	Sandstone	Arkitsa or Epiknemidian Lokris

Table 9. Ground stone tools during the Corridor House period (EH IIB).

Mitrou Find No.	Function	Date	Context	Elite Context?	Rock Type	Source
KY799-515-012	Grinding stone; repurposed as hammer stone	EH IIB	Material on surface	No	Sandstone	Arkitsa?
KY799-515-013	Multipurpose tool: grinding stone and leather scraper	EH IIB	Material on surface	No	Sandstone	Arkitsa?
KY799-515-014	Grinding stone; repurposed as hammer stone	EH IIB	Material on surface	No	Marble	local
LX784-121-013	Rubbing stone; repurposed as hammer stone	EH IIB	Material on floor above Building M	No	Marble	local
LX784-121-037	Burnishing stone	EH IIB	Material on floor above Building M	No	Basalt	Lichadonisia
LX784-125-012	Grinding stone; repurposed as hammer stone	EH IIB	Building M	No	Sandstone	Arkitsa?
LX784-125-013	Saddle quern	EH IIB	Building M	No	Basalt	Lichadonisia
LX784-125-016	Hammer stone	EH IIB	Building M	No	Serpentinite	local
LX784-154-012	Grinding/smoothing stone	EH IIB	Building M	No	Serpentinite	local
LX784-155-012	Rubbing stone; repurposed as hammer stone	EH IIB	Building N	No	Marble	local

Table 9 (continued). Ground stone tools during the Corridor House period (EH IIB).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LX784-155-014	Unknown	EH IIB	Building N	No	Schist	?
LX784-155-015	Multipurpose tool: grinding stone and pestle	EH IIB	Building N	No	Sandstone	Arkitsa?
LX784-155-017	Multipurpose tool: grinding stone and pestle	EH IIB	Building N	No	Marble	?
LX784-155-019	Rubbing stone	EH IIB	Building N	No	Marble	local
LX784-155-021	Pestle	EH IIB	Building N	No	Sandstone	Arkitsa?
LX784-155-022	Rubbing stone; repurposed as hammer stone	EH IIB	Building N	No	Chert	local
LX784-155-023	Saddle quern	EH IIB	Building N	No	Basalt	Lichadonisia
LX784-155-024	Saddle quern	EH IIB	Building N	No	Basalt	Lichadonisia
LX784-157-012	Mortar or handheld anvil	EH IIB	Building N	No	Sandstone	Arkitsa?
LX784-163-011	Grinding stone; repurposed as hammer stone	EH IIB	Building N	No	Serpentinite	local

Table 9 (continued). Ground stone tools during the Corridor House period (EH IIB).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LX784-158-011	Smoothing stone	EH IIB	Building M, pit in surface at ca. +1.30/1.40 east of Wall 151	No	Sandstone	Arkitsa?
LX784-158-012	Whetstone	EH IIB	Building M, pit in surface at ca. +1.30/1.40 east of Wall 151	No	Marble	local
LX784-158-017	Quern slab	EH IIB	Building M, pit in surface at ca. +1.30/1.40 east of Wall 151	No	Sandstone	Arkitsa?
LX784-158-018	Saddle quern	EH IIB	Building M, pit in surface at ca. +1.30/1.40 east of Wall 151	No	Serpentinite	local
LX784-107-012	Grinding stone; repurposed as edge tool	EH IIB with EH III contamination	Building M	No	Sandstone	Arkitsa?
LX784-107-014	Rubbing stone	EH IIB with EH III contamination	Building M	No	Marble	local

Table 10. Ground stone tools during the early "village" period (EH III-MH I).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LX784-097-011	Saddle quern	EH III (pottery EH IIB-EH III with MH I contamination)	Material on floor above Building M	No	Basalt	Lichadonisia
LX784-097-012	Saddle quern	EH III (pottery EH IIB-EH III with MH I contamination)	Material on floor above Building M	No	Basalt	Lichadonisia
KY798-513-022	Grinding stone	EH III	Destruction debris	No	Sandstone	Arkitsa?
LX784-111-011	Burnishing stone	EH III	Material on floor above Building M associated with Hearth 8	No	Serpentinite	local
LX784-111-013	Celt	EH III	Material on floor above Building M associated with Hearth 8	No	Sandstone	Arkitsa?
LX784-081-011	Grinding stone	MH I Early	Building L destruction	No	Sandstone	Arkitsa?

Table 11. Ground stone tools during the late "village" period (MH II-MH III).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LX784-062-011	Rubbing stone	MH II Early	Building K, second phase (and construction of Building Q, first phase)	No	Serpentinite	local
LX784-062-015	Saddle quern	MH II Early	Building K, second phase (and construction of Building Q, first phase)	No	Andesite	?
LX784-065-011	Grinding stone; repurposed as hammer stone	MH II Early	Building K, second phase (and construction of Building Q, first phase)	No	Marble	local
LE792-097-011	Smoothing stone	MH II Early	Road 5	No	Limestone	local
LX784-050-013	Pestle	MH II Early	Destruction of Building Q, second phase	No	Sandstone	Arkitsa?
LX784-060-012	Chisel	MH II Early	Destruction of Building Q, first phase, and fill of pit	No	Basalt	?
LX784-041-012	Hammer stone	MH II late	Debris on top of Building R, second floor	No	Chert	local

Table 11 (continued). Ground stone tools during the late "village" period (MH II-MH III).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LX784-058-019	Celt	MH II final/MH III	Kiln 034	No	Sandstone	Arkitsa?
LN783-540-011	Mortar	MH III (or LH I?)	MH III (or LH I?) context below Building D	No	Marble	local

Table 12. Ground stone tools during the Prepalatial period (LH I-LH IIIA2 Early).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LF790-013-016	Saddle quern	LH I phase 1	Building H	Yes	Basalt	Lichadonisia
LG789-068-011	Unknown	LH I phase 2	Road 3, earth and pebble surface at ca. +4.20	Yes?	Limestone	local
LE795-101-011	Saddle quern	LH I phase 2	Building H	Yes	Sandstone	Arkitsa?
LX784-021-012	Hand axe/knife polisher?	LH I phase 2	Building S destruction of third phase with fourth floor on top	No	Sandstone	Arkitsa?
LN783-486-012	Chisel	LH I phase 3	Building D, first floor and debris below	Yes	Sandstone	Arkitsa?
LP783-099-011	Quern slab	LH I phases 3-4	Building D, destruction of first phase and second floor on top, with later contamination	Yes	Limestone	local
LE792-027-011	Bore-head axe	LH I phase 3 or 4	Building H, small pit in surface at +4.39, north of Wall 101	Yes	Serpentinite	local
LX784-015-045	Possible anvil	LH I phase 4 with LH IIIC/PG contamination	Building S, fourth phase	No	Sandstone	Arkitsa?
LD791-075-011	Multipurpose tool: grinding stone and hammer stone	LH I (possibly phase 3)	Building H	Yes	Sandstone	Arkitsa?

Table 12 (continued). Ground stone tools during the Prepalatial period (LH I-LH IIIA2 Early).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LP784-108-011	Multipurpose tool: smoothing stone and edge tool	LH I	Road 2	Yes?	Marble	local
LE793-035-011	Saddle quern	LH IIA	Building H	Yes	Sandstone	Arkitsa?
LG789-025-020	Grinding stone; repurposed as hammer stone	LH IIA	Building H	Yes	Sandstone	Arkitsa?
LG790-046-011	Hammer stone	LH IIA	Building H	Yes	Serpentinite	local
LG790-046-026	Grinding stone; repurposed as hammer stone	LH IIA	Building H	Yes	Marble	local
LL785-053-011	Grinding stone; repurposed as hammer stone	LH IIA	Building below Building F	Yes?	Sandstone	Arkitsa?
LE793-087-011	Saddle quern	LH IIA with LH IIIA/B and LH IIIC Late	Building H, LH IIA destruction with later material	Yes	Dacite	Aegina
LG790-024-014	Celt	LH IIB with later contamination up to LH IIIC/PG	Building H	Yes	Serpentinite	local
LE793-025-011	Rubbing stone	LH IIB with 1 PG	Building H, plow zone below and next to LH IIB/LH IIIA1 grave 31	Yes	Marble	local

Table 12 (continued). Ground stone tools during the Prepalatial period (LH I-LH IIIA2 Early).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LR770-014-014	Hand axe	LH I/LH II with later material up to PG	Mixed material on a surface north of Road 4 (LH IIA destruction with later material?)	No	Marble	local
LE795-036-039	Grinding stone	LH IIIA1	Building H	Yes	Sandstone	Arkitsa?
LE795-036-040	Polisher	LH IIIA1	Building H	Yes	Limestone	local
LP782-012-013	Hammer stone	LH II-LH IIIA1 with later material up to EPG	Plow zone above Building D (elevation of Buildings D, B, A)	Yes?	Chert	local
LE793-039-011	Multipurpose tool: grinding stone and pestle	LH IIB/LH IIIA1	Building H	Yes	Gabbro	?
LE795-030-012	Multipurpose tool: hammer stone and smoothing stone	LH IIIA1	Building H Room 1, floor deposit on top of lower buckled surface at ca. +4..90/5.16	Yes	Serpentinite	local
LE793-015-012	Pestle	LH IIIA1 with some PG contamination	Building H	Yes	Diorite	?
LE795-040-011	Grinding stone	LH IIIA1	Building H, LH IIIA1 surface at ca. +5.35 and material below	Yes	Sandstone	Arkitsa?
LE795-024-012	"War club"; repurposed as hammer stone	LH IIIA1	Building H Room 1, floor deposit on top of lower buckled surface at ca. +4..90/5.16	Yes	Basalt	Lichadonisia

Table 12 (continued). Ground stone tools during the Prepalatial period (LH I-LH IIIA2 Early).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LE795-024-016	Hammer stone	LH IIIA1	Building H Room 1, floor deposit on top of lower buckled surface at ca. +4..90/5.16	Yes	Basalt	Lichadonisia
LP782-021-011	Grinding stone	LH IIIA1	Building D LH IIIA1 floor with material below	Yes	Marble	local
LL785-016-011	Hammer stone	LH IIIA2 Early	Building F destruction deposit	Yes	Quartzite	?
LL785-016-030	Multipurpose tool: grinding stone and hammer stone	LH IIIA2 Early	Building F destruction deposit	Yes	Serpentinite	local
LL785-021-011	Pestle	LH IIIA2 Early	Building F destruction deposit	Yes	Sandstone	Arkitsa?
LL785-021-012	Hammer stone	LH IIIA2 Early	Building F destruction deposit	Yes	Marble	local
LN784-066-024	Grinding stone; repurposed as hammer stone	LH IIIA2 Early/Middle	Building F LH IIIA2 Early destruction deposit and overlying LH IIIA2 Middle floor	Yes	Quartzite	?
LN784-066-025	Saddle quern	LH IIIA2 Early/Middle	Building F LH IIIA2 Early destruction deposit and overlying LH IIIA2 Middle floor	Yes	Andesite	Aegina

Table 12 (continued). Ground stone tools during the Prepalatial period (LH I-LH IIIA2 Early).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LL785-051-013	Grinding stone	LH IIIA2 Early destruction? With later material up to LH IIIC	Building F	Yes	Andesite	Aegina
LM786-018-015	Rubbing stone	LH IIIA with later material up to LH IIIC/PG	Building F, LH IIIA2 Early destruction? With much later material; located above LH IIB walls	Yes	Serpentinite	local
LL786-019-012	Saddle quern/quern slab	LH II/LH IIIA	Building F destruction	Yes	Limestone	local

Table 13. Ground stone tools during the Palatial period (LH IIIA2 Middle-LH IIIB2 Late).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LP783-017-016	Saddle quern	LH IIIA2 Middle	Building D LH IIIA2 Middle surface and debris below	Yes	Limestone	local
LM784-068-011	Grinding stone	LH IIIA2/B	Building F, possibly LH IIIA2 Early destruction with later disturbance	No	Greenschist	?
LP782-029-012	Saddle quern	LH IIB or LH IIIB2 Late with later material up to LH IIIC	Building D3 abandonment with later contamination? Or part of LH IIIB2 Late primary dump?	Yes?	Serpentinite	local?
LP782-024-011	Quern slab	LH IIIB2 Late with some later pieces	Possibly top of LH IIIB2 Late primary dump with palatial-style pottery	No	Granite	?
LP782-028-011	Saddle quern	LH IIIB2 Late	LH IIIB2 late primary dump with palatial-style pottery	No	Andesite	Aegina
LM783-083-012	Grinding/smoothing stone	LH IIIB2 Late/LH IIIC Early	Road 1, debris below fallen stones lying on top of LH IIIC Early/Middle road surface	No	Marble	?
LM785-014-011	Quern slab	LH IIIB2 with LH IIIC/PG pottery	Building F, dismantling of LH IIIB2 rubble wall	No	Andesite	Aegina

Table 14. Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LO784-820-011	Rubbing stone; repurposed as hammer stone	LH IIIC Early/Middle (pottery LH IIIA2/B with one possible later)	Fill of Tomb 73	No	Serpentinite	local
LN783-429-011	Grinding stone	LH IIIC Early/Middle	Fill of Tomb 73	No	Marble	?
LM783-070-011	Hammer stone	LH IIIC Early/Middle	Road 1, debris below fallen stones lying on top of LH IIIC Early/Middle road surface	No	Serpentinite	local
LN783-457-011	Rubbing stone	LH IIIC Early/Middle with pottery up to LH IIIC Late	Lower layer of cobbles, bones, and pottery fragments on top of hard gray surface over Tomb 73, with joins in second level; predating Building B	No	Sandstone	Arkitsa?
LM783-019-017	Unknown	LH IIIC Middle (pottery LH IIIA)	Road 1 adjacent to Building B	No	Serpentinite	local
LN786-050-012	Saddle quern	LH IIIC Middle	Building F, sequence of floors	No	Basalt	Lichadonisia
LN783-516-011	Saddle quern	LH IIIC Middle/Late	Building B? material below MPG support base 3	No	Sandstone	Arkitsa?

Table 14 (continued). Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LN787-012-013	Grinding stone	LH IIIC Middle/Late (one possible PG sherd)	Building F material on possible occupation surface with Walls 56 and 57, with plow zone	No	Serpentinite	local
LN787-022-011	Saddle quern	LH IIIC Middle/Late (one possible PG sherd)	Building F material on possible occupation surface with Walls 56 and 57, with possible plow zone	No	Serpentinite	local
LN787-022-023	Multipurpose tool: grinding stone and hammer stone	LH IIIC Middle/Late (one possible PG sherd)	Building F material on possible occupation surface with Walls 56 and 57, with possible plow zone	No	Marble	local
LO784-023-011	Multipurpose tool: whetstone and smoothing stone	LH IIIC Late (pottery LH IIIA2-IIIB1)	Building C destruction with other material	No	Basalt	Lichadonisia
LM782-021-027	Grinding stone	LH IIIC Late	Building G, upper layer of cobbles	No	Sandstone	Arkitsa?
LM782-030-011	Saddle quern	LH IIIC Late	Building G, upper floor and material below	No	Serpentinite	local
LN784-081-011	Saddle quern	LH IIIC Late	Building B? burned destruction and earthen surface on top; below Building C	Yes?	Basalt	Lichadonisia

Table 14 (continued). Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LO785-012-016	Mortar/grinding slab fragment	LH IIIC/EPG	Road 2, disintegrated building material between plow marks	No	Basalt	Lichadonisia
LO786-018-013	Grinding stone; repurposed as hammer stone	EPG with much earlier pottery as well	Mixed debris below and south of cist graves 7 and 8, and east of cist grave 16	No	Serpentinite	local
LP785-014-011	Celt	EPG with much earlier pottery as well	Plow zone	No	Serpentinite	local?
LM784-085-012	Saddle quern	EPG (with lot of LH IIIA2/B and LH IIIC)	Building F mixed debris on top of Walls 31 and 32	No	Serpentinite	local
LM782-039-012	Saddle quern	EPG (pottery LH IIIC Late/EPG)	Cist grave 39: rocks and earth covering capstone	No	Limestone	local
LN783-243-011	Saddle quern	EPG	Building A second phase with material below floor and later disturbance	Yes	Sandstone	Arkitsa?
LN783-345-011	Grinding stone	MPG (pottery LH IIIC Late with possible later material)	Building A second phase with material below floor	Yes	Quartzite	?
LN784-040-014	Burnishing stone	MPG final	Building A second phase material on floor	Yes	Marble	local

Table 14 (continued). Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LN783-342-011	Grinding stone	MPG final/LPG Early (pottery EPG)	Building A: material on top of second floor	Yes	Gabbro	?
LN783-022-033	Multipurpose tool: grinding stone and hammer stone	MPG final/LPG Early (pottery MPG)	Building A material on second floor	Yes	Granite	?
LN783-022-051	Grinding stone	MPG final/LPG Early (pottery MPG)	Building A material on second floor	Yes	Serpentinite	local
LN783-022-063	Saddle quern/quern slab	MPG final/LPG Early (pottery MPG)	Building A material on second floor	Yes	Basalt	Lichadonisia
LN783-132-011	Grinding stone	MPG final/LPG Early	Building A material on second floor	Yes	Basalt	Lichadonisia
LO782-066-011	Rubbing stone; repurposed as hammer stone	LPG (pottery LH I-LH II)	Building E	Yes	Serpentinite	local
LN783-217-011	Rubbing stone	LPG (pottery LH IIIC Late)	Building E material on floor?	Yes	Serpentinite	local?
LN783-365-011	Saddle quern/quern slab	LPG (pottery EPG)	Building E: dismantling of Hearth 3	No	Basalt	Lichadonisia
LN783-235-012	Hammer stone	LPG (pottery MPG)	Building E floor and Building A material on second floor	No	Marble	local

Table 14 (continued). Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LN783-218-011	Grinding stone; repurposed as edge tool	LPG (pottery MPG)	Building E: LPG pit in Building A	No	Sandstone	Arkitsa?
LN783-262-011	Unknown	LPG (pottery MPG)	Building A: LPG pit into first floor	No	Sandstone	Arkitsa?
LN783-322-011	Saddle quern	LPG (pottery MPG)	Building E courtyard	No	Serpentinite	local
LN783-322-012	Quern slab	LPG (pottery MPG)	Building E courtyard	No	Sandstone	Arkitsa?
LN783-233-011	Multipurpose tool: grinding stone and pestle	LPG (pottery MPG)	Building E: LPG pit in Building A	No	Sandstone	Arkitsa?
LN783-233-012	Grinding stone; repurposed as hammer stone	LPG (pottery MPG)	Building E: LPG pit in Building A	No	Marble	local
LN783-233-013	Grinding stone	LPG (pottery MPG)	Building E: LPG pit in Building A	No	Marble	local
LR797-050-013	Whetstone	LPG with much earlier pottery as well	Plow zone above capstone of LH I phase 1/2 cist grave 66	No	Sandstone	Arkitsa?
LO783-107-012	Saddle quern	LPG (no pottery)	Building E courtyard	No	Schist	?
LN783-016-015	Quern slab	LPG	Building A disintegrated building material on second floor and material of Building E on top	No	Sandstone	Arkitsa?

Table 14 (continued). Ground stone tools during the Postpalatial period and Early Iron Age (LH IIIC-LPG).

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LN783-220-012	Grinding stone	LPG	Building A material on second floor or Building E: LPG pit disturbing this floor	No	Gabbro	?
LN783-296-012	Chisel	LPG	Building E courtyard surface and material below	No	Serpentinite	local
LN786-010-011	Unknown	LH IIIC/PG	Mixed debris on top of LH IIIC Middle to Late Wall 14	No	Limestone	local
LN786-026-011	Multipurpose tool: rubbing stone and hammer stone	LH IIIC/PG	Building F disintegrated material on top of LH IIIC Early/Middle Wall 31	No	Serpentinite	local

Table 15. Ground stone tools with uncertain dates.

Mitrou Find No.	**Function**	**Date**	**Context**	**Elite Context?**	**Rock Type**	**Source**
LE793-085-017	Grinding stone	LH IIB with later material up to LH IIIC/PG	Building H destruction? With plow zone	Yes?	Sandstone	Arkitsa?
LE793-085-019	Saddle quern/quern slab	LH IIB with later material up to LH IIIC/PG	Building H destruction? With plow zone	Yes?	Serpentinite	local
LE793-085-022	Saddle quern/quern slab	LH IIB with later material up to LH IIIC/PG	Building H destruction? With plow zone	Yes?	Granite	?
LL786-011-011	Grinding stone	LH IIIA2 and PG	Building F: mixed material above LH IIB surface/floor and walls	No	Serpentinite	local
LL786-011-012	Quern slab	LH IIIA2 and PG	Building F: mixed material above LH IIB surface/floor and walls	No	Andesite	Aegina
LL786-011-013	Saddle quern	LH IIIA2 and PG	Building F: mixed material above LH IIB surface/floor and walls	No	Granite	?
LL786-011-014	Quern slab	LH IIIA2 and PG	Building F: mixed material above LH IIB surface/floor and walls	No	Limestone	local
LG790-005-024	Saddle quern	LH IIIC/PG	Plow zone	No	Conglomerate	Arkitsa?
LL785-007-013	Grinding stone	PG with much earlier material	Plow zone	No	Serpentinite	local

Table 15 (continued). Ground stone tools with uncertain dates.

Mitrou Find No.	Function	Date	Context	Elite Context?	Rock Type	Source
LL786-006-011	Adze	PG with much earlier material	Plow zone	No	Serpentinite	local
LM785-005-012	Celt	PG with much earlier material	Plow zone	No	Serpentinite	local
LM785-007-012	Celt	PG mostly, with earlier material	Plow zone	No	Trachyte	?
LP784-007-011	Saddle quern	PG with much earlier material	Plow zone	No	Sandstone	Arkitsa?
LP784-113-017	Grinding stone; repurposed as hammer stone	PG with much earlier material	Plow zone	No	Sandstone	Arkitsa?
LL786-012-013	Grinding stone	Archaic with much earlier material	Plow zone	No	Serpentinite	local
LL786-012-016	Saddle quern	Archaic with much earlier material	Plow zone	No	Serpentinite	local
LG789-005-011	Hammer stone	Historic with much earlier material	Plow zone	No	Marble	?
LR797-008-021	Grinding stone	Historic with much earlier material	Plow zone	No	Marble	local
LR797-008-022	Grinding stone	Historic with much earlier material	Plow zone	No	Sandstone	Arkitsa?
LN784-048-011	Rubbing stone	Modern with much earlier material	Plow zone	No	Andesite	?
LN784-048-013	Rubbing stone	Modern with much earlier material	Plow zone	No	Serpentinite	local
LF795-005-012	Hammer stone	Mixed: no potnote but inventoried pottery and figures	Plow zone	No	Serpentinite	local

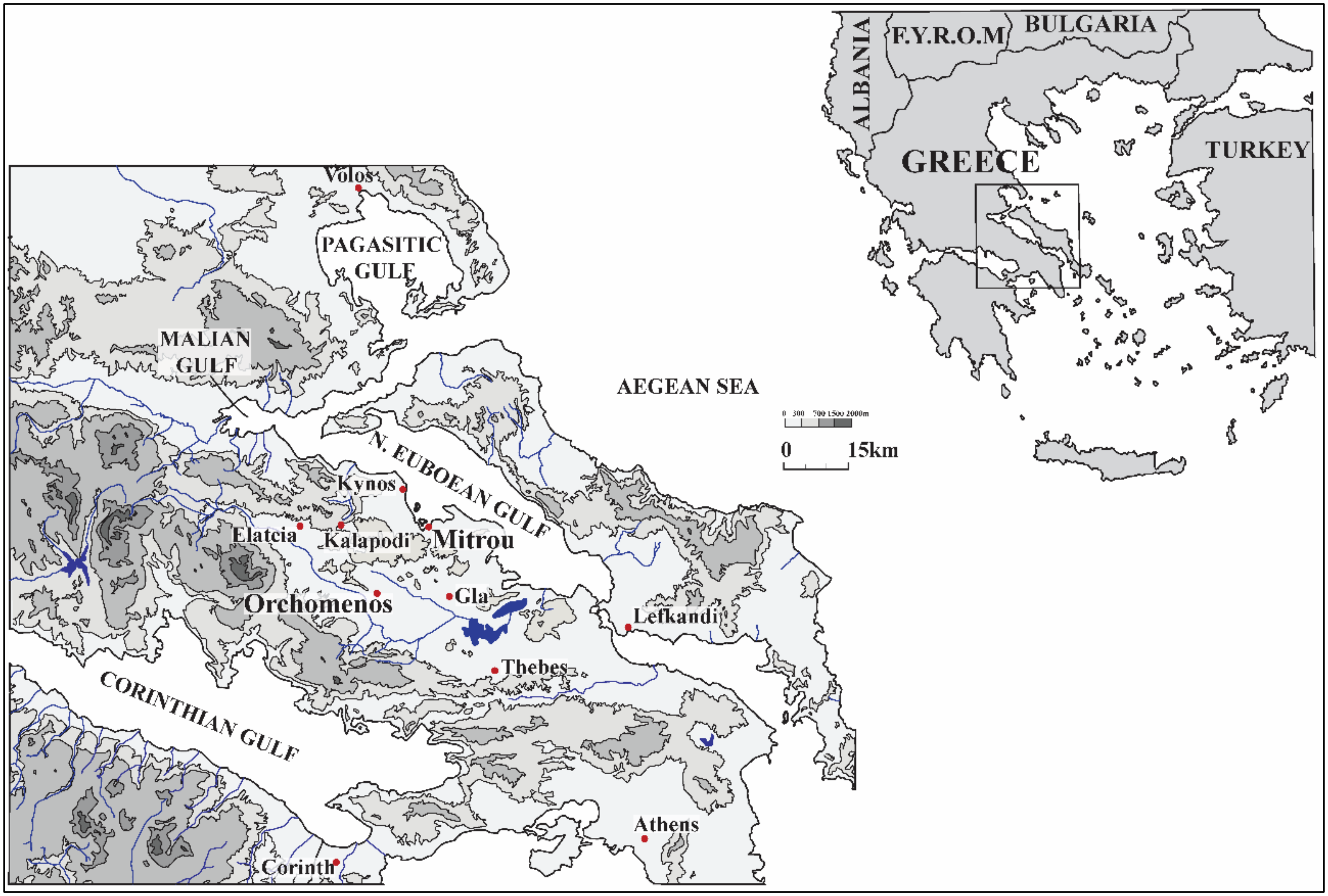

Figure 1. The site of Mitrou in Central Greece. Source: Van de Moortel 2012, 17.

Figure 2. The tidal islet of Mitrou, as seen from the hills to the southwest. Photograph taken by author, 2014.

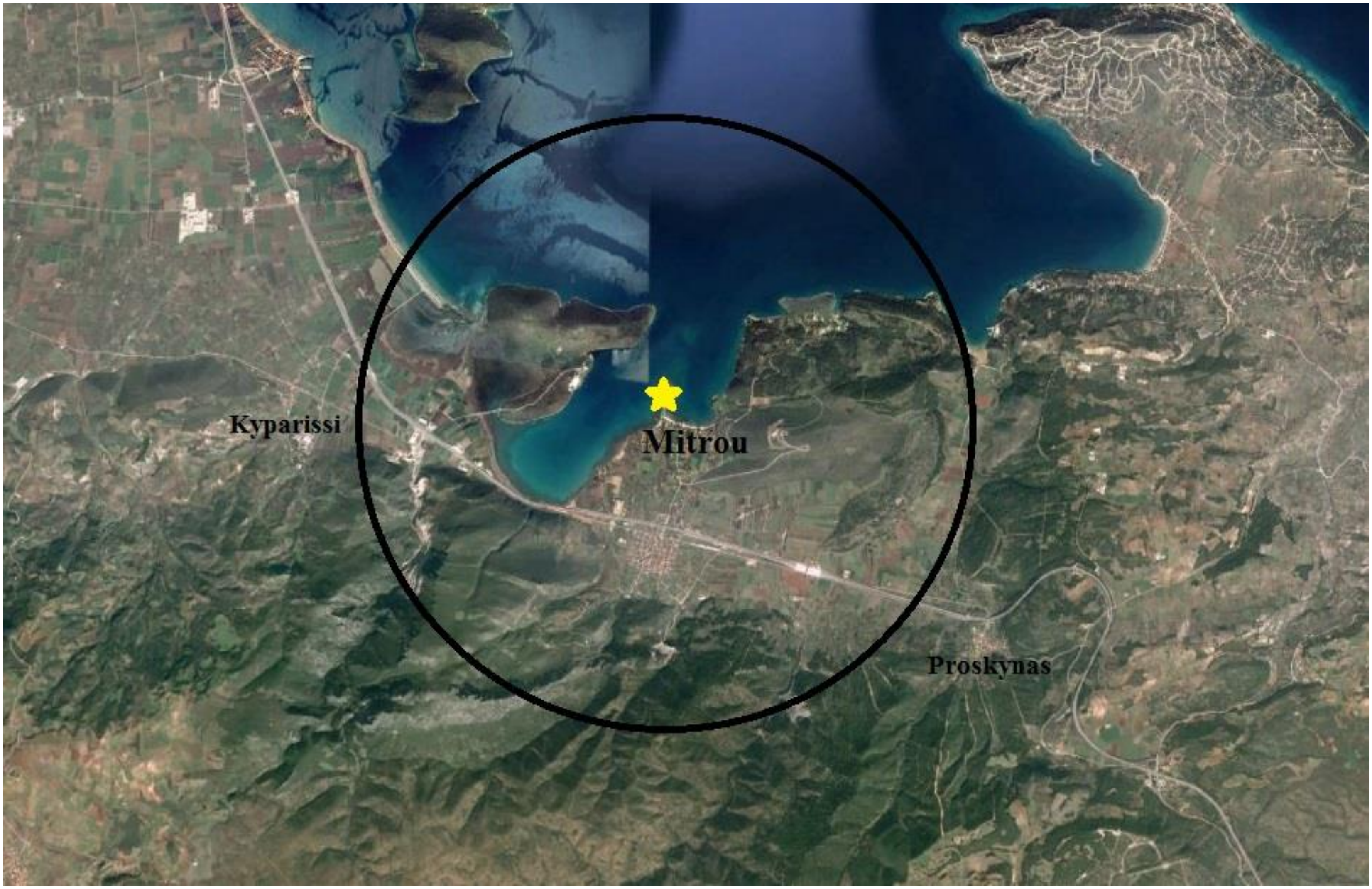

Figure 3. Proposed “local” area of Mitrou. Diameter of circle is approximately 7 kilometers. Map created by author using Google Maps.

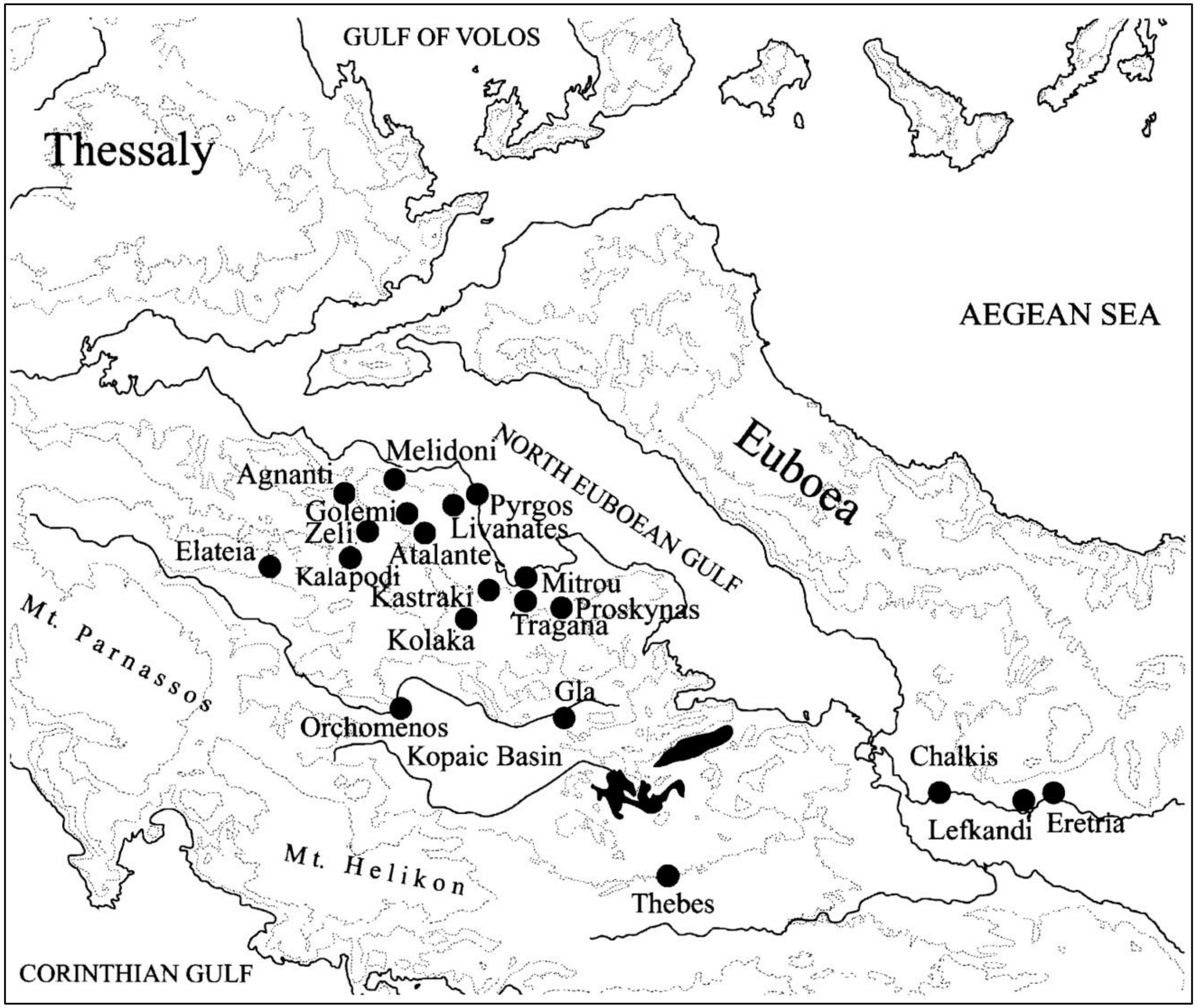

Figure 4. Mitrou and other Late Bronze Age and Early Iron Age sites in central Greece. Source: Van de Moortel 2007, Plate LX.

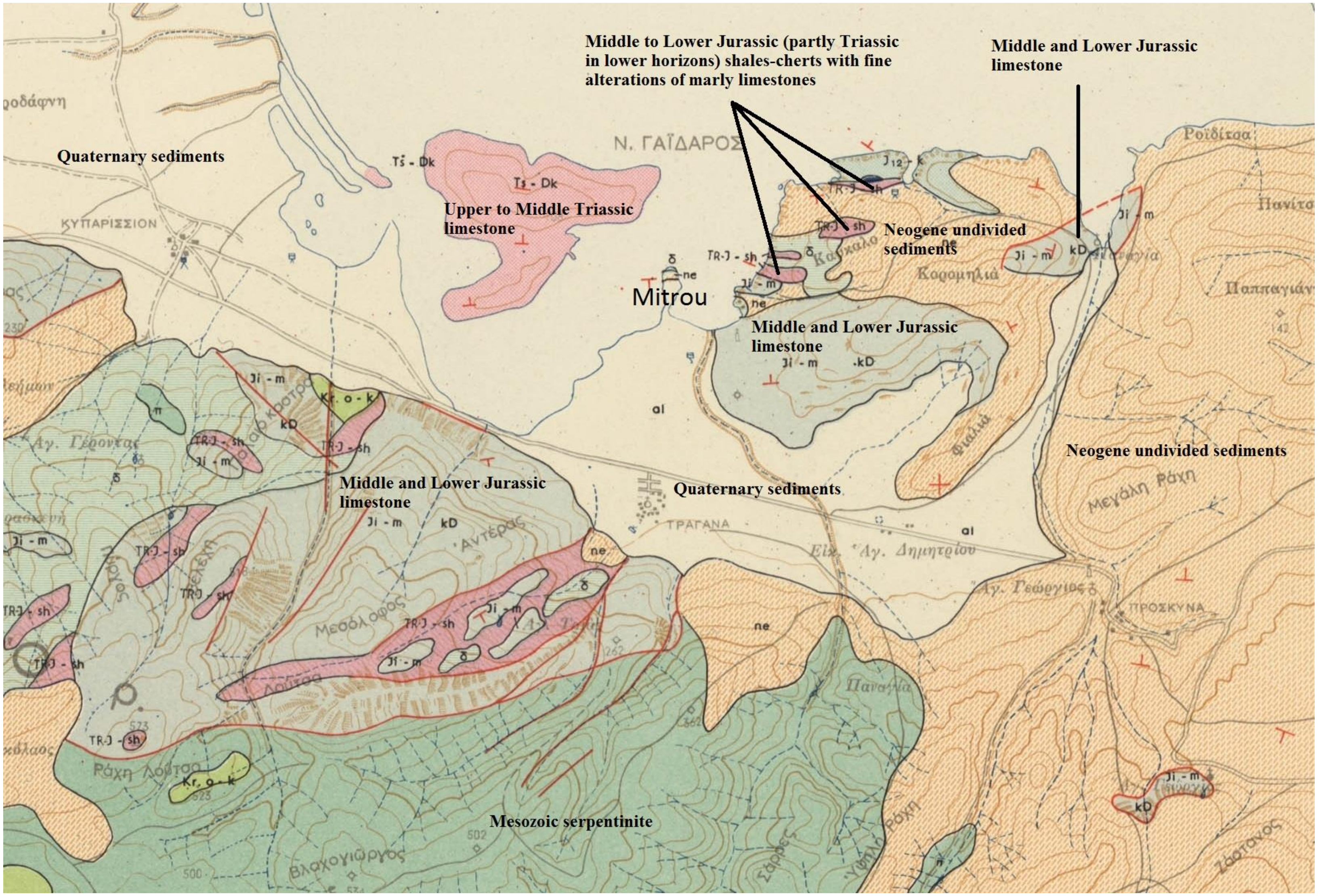

Figure 5. Simplified geologic map of the Mitrou area. Source: Greek Institute for Geology and Subsurface Research 1965.

Figure 6. Serpentinite outcrop approximately 4 km south-southwest of the site. Photograph taken by author, 2014.

Figure 7. Serpentinite outcrop approximately 4.5 km to the south of the site. Photograph taken by author, 2013.

Figure 8. Hard gray limestone outcrop on Donkey Island, to the west of Mitrou. Photograph taken by Robert Jones, College of Charleston, 2014.

Figure 9. Hard gray limestone outcrop less than 1 km directly to the east of Mitrou. Photograph taken by Jacquelyn Clements, 2013. Courtesy of Mitrou Archaeological Project.

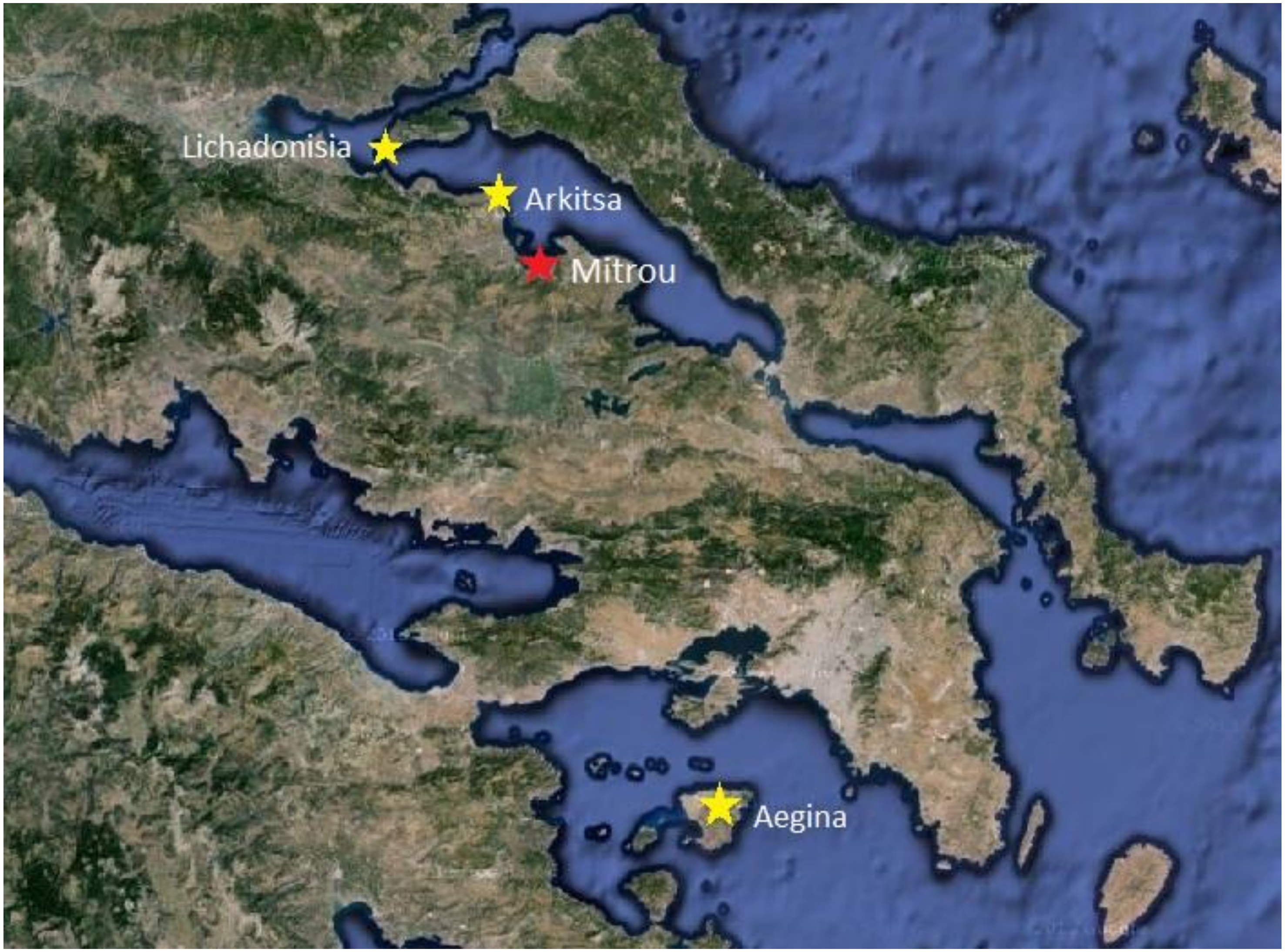

Figure 10. Rock sources discussed in the present study. Map created by author using Google Maps.

Figure 11. Marble grinding stone/pestle, side 1. LX784-155-017. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 12. Marble grinding stone/pestle, side 2. LX784-155-017. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

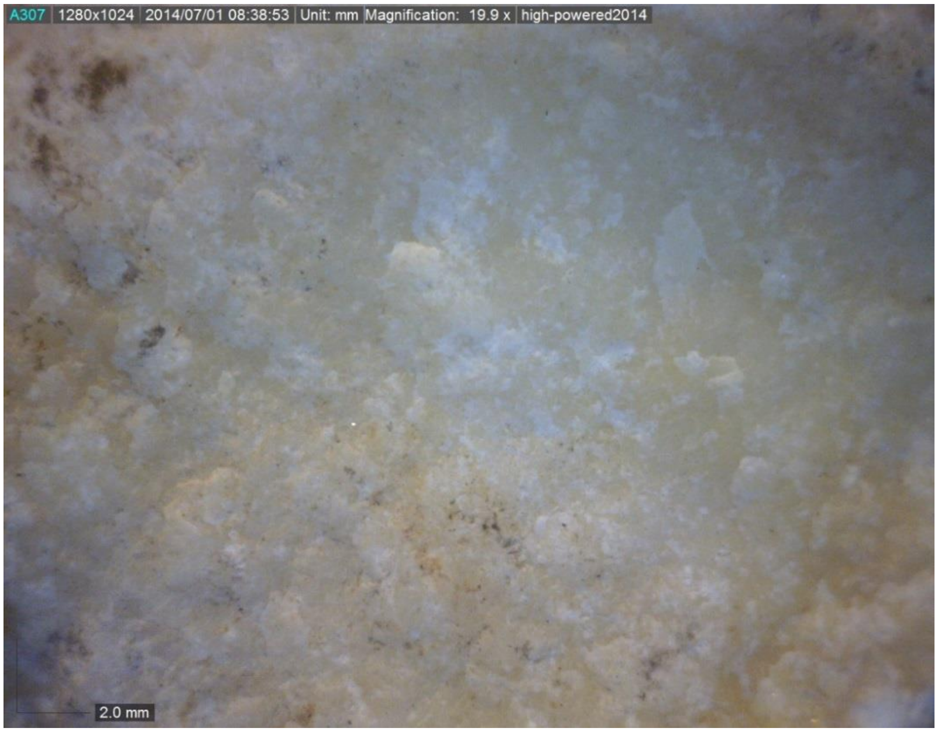

Figure 13. Marble grinding stone/pestle, magnified ~20X. LX784-155-017. Photograph taken by author, 2014.

Figure 14. Marble grinding stone/pestle, magnified ~69X. LX784-155-017. Photograph taken by author, 2014.

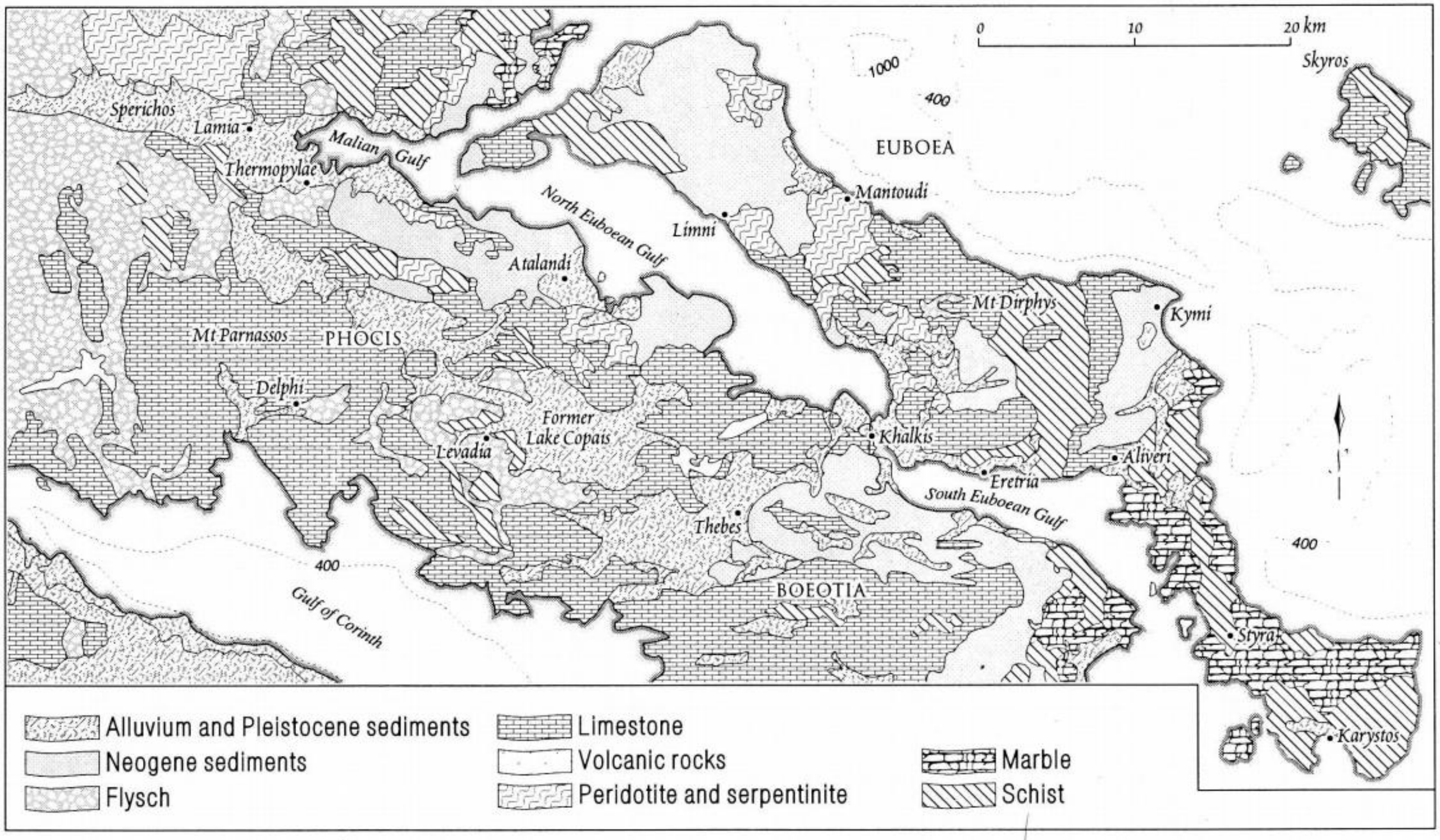

Figure 15. Simplified geologic map of Central Greece and Euboea. Source: Higgins and Higgins 1996, 75.

Figure 16. Sandstone sample from Tomb 73, side 1. Photograph taken by Vlasis Tsikoulos, 2014. Courtesy of Mitrou Archaeological Project.

Figure 17. Sandstone sample from Tomb 73, profile view. Photograph taken by Vlasis Tsikoulos, 2014. Courtesy of Mitrou Archaeological Project.

Figure 18. Sandstone sample from Tomb 73, magnified ~76X. Photograph taken by author, 2014.

Figure 19. Sandstone sample from Tomb 73, magnified ~209X. Photograph taken by author, 2013.

Figure 20. Sandstone grinding stone, side 1. KY798-513-022. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 21. Sandstone grinding stone, magnified ~30X. KY798-513-022. Photograph taken by author, 2014.

Figure 22. Sandstone saddle quern, top view. LE795-101-011. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

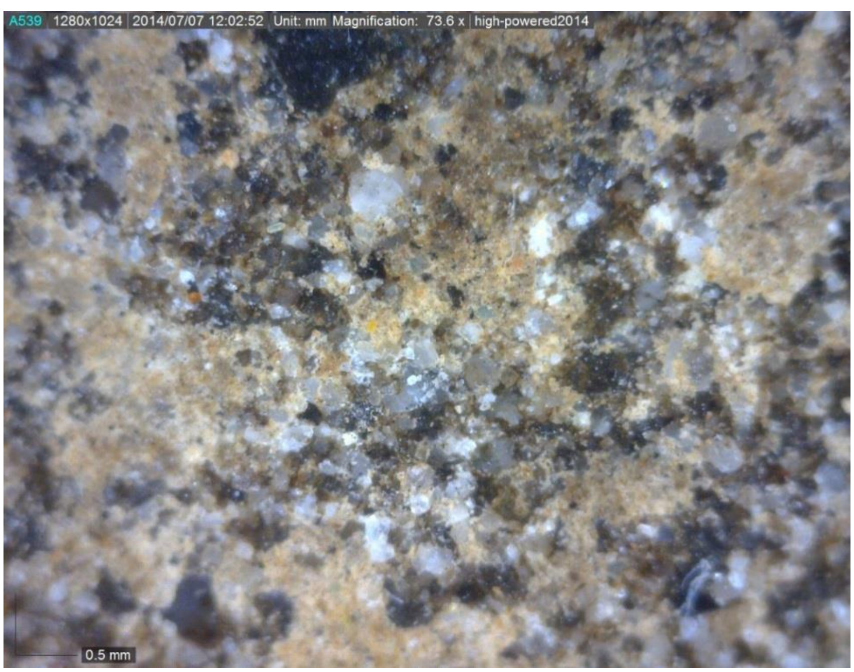

Figure 23. Sandstone saddle quern, magnified ~74X. LE795-101-011. Photograph taken by author, 2014.

Figure 24. Sandstone grinding stone, side 1. LE795-040-011. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 25. Sandstone grinding stone, magnified ~25X. LE795-040-011. Photograph taken by author, 2014.

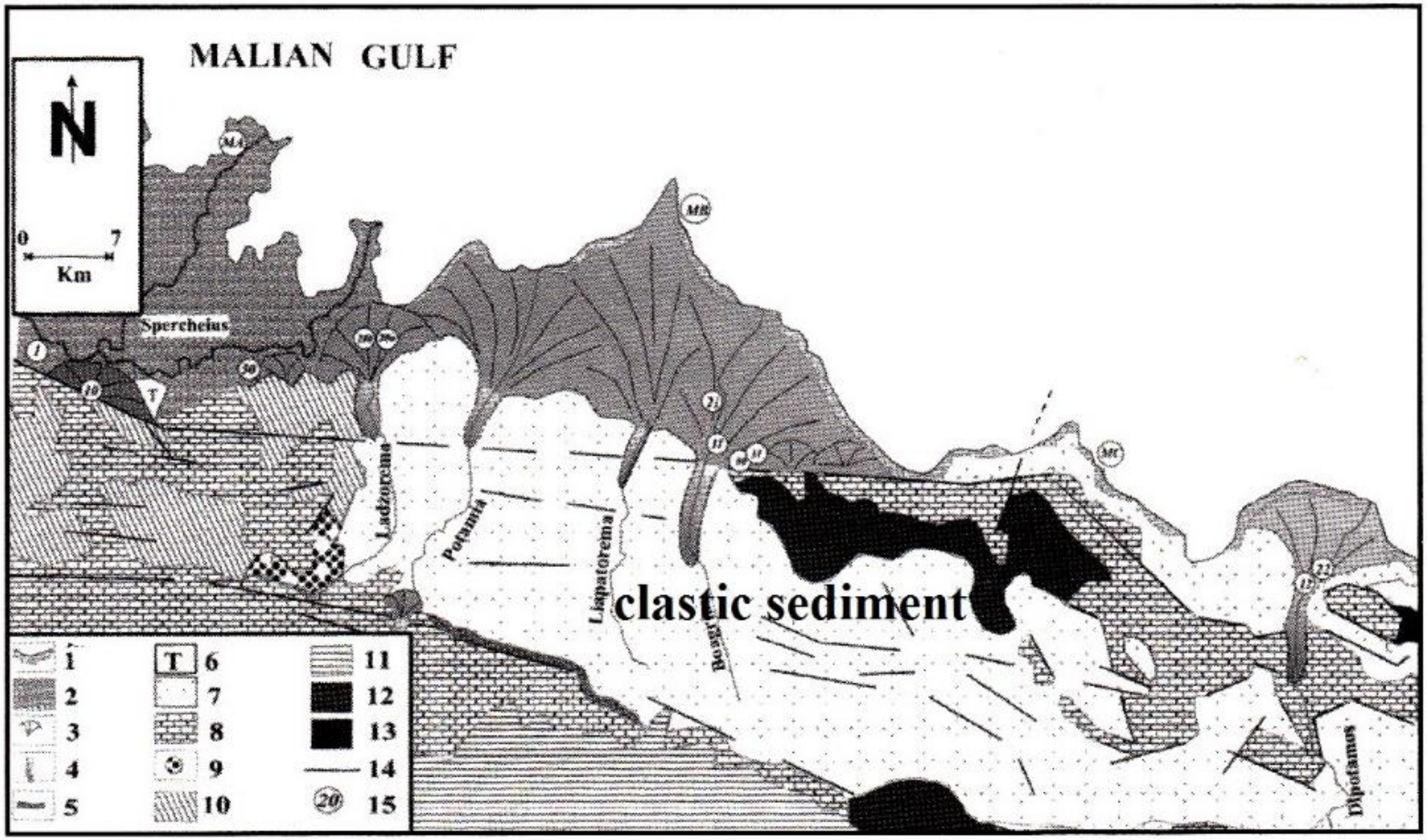

Figure 26. Map showing clastic sediment (pebbles, gravels, sandstones, marls, and clays; number 7 on map legend) in Northern East Lokris. Source: González et al. 2013, 24.

Figure 27. Example of clay fragments with impressions of organic material from roofs or second floors. LX784-024-012. Photograph taken by Jacquelyn Clements, 2013. Courtesy of Mitrou Archaeological Project.

Figure 28. Example of ground floor fragment. LP783-093-011. Photograph taken by Kyle Jazwa, 2013. Courtesy of Mitrou Archaeological Project.

Figure 29. Example of mud brick fragment. LX784-057-022. Photograph taken by Vlasis Tsikoulos, 2014. Courtesy of Mitrou Archaeological Project.

Figure 30. Example of oven fragments. LM782-047-021. Photograph taken by Vlasis Tsikoulos, 2014. Courtesy of Mitrou Archaeological Project.

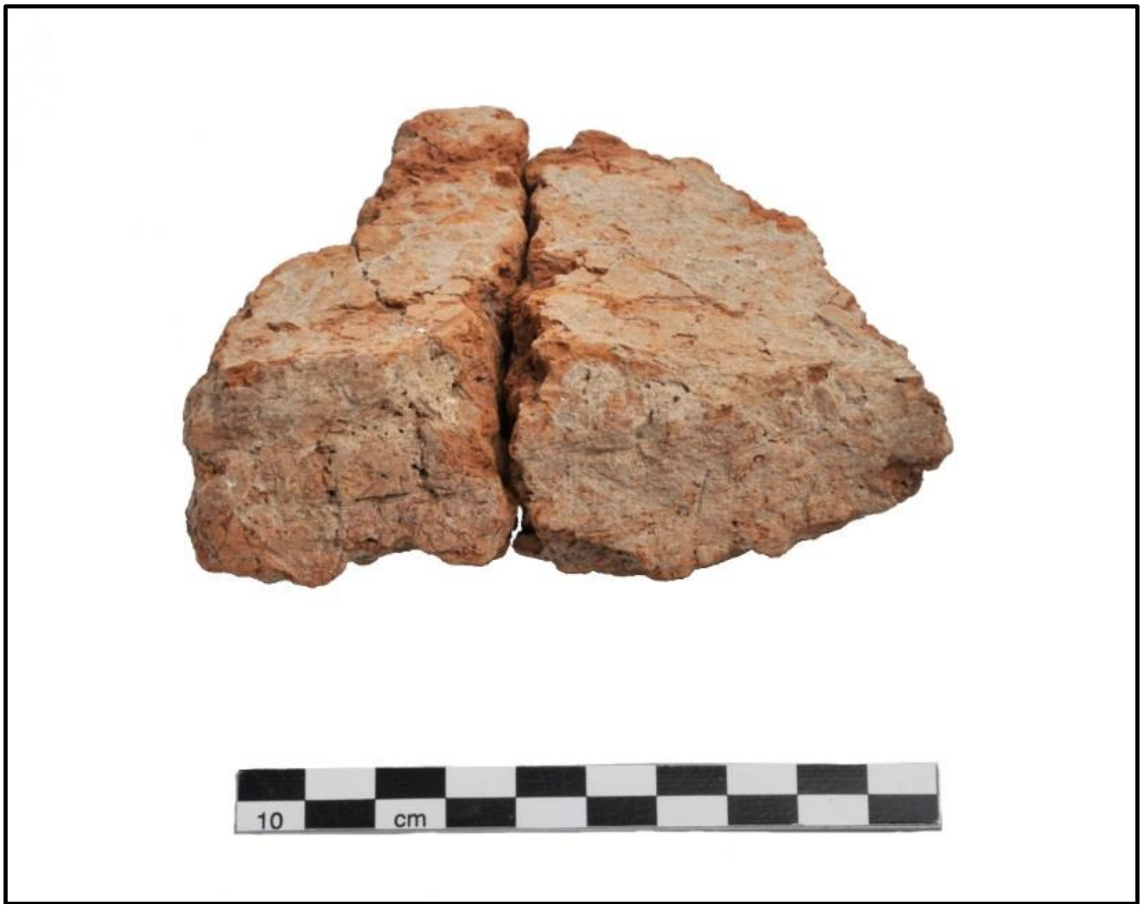

Figure 31. Example of utilitarian tray fragments, top and side view. LX784-027-017. Photograph taken by Jacquelyn Clements, 2013. Courtesy of Mitrou Archaeological Project.

Figure 32. Example of local limestone as architectural material for the construction of Late Helladic walls and a Protogeometric cist grave, from trench LN787, stratigraphic unit 028. Photograph taken by Angeliki Panagiotou, 2006. Courtesy of Mitrou Archaeological Project.

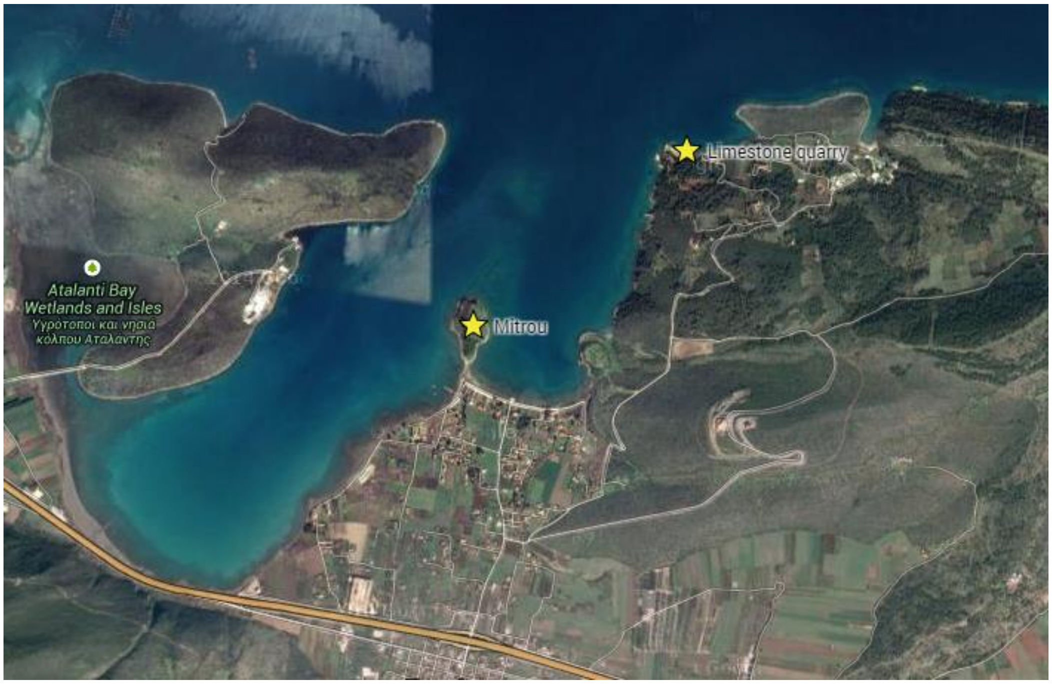

Figure 33. Mitrou in relation to limestone quarry. Map created by author using Google Maps.


Figure 34. Limestone quarry near Mitrou. Note the 40-cm scale in foreground. Photograph taken by Jacquelyn Clements, 2013. Courtesy of Mitrou Archaeological Project.

Figure 35. Two sandstone orthostates of Built Chamber Tomb 73 in situ. Photograph taken by Rachel Vykukal, 2008. Courtesy of Mitrou Archaeological Project.

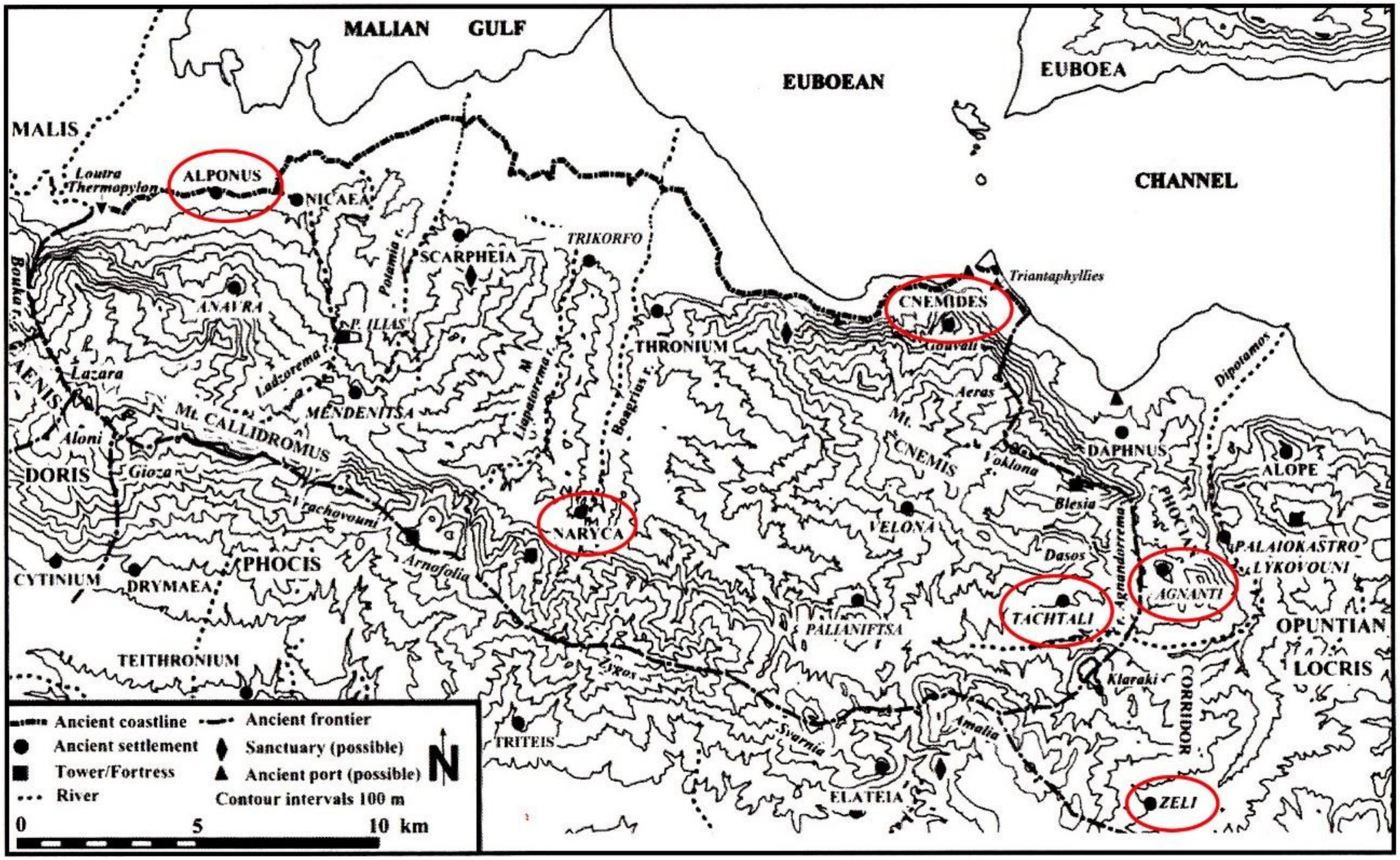

Figure 36. Ancient settlements of Northern East Lokris. Known Bronze Age sites are circled in red. Source: Pascual 2013, 67.

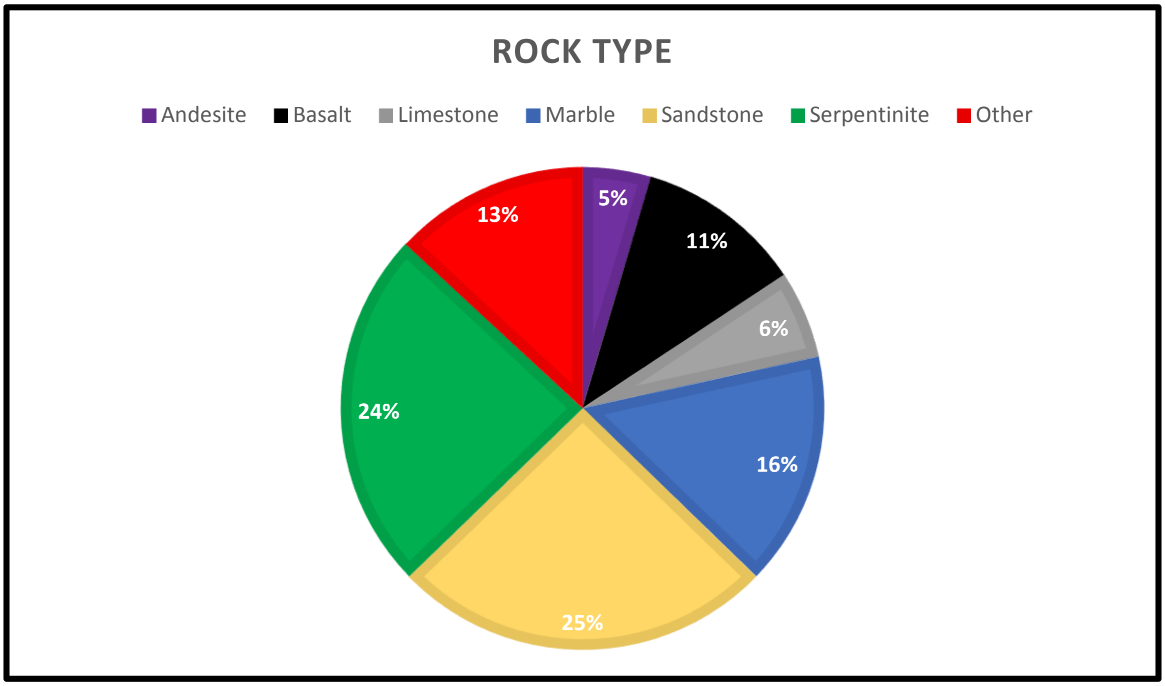

Figure 37. Rock types represented in the ground stone tools.

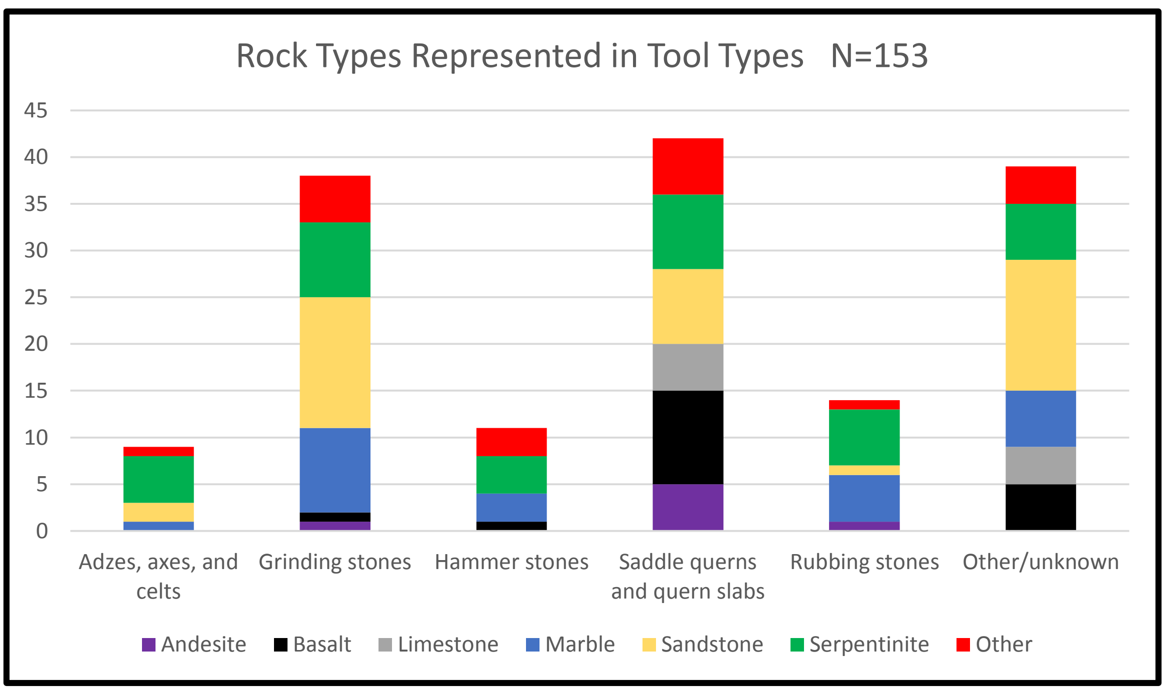

Figure 38. Ground stone tools sorted by tool type and rock type.

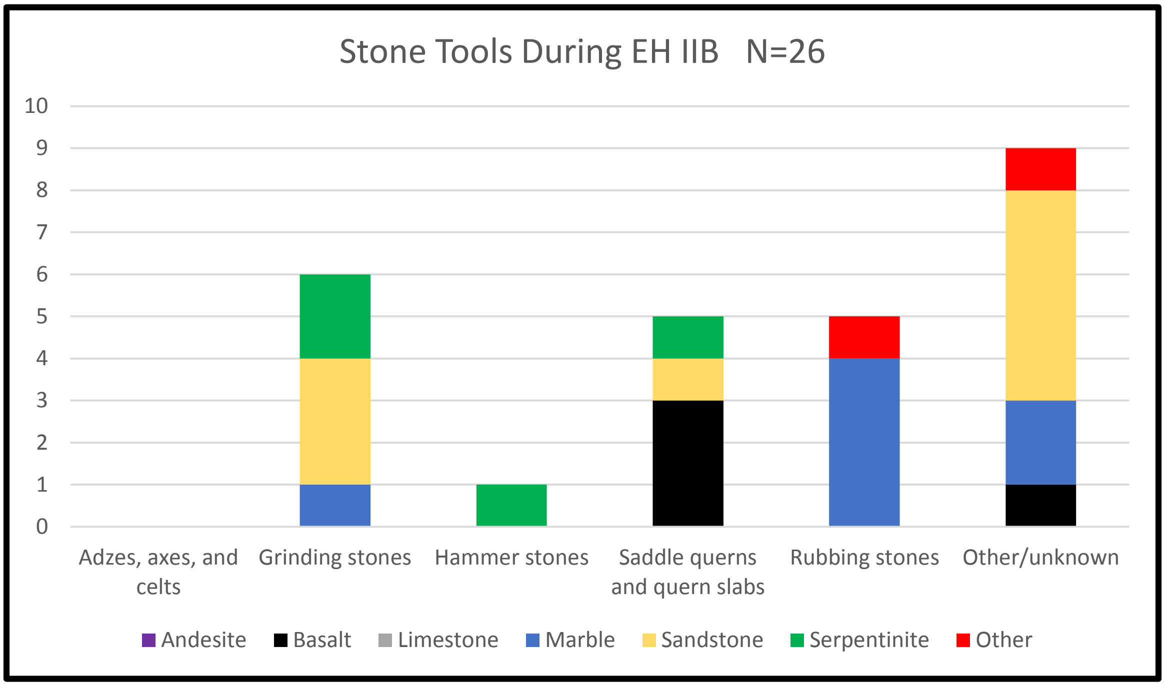

Figure 39. Stone tools during the Corridor House period (EH IIB).

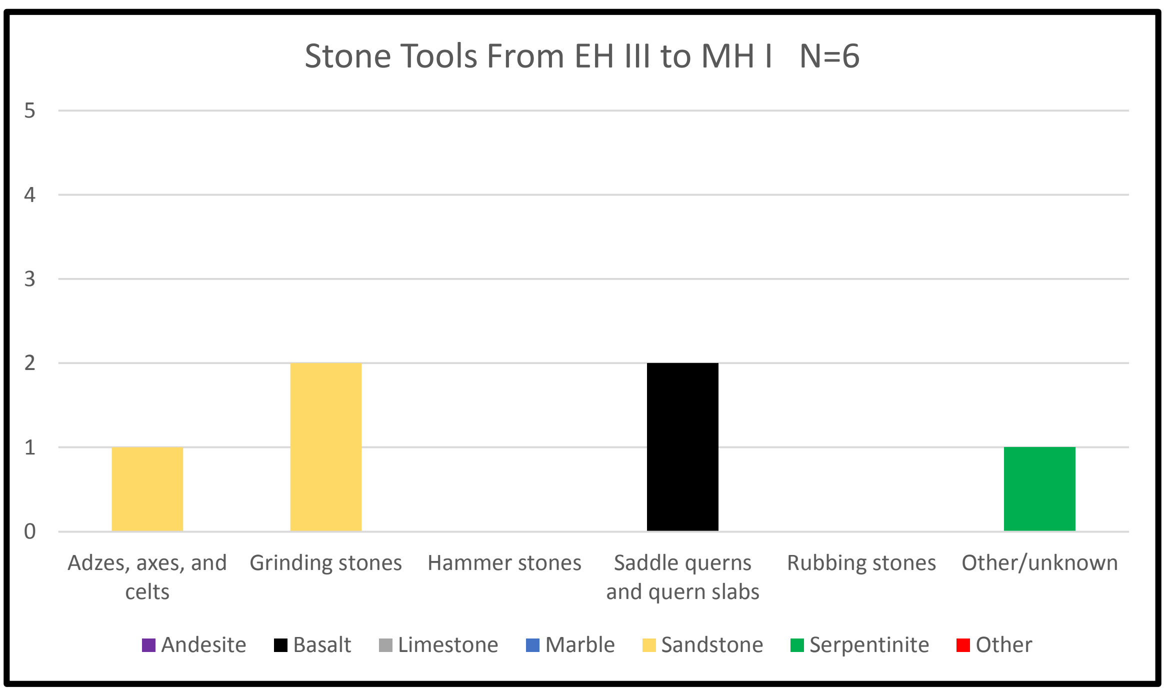

Figure 40. Stone tools during the early "village" period (EH III to MH I).

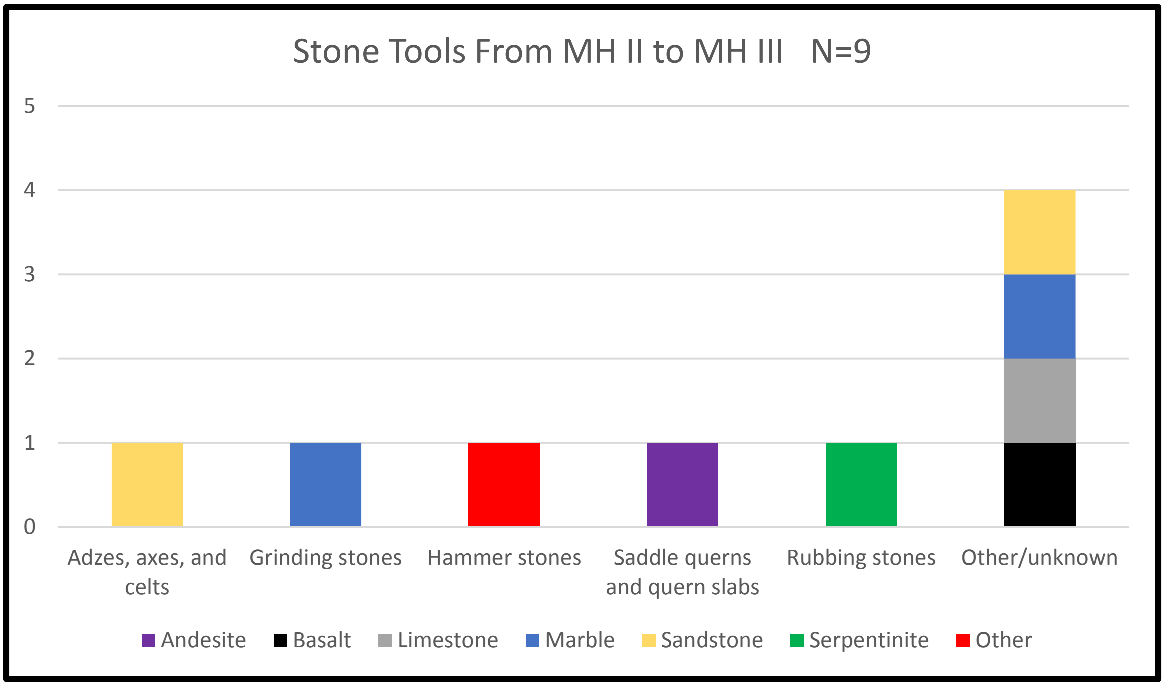

Figure 41. Stone tools during the late "village" period (MH II to MH III).

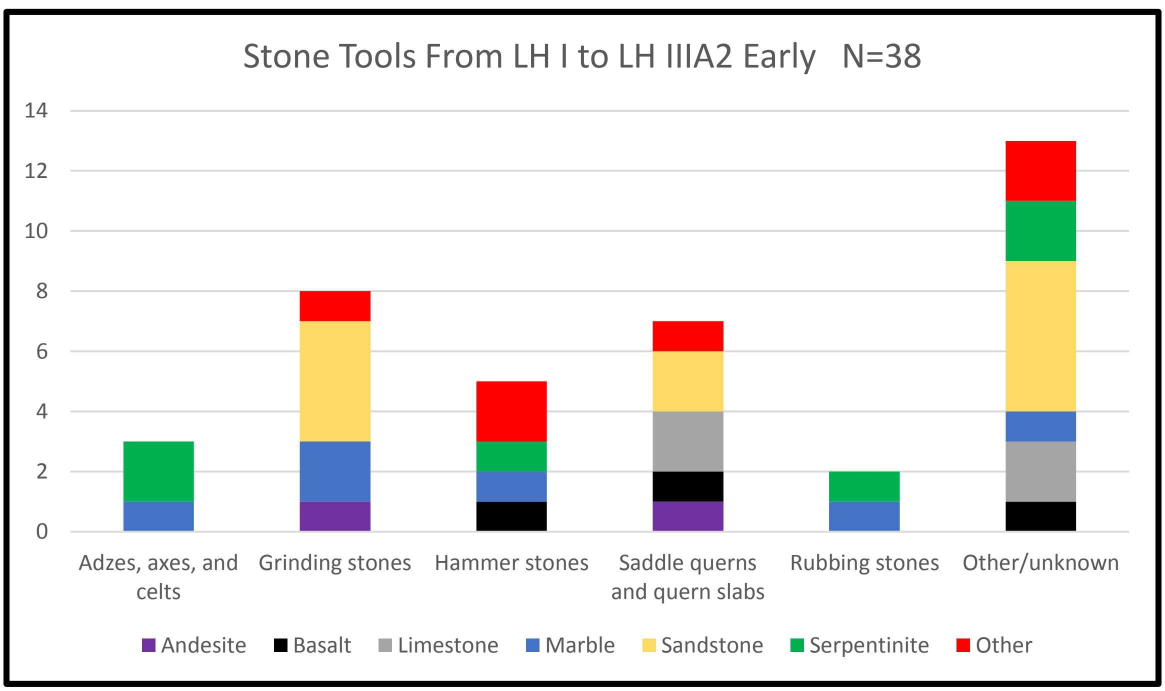

Figure 42. Stone tools during the Prepalatial period (LH I to LH IIIA2 Early).

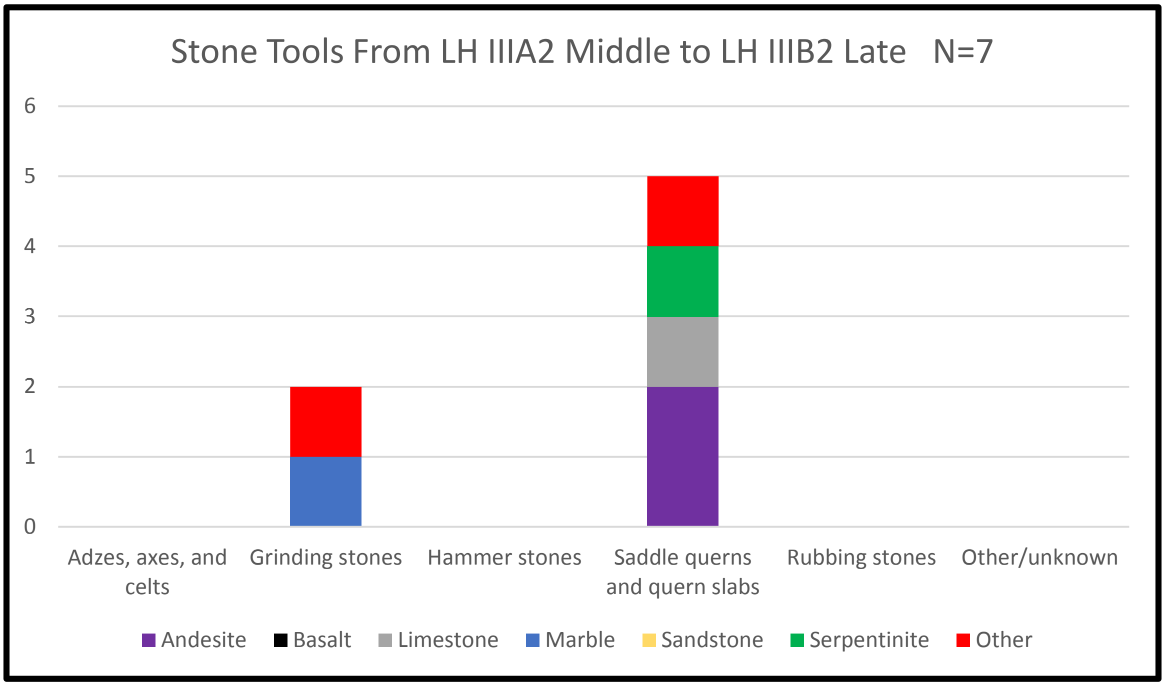

Figure 43. Stone tools during the Palatial period (LH IIIA2 Middle to LH IIIB2 Late).

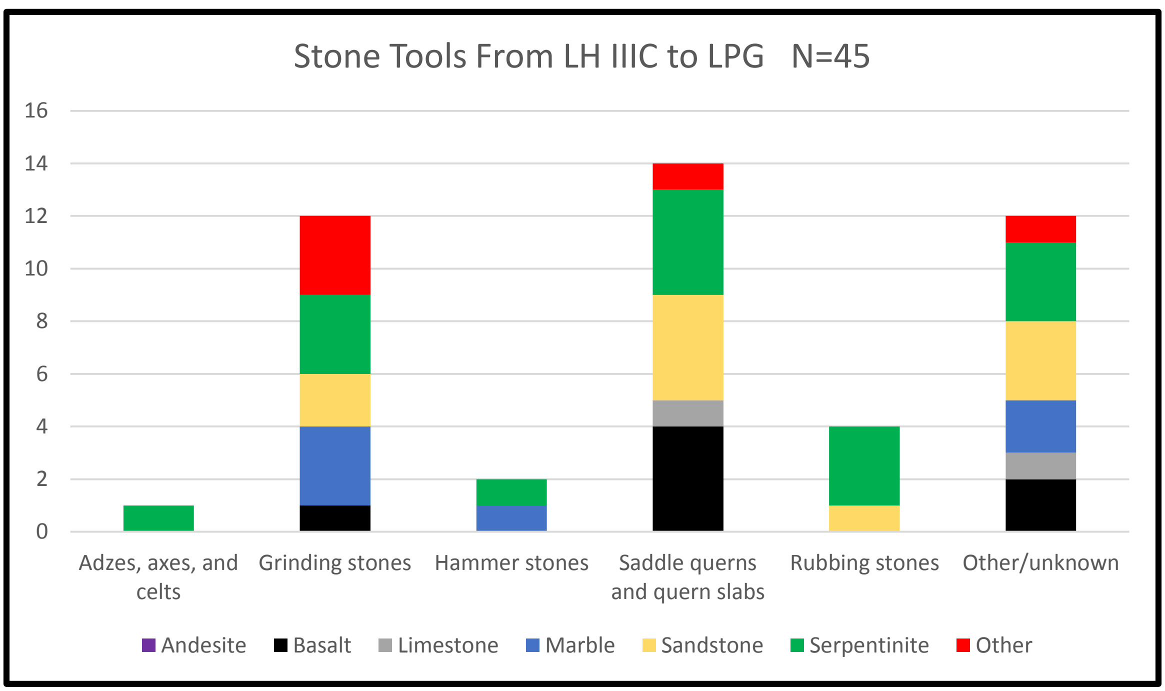

Figure 44. Stone tools during the Postpalatial period and Early Iron Age (LH IIIC to LPG).

Figure 45. Middle Helladic II Early basalt chisel, side 1. LX784-060-012. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 46. Middle Helladic II Early basalt chisel, side 2. LX784-060-012. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 47. Middle Helladic II Early basalt chisel, magnified ~30X. LX784-060-012. Photograph taken by author, 2014.

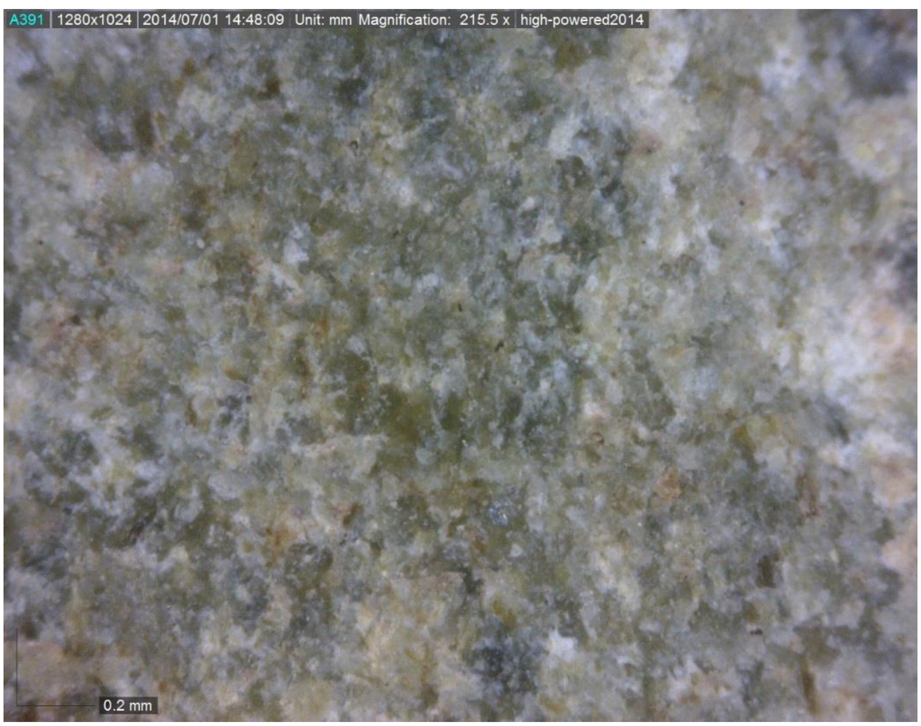

Figure 48. Middle Helladic II Early basalt chisel, magnified ~215X. LX784-060-012. Photograph taken by author, 2014.

Figure 49. Middle Helladic II Early andesite saddle quern, top view. LX784-062-015. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 50. Middle Helladic II Early andesite saddle quern, bottom view. LX784-062-015. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

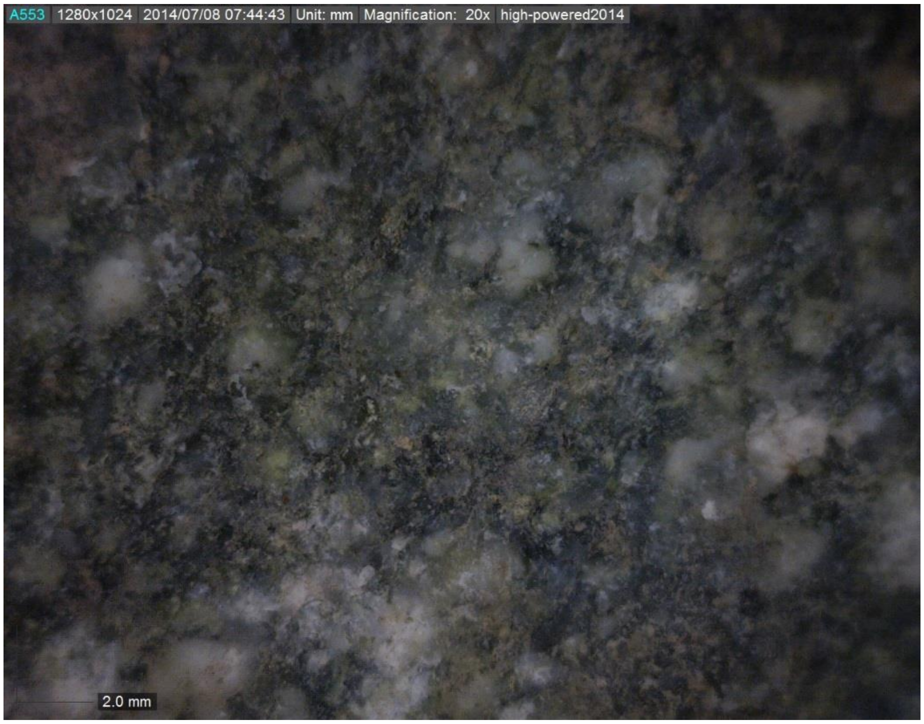

Figure 51. Middle Helladic II Early andesite saddle quern, magnified ~20X. LX784-062-015. Photograph taken by author, 2014.

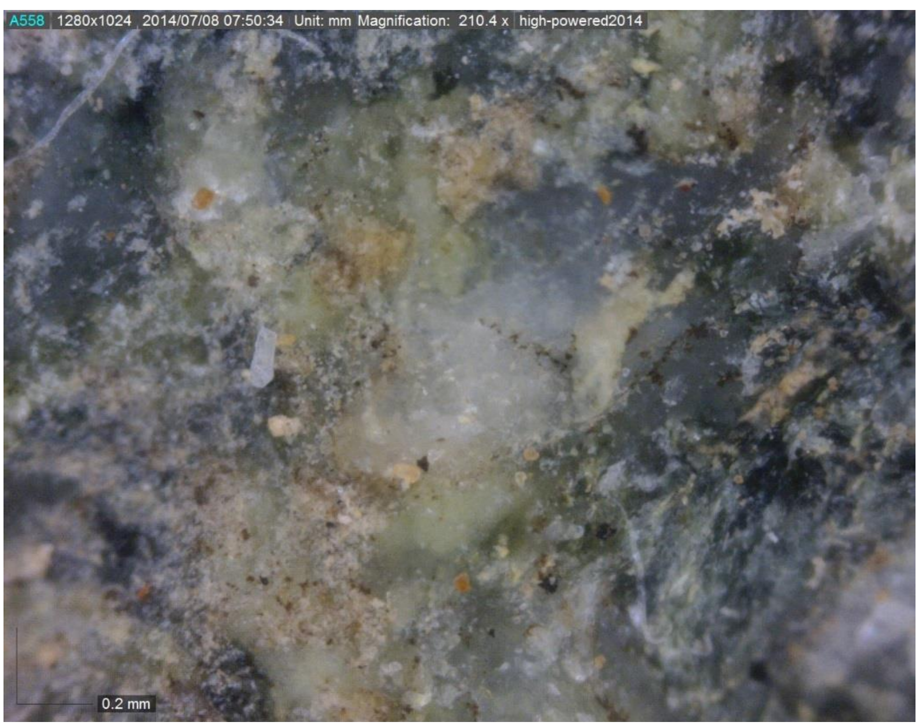

Figure 52. Middle Helladic II Early andesite saddle quern, magnified ~210X. LX784-062-015. Photograph taken by author, 2014.

Figure 53. LH IIA dacite saddle quern, top view. LE793-087-011. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

Figure 54. LH IIA dacite saddle quern, bottom view. LE793-087-011. Photograph taken by author, 2014. Courtesy of Mitrou Archaeological Project.

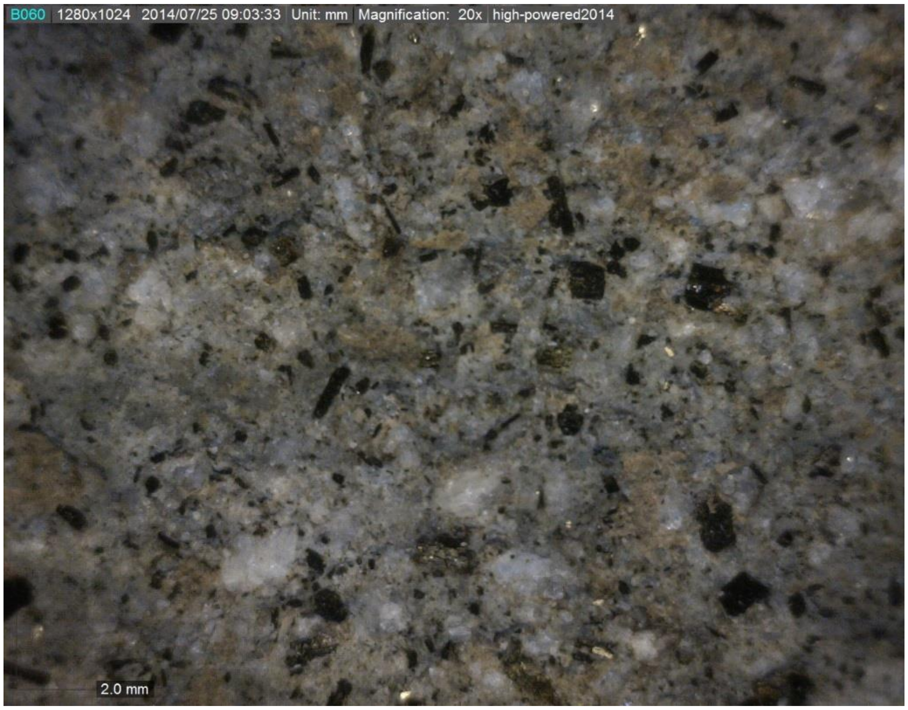

Figure 55. LH IIA dacite saddle quern, magnified ~20X. LE793-087-011. Photograph taken by author, 2014.

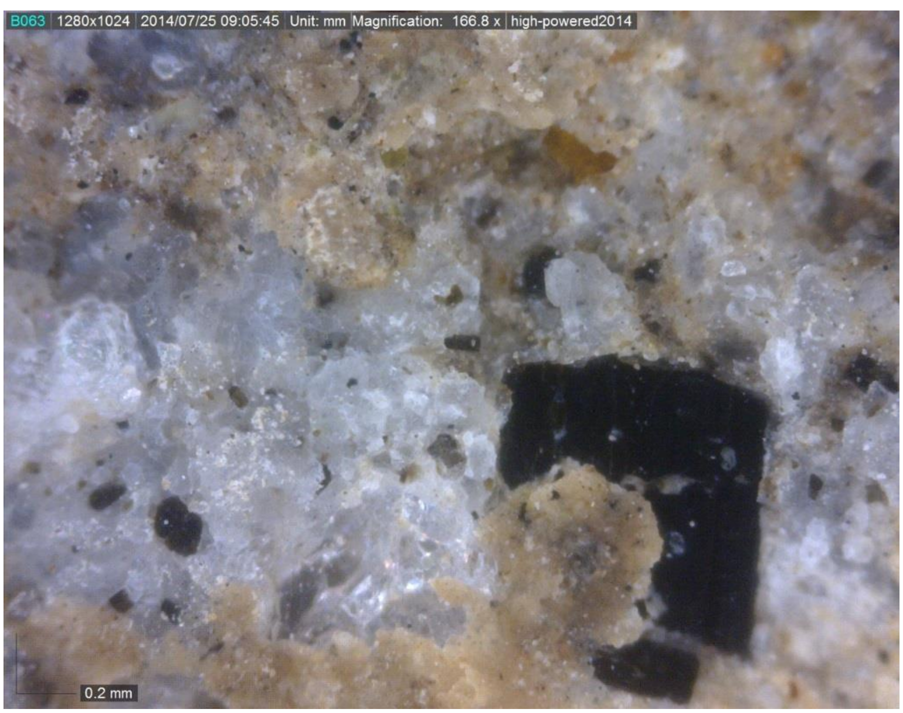

Figure 56. LH IIA dacite saddle quern, magnified ~167X. LE793-087-011. Photograph taken by author, 2014.

Vita

Lee Anderson was born and raised in Memphis, Tennessee. After graduating from Briarcrest Christian School, he stayed in Memphis to pursue a degree in Earth Sciences with a concentration in Archaeology at the University of Memphis. To give him a better preparation in archaeology, he also pursued a minor in Anthropology. Wishing to transition to studying archaeology in the classical world, in the fall of 2012 he began a Master of Arts in Anthropology with a concentration in Mediterranean Archaeology at the University of Tennessee, Knoxville. He was able to combine his geoarchaeological and anthropological backgrounds when he spent two exciting summers in Greece studying Mitrou's architectural materials and ground stone tools, culminating in this thesis. Although he will not technically graduate from UT until May 2016, in Fall 2015 he began the Ph.D. program in Greek and Roman Studies at the University of Victoria, B.C.