

Bioarchaeology in Greece:
Breathing Life into the Early Helladic and Archaic Skeletal
Assemblages from Klenia

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Rescue excavations between 2014 and 2015 in Klenia, Corinthia, Greece uncovered an assemblage of human skeletal remains from one Archaic (750-479 BCE) and four Early Helladic (2650-2200 BCE) tombs. Until recently, bioarchaeology and the comprehensive analysis of human skeletal remains in Greece has been uncommon. However, theoretical and technological developments in bioarchaeology have highlighted the importance of studying these remains, as they provide insights into the biocultural lifeways of individuals of the past. The present research provides basic osteobiographical data for the human skeletal remains recovered from the Klenia tombs and explores their geographical and temporal context in order to provide situated interpretations and insights into the lives of these individuals. The results of this work reveal information pertaining to the life and possible weaving and cooking activities of an older adult female from the Archaic period, and to the lives of those interred in the Early Helladic graves, which likely represent a familial or social kinship. The Early Helladic skeletal remains within their context suggest an agricultural lifestyle. Further, the discovery of infant skeletal remains within these tombs highlights improvements in bioarchaeological recovery methods, and suggests the inclusion of infants in commingled tombs within extramural cemeteries. This alters previous understandings of intramural infant burial during the Early Helladic period in Greece.

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List of Abbreviations

AAA	American Anthropological Association
AAPA	American Association of Physical Anthropologists
AIA	Archaeological Institute of America
APA	Association of Professional Archaeologists
BCE	Before Common Era
EBA	Early Bronze Age
EH	Early Helladic
MLNI	Most Likely Number of Individuals
MNI	Minimum Number of Individuals
PAS	Portable Antiquities Scheme
SAA	Society for American Archaeology

Chapter One

Ethical and Local Considerations in Public Bioarchaeology

1.1 Introduction

Public considerations in archaeology and bioarchaeology are manifold. Archaeological investigation is largely destructive in nature, and bioarchaeological studies involve the handling of sensitive materials. The accumulation of knowledge via these forms of research, while having benefits to the contemporary understanding of human history, is not enough to justify forgoing considerations of the potential impacts that the research process has on public stakeholders (Alfonso and Powell 2007, 5). Therefore, it is necessary to understand the potential impacts and how they apply to the context evoked by a particular project. In line with the subject matter of this project, the ethical considerations of archaeology and, specifically, bioarchaeology will be discussed. Following Shoup and Monteiro (2008), the well-established social value of archaeology in areas where Classical archaeology is dominant, such as in Greece, has, in the past, resulted in less anthropological inquiry, and a weakened understanding of the ethical considerations undertaken with modern populations as a result (328). Therefore, the following exploration of ethical considerations and their application in the Greek context has value to the ongoing growth of anthropological inquiry in Greek archaeology and bioarchaeology. The research project outlined in Chapter 2 studies the assemblages human skeletal remains from an archaeological context in Klenia, Corinthia, Greece. Therefore, the application of both archaeological and bioarchaeological ethics within this Greek context will be explored.

1.2 Identifying Key Concepts: ‘Publics’ and Public Issues Anthropology

In order to explore the impact that both archaeology and bioarchaeology has on the public, it is necessary to identify the nature of the public itself. Following Richardson and

Almansa-Sánchez (2015), it is impossible to consider a public, which is often characterized as a static entity with members that hold similar experiences and values, as homogenous (201). Rather, a public is heterogeneous and mutable based on its social, cultural, and geographical contexts (200). Therefore, it can be said that a universal application of public archaeology is not attainable, making the consideration of a project within its context necessary. For example, a public issues project involving ancient human skeletal remains from Greece will have a different impact than one in Indigenous communities or in Ultra-Orthodox Jewish communities, both of which claim spiritual or religious significance associated with human remains, and have political and social motivations for monopolizing control over these remains (McEvoy and Conway 2004, 541-543; Morrell 1995, 1424; Weingrod 1995, 9). This is not to say that spiritual and religious significance associated with human skeletal remains is absent in Greece. On the contrary, the handling of human skeletal remains is more common in Greece due to secondary burial practices (see *2.4 Previous Work*), and the treatment of these remains involves extensive ceremonies wherein great care is given to the skeletal remains and the cemeteries in which they rest (Danforth 1982, 14-20). However, the excavation of ancient human skeletal remains in Greece is less restrictive than in other contexts. Therefore, a universal public archaeology is inappropriate, and the goals of public issues anthropology can be made more general. Broadly speaking, it can be said that public issues anthropology focuses on the ways in which anthropological research involves and impacts diverse publics. It combines theory and methods that reflect an understanding of the positive and negative implications of research, fieldwork, and writing within the public and academic spheres. In this way, the goal of public issues anthropology research is to positively impact all involved stakeholders, both public and academic, by creating a productive dialogue between them. In an effort to apply this framework to the case study

outlined in Chapter 2, a discussion of the applicable ethical considerations and how these dialogue with the Greek context will be made.

1.3 Ethical Considerations

The Codes of Ethics relevant to this study come from both anthropological and archaeological sources, as well as sources focusing on bioarchaeological ethics. These Codes of Ethics highlight the needs of both the local and academic stakeholders in archaeological projects. Until recently, an official recognition of the obligations that archaeologists have towards the public, both as stakeholders and as interested community members, had not been established (Hardy 2017, 95). However, discussions of ethics and responsibility have been made within the archaeological community since the formation of the discipline (Hardy 2017, 95). Since the late twentieth century, official statements of codes of ethics within scholarly communities practicing archaeological excavations have been made in an effort to provide guidelines for conduct with regards to the discipline, the wider impacted communities, and the environment (AAA 2012; AAPA 2003; AIA 2016a; AIA 2016b; APA n.d.; SAA 1996). The codes that are specific to archeological conduct cover aspects such as stewardship, accountability, commercialization, public education and outreach, intellectual property, public reporting and publication, records and preservation, training and resources, and access to a safe educational and workplace environment. These codes intend to promote the respectful treatment of the people and materials involved in a project, as well as the use of proper training and equipment in handling archaeological materials. Further, they promote the consideration of archaeology as an irreversible process so as to highlight the implications of preservation and conservation efforts on future work. Concerning publication, they advocate for disseminating findings for both

academic and public access. Generally, the goal is to encourage ethical public involvement and the preservation of materials and findings for future work.

This research project focuses on assemblages of human skeletal remains, which brings a second component of ethics into consideration. Codes of Ethics specific to bioarchaeology and the handling of human skeletal remains revolve around considerations of the ethical treatment of these remains in light of cultural beliefs and morals revolving around the remains themselves (Alfonso and Powell 2007, 5). These codes state that regardless of their antiquity, human remains represent a once living individual, and should be treated with dignity and respect as opposed to solely as a means for study (Walker 2000, 20). In conjunction with the archaeological ethics of preservation, the ethical treatment of human remains involves maintaining their physical integrity and documentation through the use of non-destructive methods of research whenever possible, and the use of appropriate storage facilities (Cybulski et al. 1979, 34). As a result, my investigation into the lives of the individuals from Klenia uses non-destructive methods of analysis, including the use of osteometry and morphological analysis.

1.4 Archaeology in Greece: Who Benefits?

As mentioned previously (*1.1 Introduction*), anthropological inquiry into public considerations in Greece has been less dominant than the field of archaeological excavation. This is due to the long history of archaeology in the Greek context. However, interdisciplinary studies and the increasing awareness of public considerations are improving the recognition of the impacts that archaeology has on the public. Further, the importance of a contextualized understanding of the public stakeholders has also been discussed (*1.2 Identifying Key Concepts*). Taking the ethical concerns of stewardship and conservation efforts into consideration, and that the goal of public issues anthropology is to create positive impacts on all stakeholders, an effort

will be made to apply these concepts to the Greek context. When considering archaeology and how it impacts Greece, one of the prominent factors is the economy. Influences on both the wider and localized economies in relation to archaeological work result largely from the tourist industry as well as the illegal antiquities market (Borodkin 1995; Buckley and Papadopoulos 1986). Therefore, it is important to investigate the positive and negative consequences of these archaeological impacts on both the Greek public and the academic community.

In places that have archaeological history or the potential for archaeological inquiry, there is the prospect of economic growth via archaeological tourism. Conversely, archaeological tourism may have negative impacts on the local community. The benefits of archaeological tourism are largely economical while also providing a means for development. Archaeological sites and the institutions that are associated with them, such as universities, museums, and galleries, have an impact on the community by attracting both tourists and new community members, as well as encouraging projects in sustainable development (Burtenshaw 2017, 40). Further, archaeological work creates employment opportunities in tourism, archaeological conservation, research, and other industries (Shoup and Monteiro 2008, 329-30; Tillotson 1988, 1940; Burtenshaw 2017, 37-41). Moreover, collaborative efforts between archaeologists and the community provide mutual benefits. For example, in Shala Valley in Albania the local community set goals of creating a new road and school, agricultural subsidies, etc., and met these goals with the help of the archaeologists working in the locale. In addition, public involvement and outreach can strengthen rapport between archaeologists and locals, which benefits archaeological research via the access to local site information (Shoup and Monteiro 2008, 330-332).

While there are many benefits of archaeological excavation and tourism to both the academic and public stakeholders, there are also downfalls that must be addressed. The introduction of mass tourism in an area can result in the loss of cultural traditions that initially made the area appealing from a tourist standpoint (Shoup and Monteiro 2008, 329). The distress caused to the local community as a result of this needs to be taken into consideration. Mass tourism also involves the potential for site damage. This can impact both the archaeological sites as well as the local community. For example, local buildings may be torn down for tourist amenities and parking, and areas can be transformed to cater to tourist requests such as photo opportunities, all of which can disrupt the original architecture (Little 2013, 116; Tillotson 1988, 1940). Further, the deterioration of a town and the archaeological site can lead to the demise of the archaeological tourism in itself. Without a sustainable and well-planned economic plan, the physical deterioration of roadways and buildings under the stress of mass tourism can make a destination undesirable for tourists. In this way, a short-term plan for profit as opposed to a long-term investment can be detrimental to the local economy (Tillotson 1988, 1940; Little 2013, 116). In line with the codes of archaeological ethics concerning conservation, long-term plans should be put in place prior to excavation in order to deter this outcome (AIA 2016b). Equal collaboration between academic and public stakeholders may be difficult to achieve due to social, economical, political, and other factors that influence power relationships between the public and academic stakeholders in a given project. In response to this issue, Hodder (2011) suggests that the only potential for equal ground may be found in listening and giving respect. However, this does not resolve the issue of who may be willing or is able to speak in a given situation (Hodder 2011, 22-3).

In addition to the impact of archaeological work and the resulting tourism, the antiquities market also has influence on the local economy. Illicit trade in antiquities is something that, while detrimental to the archaeological process, as it destroys provenience and is sometimes done with this destruction in mind, is beneficial to the local economy. Looting is frequently performed in order to make a living, and as long as there is a market for illicit antiquities, people will supplement their income via looting unless alternative options are made available to them (Qin 2004, 298). In considering the frequent opposition to looting, Hodder (2011) questions the moral opposition to looting versus a universal claim of cultural heritage, if a community depends on the act of looting economically. Further, he examines how universals contribute to the political and cultural agenda and dominance of the global North (Shoup and Monteiro 2008, 330). Taking this into consideration, it is important to find a mutually beneficial solution to the issue of looting. Looting in Greece is common due to the intensive use of the land in antiquity, and often results in new legal excavation, by discovering sites previously unknown to archaeologists. For example, near the small village of Klenia, two *kouroi* statues were recently recovered after having been looted and the graves these statues once marked were then formally excavated (Morgan et al. 2010, 25).

In an effort to propose a productive solution to the issue of looting within the Greek context, there are examples of museums that have hired locals and looters, providing legitimate income while benefiting from the local knowledge regarding the locations of archaeological sites (Shoup and Monteiro 2008, 330). In addition, in England and Wales, the Treasure Act 1996 and Portable Antiquities Scheme (PAS) have seen benefits to their implementation (Bland et al. 2017; Bland 2004). The Treasure Act resulted in the implementation of a legitimate reward system, wherein found objects of archaeological significance can be purchased by a museum

from the object's finder. There are both positive and negative outcomes associated with this act. On the one hand, there is the potential that it may motivate untrained archaeological excavations. On the other hand, it may also increase public interest in proper archaeological practices. The impact of these implementations can be seen in the numbers of reported finds; before 1997 an average of twenty-six finds were offered to museums, while in 2015, 1038 finds were reported. The goal of PAS, which was made in conjunction with the Treasure Act, is to record the locations of finds and disseminate information concerning good archaeological practices to the local community (Bland et al. 2017, 109-114). The recording of find locations has the potential to reveal new archaeological sites, which is beneficial to the discipline. Therefore, while it may be impossible to eradicate the antiquities market logistically or morally, there are alternative options that have mutual benefits to both the public and academic spheres.

1.5 Towards a Mutually Beneficial Archaeology in Greece

In conducting archaeological excavations and handling human skeletal remains, it is important to be aware of both the positive and negative outcomes of a given project. The skeletal assemblages from Klenia, which are from a series of rescue excavations, suggest that the area of Klenia may have further archaeological significance that has yet to be explored. Future archaeological work and research in the area would be beneficial to the academic sphere, in that it holds the potential for further contributions to the archaeological record of the hinterland surrounding Corinth and to the contemporary understanding of Greek history. However, it is necessary to be concerned with public benefit and interest in addition to the benefit of academia. While visiting Klenia, an attempt was made by myself and my advisor, Dr. Maria Liston, to locate the excavation site from which the skeletal assemblages were recovered. The result of this attempt was that we were escorted by the mayor of the village to a nearby excavation site that

was more well-known, as it was associated with the recent recovery of the two *kouroi* statues (Morgan et al. 2010, 25). What is apparent is that there are different levels of interest in archaeological investigation depending on the elaborateness of the finds, which is not necessarily a bad thing, but it provokes the question of whether or not the public would be interested in future archaeological investigations for projects that may not return a great deal of interest or tourist attention. In going forward with archaeological research, then, it is important to consider the public benefit in conjunction with the academic, as well as make information pertaining to the lesser known excavations readily available to interested parties. While doing my work at the Wiener Laboratory in Athens, I was present for group tours of the lab, and was encouraged to answer questions from the individuals who found my work interesting. While this is a small-scale example, making information accessible and encouraging interest in a multitude of archaeological finds can be as simple as being transparent about the work.

1.6 Proposed Venue for Publication

I intend to submit my research for publication with the *Journal of Anthropological Archaeology*. This journal encourages submissions of articles with a range of archaeological topics spanning both time and space. Specifically, they welcome articles that explore human societies and their complex evolution, organization, and operation (Elsevier 2018). In addition, the journal offers open-access content with Elsevier publishing, which would allow for the easy circulation of this thesis work. This would be beneficial to the public significance of this research, as it will contribute to a wider awareness of the site of Klenia, and to potential benefits via future research projects.

Chapter Two
Bioarchaeology in Greece:
Breathing Life into the Early Helladic and Archaic Skeletal Assemblages from Klenia

2.1 Introduction

Human skeletal remains have the potential to reveal much about the past lifeways of individuals and groups of people. Data taken from such remains can provide information concerning diet, health, migrations, age-at-death, sex and pathological conditions, as well as bone representation within tomb contexts, which can give insights into burial practices. Archaeology is a field based on fragmentary evidence as a result of preservation biases and other limitations impacting the amount of data we have and our interpretations of that data. It is important to recognize the value of the fragments of material cultures and biological remains that are available and to analyze them carefully and fully, especially when dealing with materials from periods about which we know very little. In the past, analyses of human skeletal remains in Greece have been limited despite the abundance of ancient Greek cemeteries (Triantaphyllou 1999, 5). This is largely due to inadequate recording or the consideration of the skeletal remains as unimportant. However, in the past two decades, bioarchaeological work has become more prevalent, and the present work intends to contribute to this growth and also to encourage it further.

My research examines the assemblages of human skeletal remains recovered during rescue excavations in Klenia, Corinthia, Greece. These tombs date to the Early Bronze Age (EBA) or Early Helladic II (EH II; 2650-2200 BCE) and the historic Archaic (750-479 BCE) periods of Greece. Not much is currently known about the EH period (Cultraro 2007, 81). Therefore, the analysis of these tombs will contribute to filling the current gap that exists in our

understanding of this early period of Greek prehistory. Because there are written records and more extensive sites, we have a greater understanding of the Archaic period. Therefore, the approach taken with my single Archaic burial is an individualized osteobiography, in order to postulate what her life may have been like. A group approach will be taken with the commingled EH burials within the larger context of the EBA. The aims of this project include encouraging bioarchaeological work within Greece, developing interpretations about the lives of these individuals, and to contributing to the narrative of the EH period.

2.2 Klenia: Site and Excavation History

The human skeletal assemblages for my thesis originate from the small village of Klenia, (Tenea), which is located on the Greek mainland, roughly 15 kilometers south of ancient Corinth (Figure 1). On October 2nd of 2014, the first of five tombs was uncovered during the construction

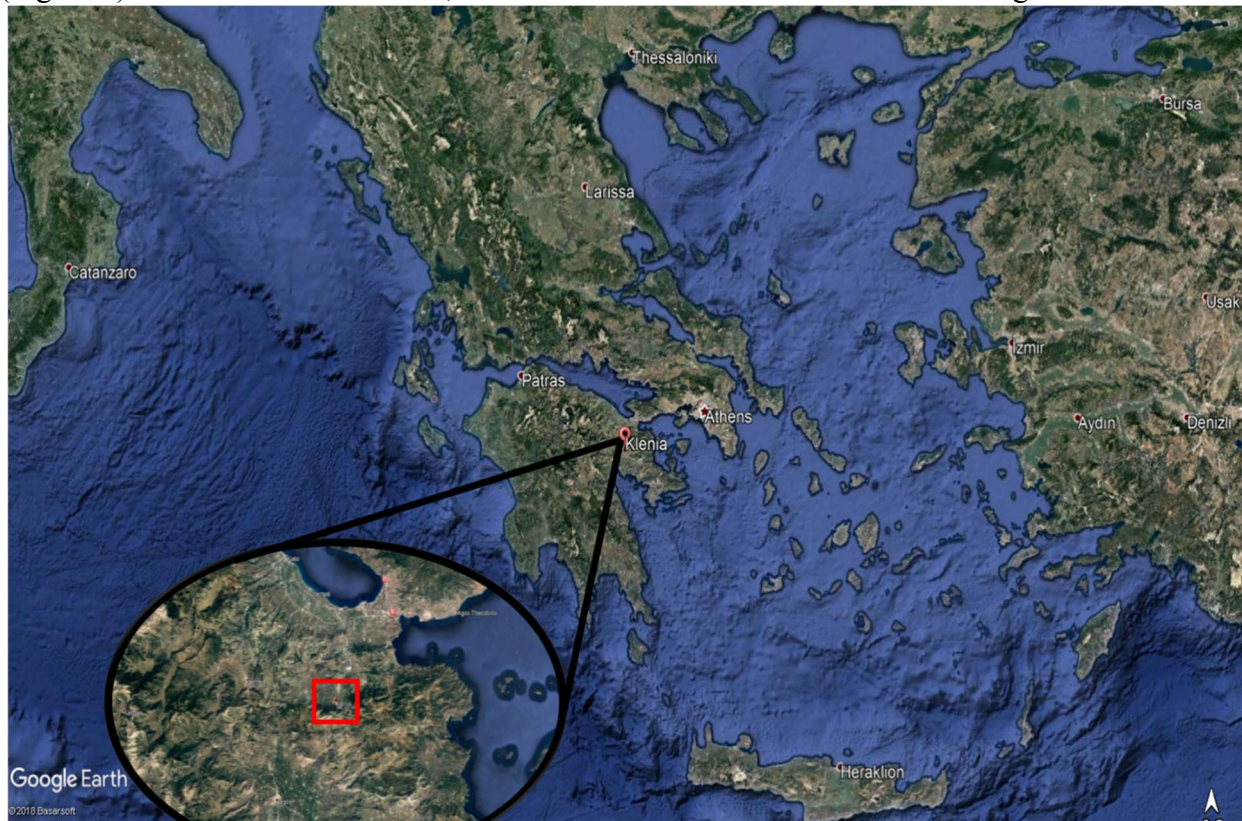


Figure 1. Map of Greece indicating the location of Klenia, Corinthia (Google Earth).

of a retaining wall. At this time, work was halted and the ΛΖ ΕΠΙΚΑ (37th Ephorate of Prehistoric and Classical Antiquities) began archaeological excavations, which were directed by Dorothea Rokkaki. The excavation site was located off of the road from Corinth to Argos, at the foot of a mountain called Bouvó (“Mountain”), on the top of which a modern-day cemetery is located.

Weather conditions resulted in the excavations taking place in three phases between 2014 and 2015. The first phase of excavations occurred between October 2-23, 2014. The second phase occurred November 17 - December 3, 2014, and the final phase from August 26 - September 9, 2015 (Rokkaki, pers. comm., 2018).

The tomb discovered during the construction of the retaining wall (Tomb I) dates to the Archaic period. Its construction consisted of a limestone larnax or box covered with a thick slab (Figure 2). In association with Tomb I were the skeletal remains of a single individual who was interred in a supine position as well as two ceramic vessels, a *kotyle* (drinking cup) and an *oinochoe* (wine jug). The placement of the Archaic burial, in line with the EH burials, provides some evidence that the earlier cemetery was known of at the time of the construction of the Archaic tomb (Figure 3). This continuity is seen today, with the modern cemetery located nearby. This suggests the likelihood of there being more tombs in the area.



Figure 2. Tomb I (Archaic), Klenia (Photo D. Rokkaki).

Tombs II through V date to the EH II period, 2,000 years earlier than the Archaic period. These tombs consisted of chambers cut into the bedrock containing multiple individuals in each, except for Tomb IV, from which no skeletal remains were recovered. The absence of skeletal remains from this tomb suggests that it was likely robbed at some earlier time. These tombs show signs of disturbances, and the skeletons are commingled and disarticulated in such a way that suggests their re-use for successive burials rather than having all of the individuals interred at the same time (Figure 4). In association with these tombs were three vessels that had been deposited as grave goods and a large quantity of obsidian blades that were frequently placed underneath the skulls (Rokkaki, pers. comm., 2018).



Figure 3. Alignment of the Archaic and Early Helladic tombs (Photo D. Rokkaki).

The placement of grave goods near to the skull has been documented elsewhere. Further, the use of obsidian as grave goods has been documented, for example, on the Cycladic islands, located east of the

Figure 4. Commingled Early Helladic tomb, Tomb V, Klenia (Photo D. Rokkaki).



Greek mainland. There, when there are multiple burials in one tomb, the skulls of previous burials are placed with stone ‘pillows’ in front of them, on which artifacts, such as obsidian blades, are deposited (Carter 1998, 180). At the site of Agios Stephanos on the Greek mainland, there is one example of an obsidian blade being placed on the skull of a male (Carter 1998, 226). Caches of obsidian flakes and blades have been found at other EH sites, for example, at Agios Kosmas, where the abundance of these objects led to the interpretation of involvement in Melian obsidian manufacture (Mylonas 1934, 267).

2.3 Chronology and Geography

Bronze Age dating has largely been developed using relative chronologies of ceramic assemblage types. The assigned periods of time follow a three-age framework (Manning 2010, 11; Shelmerdine 2008, 3). Absolute dating techniques, including radiocarbon dating, dendrochronology, and ice cores have been used to refine and validate Bronze Age chronology (Muhly 2010, 6). In Greece, the Bronze Age is split into Early, Middle, and Late, with these periods being split further into the typically tripartite subdivisions of I, II, III and A, B, C, etc. (Manning 2010; Shelmerdine 2008). While having a relative chronological framework is useful in situations where other methods are not available, the archaeological evidence for which these dates are created rarely fits this unilinear, evolutionary framework (Manning 2010, 11-15). It is important to recognize the flexibility of the dates resulting from variabilities in the use and disuse of assemblage types.

Using this system, the EBA or EH period in Greece begins in approximately 3100 BCE and ends in 2000 BCE. EH II (2650-2200 BCE) is recognized as a period within which there was much innovation and increasing social complexity with the use of monumental architecture, fortifications, metallurgy, status differentiation, and communication or trade between the regions

(Pullen 2008, 24). These changes originated during the Final Neolithic period (4500-3500 BCE), through trade networks and the production and use of metal tool technologies (Prevedorou 2015, 77). Further, the site organization and growing complexity throughout the EH period provides the framework required by the later Mycenaean civilizations on the Greek mainland, which involved large central palace-societies and a great deal of trade and social organization (Blintliff 2012, 83).

Dating methods for the Archaic period include the use of the relative and absolute methods previously discussed. In addition, writings of historical events that occurred during the Archaic period in Greece contribute to its chronology. The Archaic period begins in approximately 750 BCE and ends in 479 BCE, with the conclusion of the Battle of Plataea and the second Persian invasion in Greece (Wiesehöfer 2009, 162). Site formation and organization within the Archaic period is an expansion on the earlier central palace-societies, in that they consist of *poleis*, large established settlements or synoecized villages, most frequently with a central urban area and surrounding rural areas (Blintliff 2012, 236). Agricultural work was common, but specialized labor, such as ceramic, metal, and cloth production, also became prominent during this period (Wees 2009, 444-450).

The site of Klenia is commonly associated with ancient Tenea, which was recently identified at Chiliomodi, just north of modern Klenia (Maltezou and Kambas 2018). The settlement is located inland in a mountainous region of the Peloponnese, within the territory of Corinth, and lay on the main route from Corinth to Argos (Marchand 2009, 110). Corinth was a centre of trade and was famous for its wealth as well as its agricultural prosperity. This region would have been capable of supporting a considerable population during the prehistoric period (Blegen 1920, 10-11). Tenea/Klenia, located inland and within the Corinthian plain, would have

been an agricultural community, suggesting potential occupations of the individuals recovered from the EH tombs. In the Archaic period, it is likely that the area still held agricultural significance, although the increasing labor specialization suggests that the types of work may have diversified.

2.4 Previous Work: What can be said about the Early Helladic Period?

The EH period has been largely explored via the survey and excavation of settlements, while burial analyses are rare. Current understandings of EH burial practices are that the majority of burials involved multiple, successive inhumations like those seen at Klenia, and included little in the way of grave goods (Pullen 1994). One limitation on EH mortuary analysis is that the practice of multiple internments has been viewed as disrespectful by modern scholars who may not have understood their context (Prevedorou 2015, 113-4). Further, the lack of grave goods has contributed to the lack of mortuary analysis during this period and to the interpretation of a lack of social stratification or complexity (Weiberg 2007, 202-5). This has been recently contested, however, with finds of large caches of ceramics in other EH cemeteries, such as at Tsepi (Prevedorou 2015, 96). The multiple inhumations in EH graves are commonly interpreted as familial burials. However, some have argued that the number of individuals per tomb is too large to represent a nuclear family (Brannigan 1993, 93). As a result, alternative interpretations for this burial rite have been proposed, such as the inclusion of extended family within the tombs, village burials, the economic management of land resulting from population increases, and the existence of corporate groups (Pullen 1994, 130). Corporate groups in this context refers to non-biologically related social groups that use the cemetery landscape and burials to lay claim to land and resources (Prevedorou 2015, 10-11). Further, some scholars place EH communities into the social organization known as the chiefdom, which is commonly organized according to kinship

and common descent (Wiencke 1989, 497; 502). Therefore, commingled burials could also express this form of social organization, which is largely motivated by expressions of ancestry (Prevedorou 2015, 97).

In modern Greece, the commingling of human skeletal remains in secondary burials is still practiced. The process begins with burial in a rented tomb until decomposition is complete. Following this, the remains are exhumed, cleaned, and re-buried in a commingled tomb or placed into an ossuary. In the Greek Orthodox tradition, which practices secondary burial rites, it is believed that after the decomposition process is complete, the remaining skeletal elements are no longer representative of the once-living individual. Rather, the decomposition process releases the soul from the corporeal body, and the remnants are representative of the collective ancestral group. This is something that makes doing excavation work in Greece different from other locations. The exhumation and handling of human skeletal remains is a common practice, and is not viewed as disrespectful. Most of the commingled burials in contemporary Greece are representative of family groups, although there are examples of entire villages using communal burials (Danforth 1982; Fox and Marklein 2014, 195). It has been questioned whether this process in the EH period involved the contemporary two-step process of removal and re-burial (Mylonas 1934, 270-1), or simply involved the re-use of a singular tomb, wherein the skeletal remains from the previous burial rites are pushed to the side, or gathered in bags (M. Liston, pers. comm., 2018), in order to make room for the new interment.

The EH period, especially EH II, sees a significant rise in site density, associated with a rise in population size and social complexity (Blintliff 2012, 84; Cavanagh and Mee 1998, 15; Prevedorou 2015, 78). In late EH II, the site landscape consists of some larger sites with many smaller sites, frequently called farmsteads or hamlets, scattered in between (Wiencke 1989, 495-

7; Blintliff 2012, 84). With these developments come changes in land use. The exploitation of new land and the use of new agricultural technologies such as the plough and traction suggest an intensification of agriculture during the EH period (Blintliff 2012, 84; Prevedorou 2015, 78). Increases in trade networks are also prevalent during this period. The advances in technology and cultivation of vines, oils and cereals likely came from northern Greece, Anatolia, and the Levant. Local trade is seen in the transfer of ceramic tableware between different regions, which likely indicates a social practice more than one of necessity (Blintliff 2012, 83-5).

2.5 Archaeology and Bioarchaeology in Greece

In the period of time following the initial discovery of Bronze Age sites associated with Homeric epic by Heinrich Schliemann and his contemporaries, the practice of archaeology in Greece transitioned from a focus on the heroic to one driven scientifically and methodologically (see MacKinnon 2007; Muhly 2010; Stubbings 1972). With the introduction of new technologies and more attention being paid to material culture outside of the grandiose, advancements were made in the fields of ceramic analysis and site chronology (Muhly 2010, 3). Further, with the theoretical shifts in the discipline, specifically the formation of “New Archaeology” or processualism during the 1960s and 1970s, more attention was paid to biological and geological materials such as seeds, soils, sediments, and bones, both human and animal, leading to studies in site formation, paleoenvironmental studies and environmental reconstruction, diet, taphonomic studies, etc. (Mackinnon 2007, 474).

Until recently, the documentation provided for archaeological cemeteries sometimes included plans or burial sketches, but usually contained no details concerning the skeletal assemblages (MacKinnon 2007, 475). The study of human skeletons largely resided outside of the field of archaeology, and belonged to the disciplines of physical anthropology and biology,

and scholars from this background had little or no knowledge of history and archaeology (Triantaphyllou 1999, 5). The result of this disciplinary rift was the severe limitation of comprehensive analyses of human skeletal remains.

2.6 Theoretical Framework: Contextualization and Meaningful Interpretations

Excavated materials can shed light on the past, but deposition and sedimentary processes, which limit the survivability of ancient materials, leave much of the archaeological record in shadows. In addition, the archaeological record is messy not only because it is fragmentary, but because people are messy, too (Harraway 1988, 585; Hauser 2011, 192). When researchers ignore the partiality of their finds, they create complete narratives using only fragments of a story in order to answer the questions that they bring to the field. As a result, researchers unconsciously project their identities and biases, which impact the questions that they ask, the things that they perceive, and the conclusions that they draw, onto their interpretations of the past, and therefore obscure the realities of the ancient lives that they study (Campbell and Rice 2011, 57-63). Further, these contemporary interactions with the archaeological record make up only part of those that complicate it. The people of the past, those who create the record, are similarly complex in their identities and the ways in which they construct their world, and their archaeological remnants reflect this (Hauser 2011, 187).

The recognition of inherent bias and the impossibility of complete objectivity in research largely falls within the realm of post-processualism. This movement began in the 1980s as a reaction to the overtly scientific processualism or “New Archaeology” that became prevalent in the 1960s (Mackinnon 2007, 496; Wallace 2011, 21). At this time, many scholars moved away from the traditional cultural-historic framework and began exploration of archaeology as a science. For example, Binford (1962) argued that the cultural-historical framework that had

previously dominated the archaeological discipline was not scientifically testable. The post-processual movement largely emphasized the process of interpretation, highlighting the problems with processualism such as the impossibility of complete objectivity and the reality of the social construction of knowledge (Hodder 1986). This movement used the philosophical approach of hermeneutics, and moved away from scientific objectivity and into the realm of recognizing the multiplicity of perceptions and interpretations (Wallace 2011, 21). In recognizing bias and the multiplicity of interpretations of data owing to varying perspectives or paradigms, post-processual researchers advocate for the use of multiple lines of evidence and multiple interpretations to inform their own (Hodder 2012, 1-2). In addition, the contextualization of data within the appropriate temporal, geographical, social framework is important in creating meaningful interpretations of data (Hauser 2011). This is due to the impractical nature of universals, and the need for more localized or regional approaches in analysing data (Harraway 1988).

Biocultural theory is an important aspect of this contextualization. While skeletal elements can appear inherently biological in nature, the reality is that humans are the product of biocultural evolution, and our behaviour and environments, both natural and social, have influences on our biology which are visible in the skeleton in a variety of ways (see Agarwal 2011; Larsen 1997; Pearson and Buikstra 2016; Zuckerman and Armelagos 2011). While mortuary archaeology focuses on burial customs and the practices surrounding death in past populations, the analysis of human skeletal remains is really a study of the lives of those interred. This study of the Klenia population strives to provide the necessary context to appropriately situate the data, to be mindful of bias, and to recognize the value of multiple perspectives and

interpretations. Further, it intends to reach meaningful interpretations concerning the lives of those buried at the site during the EH and Archaic periods in Corinthia, Greece.

2.7 Methodology

The data collection portion of this research project provides basic osteobiographical information for the Klenia assemblages. In doing so, the standard bioarchaeological methods outlined by Buikstra and Ubelaker (1994) were consulted, as well as additional methodologies as required by the skeletal assemblages. The methods used in this analysis are largely directed by the degree of preservation and the commingling of the EH burials.

The data collection took place in the Wiener Laboratory of the American School at Athens, in Athens, Greece. Upon arriving at the lab, the skeletal assemblages from Klenia were still caked in dirt from the excavation process, which made the observation of morphological characteristics difficult if not impossible. As a result, the first step in my analysis involved the careful washing of the bones, followed by the reconstruction of skeletal elements. This process aided in piecing together more complete bones for the later Minimum Number of Individuals (MNI) and Most Likely Number of Individuals (MLNI) analyses, and also demonstrated the level of commingling of the remains by identifying joins between archaeological passes.

I calculated both MNI and MLNI to increase the accuracy of population estimates. MNI has been described as an estimate of the recovered assemblage (Adams and Konigsberg 2008, 241). MNI makes use of a specific element or feature that is sided, to avoid counting the same individual twice. For example, the presence of four right tibiae from a funerary context indicates that there were at least four individuals buried within a tomb. However, MNI always underestimates the number of interred individuals. MLNI calculates the number of those interred

at the time of death as opposed to at recovery, which follows a series of taphonomic occurrences that limit the number of bones recovered from a given archaeological context. This is done via pair matching, which involves the comparison of the right and left elements to determine if they belong to the same individual, and then using the following calculation: $MLNI = \frac{(L+1)(R+1)}{P+1} - 1$, where L represents the number of left-sided elements, R represents the number of right-sided elements, and P represents the number of pair matches (Adams and Konigsberg 2008, 241-6).

The biggest danger to an MLNI calculation is the misidentification of pairs, which can be limited via the processes of rejoining fragments (Adams and Konigsberg 2008, 247-9). In the Klenia sample, the remains were reconstructed, and then multiple skeletal elements were used in determining the MLNI in order to account for potential errors.

Due to the fragmentary and commingled nature of the Klenia skeletal assemblages, the analysis of age-at-death and sex was also completed using multiple methods. The methods used in determining biological sex from human skeletal remains primarily rely on the use of the *os coxae* and cranium, although alternative methods of determination using long bone measurements and tooth morphology have also been used. These methods rely on the degree of sexual dimorphism that is present between males and females in any given human population. In general, males tend to be larger and more robust, while females are smaller and more gracile in their features. Further, the biomechanical features of the *os coxae*, which are developed due to the biological changes relating to childbirth, increase the extent of sexual dimorphism present in the bone. Therefore, the most common and reliable methods of sexing human skeletal remains use the features of the pelvis (Buikstra and Ubelaker 1994, 16; Phenice 1969). From the Klenia sample, the only pubis present was from Tomb I, and this was used in a determination of sex for this individual inhumation. Other methods of sexing used with the Klenia sample include the

morphological features of the preserved crania and mandible (Walker 2008), as well as the measurement of one femoral head (Bass 1987, 220). The morphoscopic analysis of the cranium involved the observation of the nuchal crest, mastoid process, supraorbital margin, glabella, and mental eminence, which were all scored based on their robusticity, or lack thereof, in order to give a quantified estimate of biological sex (Walker 2008).

There are also a variety of ways by which to determine the age-at-death in human skeletal remains. These include via dental eruption and wear, the fusing of epiphyses and cranial sutures, and through the appearance of articular joints. The joints considered the most diagnostic of age-at-death include the pubic symphysis and the auricular surface. As a result, the age-related changes visible in these skeletal elements have been extensively studied, described, and categorized into phases by Todd (1920), Suchey and Brooks (1990), and Lovejoy et al. (1985). Other areas of articulation on the human skeleton may have broad markers of age in the form of osteoarthritis, but these have no clearly defined age categories. In addition, while arthritis is more common in older individuals, some types, such as rheumatoid arthritis, are known to affect adolescents, making age diagnoses using the arthritic appearance of joints less reliable (Cruse 2002). The single pubis bone present for Tomb I was used in aging this individual, but additional alternative methods were consulted for Tomb I as well as for the EH Tombs. The alternative methods used include aging via dental wear (Brothwell 1981, 72), diaphyseal measurements (Schaefer et al. 2009), the measurement of an unerupted dental crown (Hillson 1996, 136), as well as cranial suture aging (Meindl and Lovejoy 1985).

The use of multiple methods as a response to fragmentary skeletal remains intends to increase accuracy. However, it is necessary to address the varying reliability between these methods. While the observation of the pubis is a more reliable method of determining of

biological sex, other methods may not be as accurate. This is due to factors of preservation, the age of the individual, and the morphological variation found within and between human populations. The age of the individual is important because sexing human remains is more difficult, if not impossible, when the remains belong to an adolescent individual who has not yet reached sexual maturity (Buikstra and Ubelaker 1994, 16). Additionally, as females get older, alterations in their bony tissues and skeletal structure related to post-menopausal changes often result in their misidentification as males (Larsen 1997, 335). Concerning variation, the categorization of people into binaries presents issues in the sense that people and their biology rarely fit into discrete categories. Moreover, most of the standards commonly used in skeletal analysis were made using series consisting of European and modern American populations, and studies have shown that the variations seen in these populations are not necessarily applicable to different geographical and prehistoric contexts (White et al. 2011).

Concerning age-at-death, juvenile skeletal remains are easier to age due to there being a number of well-documented age-related changes that occur throughout childhood and adolescence, such as the phases of dental eruption. Over time, age markers become more ambiguous, and the methods of aging skeletal remains become less accurate (White et al. 2011). Some of the methods used in these determinations for the Klenia sample are less reliable than others, but were used due to the fragmentary state of the remains. For example, cranial suture aging is less reliable due to variability in suture closure rates, and estimating age-at-death from dental wear is also less accurate due to the potential impacts of diet and extra-masticatory activities that also influence dental wear. As a result of these methodological concerns, I am using as many methods as possible, and am bring transparent about their relative accuracies. Further, where applicable, I compare the Klenia remains with the comparative collection at the

Wiener Laboratory, which contains skeletal remains more applicable to an ancient Greek population.

2.8 The Klenia Skeletons

The human skeletal assemblages recovered from the excavations in Klenia experienced several taphonomic processes that limited bone preservation. Tomb I, the single Archaic burial, was contained within a limestone box. Due to this construction, water pooled within the tomb, which deteriorated the portions of the bone resting on the bottom. The skeletal assemblages found within the EH burials also experienced deterioration as a result of water damage, as well as from the growth of plant roots and the gnawing of rodents. Further, some of these remains experienced damage from excavation. The poor preservation of the remains, while not terrible given the length of time spent entombed, largely directed and limited the data collection and analysis for this project. A discussion of each of these tombs and what was discernable in terms of age-at-death, sex, and pathological representations, follows. A summary of this data can be found in *Table 1*.

Tomb I, which dates to the Archaic period, contained one individual. I estimated that this individual is an adult female, with an age that exceeded at least 50 years at the time of death. Age was determined using the levels of deterioration on the symphyseal surface of the pubis and ossification of the sternal rib ends, as well as the degree of cranial suture obliteration. In determining sex, the features of the pubis from Tomb I were scored all within the female range (1-2), while the scores for the cranium varied between female and ambiguity (1-3) (Phenice 1969; Walker 2008). Overall, the estimated sex for the individual was a 1 for the pubis and a 2 for the skull, with the presence of the ventral arc on the pubis strongly indicating that the individual was female (Figure 5). In scoring the pubic symphysis for the determination of age,

the score using Todd (1920) was a 9 or a 10 (45-50+ years), while the score using Suchey-Brooks (1990) was a 5 or a 6 (\bar{x} = 49-59 years). Cranial suture aging for this individual provides a composite lateral-anterior score of 9, which is within the S6 age category and provides an age range of between 40 and 60 and over, with a mean age of 53 (Buikstra and Ubelaker 1994, 32-6). I was unable to confidently determine a composite vault score due to the deterioration of



Figure 5. Ventral arc, Tomb I, Klenia (Photo E. Schaljo).

the cranium and the sutures required for this measurement. Sternal rib-end aging was also used. The phase of rib-end aging determined for this individual was a 7 or an 8, providing age ranges of between 59 and 71, and 70 or over (İşcan and Loth 1986). While this method was developed with the use of the fourth rib in mind, Dudar (1993) suggests that it is possible to apply the technique to other sternal rib ends, albeit cautiously. Taking into consideration all of these methods and their varying reliability, I determined that the age-at-death for this individual was at least 50 years, but likely exceeded this.

Pathological markers will be discussed further in drawing interpretations from these remains (see 2.9, *Discussion*), but include the presence of osteoarthritis in the lumbar spine, alveolar resorption and tooth loss, and the growth of plaque on the costal surfaces of the vertebral ends of several of the ribs, likely associated with a chronic lung inflammation or irritation (for the impacts of inflammation on bone, see Weston 2008; Weston 2012). Pitting was observed on the endocranial surface of the skull which was initially thought to represent

pathology, but x-rays of the cranium suggest that these were caused by the same taphonomic processes that eroded the left side of the skull as well as several portions of the long bones. Despite the poor preservation, two out of three of this individual's auditory ossicles, the malleus and the incus bones, were found preserved within the internal auditory meatus. These bones are typically not well-preserved in archaeological contexts due to their small size and frequent displacement from the skull (White and Folkens 2005, 100). Their preservation is further confirmation that the body remained relatively undisturbed after burial. The observation of the morphological characteristics of the dentition in association with this individual was also difficult due to the layer of calcareous residue, likely limestone deposits, coating much of the bony and dental elements.

Tombs II, III, and V date to EH II and consist of commingled burials. In studying these, the assemblages were sorted by bone type and side in order to determine the MNI and MLNI. Following this, analyses of the available skeletal elements allow for discussions about age and sex representation within each of these tombs. Many of the skeletal elements in association with the EH tombs are highly fragmentary. This limited the inclusion of some elements in the number estimates and contributed to difficulties in observing pathological changes. The total estimated population from Tombs II, III and V using MNI is 20. While using MLNI, the total estimated population is 29. Tombs II and V had similar results between their MNI and MLNI calculations, likely due to the fragmentation of the skeletal remains and the resulting caution used in determining pair matches. A breakdown of these estimates and a discussion of age-at-death and sex follows.

Tomb II included the burials of at least four adults and two juveniles, as indicated by both the MNI and MLNI. The highest number for the adult MLNI comes from the femora. The

number of juveniles was determined from the presence of two left and one right juvenile tibia, with one pair match between the sides. The absence of any reliable indicators of sex from the adult remains, such as *os coxae* or full crania, makes the determination of sex from these remains more difficult. The age of a juvenile humerus and clavicle was estimated using the diaphysis measurements (Schaefer et al. 2009, 144; 174). An estimated range of measurements for these bones was used, as both bones are incomplete. The estimated maximum length of the humerus is between 207 and 217 mm, which provides a rough age estimate of between 8 and 10 years. The estimated length of the clavicle, between 113 and 118 mm, provides an age estimate of between 13 and 15 years. These differential age ranges support the number of juveniles being two. No pathological conditions were observed on the skeletal remains from Tomb II.

The ulnae, radii, and humeri from Tomb III all indicate an MLNI of eleven adults. In addition, the radii, humeri, and femora all indicate an MLNI of two juveniles. There are four adult mandibles from discrete individuals (Figure 6), and the MNI for this tomb, which is based on the distal ends of left humeri, is five. The discrepancy between the MNI and MLNI calculations for the adults represented is largely due to the lack of pair matches found for the MLNI calculations. However, as noted earlier, MLNI counts have been found to be highly accurate, and the underrepresentation of adults in the other elements from Tomb III may indicate either preservation biases or the removal of skeletal elements during secondary burial practices. The removal of skeletal elements from tombs, especially crania, during secondary burial rites has been documented in Turkey and Greece during the Neolithic period (Haddow and Knüsel 2017; Triantaphyllou 2008, 146). The highly fragmentary nature of the EH tombs at Klenia makes the determination of deliberate removal of skeletal elements uncertain. However, the number of individuals in Tomb III relative to the scarcity of cranial fragments from this tomb, and also



Figure 6. Mandibles 1 through 4, Tomb III, Klenia (Photo E. Schaljo).

relative to the better cranial preservation in Tombs II and V, could indicate that the crania were being removed from Tomb III. Techniques for age and sex determination were employed on the four mandibles, the dentition, and on one well-preserved femoral head. As discussed earlier, age determination using dental wear, especially on disassociated dentition, is a less accurate method. As a result, the following age ranges should be understood as broad estimates, included here due to there being no other skeletal elements suitable for age determination. The first mandible has a great degree of ante-mortem tooth loss and alveolar resorption, suggesting an individual of older age. The second mandible that retained one molar with little to no wear falls within the young-adult age range of between 17 and 25 years old (Brothwell 1981, 72). This mandible is gracile, and may represent a female. The third mandible has moderate wear on its dentition, which indicates an age of between 25 and 35 years. The fourth mandible, which retained no teeth due to post-mortem damages, has a large mental eminence, suggesting that this individual is male. The teeth disassociated from a mandible or maxilla have little wear and fall within the 17 to 25-year range (Brothwell 1981, 72). These do not represent discrete individuals, as the disassociated dentition could belong to one of the individuals already represented by a mandible. A total

diameter measurement could be recovered from one femoral head, which was 40.43 mm, and falls within the female range (Bass 1987, 220). Three of the mandibles from Tomb III show evidence of alveolar resorption, which may indicate periodontal disease. No other pathologies from Tomb III were observed.

The skeletal assemblage from Tomb V represents six adults and three juveniles, based on the MLNI from the humeri. The MNI for this tomb is five adults and two juveniles. The age and sex of the remains were explored using the crania, dentition, and the long bone measurement of a juvenile femur. Cranial



Figure 7. Crania 2 and 3, Tomb V, Klenia (Photo E. Schaljo).

suture aging was used on Crania 2 and 3, both of which are relatively complete (Figure 7). The sutures on Cranium 2 resulted in a composite vault score of a 7 or 9, which places the individual into the S3 age category. This provides an age range of between 28 and 44 years, with a mean



Figure 8. Deciduous second molar, underdeveloped, Tomb V, Klenia (Photo E. Schaljo).

age of 38. The sutures of Cranium 3 have a composite vault score of 14, which is within the S4 category, and provides an age range of between 31 and 62 years, with a mean age of 44 (Buikstra and Ubelaker 1994, 33-6). Age from dental wear was used on three adult molars, two of which fall within the 17 to 25 age range, and one of which falls into the 33 to 45 age range (Brothwell 1981, 72). In addition, there is one deciduous second molar that was not fully developed at the time of death, which was measured in order to

calculate age (Figure 8). Its height of 5.06 mm provides an age range of between 4 and 10 months (Hillson 1996, 136). Although unmeasurable for use in an age calculation due to their preservation, three small phalanges also suggest the presence of an infant burial within Tomb V (Figure 9).



Figure 9. Three small phalanges from Tomb V, possibly representing the infant burial (Photo E. Schaljo).

Further, the juvenile femur was measured at 146 mm. In order to account for the missing portion of this bone, 2.5 cm were added onto this measurement, a correction based on

comparison to juvenile bones of similar size from the Wiener Laboratory collection, creating a total estimated length of 171 mm. This provides an age estimate of two years (Schaefer et al. 2009, 267). No obvious pathologies were found from the skeletal assemblage in Tomb V.

Table 1: Summary of Skeletal Data from Klenia

	MNI - Adults	MLNI – Adults	Males	Females	Age Range(s) ^a	MNI- Juveniles	MLNI – Juveniles	Age Range(s)
Tomb I	-	1	-	1	50+	-	-	-
Tomb II	4	4	N/A ^b	N/A	-	2	2	8-10 13-15
Tomb III	5	11	1	2 ^c	17-25 25-35	2	2	-
Tomb IV ^d	-	-	-	-	-	-	-	-
Tomb V	5	6	N/A	N/A	17-25 28-44 31-62 33-45	2	3	4-10 M ^e 2
Totals ^f	14	22	1	3		6	7	

^a In years, unless otherwise noted

^b Sex was unable to be determined confidently using the available skeletal elements

^c Two skeletal elements reflect female characteristics, but could belong to the same female

^d No human skeletal remains were recovered from Tomb IV

^e M - Months

^f Total (Adult + Juvenile) MNI = 20; Total (Adult + Juvenile) MLNI = 29

2.9 Discussion

The tombs from Klenia and the skeletal and dental remains in association with them reveal much about what life was like for the interred individuals. Tomb I, the single inhumation from the Archaic period, will be considered in an individualized osteobiographical sense. When considered within the Archaic context and what is known about the lives of females during this period, the skeletal remains from Tomb I reveal information pertaining to her lifeway and potential activities such as food preparation and the weaving of garments. The EH remains will be considered on a population level, albeit a small one, within the context of the EBA in Corinthia. The EH tombs support ideas concerning the social and familial nature of commingled tombs and ideas about agricultural activities during the period, while also countering previous understandings of infant burials during the EH period.

In taking a more individualized approach with Tomb I, I am looking at contextual data from the Archaic period that is relevant to the gendered roles commonly associated with females. As a historic period, much of what is known about the Archaic period comes from ancient texts (see Wees 2005). However, the lives of females from the female perspective is lacking, since the majority of primary source authors are male (Katz 1992, 79). In addition to literary sources, Morris (1999) attempts to discern gender roles via archaeology. In comparing the use of space in Greek homes over time, he concludes that stricter gender ideologies became present in the Archaic period. The roles generally associated with women in this period largely centered around the control over the property and household. Responsibilities included raising children, supervising the preparation of food, keeping the family's financial accounts, directing the work of slaves and nursing them when they were ill, and also textile weaving (Martin 2013, 87-89; Wees 2005, 10). Marriage was arranged by men, fathers would betroth a daughter to another

man's son when she was a child. She would be married young, likely in her early teens, and an exchange of a dowry would take place, potentially one of land and also personal possessions (Martin 2013, 87-89; Pomeroy 1995, 41). This is not to say that this was the experience of every single female during the Archaic period, but the norms of the period do allow some insight into what this individual's life may have been like in addition to her skeletal remains.



Figure 10. Parturition scars, Tomb I, Klenia (Photo E. Schaljo).

From her skeletal remains, it can be said that she probably was a mother, or at least, she likely gave birth. This is suggested by the scarring on her pubis that may indicate parturition or pregnancy (Figure 10). Dorsal pitting on the pubis is frequently associated with strain during childbirth, especially when observed in younger females (Kelley 1979; Snodgrass and Galloway 2003; Suchey et al. 1979). However, the changes on the dorsal surface become less reliable with age, and have also been observed on male pubic bones, indicating that there are causes for these changes outside of pregnancy (Suchey et al. 1979, 522). While studies show a strong correlation between dorsal pitting and childbirth, the age of the female from Tomb I coupled with the potential alternate causes of dorsal pitting results in the likelihood, not

Figure 11. Alveolar resorption on the maxillae, Tomb I, Klenia (Photo E. Schaljo).





Figure 12. Lipping and the growth of osteophytes on a lumbar vertebra, indicating osteoarthritis, Tomb I, Klenia (Photo E. Schaljo).

certainly, of parturition. She also lived a long life, and likely experienced difficulties and pain from the various pathological conditions. The alveolar resorption and resulting tooth loss indicate that she had periodontal disease and that she would have had difficulty with chewing properly (Figure 11). She may have also worn down her teeth in the processing of animal hides, and probably in spinning and weaving, which was a common practice of women in the Archaic period (Larsen 1997, 77). In addition, the presence of osteoarthritis in her lower spine suggests difficult movement in this region of the body (Figure 12). Spinal osteoarthritis is a degeneration of the vertebral bodies and discs which frequently results in lipping and the growth of osteophytes (Larsen 1997, 162-5). Further, the plaque on her ribs likely indicates a chronic infection or irritation of the lungs (Figure 13). This could be the result of smoke inhalation, which would be expected for someone involved in food preparation (M. Liston, pers. comm., 2018). There are also a variety of infections and diseases that cause chronic lung irritation, including pneumonia, bronchitis, tuberculosis, asthma, etc. (Chung and Pavord 2008). There is no additional skeletal evidence for these conditions, but this does not rule out the possibility of there being additional causes for the observed plaque. These conditions would have affected her day-to-day life, but her age indicates that she was healthy and strong enough to survive these impacts. This is the only Archaic burial that was found during these rescue excavations in Klenia, but it is highly likely that there are more nearby, and recent



Figure 13. Plaque on the ribs indicating a possible inflammation or irritation of the lungs, Tomb I, Klenia (Photo E. Schaljo).

excavations outside of the village of Klenia revealed several burials that look remarkably similar to Tomb I in appearance and date.

Generally speaking, the EH tombs at Klenia included multiple, successive burials that were commingled as the internments occurred. Further, these tombs incorporated the burials of both males and females, as well as that of infants, juveniles, adults, and perhaps elders. Therefore, there appears to be no segregation within or between the tombs based on sex or age, which contrasts previous understandings regarding EH burials. At other EH sites, infants had only been found buried within houses, with the conclusion being that age played a role in social status, in that infants were not considered as equal members of society and were excluded from the common burials as a result (Pullen 1994, 128). My

research counters this argument, as have other, more recent osteological discoveries in Greece, such as findings in the cemetery at Tsepi (Prevedorou 2015). Finding skeletal infant remains is also important as it indicates improvement in bioarchaeological recovery techniques.

With this age and sex representation within the tombs, it does seem likely that they represent familial burials, likely including extended members due to the number of occupants within each tomb. If not familial, these tombs likely represent some form of association, be it biologically related or not, which opens the tombs up to interpretations of social organization or

the recognition of lineages or social connections via burial context. In Crete, it has been proposed that these multiple burials could represent a village simply filling up one tomb before constructing another (Brannigan 1993, 94). However, in a discussion of the Mesara *tholoi* tombs on Crete, Brannigan (1993) suggests that when in close proximity to one another, it is clear that they are used contemporaneously, indicating that it is more likely that these tombs represent an extended family or a clan group, which is similar to what I am proposing for the Klenia individuals.

Beyond the presence of dental disease on some of the recovered mandibles observed via alveolar resorption, little pathology was found in the EH tombs. This does not mean that the population was necessarily disease-free, rather, it could indicate that the individuals died before a disease or condition impacted the bony tissues. The lack of a direct relationship between archaeological skeletal assemblages and the health of the living population is called the Osteological Paradox (Wood et al. 1992). For example, human skeletal remains with a large quantity of skeletal pathologies may indicate that the individual was healthy, in the sense that he or she survived long enough for the condition(s) to impact the bony tissues. The lack of pathology could also be the result of the many taphonomic processes that have severely limited the preservation of the bones.

An anomalous feature of the dentition is the presence of three highly shovelled incisors from Tomb II, which are disassociated from any discrete individual. The shovelled incisors is a genetic nonmetric trait, which can suggest of migration and/or gene flow in some cases (Larsen 1997, 305; 317). This feature is most frequently found in Native American and Asian populations, and is rarer in African or European populations (Kimura et al. 2009, 528). However, it is not too surprising to find this in Greece, as trade routes provided contact with Asia. Further,

studies involving both geographically and temporally related groups have found shovelling in modern Turkish populations, in Minoan populations on Crete during the Middle Minoan period (1750-1550 BCE), and even in Neanderthal remains from Southern Greece (Canger et al. 2014; Carr 1960; Harvati et al. 2013). This feature might be used in determining genetic relatedness, but the teeth in question represent a small sample and are also disassociated from any discrete individual(s), making this discussion less appropriate.

A trait that stands out among the EH tombs is the shape of the tibiae. Many of those in association with these tombs are fairly flat, or platycnemic in appearance (Figure 14). This is



Figure 14. Tibia from Tomb V, Klenia, showing mediolateral flattening (platycnemia) (Photo E. Schaljo).

important because bone shape can indicate biomechanical loads. According to Wolff's Law, bone tissue will develop in the direction of functional demand, which means that bone variation that is related to biomechanical function can also be used to indicate activity patterns (Larsen 1997, 195). Platycnemic tibiae are frequently associated with more stress in terms of bending and torsion (Lovejoy et al. 1976). While

associating specific activities with tibial shapes is inappropriate, it can be said that the shape in this population represents some form of biomechanical stress. Given the context of the EH period, which sees the intensification of agriculture and the use of new agricultural technologies such as the plough and traction, the shape of the tibiae may be related to farming activity. In addition to biomechanical stress, platycnemia has been previously thought to relate to stress from nutritional deficiencies (Larsen 1997, 222). The lack of other markers indicating nutritional

stress in the EH remains makes this determination difficult. However, the presence of platycnemia in the tibiae does not necessarily mean that it has to be either biomechanical or nutritional stress, as there is the potential for both of these factors to impact the population simultaneously. Studies have shown that increased agricultural exploitation during the Neolithic gave rise to new health and nutritional concerns within human populations (Armelagos et al. 1991; Larsen 1995; Omran 1971). This resulted from increased sedentism, close proximity to domesticated animals, rising population density, and a decrease in food variety as staple crops became more prevalent in diets. As a result, agricultural intensification and nutritional stress can go hand in hand, suggesting that both factors could be responsible for the stress causing the flattening of the tibiae in the EH population.

2.10 Conclusions

My analysis of the EH remains from Klenia both confirms and alters understandings of the period. The tombs are likely familial in nature, although there is the potential that they represent another form of association. The concern with kinship in chiefdom societies, which is the form of social organization commonly associated with the EH period in Greece, suggests the importance of representing social lineages in burial contexts. The exploitation of new land resulting from increased agricultural intensification could also indicate the importance of laying claim to land and resources by using cemeteries. This exploitation occurs at the same time that cemeteries, areas close to but outside of the living settlements, become prominent on the Greek mainland (Cavanagh and Mee 1998, 20; Prevedorou 2015, 101; Pullen 1994, 126). During the EH period, we see increasing population density and site trends revealing the growth of well-established 'central places' that have better control over resources and the frequent abandonment of smaller and newer settlements (Wiencke 1989, 499). Therefore, it is possible that social

groups would be competing for land, and may have used cemeteries to do so. In addition, the aforementioned intensification of agriculture during this period is possibly indicated by the morphological characteristics of the tibiae in association with the EH tombs.

Counter to what was previously understood, my research indicates that infants were buried within the common tombs as opposed to only within the home. Infant remains have been found in other recent bioarchaeological studies within Greece (Prevedorou 2015, 97), although previous excavations rarely found infant remains unless they were interred individually, most frequently within the home (Pullen 1994, 128). The reasoning for this largely comes from the improvement of bioarchaeological recovery techniques in Greece, which can be attributed to the recognition of the importance of skeletal remains to archaeological inquiry that accompanied theoretical changes in the discipline (MacKinnon 2007, 474). Therefore, it can be said that the lack of infant skeletal remains from previously excavated EH cemeteries is not the result of infants being excluded from these tombs. Rather, it is far more likely the result of recovery biases that directly relate to there being less concern for bioarcheology at the time of these excavations. As a result, the advancements in skeletal analyses in Greece not only allow insight into biological aspects of the individuals of the past, but also improve our understanding of population dynamics and burial customs.

While it is difficult to draw broad interpretations about the Archaic period from the single female inhumation found at Klenia, it is my hope that my analysis has provided insight into her life during the Archaic period in Greece. A long life including the possibility of childbirth and daily activities involving food preparation and textile weaving paints a conceivable picture of this individual as a mother and caretaker. The probability of more burials at the site of Klenia

indicated by the positioning of the Archaic tomb in relation to the EH tombs suggests the potential to breathe more life back into these periods and the individuals who lived during them.

Skeletal studies in Greece have only become common recently, despite the abundance of evidence from archaeological cemeteries. Data from mortuary contexts is especially lacking for the early periods of Greek prehistory due to the frequent commingling of remains and lack of associated grave goods. My work has shown that the improvements in skeletal analysis in Greek archaeology has added and continues to add insights into these periods, including in the way of social dynamics and lifeways of the individuals. I have attempted to provide an overview and first look at the skeletal assemblages from Klenia, while leaving room for future projects such as further explorations of diet, health, and pathology. In addition, future archaeological investigations may provide insights into the connection between the Klenia skeletal assemblages and the other discoveries in Tenea/Chiliomodi. It is my hope that my work will both contribute to the current understanding of these periods of Greek history, and encourage bioarchaeological work in Greece.

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