

Skeletons in Wells: Post-Mortem Treatments in Roman Eretria, Greece

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

This thesis is an osteoarchaeological analysis of adult and juvenile human skeletal remains (more specifically, crania and long bones) that were excavated by the Swiss School of Archaeology from a 3rd century CE Gymnasium well at Eretria during the field seasons of 2016 and 2017. The bones were commingled and incomplete; attempts to identify individuals yielded little additional information. Personal criteria such as age, sex, pathology, as well as taphonomic and other changes on bone were recorded. The data collected from the skeletal remains are used to determine whether these individuals were deposited in the well as skeletonized individuals or as whole bodies. The level of breakage, the sharp force trauma, and the missing elements of bone suggest that the adults and juveniles entered the well as skeletonized individuals. It is likely that these individuals were buried elsewhere first and that the deposit in the Gymnasium well is a secondary interment. This thesis further argues that the individuals that were deposited in the Eretrian Gymnasium well received a variation of a “normative” manner of burial in ancient Greece as opposed to a form of “deviant” burial that human skeletal remains in wells have come to be associated with in archaeological literature. The thesis will explore why the term “deviant” should be broadened when it is being applied to burial practices.

Key Words: Skeletons in wells, leprosy, “deviant” burial, Roman Eretria

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List of Abbreviations

BCE	Before Common Era
CAPA-ACAP	The Canadian Association for Physical Anthropology- L' Association Canadienne d' Anthropologie Physique
CE	Common Era
ESAG	Swiss School of Archaeology in Greece
KAS	<i>Kendriko Archaiologiko Symvoulío</i> (Central Archaeological Council)
LEH	Linear Enamel Hypoplasia
MLNI	Most Likely Number of Individuals
MNI	Minimum number of Individuals

Chapter One: Ethical Considerations and International Cooperation in Greek

Bioarchaeology

1.1 Introduction

Information gathered from skeletal remains can provide important insights about archaeological sites and the people that occupied these locations. Although the skeletal remains that bioarchaeologists study may belong to historical people, analysis of remains, and the results gathered, have implications in the modern world. For example, interpretations by archaeologists can influence the way in which people view their cultural heritage. Numerous rules, regulations, and ethical guidelines are in place to protect the material that are being studied to answer our questions about the past.

In bioarchaeology, researchers must treat the skeletal remains that they study with care and respect regardless of the geographical location or the time period (Cybulski 1979; Walker 2000). All researchers are responsible for the preservation of remains so that the remains can be re-examined in the future, long after their own research is completed (Cybulski 1979; Walker 2000). If the remains under examination can be linked with any descendant populations, researchers are also responsible for conducting their work in collaboration with these populations (CAPA-ACAP 2019; Cybulski 1979; Walker 2000).

A perspective of public anthropology can be used to understand the ethical concerns that researchers must face throughout their work. This chapter is a discussion of some of the ethical concerns of bioarchaeological and archaeological research. The skeletal remains that will be discussed in chapter two of this thesis were excavated from a third century CE gymnasium well located at the Greek town of Eretria. Therefore, ethical considerations of bioarchaeology and archaeology will be discussed in a Greek context.

1.2 The Public

Prior to a discussion of bioarchaeological and archaeological implications of the research project described in chapter two, the “public” of public anthropology should be considered. The word “public” is hard to define. This is because the public is not a homogenous entity (Richardson and Almansa-Sánchez, 2015). Definitions of the public depend on the specific geographical location, culture and society (Richardson and Almansa-Sánchez, 2015). The responsibility of the researcher is to conduct their research according to ethical practices by considering the specific needs and values of the colleagues, as well as the communities, that are involved in the research project (Richardson and Almansa-Sánchez, 2015). Within this study, the public is an amalgamation of several agents; both academics in the field, and members of the local community.

There are multiple stakeholders within Greek archaeology. These stakeholders are the Ministry of Culture and Sport, the Greek Archaeological Service and Central Archaeological Council (KAS) that operates within that Ministry, the universities, foreign archaeological schools, museums, and the local communities. Co-operation between each of these diverse groups is important. However, conflicts between these entities are not uncommon. For example, local property owners may not view archaeologists favourably if they have to vacate their properties because of excavations that are going to be conducted on their land. For example, in Amarynthos, a town east of Eretria, the Swiss School of Archaeology in Greece (ESAG), had to demolish multiple vacation homes in order to excavate the Sanctuary of Artemis Amarysia.

1.3 Bioarchaeology and Ethics

In bioarchaeological research, ethical considerations should be clarified prior to the analysis of human remains. Ethics practised during excavation and study of human remains in North

America cannot necessarily be applied to a project in Greece, as social attitudes toward handling of skeletal remains are not the same in Greece as they are in North America. In Canada, respecting the wishes of the descendant Indigenous communities regarding the skeletal remains of their ancestors is paramount in bioarchaeological research (CAPA-ACAP, 2019). Good ethical practice demands that bioarchaeologists should work in collaboration with descendant communities. In Greece, governmental authorities and Modern Greek people constitute the descendant communities, so their opinions strongly influence the process and presentation of research.

The custom of exhuming the dead after a period of time is common in all parts of contemporary Greece (Alexiou, 2002). Upon exhumation, the remains of the dead are usually placed in individual boxes within an ossuary (Danforth, 1982). With this, the deceased cease to exist as individuals and become part of the larger community of the village dead. In many rural communities where the custom of exhumation is practiced today, the whole community is responsible for the bones of their ancestors as they were in antiquity (Alexiou, 2002). A number of museums that I visited while I was in Greece had skeletal remains from antiquity on display as well. This type of frequent acceptable contact with skeletal remains makes skeletal analysis in Greece different than in North America and thus requires its own ethical considerations.

Wishes of contemporary Greek people should be recognized when examining skeletal remains from third century CE Eretria. The research should follow rules and regulations drawn up by the Greek State. The Central Archaeological Council or the *Kendriko Archaialogiko Symvoulío* (KAS) is responsible for advising and submitting proposals to the Ministry of Culture and Sport about any areas pertaining to Greek heritage (Hamilakis, 2007). This can include creation of archaeological policy, awarding excavation permits, allowing movement of artifacts,

and providing approval for any destructive methods of analysis. Archaeological excavations and research on excavated material are conducted with the approval of the Greek State through the Ministry of Culture and Sport, various archaeological councils such as the KAS, and under the supervision of local authorities that work for the State Archaeological Service (Hamilakis, 2007). Greek archaeologists are public servants. They are appointed by the ministry (Hamilakis, 2007). Therefore, the State Archaeological Service does represent wishes of the local Greek people to a large extent.

The remains that we study as researchers are not just objects of study. Skeletal remains should be treated with respect not only because the remains are associated with a person but also because of the valuable information that the remains can provide about occupants of a site (Alfonso and Powell, 2007). Destructive methods of analysis should be avoided whenever possible to ensure that analysis of the remains could be replicated in the future (Cybulski 1979; Walker 2000). In Greece, destructive methods of analysis are strictly regulated and permits for these types of skeletal analysis are often denied to researchers. The analysis of the individuals excavated from the Eretria gymnasium well did not involve any destructive methods of analysis. Instead, the data for my thesis were drawn from morphological analysis and osteometry.

As researchers, we also owe it to the people that we are studying, colleagues that use our research, and local community members to be as accurate as we can in our results and interpretations. Interpretations should be made by considering complexities ingrained within and surrounding the body (Alfonso and Powell, 2007). More and more bioarchaeological studies have moved beyond reductionist descriptions of skeletal biology and use archaeological, ethnographic and historical information to provide a well-rounded idea of lives of past individuals (Agarwal and Glencross, 2011). For example, careful analysis of age, sex, and

changes evident on bone, as well as the burial location and burial customs of the period should be considered before making any interpretations of the lives of the Eretrian individuals. Despite the “unusual” burial context, labeling Eretrian individuals who were deposited in the well as “socially excluded individuals” or “deviants” prior to analysis is not appropriate.

Bioarchaeologists have an obligation to inform the community about their findings and their research should be available to the interested members of the public (CAPA-ACAP, 2019). Bioarchaeologists should report their findings without omitting any significant data, along with the theories, methods and research designs that were used to interpret the findings (Alfonso and Powell, 2007). Distributing the findings of a project to local communities is essential for reducing any power imbalances that may be in place between researchers and local residents. In Greece, foreign archaeologists play a key role in the production of knowledge about the cultural heritage of Greece. Where allowed by the KAS, local residents should be included throughout this process of knowledge production: during excavation, analysis of remains and publication and distribution of research. ESAG holds numerous events for local Greeks, foreign researchers, and public officials. For example, on August 02, 2019, ESAG provided a public lecture and guided tours of the excavation site at Amarynthos for local Greeks in cooperation with the municipality of Eretria and the cultural association of Amarynthos (ESAG, 2019). ESAG also publishes an annual Greek language newsletter about excavations at Eretria. Findings of my research can be made available for local Greeks through such guided tours and publications. Publication of research and public outreach projects contribute to sharing of ideas between the researcher, the public as well as other academics interested in the field who can in turn move the discipline forward.

1.4 International Co-operation in Greek Archaeology

In Greek archaeology, foreign institutions of archaeology play a key role in the excavation, analysis, and preservation of artifacts and monuments. Interpretations of the archaeological heritage of the country are a collaboration between both the local and foreign archaeologists. The skeletal remains analyzed in the following chapter were excavated by ESAG in cooperation with the Greek Ministry of Culture and Sport and Ephorate of Antiquities in Euboea, the regional authority on archaeological remains in Eretria. Artifacts, faunal and skeletal remains discovered from the ancient city of Eretria are studied by academics and students from Greece as well as from numerous foreign institutions of archaeology that operate in Greece. Within this context, foreign researchers must not force their interpretations of Greek heritage onto the locals who may have different views of culture and heritage compared to those of the archaeologists.

In 2011, there were 23 Greek universities and institutes and 17 foreign schools conducting excavations in Greece (Luke and Kersel, 2011). Foreign institutions of archaeology have existed in Greece as early as the nineteenth century; the French Archaeological School was established in 1846 and the German, American and British schools were established soon after (Hamilakis, 2007). Apart from the American School, the respective governments of the foreign schools fund these institutions.

The public view of these schools has changed through the years (Hamilakis, 2007; Davis, 2013 and Davis and Vogeikoff-Brogan, 2013). In the early 20th century, many of these schools assisted local Greeks with humanitarian efforts (Davis 2013). For example, the British School made their facilities available for British Nurses working at Marasleio School in Athens during the Balkan Wars. The American School also worked with the American Red Cross in their relief efforts to Greece during 1918-1919. Relief efforts by British and American Schools continued

for decades as Greece went through periods of major economic and political change. During the 1960s and into the early 1980s, however, the foreign schools were thought of as remnants of the colonial past (Davis, 2013). In the 1980s, Greek government representatives like Melina Merkouri even advocated for the dismantling of these foreign institutions and the nationalization of their facilities (Davis and Vogeikoff-Brogan, 2013). The foreign schools certainly did not train Greek students of archaeology and did not engage in collaborative efforts with local archaeologists until the 1980s (Davis, 2013). The relationship between the foreign schools and local Greeks was very much an imbalanced one.

Indeed, the earliest of these schools were established during an age when Greek classical monuments and artifacts were thought of as part of “Western” civilization and therefore, should be shared by all “civilized” western nations (Hamilakis, 2007). Many of the Greek sculptures and artifacts that are on display in European museums were acquired without the consent of Greeks in the 19th century during the period of Ottoman rule in Greece (Sánchez, 2017). Today, the restitutions of Greek cultural property are a major concern in Greek archaeology. For example, in the recent years, the continual demand for the return of the Parthenon (Elgin) marbles from the British Museum to Greece has attracted enormous publicity (Hamilakis, 2017).

Although international co-operation has not been smooth in Greek archaeology, the foreign schools do contribute to Greek scholarly research and economic capital. These institutions have well-equipped libraries and laboratories that any researcher of Greek archaeology can use. The foreign institutes, supported by their governments, provide monetary funds for construction and renovation of new facilities within Greece as well. For example, the permanent exhibition at the Museum of Eretria was renovated with funds from the Federal Office of Culture of Switzerland. The Ministry of Culture and Sport rarely has the resources or the personnel to carry out long-

term systematic excavations (Koutsoumba, 2013). In 2011, the Ministry of Culture and Sport even announced that it would not fund any systematic excavations unless the excavations were co-funded by foreign schools (Koutsoumba, 2013). In this context, collaboration between local and foreign archaeologists is essential. Since many of these foreign schools also have other schools of archaeology established in neighbouring countries, local Greek archaeologists get the opportunity to not only exchange their research with archaeologists working in Greece but also in other parts of the world as well. Thus, foreign schools provide Greek archaeologists the opportunity to internationalize their work (Hamilakis, 2007).

The results of collaborative projects between foreign schools and the Archaeology Service of Greece benefit not just the academics but also the local Greeks as well. The archaeological sites, artifacts and monuments attract a lot of tourism and are a major contributor to the Greek economy. However, tourism can have negative effects as well as tourists can damage sites by vandalism or simply through wear and tear on the monuments because of overcrowding. The tourist experience at archaeological sites and museums is summarized and sold in a way that is easily digestible for the tourist who is likely a stranger to Greek archaeology (O'Donovan and Carroll, 2011). Thus, the information available for tourists should be thorough but also comprehensible. For example, at the Museum of Eretria, in addition to detailed signs, the museum had books and pamphlets about the artifacts that were on display for tourists who were interested in learning more about the archaeology in Eretria. These books could be purchased at the main ticket desk.

1.5 Proposed Venue for the Publication

I intend to publish Chapter Two of my thesis in the *International Journal of Osteoarchaeology*. The focus of the journal is to publish papers that are theoretically informed

and shed light on the behaviour and ideologies of past cultures based on the osteological analysis of human and animal remains (Wiley Online library, 2019). According to Scimago Journal and Country Rank (SJR), this journal is consistently ranked at a Q1 ranking; the highest ranking awarded in terms of its impact in the field of archaeology, anthropology and the arts and humanities (2019). Another reason why I would like to publish my thesis in this journal is that it actively encourages students who are interested in the field of osteology to publish their research. The journal can be accessed through the Wiley Online Library. As a result, the findings of the research will be accessible for both scholarly and non-scholarly members of the archaeological community who are interested in the Eretrian gymnasium individuals or the phenomenon of skeletal deposits in wells.

Chapter Two: Skeletons in Wells: Post-Mortem Treatments in Roman Eretria, Greece

2.1 Introduction

The location and the manner of burial can provide information about the mortuary rituals of a group. However, when examining burials of past people, researchers must be cautious not to apply current western-centric notions of “normative” ways of burial to that of the past. In archaeology, “unusual” or “deviant” burials are those burials that stray away from the norms of the period and the population under examination (Tsaliki, 2008). However, the term “deviant” may be too narrow when defining burials as what is considered a “normative” burial in a certain population may be far more diverse than what archaeologists understand (Cherryson, 2008).

My research examines the post-mortem treatment of adult and juvenile individuals recovered from a third century CE gymnasium well in Eretria, Greece. Few archaeological studies have been published about the phenomenon of human skeletal remains in wells in Greece (Bourbou and Themelis 2010; Papadopoulos 2000; Little and Papadopoulos 1998; Liston et al. 2018; Waage 1949). Of these, most studies classify individuals discovered from wells as “deviants” or “socially excluded individuals” because of their burial location (Bourbou and Themelis, 2010). In this thesis, I will argue that the adult and juvenile individuals recovered from the Gymnasium well received a variation of a “normative” burial as opposed to a “deviant” form of burial.

The Eretrian Gymnasium well collection has not been studied previously, beyond a brief preliminary report (Liston, n.d.). My thesis examines the adults and older children, while a large mass of infant remains from lower levels in the well will be studied by Liston and will not be considered here. Although, methodologies employed for studying commingled collections vary, more and more osteological analyses of skeletal remains from commingled collections are

contextualized with archaeological, ethnographic and historical data, to explore the identities of individuals represented as well as the population that interred them (Glencross, 2014; Agarwal and Glencross, 2011). Analysis involved making refits of broken bones, making estimates of age-at-death and sex as well as observing patterns of pathology and sharp force trauma on bone. Analyses of the skeletal material were conducted with two questions in mind. They were:

1. Did the bones enter the well as whole bodies or were they already skeletonized when they went into the well (i.e. from disturbed or deliberately exhumed graves)?
2. Why were the bodies and/or bones deposited in the well?

Archaeological literature on skeletons in wells and the burial practices of Roman Eretria were used to explore whether these individuals received a “deviant” or a “normative” burial. This research will contribute to the bioarchaeological understanding of the Eretrian disposal of the dead during the Roman Period.

2.2 Eretria: A Background on the City

The city of Eretria is located on the island of Euboea, opposite the mainland coast of Greece (Figure 1). Evidence of occupation in Eretria dates to the Early Helladic Period (3000-2000 BCE) but the urban development of Eretria seems to have occurred much later in the 8th century BCE. Around 750 BCE, at the beginning of the Archaic period in Greek history, many Euboean city-states like Eretria, Chalkis and Cumae established several colonies throughout the Mediterranean (Schefold, 1968). During this period of colonization, these Euboean city-states (Figure 1) were at the centre of the Greek world and were held in high regard, perhaps even more so than Athens (Schmid, 1999). Much of our knowledge about Eretria comes from the late Classical and Early Hellenistic period when the city underwent a building phase of luxurious

private buildings (Schmid, 1999). The Romans conquered the city in 198 BCE, after which the influence of the city began to slowly diminish until all traces of occupation disappear from the city in the 6th century CE. In the 19th century, the modern city of Eretria (Figure 2) was built to provide a home for Greek refugees who were fleeing the destruction of Psara in Turkey by the Ottomans (ESAG, n.d.).



Figure 1. Map of Greece (Schefold 1968, 273).



Figure 2. Modern city of Eretria (ESAG, n.d.).

The ancient city (Figure 3) was first excavated by the Greek archaeologist Christos Tsountas in 1885. The American School of Classical Studies in Athens continued to excavate the site from 1891 to 1895, particularly focusing on the theatre, the temple of Dionysus, the fortification walls and portions of the upper gymnasium (Kypraiou, 2000). The skeletal remains analyzed in this study derive from the well associated with later Swiss excavations of this gymnasium. The Greek Archaeological Service and the Archaeological Society have continued to excavate Eretria and its surrounding areas since the early twentieth century. Since 1962, the Swiss School of Archaeology in Greece (ESAG) has assumed the responsibility of excavating the site with permission from the Ministry of Culture and Sport.



Figure 3. Archaeological plan of Eretria (ESAG, n.d.). The location of the well is indicated by the arrow.

2.3 Upper Gymnasium and its Well

The upper gymnasium is located about 150 m east of the theatre of Dionysus, on the slopes of the acropolis (Figure 3). Within this thesis, the upper gymnasium will be referred to simply as the gymnasium. The gymnasium consisted of two adjoining building complexes with two central courtyards and bathing facilities (Figure 4). The gymnasium was remodeled several times and was finally abandoned around 100 CE (Ackermann and Reber, 2018).

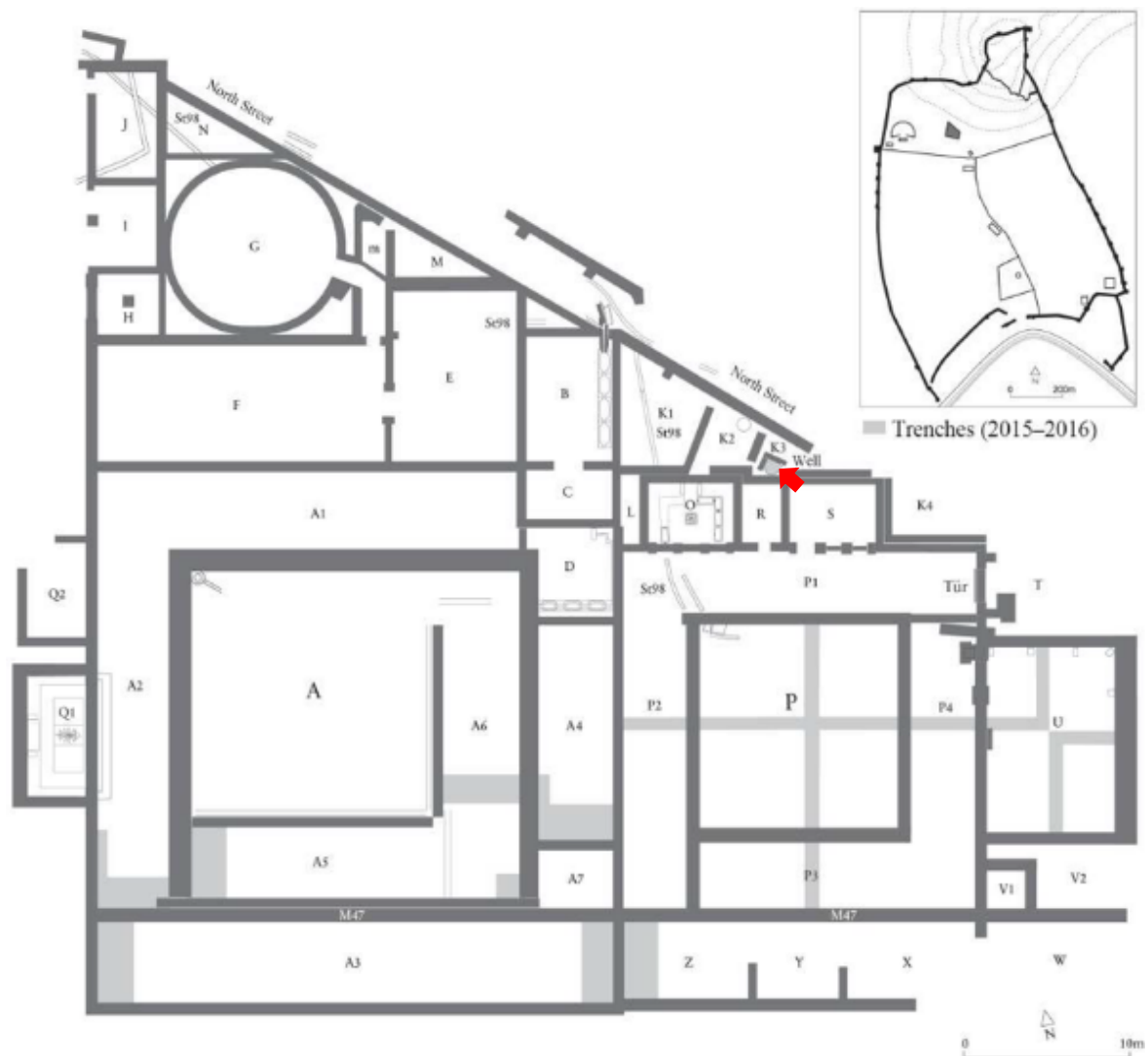


Figure 4. Plan of the gymnasium (Ackerman and Reber 2018, 173). The location of the well is indicated by the arrow.

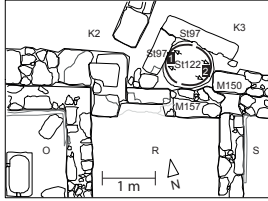
A three-year excavation program of a Gymnasium at Eretria was conducted by ESAG between 2015 to 2017 under the guidance of Guy Ackermann of University of Lausanne, Karl

Reber, the director of ESAG, and Rocco Tettamanti of Fribourg Archaeological Service. The aim of this excavation was to clarify the time frame of the building phases and the plan of the building (Ackerman and Reber, 2018). The first phase of construction of the gymnasium (Figure 4) dates from the Classical through Hellenistic period from 330-320 BCE. This first phase of construction included the contemporaneous construction of western parts of the building (courtyard A and porticoes A1, A2 and A4) and eastern parts of the building (rooms K1, L and O) (Ackerman and Reber, 2018). Wall M47 that runs through both parts of the gymnasium was taken as an indicator of the contemporaneous construction of the two halves of the building. The well found in room K3 (Figure 4) towards the north of the eastern courtyard, where the skeletal remains were found, would have been part of this initial construction phase as well (Ackerman and Reber, 2018).

The gymnasium was likely abandoned for a *thermae* facility (Roman baths) with hypocaust heating that was constructed in the southern part of the city (Ackerman and Reber, 2018). In many other Greek cities, *thermae* complexes were integrated into the already existing Hellenistic period gymnasiums in the Roman era. However, in Eretria, perhaps as a result of lack of central heating in the building, the gymnasium was abandoned in favour of the new bathing facility (Ackerman and Reber, 2018).

The excavation of the well (Figure 5) in room K3 of the gymnasium was completed after three field seasons (2015-2017). The well was 13.45m deep and had a diameter of 1m. The water for the well would have been fed by the karst faults of the natural limestone of the acropolis which rises behind the gymnasium. About thirty notches (Figure 6) were drilled on either side of

Érétrie - Gymnase
Local K3
Puits St122
D57 - M2037
Geoffroy Luisoni
Juillet 2017
1:50



Sud - Vue Ouest - Nord

Nord - Vue Est - Sud

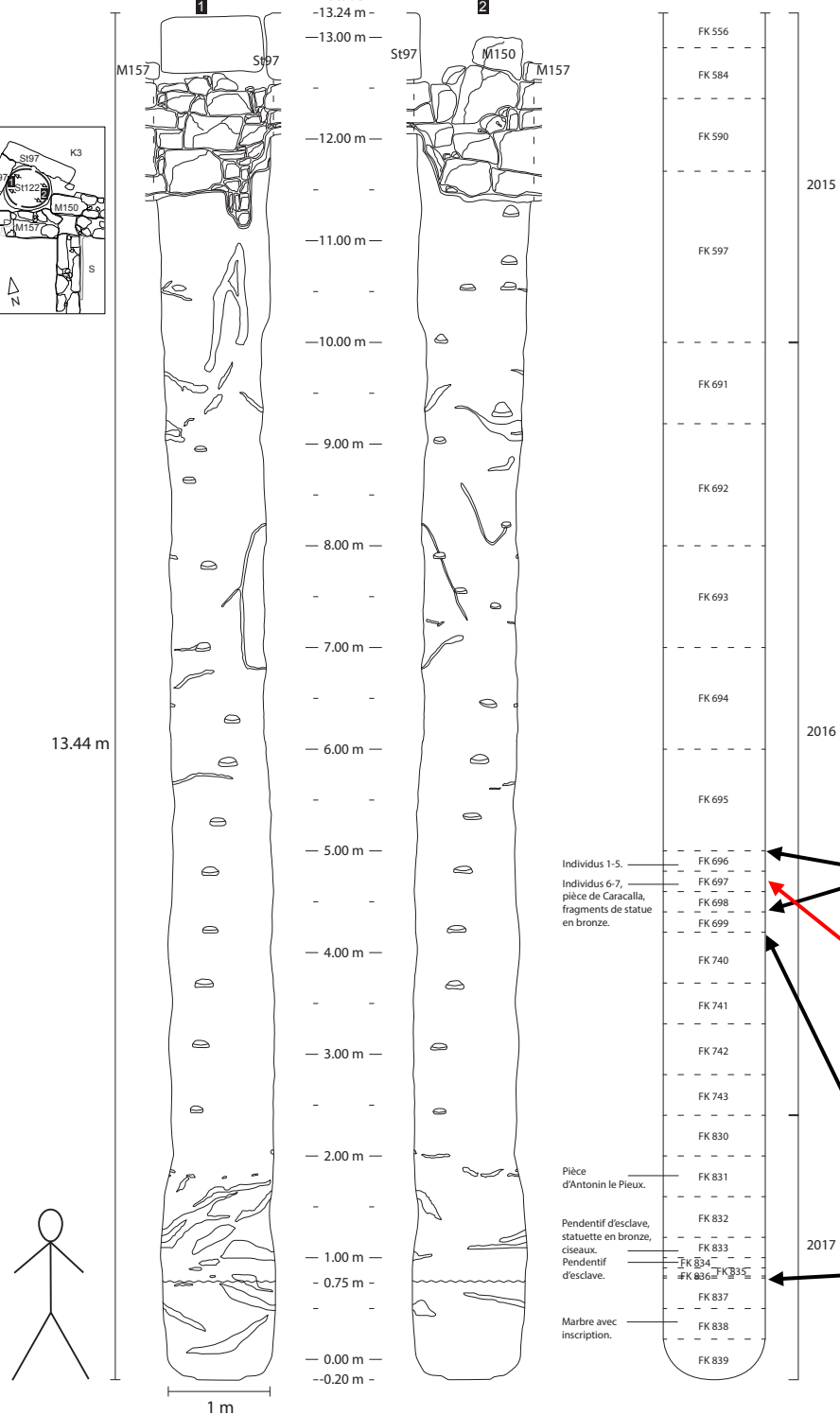


Figure 5. The gymnasium well of Eretria (after Reber et al. 2018, 128).

the well wall in the shape of half circles. These notches were likely wedged with small wooden beams and could have been used for moving up and down the well by those who were tasked with digging or cleaning the well (Ackerman and Reber 2018; Reber et al. 2018). The discovery of coins issued during Caracalla's reign (211-217) inside the well, suggest that the access to the well was closed off at a much later date in the history of the building (Reber et al, 2018). The gymnasium well produced an assemblage of human and animal skeletal remains together with portions of a bronze statue of a young man, a gilt bronze figurine of Artemis Ephesus and three bronze weights (ESAG, n.d.). The ceramics and coins discovered within the well have been used to date the skeletal remains of the well to the 3rd century CE.

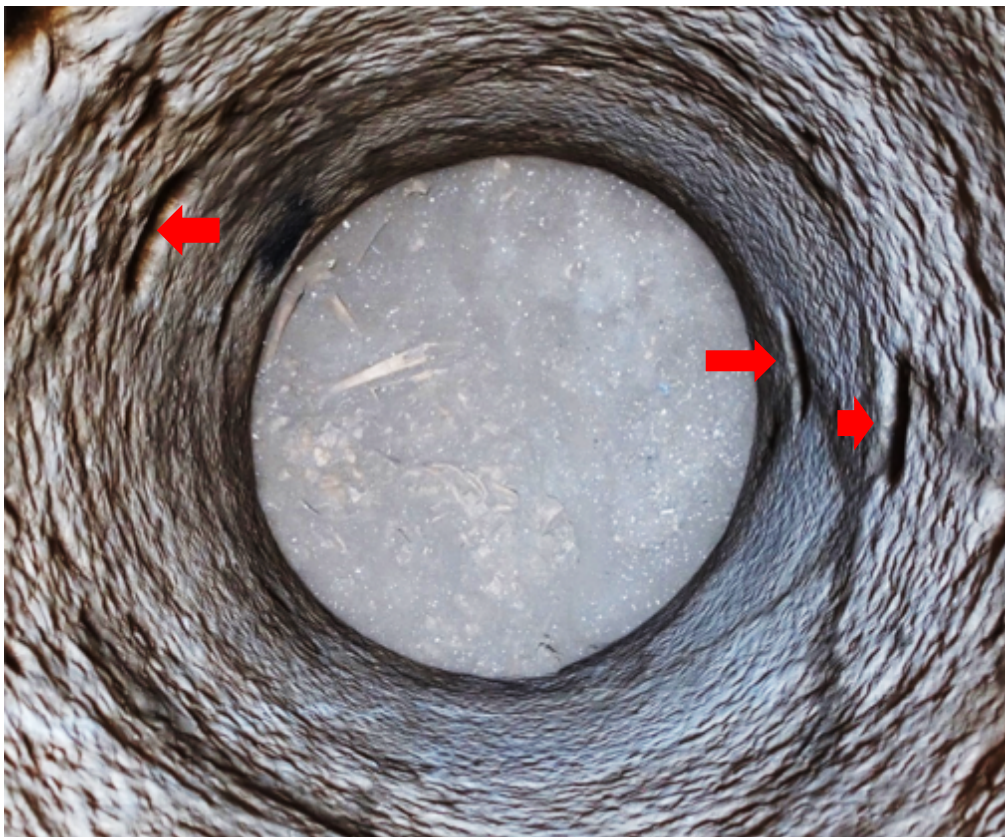


Figure 6. Notches on the well wall (Photo G. Ackerman).

2.4 Eretria during the Third Century CE

The early years of the Roman conquest of Greek city-states in the first century BCE were very much a period of destruction and violence that led to the decline of many city-states (Evangelidis, 2014). It was only after establishment of the Augustan regime (27 BCE- 14 CE), that the Greek city-states started to flourish again (Evangelidis, 2014). There has been much debate on whether Eretria was in decline after it was conquered by the Romans in 198 BCE. The city was destroyed again in 86 BCE by the Romans during the Mithridatic war. After this destruction, it seems that the surviving residents moved up to the acropolis for security (Ackerman, 2019).

During the period between 86-27 BCE, public buildings in the lower town were either completely abandoned or partially dismantled (Ackerman, 2019). However, some Hellenistic and Classical public buildings of the city, like the gymnasium, were re-used and re-modelled after this period. The city may have even gained economic value from its fishing and purple dye works industry in the 1st and 2nd century CE (Schmid, 1999). In order to embark on public building projects such as that of the Roman baths that were being constructed in second century CE, the city would certainly have had to be earning money from its industries. The city continued to exist in the Roman period as a provincial Greek town (Schmid, 1999).

2.5 Greek and Roman Funerary Laws

In Greece, burials took place within settlements until the establishment of city-states in 8th century BCE. With the establishment of city-states, as a rule, burials were to be found outside the city walls, typically along major roads (Bobou, 2013). Since the 5th century BCE, Greek city-states had instituted numerous funerary legislations regarding appropriate funerary rites, post-burial rituals and legal protections available for the dead (Garland, 1985). Nineteenth century

excavations of Eretria by the American School describe the discovery of several graves found along either side of the “sacred way” for miles eastward, outside of the city walls (Figure 7) (Pickard, 1891). The graves were from various periods of Eretrian history. The Roman graves

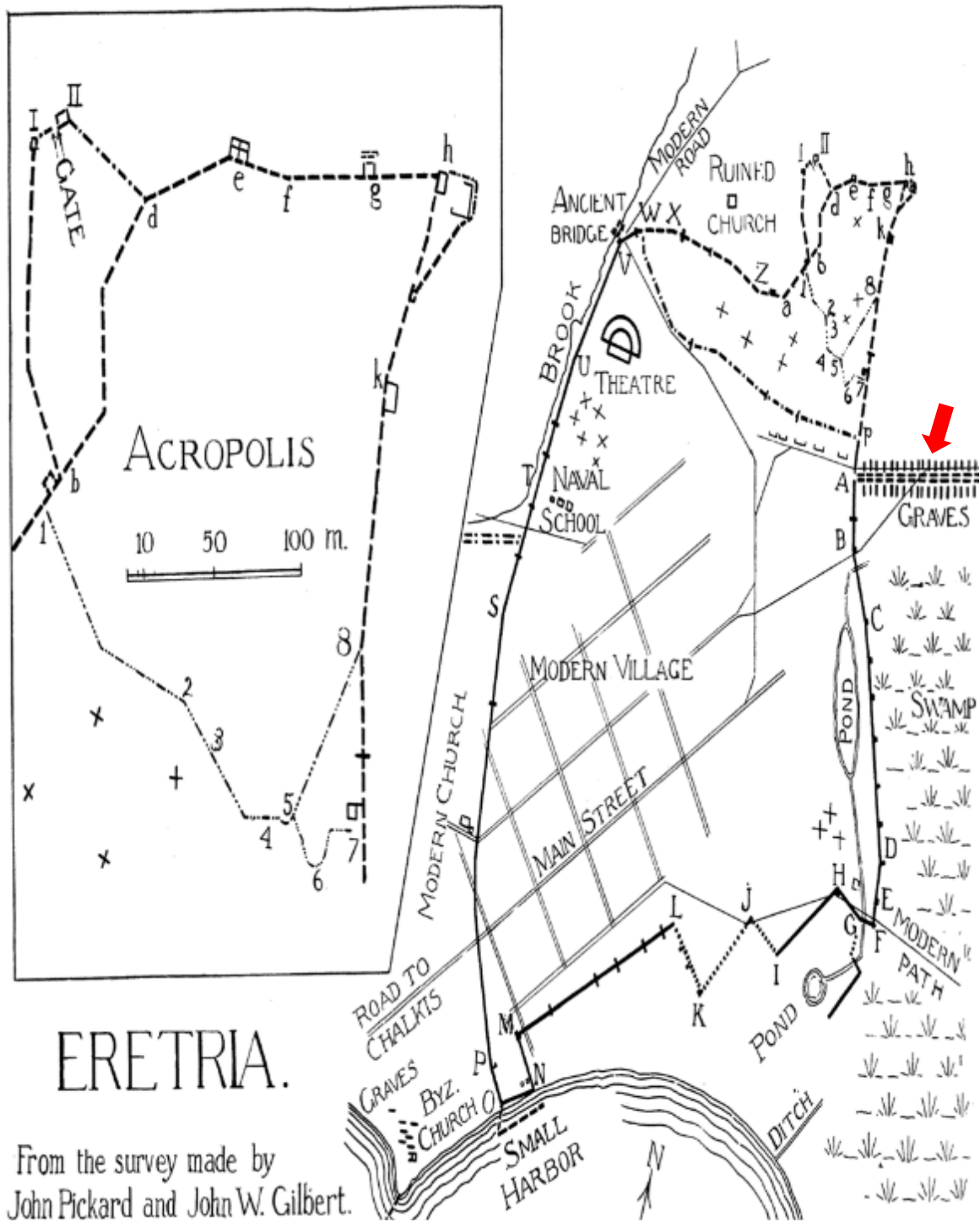


Figure 7. Map of Eretria with graves outside of the city walls (Pickard, 1891).

were fitted with stone slabs that had been previously used in other building structures (Frothingham, 1891). The report of the excavation also mentions that Roman and Byzantine graves were positioned at any angle where there was space as opposed to the archaic graves that were positioned at an east and west direction (Frothingham, 1891). The author does not provide any information on the skeletal remains of the Roman period graves. However, it is clear from the lack of space for the Roman and Byzantine graves, that this area outside the city limits was used for burial for a large part of the history of the city-state.

According to Roman funerary law of the third century CE, burials must be located outside the city walls. Those who brought a corpse within the city limits were punished severely as it was thought to pollute the city's sacred spaces (*Paulus Opinions 1.21.2*). In his work, Paulus describes other funerary laws and punishments for vandalism of graves, the prescribed mourning periods for death of a family member and who must pay for funeral rites. These laws stress the importance of providing a formal burial to the Roman dead. Anyone who did not do so faced serious consequences, whether public shaming or legal actions against them.

In exceptional cases however, burials did occur within the city even after the rise of city-states. For example, a monumental tomb of a youth dating to the end of the 2nd to early 1st century BCE has been discovered within city walls at the 'House of the Mosaics' in Eretria (Ackerman, 2019). In Greek archaeology, these types of intra-urban burials have been interpreted as founder tombs, although these tombs can be markers of cultural and regional differences, high status or even burials of fallen war heroes (Bobou, 2013). For the most part, however, burials were placed outside of city walls along major roads.

Providing a formal burial for the deceased was the moral duty of the surviving family members. Failure to do so, was thought to attract anger from the Greek gods (Garland, 1985).

Within Greek legal theory, the dead continued to possess legal rights even after their death and it fell to the heir to carry out prosecutions on behalf of the deceased (Garland, 1985). Although according to social norms and legal decrees, the dead were held in high regard, there were instances where the deceased were treated differently in terms of type of burial. For example, untimely dead (i.e. children, victims of murder etc.), war dead and criminals were often granted different forms of mortuary treatment. Infants were buried with much less care than their adult counterparts (Garland, 1985). The burial procedures for specific criminals is unclear. However, according to Xenophon, the Athenians deposited the bodies of traitors and tomb robbers in what is known as the *barathron* or a pit (Garland, 1985).

Despite the legal and moral requirements for formal burial, skeletal deposits in wells are a common phenomenon in Greek archaeology (Papadopoulos 2000). These deposits date from the Bronze Age (3000-1200 BCE) to the Hellenistic period (3rd -2nd century BCE) (Bourbou and Themelis, 2010). In previous studies, individuals recovered from wells have been often interpreted as “social outcasts” or “deviants” because of their “unusual” burial location (Papadopoulos 2000). Skeletal remains from 5 males, 9 females and 4 children have been discovered from an Early Helladic Well in Corinth. The author believes that the individuals entered the well as bodies not skeletal elements as the mandibles were found articulated with the crania (Waage 1949). Unlike other studies, the author does not comment on the possible social status of the individuals. Skeletal remains from an individual dubbed AA288 were discovered from an Early Iron age well (U-V 19:1) at the Athenian Agora. The authors believe that AA288 would have been considered a social outcast by his community members as a result of the epilepsy that he may have developed from his head injuries (Little and Papadopoulos, 1998). The authors argue that his social status would have caused this “unusual” burial treatment. The

Athenian Agora ‘Bone Well’ dating to the Hellenist period contained remains of approximately 460 newborn infants, an older child with debilitating diseases and an adult who exhibit signs of hereditary hemochromatosis along with 150 dogs and various other skeletal remains of animals (Liston et al., 2018). The authors argue that the well served as a burial place for those members that were not part of the community perhaps because of their young age or social status (Liston et al., 2018). Remains of 262 infants have been discovered from a Hellenistic period well in the Agora of Messene. Just as the Athenian Agora ‘Bone Well’ infants, these infants seem to have awarded an ‘unusual’ burial because of their young age. The authors also conclude this deposit to be a secondary burial (Bourbou and Themelis, 2010). Human skeletal remains from at least 19 infants and remains of 26 dogs have been recovered from a Hellenistic well associated with the *Sebasteion* in Eretria as well (Chenal-Velarde, 2006). The analyses of the human skeletal remains from this well is ongoing. The gymnasium well deposit indicates that this practice of disposing skeletal remains in wells continued into the Roman period in Eretria. Upon examination of Greek and Roman laws, it is clear that although majority of burials took place outside of city walls, there were acceptable variations.

2.6 Theoretical Framework

The burials of Eretrian individuals from the gymnasium well will be interpreted using the concept of “deviant” burial. It is important to examine the concept of deviancy prior to engaging in any discussion of “deviant” burial. Deviancy or “deviant” behaviour is hard to define because what might be considered “deviant” in one group may not be considered so in the other. A certain behaviour is determined as “deviant” by those who witness the behaviour (Shay, 1985). Individuals who perform “deviant” behaviours attract sanctions because these behaviours are recognized to be opposing the established norms of the group that the audience members are a

part of. These sanctions may be reflected in the type of burial an individual receives as well (Shay, 1985).

As previously mentioned, “deviant” burials are those burials that stray away from the norms of the period and the population under examination (Tsaliki, 2008). In archaeology, “deviant” burials may be defined as “unusual”, “anomalous”, “extraordinary”, “non-normative” or “abnormal”. This thesis uses the term “deviant” as it is the most common term that is being used in archaeology to refer to burials that seem to stray from “normative” forms of burial. Historically, the term “deviant” has also been used to describe individuals that have been recovered from wells. The following list of criteria (Table 1) compiled by Anastasia Tsaliki of Durham University for determining archaeological cases of “unusual” or “deviant” burials is meant to serve as a reference guide for recording these forms of burial. Although it is by no means an exhaustive list, it does stress that both skeletal material and the burial location should be considered to determine whether a certain burial is “unusual” or “deviant” (Tsaliki, 2008). This list will be used later in the paper to determine whether the skeletal deposit within the gymnasium well constitute as a “deviant” burial.

Basic Criteria Applied to Distinguish Deviant Burials

- 1) Primary and secondary burials in unusual places and or positions when compared to the normal burial practices of the period and the population
- 2) Mass burials, especially those without evidence or historical documentation for a crisis (epidemic, war, civil unrest)
- 3) Inhumations or cremations in cemeteries or in isolation with signs of “unusual” ritual activity such as cut marks, unusual artefacts of possible symbolic or ritual use
- 4) Instances of inhumations in regions where cremations are prominent and vice-versa
- 5) Skeletons with evidence that might indicate crime, torture or “special” mortuary ritual.

Table 1. Criteria for distinguishing deviant burials (Tsaliki 2008, 2).

In some cases, deviancy in burial is discussed in connection with practices that indicate fear of the dead or necrophobia. Necrophobic practices typically involve restricting the dead within graves so that the dead will not return and cause harm in the world of the living (Tsaliki, 2008). For example, in Poland, since the early twelfth century, burials that were covered with stones were interpreted as anti-vampire practices intended to deter the dead from “rising” (Gardeła and Kajkowski, 2013). However, there are alternative explanations for why these burials might have occurred. For instance, covering the burials with stones may have protected the interments from being dug up by wild animals (Gardeła and Kajkowski, 2013). The thesis will address whether necrophobia played a part in the burial of Eretrian individuals later in the paper.

There have been several critiques of the term “deviant” in archaeological research. “Deviant” behaviour cannot be observed in the archaeological record. The manner of burial and physical remains is analyzed and compared against what archaeologists constitute to be a burial of a “deviant” individual. Without historical written records, cases of deviancy in burial as assigned by archaeologists will always be tentative and might not reflect the attitudes of the population under study (Shay, 1985). A burial is established as “deviant” by comparing it against an archaeologist’s understanding of a “normative” burial (Crerar, 2016). However, as discussed in the previous section, “normative” forms of Greek burial during the Roman period are not easy to establish. Differences in burials as a result of transition periods, social status and religious ideals may be considered as either “deviant” or “normative” depending on the individual researcher (Cherryson, 2008).

In archaeological literature, deviancy in burial is often associated with negative social identity (Crerar, 2016). For example, differential burial treatment may be associated with

individuals who are believed to have transgressed the prescribed societal norms either voluntarily or involuntarily (Crerar, 2016). However, the “unusual” nature of a burial does not necessarily indicate that the people responsible for the burial regarded the deceased individual to have performed “deviant” behaviour. Some acts, although atypical and violent according to modern western views, may have indicated reverence and affection in communities that performed these burials (Gardela, 2013). For example, according to Norse textual sources, portions of King Hálfdan’s body were interred at multiple locations in the country so that these areas of burial could expect good harvests (Gardela, 2013). This type of funerary violence may be interpreted as “deviant” because these practices do not conform to western ideals of “normative” burial.

Even though there is debate surrounding the concept of deviancy in burial, it is nonetheless useful to archaeologists as it can provide information about the society that interred these individuals. The study of deviancy in archaeological contexts then provides information about both who were considered to have performed “deviant” behaviour as well as the people that interred these “deviants”. The possibility that the deceased person was a “non-deviant” and the person performing the burial was the “deviant” (i.e. murderer hiding the body) should be considered as well. The concept of deviancy can be studied in connection with pathology as well. Pathological conditions which cause deformities, affect the mental state of individuals and create social stigma, may be linked to the nature of an individual’s burial (Tsaliki, 2008). Examination of the way in which these affected individuals were treated in death, may provide a clearer picture of the living, including their perceptions of the disease, social prejudices and perhaps even their belief systems.

2.7 Materials and Methods

The skeletal remains were analyzed at the Archaeological Museum of Eretria, where they are permanently housed. This process did not involve any destructive methods of analysis. The Eretrian gymnasium well sample was analyzed with two main questions in mind. The first of these was whether the individuals represented in the sample entered the well as intact bodies or were they already disarticulated skeletons by the time they entered the well. The second was why these individuals were deposited in the well. The degree of breakage, missing elements of bone, and the sharp force impact trauma mentioned in the preliminary report (Liston, n.d.) could indicate whether these individuals entered the well as disarticulated skeletons or as whole bodies.

The skeletal remains had excellent preservation. Most likely the result of damp conditions of the well. The deposits from the well were 100% water-sieved and as a result, the rate of recovery was excellent as well. The human skeletal remains belonging to FK696 and FK697 contexts, excavated during the 2016 field season had already been separated from the animal remains and were grouped according to context of the well and bone by Prof. Maria Liston. Prof. Liston and I separated the skeletal remains excavated from the 2017 field season into animal and human remains. These later contexts excavated from the 2017 field season largely contained infant and animal remains and did not contain any adult remains. Adult and juvenile skeletal material analyzed in this thesis mainly derived from the sequential units of FK696 and FK697 contexts (Figure 5). There were few skeletal remains belonging to juveniles found from the FK698 and FK743 contexts which were excavated during the 2017 field season.

I conducted the analysis of adult and juvenile remains while the infant/fetal remains were examined by Professor Maria Liston. Refits of cranial bones were made whenever joints were discovered. Re-creation of complete skulls or skeletal individuals were not possible as a result of

the extent of breakage and limited time available for research. Each adult and juvenile cranium, mandible and a selected amount of long bones was assigned a letter based on context (i.e. FK696-A, FK696/FK697-T3) to differentiate between individuals (See Table 6 and Table 9). Refits were made for long bones (humerus, ulna, radius, femur, tibia, fibula, foot and hand phalanges and clavicle) as well. Reconstruction and analysis of the very fragmentary thoracic and pelvic girdle fragments was not possible due to the limited time available for research. Refits of broken bones and pair-matching of long bones were observed only across adjacent contexts

and never throughout multiple contexts indicating that these individuals were deposited in the well relatively within a short period of time, perhaps even in a single event, and there was little movement of the bones after they were deposited.

Some adult proximal hand phalanges (Figure 8) and juvenile



Figure 8. Green staining on adult proximal hand phalanges (Photo P. Weerasinghe).



Figure 9. Green staining on juvenile metacarpals (Photo P. Weerasinghe).

metacarpals (Figure 9) exhibit signs of green staining likely from the copper components of the bronze statue fragments and coins (Hopkinson et al., 2008). The statue fragments and the juvenile metacarpals were discovered from the FK697 context and the adult phalanges were discovered from the FK696 context. Because these were found in vertically adjacent contexts, the adult bones could have been near the bronze statue fragments and coins within the well.

Both Minimum Number of Individuals (MNI) and Most Likely Number of Individuals (MLNI) were used to establish the sample size of the Eretrian gymnasium well collection. Perhaps the most frequently used method of quantifying commingled skeletal collections, accurate estimates of MNI depend on the rate of recovery as the estimate cannot account for missing individuals (Nikita and Lahr, 2011). MLNI on the other hand, provides an estimate of the initial population represented in the sample. It is because of this reason, that the estimates of MLNI are thought to be more accurate than the MNI estimates which constantly under-estimate the sample size (Nikita and Lahr, 2011). However, determining estimates of MLNI is not without its own drawbacks. Pair-matching is an important process in determining MLNI (Adams and Konigsberg, 2004). Inability to establish pairs because of fragmentation or lack of preservation can lead to inaccurate estimates.

Specific segments of bone that shared unique landmarks or morphologies (i.e. nutrient foramen on the medial portion of the femur) were used so that skeletal remains from the same individual would not be counted as two different individuals (Adams and Konigsberg, 2004). Pairs of bone were established based on size, features on bone (i.e. shape of foramina and facets) and possible age. Counts of each bone were applied to a calculation, where N represents the number of elements of bone, L represents number of left bones, R represents number of right bones and P represents the number of paired bones. The following table (Table 2) provides the

equations used to calculate MNI and MLNI of a skeletal collection. MNI for the well collection, was calculated using $N = \text{Max} (L, R)$. The MLNI was calculated using the equation,

$$N = \frac{(R+1)(L+1)}{(P+1)} - 1 .$$

Equations for calculating MNI	Equations for calculating MLNI
$N = \text{Max} (L, R)$	$N = \frac{R^2 + L^2}{2P}$
$N = (L + R) / 2$	$N = \frac{LR}{P}$
$N = L + R - P$	$N = \frac{(R+1)(L+1)}{(P+1)} - 1$

Table 2. Calculations for determining MNI and MLNI (after Nikita and Lahr, 2011).

Identifying the possible sex and age of the Eretrian individuals was essential to this thesis. It is possible that these individual attributes contributed to their burial treatment. Making these estimates also help with the differential diagnoses of pathologies as some pathologies are unlikely in certain sex and age groups. A variety of sex and age estimation methods were used, depending on the available skeletal elements. Estimates of adult sex were made by assessing femoral head diameters (Bass, 1995) and sexually dimorphic cranial features (Walrath et al., 2004). The pelvis were too fragmentary to contribute to this analysis. Sex of juveniles cannot be accurately determined as a result of absence of sexually dimorphic skeletal traits. Estimates of adult ages were made by observing cranial suture changes (Meindl and Lovejoy, 1985) and signs of age-related pathologies such as arthritis. Estimates of juvenile ages were made by observing epiphyseal closures (Krogman and Iscan 1986; McKern and Stewart 1957; Buikstra and Ubelaker, 1994) and timing of dental development (Ubelaker 1989).

Signs of pathology were recorded using photographs and visual inventory forms (Buikstra and Douglas Ubelaker, 1994). Differential diagnoses of pathologies were made using White and Folkens (2005) and Buikstra (2019) as well as other sources when appropriate. As the presence of leprosy had previously been identified by Liston (n.d.), Ortner's (2008)

categorizations of manifestations of leprosy were used to record any evidence of leprosy on bone. In his work, Ortner provided detailed descriptions of the disease as well as pictures of the different levels of manifestations which were useful for determining not only whether these individuals exhibit signs of leprosy but also the severity of the disease.

Signs of impact trauma were also recorded using visual forms (Buikstra and Ubelaker, 1994). Trauma that occurred before death is defined as ante-mortem trauma. Signs of active healing at the site of injury is indicative of this type of trauma (Wieberg and Wescott, 2008). Trauma occurring near or at the time of death is defined as peri-mortem trauma and those occurring after death (i.e. taphonomic processes and excavation damage) are considered post-mortem trauma (Wieberg and Wescott, 2008). Signs of impact trauma were identified by consulting Walker and Long (1977) as well as Villa and Mahieu (1991).

2.8 Results

Sample size

The MNI for the two contexts (FK696 and FK697) is 15 adults and 5 juveniles. The MLNI is 29 adults and 7 juveniles. Both estimates for adults were made using femora, and for juveniles, humeri were used.

Table 3 and Table 4 provides an inventory of selected skeletal remains for adults and juveniles. Several factors could have resulted in this discrepancy between the two estimates. As mentioned, establishing pairs is an important

Bone	Right	Left	Un-sided	Pairs	MLNI	MNI
Humerus	11	8	16	6	14	11
Radius	6	6	8	2	15	6
Ulna	7	3	7	0	-	7
Clavicle	7	6	0	3	13	7
Femur	15	12	23	6	29	15
Tibia	12	10	37	5	23	12
Fibula	7	5	19	4	9	7
Orbital	6	5	0	5	6	6

Table 3. Inventory of selected elements of bone (adults).

process in determining MLNI (Adams and Konigsberg, 2004). Only six pairs were established from 14 right and 12 left femoral fragmentary elements. If the number of pairs is closer to the number of bones from left and

Bone	Right	Left	Un-sided	Pairs	MLNI	MNI
Humerus	5	3	2	2	7	5
Radius	4	2	1	1	7	4
Ulna	5	1	0	1	5	5
Clavicle	2	1	0	0	-	2
Femur	4	3	7	3	4	4
Tibia	3	4	3	3	4	4
Fibula	1	2	6	1	2	2
Orbital	2	2	0	2	2	2

Table 4. Inventory of selected elements of bone (juveniles).

right side, estimates of MNI and MLNI will be much closer. Failure in pair-matching between elements as a result of damage to bone and missing elements may have resulted in the difference between these two estimates.

Although the constant damp conditions of the well had preserved the skeletal remains, many elements of bone were missing. Tables 3 and 4 illustrate that skeletal elements from the right were consistently represented more than elements from the left side. This lack of equal representation between right and left skeletal elements would have affected the number of pairs that could be established. As a result of the multiplicative nature of the equation $N = \frac{(R+1)(L+1)}{(P+1)} - 1$, the difference between the number of pairs, and the right and left elements of bone would have been heightened (Adams and Konigsberg, 2004), even though the chi square tests, do not indicate a statistically significant difference between the expected and the available number of right and left elements with the $\alpha = .05$ (refer to pages 52 to 53 for chi square tests). Low amounts of pair matched bones and high estimates of MLNI compared to that of MNI is expected in commingled and disturbed burials (Giachino, 2016). High estimates of MLNI and low numbers of pairs of bone can be observed in the Eretrian gymnasium well collection as well.

This may suggest that the well deposit is a disturbed burial or that the remains from the well derive from disturbed burials.

When the recovery is 100%, the MNI will represent the initial population present in the sample and the sample size will be much more accurate (Nikita and Lahr, 2011). Archaeological field methods and the cultural practices of Roman Eretrians would have impacted the rate of recovery. The soil from the well was screened using the method of water-sieving. This method would have allowed for nearly 100% retrieval of skeletal elements and as a result, would not have caused an inherent bias in the estimate of MNI. However, cultural practices such as selection of skeletal elements would have caused issues with recovery. The side selection of front or back limbs of animals seems to have been important in sacrificial offerings to Greek gods and in grave offerings (Liston, 2007). Element side selection seems to have played a role in the Iron Age secondary cremation burials of humans at Kavousi Vronda, Crete as well (Liston, 2007). As previously mentioned, the right elements of bone are more frequently represented in the gymnasium well collection than the left elements. However, the chi square tests do not indicate a statistically significant difference between left and right elements (refer to pages 53 and 54 for chi square tests) and thus it is possible this practise of selecting skeletal elements for burial was not performed. However, since some elements are frequently underrepresented in this collection and because MNI estimates cannot account for missing individuals, the estimate of 15 adults and 5 juveniles may not be entirely accurate.

Age and Sex Estimates

Accurate age and sex estimates were difficult to establish since most traits needed to determine age and sex estimates were not present. Patterns of tooth eruption (Ubelaker 1989), suggest that the FK697-J individual is between 4-6 years old and FK697-K individual is 5-7

years old. In addition to these two individuals, an older juvenile (FK696/FK697-T3) could be identified by larger set of bones. The proximal epiphysis of the left tibia had not fused at the time of death, which makes this individual younger than 16 years old. Adult age and sex estimates were made using cranial traits. The following table (Table 5) provides the adult and juvenile age and sex distribution for the Eretrian gymnasium well collection. For adults, the table (Table 5) only considers cranial traits, not long bones.

Age	Male	Female	Unable to sex
0-3 years			
3-12 years			2
12-20 years			1
20-35 years	1	1	
35-50 years	5	1	
50+ years	1		
Total	7	2	3

Table 5. Age and sex distributions for Eretrian individuals.

Evidence of Pathology (Adults)

Several pathologies were evident on the skeletal remains of adult individuals. The following table (Table 6) summarizes the age and sex estimates as well as the pathologies evident on each identifiable adult individual categorized in Table 5. The pathologies listed are not an exhaustive list of pathologies present in the gymnasium well collection since a complete analysis of pelvic and thoracic cavity, and a complete dental inventory were not completed.

Individual	Age	Sex	Pathologies
FK696-A	Middle adult (35-50 years)	Male	<ul style="list-style-type: none"> -Metopic suture persists into adulthood -Porosity on the frontal and occipital squama – possible signs of childhood anemia (signs of healing) -Third molar agenesis of the right mandibular third molar -Caries on the first maxillary molar -Heavy calculus buildup of the maxilla -Possible signs of leprosy on the maxilla- destructive remodelling of the nasal aperture, evidence of vascularity in the maxillary sinus, porosity on the rhino-maxillary region

FK696-B	Young adult (20-35 years)	Female	-Metopic suture persists into adulthood -Signs of healed porosity on the occipital, signs of vascularity on the left parietal bone, thickening of the lambdoidal suture (possible signs of childhood anemia)
FK696-C	Middle adult (35-50 years)	Male	-Metopic suture persists into adulthood -Signs of healed porosity on the occipital and right parietal squama (possible signs of childhood anemia)
FK696-D	Middle adult (35-50 years)	Male	-Healed signs of porosity on the right parietal bone, vascularity and porosity on the supraorbital margin (possible signs of childhood anemia)
FK696-E	Middle adult (35-50 years)	Male	-Healed porosity and vascularity on the left supraorbital margin- (signs of childhood anemia)
FK697-F	Young adult (20 to 35 years)	Male	-Porosity and vascularity on the occipital and left parietal squama (possible signs of childhood anemia) - Vascularity could have resulted from the pressure of premature suture closure of the sagittal suture (craniosynostosis) -Destructive remodelling of the nasal aperture, maxillary sinus exhibit signs of vascularity, porosity of the rhino maxillary region- (possible signs of leprosy) -Presence of LEH on right maxillary premolars -Presence of caries on the first right mandibular molar
FK697-G	Middle adult (35-50 years)	Male	
FK696/697-H	Middle adult (35-50 years)	Female	-Thickening of diploe on the parietal squama exhibit signs of childhood anemia -Possible healed osteomyelitis of the mastoid (mastoiditis) -Signs of arthritis in the TMJ
FK697-I	Older adult (50+ years).	Male	-All mandibular and maxillary teeth have been lost, space for tooth roots have been closed- a result of old age and or periodontal disease -Destructive remodelling of the nasal aperture, inflammation and porosity of the roof of the maxilla- (possible signs of leprosy)

Table 6. Examples of pathologies observed among adult individuals.

Porotic Hyperostosis

At least six individuals in total exhibit signs of porous lesions (porotic hyperostosis) and vascularity of the cranial vault that had healed by the time of death (Figure 10 and Figure 11). All six of these individuals exhibit signs of fine pitting of the skull as well. At least two of these individuals also exhibit some thickening of the diploë. Scurvy, anemia, osteomalacia or rickets could have caused these porous lesions (Brickley, 2018). The following table (Table 7) provides a differential diagnosis for this group of individuals. This is a complete survey of porotic hyperostosis evident on adult crania.

Based on the skeletal lesions, the most likely diagnosis is anemia. This metabolic disease can occur because of an iron-deficient diet, as a secondary consequence of infectious disease or it may be genetic, in the form of



Figure 10. Porous lesions of the cranial vault (Photo P. Weerasinghe).

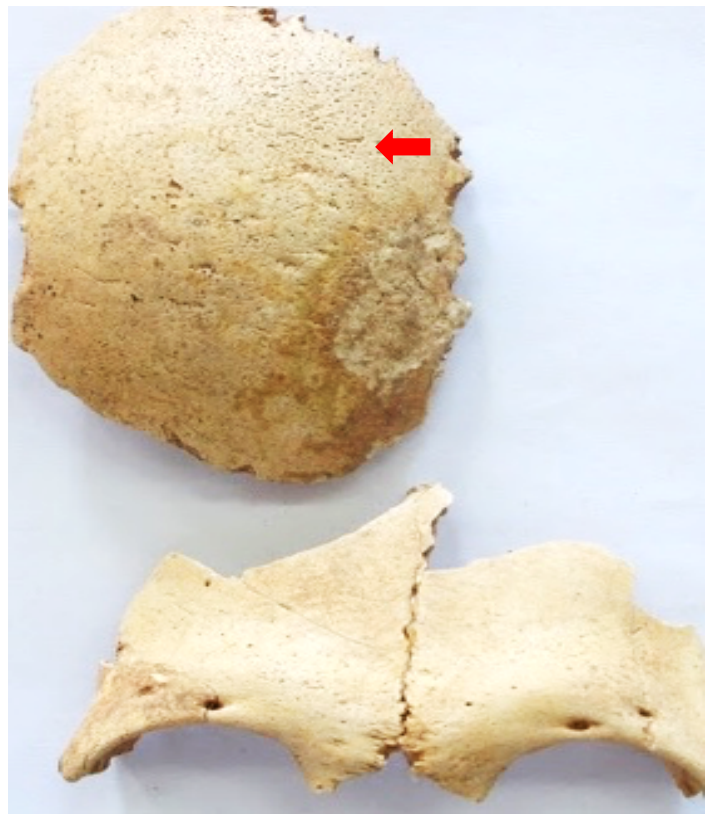


Figure 11. Porosity and vascularity of the cranial vault (Photo P. Weerasinghe).

thalassemia or sickle cell anemia (White and Folkens, 2005; Ortner, 2003; Buikstra, 2019). The case for thalassemia and sickle-cell anemia in ancient Greece is plausible as the genetic variant for thalassemia is present in contemporary Greece (Ortner, 2003). Researchers have suggested these genetic disorders as possible causes of porotic cranial lesions in prehistoric and historic populations of the Mediterranean (Angel, 1966; Barnes, 2003). However, the porotic lesions are remodeled in the adult Eretrian individuals and those who had genetic anemia would have died well before reaching end of young adulthood (35+) (Brickley, 2018). The specific diet of the Eretrian individuals is unknown and anemia could have resulted because of limited access to resources. In antiquity, the city was surrounded by marshlands and malaria would have been prevalent (Schefold, 1968). It is also possible that the individuals who exhibit signs of porotic hyperostosis acquired anemia because of a malarial infection.

Lesions on bone	Scurvy	Anemia	Rickets	Osteomalacia	Eretrian Individuals
Porous lesions of the cranial vault (Porotic hyperostosis)	*	*	*	*	*
Porous lesions of the orbitals (Cribra orbitalia)	*	*			
Thickening of the diploë		*			*
Porosity of the posterior Maxilla, greater wing of the sphenoid and zygomatic bone	*				
Porous new bone formation on alveolar bone and palatine process	*				*
Porosity of the metaphyseal and diaphyseal bone	*				
Bending deformities of the arms and legs			*		
Subperiosteal bone deposition on the glabella			*		
Bones are lightweight				*	
Cardboard like consistency				*	
Deformation of the pelvis				*	
Decreased curvature of ribs				*	

Table 7. Differential diagnoses for Eretrian individuals with cranial lesions.

The possibility of comorbidities among these individuals was considered. FK696-A who exhibits porotic hyperostosis of the cranial vault also exhibits porous lesions of the alveolar bone and palatine process (Figure 12). These lesions occur as a result of petechial hemorrhage and gingivitis of the gums, indicative of clinical cases of scurvy (Geber and Murphy, 2012). It is possible that this individual had scurvy



Figure 12. Porous lesions of the palatine process (Photo P. Weerasinghe).

in addition to anemia. It is important to note that because vitamin C is required for osteoid formation, skeletal evidence of scurvy is evident on bone only after vitamin C is re-introduced after periods of deficiency (Geber and Murphy, 2012). Thus, individuals who had severe scurvy but died without access to vitamin C would not exhibit lesions characteristic of the disease and will not be identified in osteological analysis.

Cranial Deformities

One of the individuals (FK697-F), who was a male between the ages of 20-35 years, exhibits porosity and vascularity of the cranial vault, exhibits signs of premature suture closure (craniosynostosis) of the sagittal suture

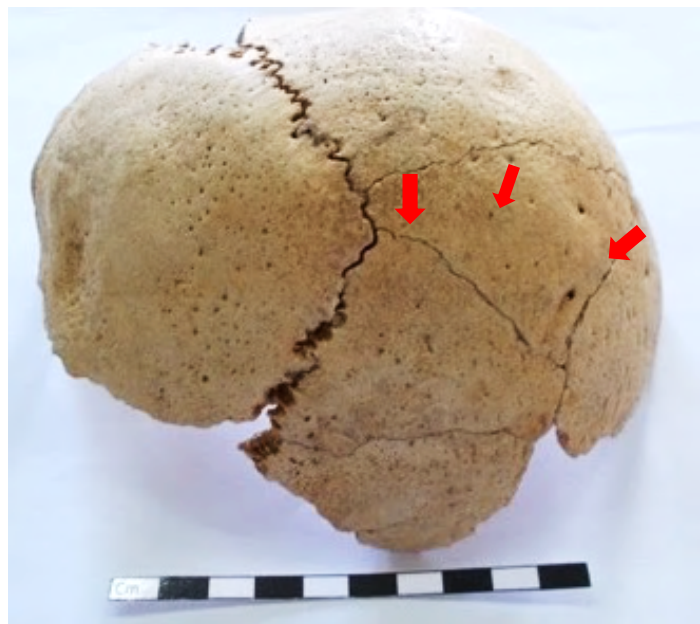


Figure 13. Premature suture closure of the sagittal suture (Photo P. Weerasinghe).

as well (Figure 13). This individual's sagittal suture had been completely obliterated both endocranially and ectocranially while the lambdoidal suture was still open. This could have resulted in the individual having an elongated skull with a prominent forehead (Ortner, 2003). The extent of cranial deformation could not be observed since the complete cranial vault was not available. The vascularity and porosity on his cranium could have occurred as a result of the tension exerted by the premature suture closure (Herring, 2008). It could also have been a result of childhood anemia.

Another three individuals (FK696-A, FK696-B and FK696-C) have metopic sutures that have persisted into adulthood, which normally would have fused early on in childhood (Figure 14). Often called "metopism", the

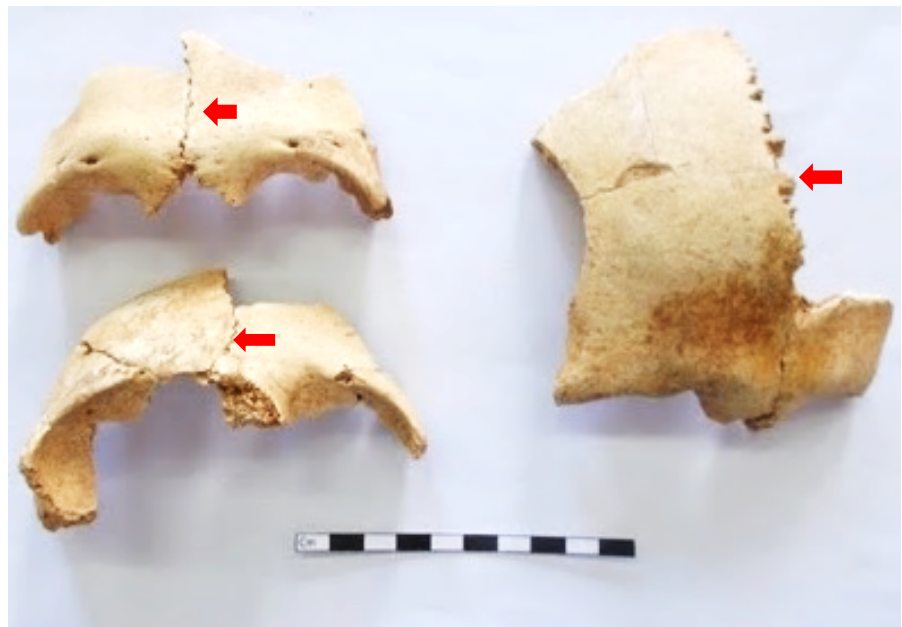


Figure 14. Evidence of "metopism" (Photo P. Weerasinghe).

frequency of this nonmetric variant is influenced by geographical origin (Guerram et al., 2014). It has not been connected with any type of disease in archaeological literature. This is a complete survey of all cranial deformities in the gymnasium well collection.

Dental pathology

Several dental pathologies were observed among the Eretrian well individuals, but time limitations did not permit a complete inventory of teeth. The pathologies discussed in this section of the thesis are some of the examples of dental pathologies observed among the Eretrian

individuals. Three individuals exhibit signs of caries in the 1st right maxillary molar (FK696-A), 1st right mandibular molar (FK697-F), and 2nd left mandibular premolar (FK696-UM02) (Figure 15). The presence of caries indicate that these three individuals probably had high carbohydrate diets (Roberts and Manchester, 1995).

FK697-F also exhibits signs of Linear Enamel Hypoplasia (LEH) on his right maxillary premolars (Figure 16). Enamel hypoplasia can be observed as lines or grooves on the enamel surface (Roberts and Manchester, 1995). LEH, often considered to be an “indicator of stress”, could have occurred as a result of metabolic stress, genetic factors or injuries of the oral cavity although a



Figure 15. Caries of the second left mandibular premolar (Photo M. Liston).



Figure 16. LEH of the right maxillary premolars (Photo P. Weerasinghe).

specific cause is difficult to identify (Pitsios and Zafiri, 2012).

Another individual, FK697-I, an older male (50+ years), had lost all his mandibular and maxillary teeth and infilling of crypts for roots of the teeth could be observed (Figure 17) indicating that the individual had lost his teeth years before his death. The tooth loss could have occurred as a result of old age or as a result of a periodontal disease that had caused premature tooth loss in the individual (Roberts and Manchester, 1995).



Figure 17. Loss of maxillary and mandibular teeth (Photo P. Weerasinghe).

The maxillary teeth of the FK696-A individual, a male between 35- 50 years old, also had heavy calculus buildup (Figure 18) indicating poor oral hygiene. Calculus is often formed in the lingual surfaces of the lower incisors and the buccal surfaces of the upper molars since these sites are closest to ducts of the main salivary glands (Cawson, 1970). However, in this individual, the calculus buildup of the labial surfaces of the upper central incisors, left lateral incisor and canines was observed as well.



Figure 18. Heavy calculus build-up of the maxillary teeth (Photo P. Weerasinghe).

Evidence of Ante-mortem Trauma

One of the adult individuals (FK696-HRU03) had suffered a fractured elbow (Figure 19 and Figure 20) that had healed by the time of

death. All three bones of the humerus, radius and ulna of the left side were affected. The distal humerus and the proximal radius and ulna had developed extensive lipping. Loss of diameter at the midshaft of all three bones could be observed indicating limited use of the elbow. The point of radial articulation had shifted proximally towards the humerus. This individual would have had limited movement in the joint after the injury. The fracture had healed in a way that would have made it impossible for the individual to fully extend the arm at the elbow or pronate the arm completely. The radial head exhibit signs of arthritis, perhaps as a result of limited movement of the arm. This individual would have received significant care immediately after the fracture for it to heal in such a way that it could be used even in a limited capacity.¹



Figure 19. Fractured left elbow- bones are articulated (Photo M. Liston).

¹ I thank Dr. James Santangelo, orthopedic surgeon for his evaluation of this injury



Figure 20. Fractured left elbow- the disarticulated humerus, radius and ulna (Photo M. Liston).

Wedel and Galloway (2014) was consulted to determine fracture type for each bone. The exact fracture type was difficult to establish because of pattern of healing. It is likely that the humerus suffered a “Y”, “T” or lambda supracondylar fracture of the humerus. The radial head had suffered a comminuted fracture. The ulna had suffered a comminuted fracture at the olecranon as well. In most instances, supracondylar fractures occur as a result of a fall where the forearms and hand bear the weight of the body (Wedel and Galloway, 2014). The height of the fall plays a critical role in the extent of the injury and as the fall’s height increases above five meters, fracture of the ulna can be observed as well (Wedel and Galloway, 2014). Since the ulna was affected, it is possible that this individual also fell at least 5 meters. Radial head fractures and olecranon fractures can occur in falls where the arm bears the weight of the body as well. Like the supracondylar fractures, these fractures occur when the hand is outstretched, the forearm is pronated, and the elbow is partially flexed. This is the most severe example of the ante-mortem trauma observed among gymnasium well collection.

Infectious Disease

The individuals represented in the collection also exhibit several infectious pathologies on bone. These could be observed on bones of the hand and feet, lower leg, nose and maxilla.



Figure 21. Concentric remodelling of the metatarsals (Photo P. Weerasinghe).

Deformities of the hand and leg bones include destructive remodeling of the metatarsals and metacarpals in the form of concentric remodelling (Figure 21). Depressions on the palmar surfaces of the distal phalanges of the hands and feet could be observed. The depressions on phalanges would have developed as a result of contracture of fingers and is termed the “claw hand” deformity (Figure 22). The distal foot phalanges exhibit signs of extensive lipping as well (Figure 23). At least three fibula pairs (Figure 24) and two tibia pairs (Figure 25) exhibit signs of inflammation of the periosteal membrane of the bone or periostitis. At least five maxillae exhibit signs of destructive remodelling of the nasal aperture (Figure 26). Three of these also



Figure 22. "Claw hand" deformity (Photo P. Weerasinghe).

had some destructive remodelling of the alveolar process. All five maxillae had some porosity of the rhino-maxillary region and the nasal spine was eroded as well. This is a complete survey of all infectious pathologies evident on crania and long bones.



Figure 23. Lipping on the distal foot phalanges (Photo P. Weerasinghe).



Figure 24. Periostitis of the fibula (Photo P. Weerasinghe).



Figure 25. Periostitis of the tibia (Photo P. Weerasinghe).

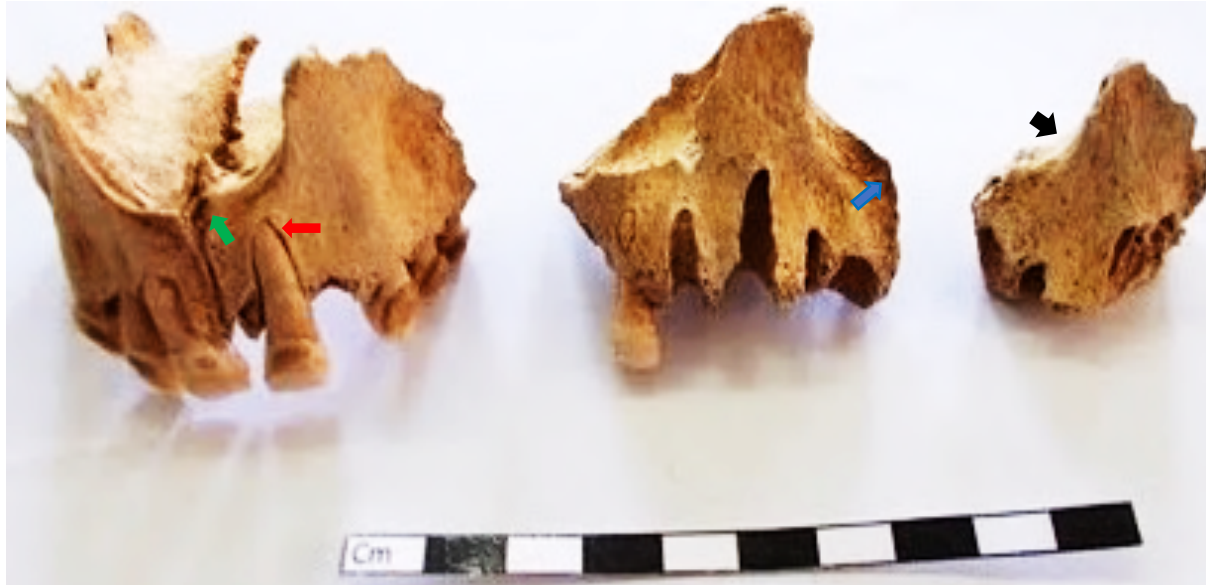


Figure 26. Destructive remodelling of rhino-maxillary region: destruction of alveolar process indicated by red arrow, porosity of the rhinomaxillary region indicated by blue arrow, the rounding of normally sharp aperture margins are indicated in black arrow and the erosion of the nasal spine is indicated by the green arrow (Photo P. Weerasinghe).

Bones Involved	Syphilis	Tuberculosis	Leprosy	Eretrian Individuals
Saber shin deformity (without periostitis)	*			
Periostitis of the tibia			*	*
Involvement of skull (caries sicca)	*			
Destructive remodelling of the hand and foot			*	*
Periostitis of the fibula	*		*	*
Destructive remodelling of the rhino-maxillary region	*		*	*
Angular deformity of the spine (lower thoracic & upper lumbar vertebrae)		*		
New bone formation on ribs		*		
Osteomyelitis of the hip & Knee joint		*		

Table 8. Differential diagnoses for Eretrian individuals with infectious pathologies.

A number of infectious pathologies were considered for differential diagnoses (Table 8). They are syphilis, tuberculosis and leprosy (Hanson's Disease). In syphilis patients, hands and feet are not affected and the involvement of the fibula is rare (Rothschild and Rothschild, 1995).

The Eretrian individuals also do not showcase cranial lesions that are typical of individuals with syphilis. Changes to vertebrae, tuberculosis induced septic arthritis in the hip and knee joints, periosteal bone formation on ribs and long bones are diagnostic of tuberculosis (Roberts, 2011). None of these pathologies could be observed among the Eretrian individuals. The combination of lesions on Eretrian individuals in the rhino-maxillary region, the lower legs, the hands and feet suggest that a differential diagnosis of leprosy is most likely (Ortner, 2008).

Juvenile Pathology

Individual	Age	Sex	Pathologies
FK697-J	4-6 years old.	Un-determined	-Signs of anemia- both orbital roofs exhibit signs of Cribra Orbitalia. Does not show signs of healing.
FK697-K	5-7 years.	Un-determined	
FK696/FK 697-T3	Younger than 16 years	Un-determined	-Evidence of osteomyelitis of the left tibia

Table 9. Examples of pathologies evident on juvenile remains.

The juveniles also exhibit a number of pathologies. Table 9 summarizes the estimated age and evidence of pathologies on juvenile bone. This is not a comprehensive list of the pathologies evident on juvenile bones. The orbital roof of one of the juveniles (FK697-J) shows signs of cribra orbitalia (Figure 27). The lesions were still active at the time of death. Cribra orbitalia is often associated with anemia but also scurvy and rickets (Brickley, 2018). However, this individual does not exhibit signs of porosity of the maxillae, zygomatics or the greater wings of sphenoid that are characteristic of scurvy (Buikstra, 2019). Scurvy can also create porous lesions on long bones, especially on metaphyses (Buikstra, 2019). Porous lesions of the alveolar bone and palatine process can be observed among individuals with scurvy as well (Geber and Murphy,

2012). These types of pathologies were not present among the Eretrian juveniles. Osteological effects of rickets are most often observed in bowing of the limbs (White and Folkens, 2005; Buikstra, 2019). This type of pathology was not evident in any of the Eretrian individuals.



Figure 27. Cribra orbitalia, FK697-J individual (Photo P. Weerasinghe).

Evidence of osteomyelitis of the left tibia (Figure 28) could be seen in the FK696/FK697-T3 individual. Osteomyelitis is often caused by the pus-producing microorganism, *Staphylococcus aureus*. The microorganism is introduced to bone through an injury at the site or indirectly through the bloodstream and may lead to “staph” infections (White and Folkens, 2005; Roberts and



Figure 28. Osteomyelitis of the left tibia: the involucrum is indicated by green arrow, the necrotic bone by blue arrow and the cloacae by red arrow (Photo P. Weerasinghe).

Manchester, 1995; Buikstra 2019). If the infection caused septicaemia or blood poisoning, it could have led to the death of this individual.

Evidence of Post-mortem Impact Trauma

Several juvenile and adult bones contain evidence of impact trauma. Some of these are white in colour (Figure 29 and Figure 30) which indicate that these were the result of new damage; likely from modern excavation tools. Another type of damage could be observed. These fracture surfaces were stained the same colour as the surface of the bone suggesting that these fractures occurred before modern excavations.

Post-mortem and peri-mortem fractures are often discussed in terms of “dry” and “fresh” bones. The pattern of breakage on “dry” bone is different from that of “fresh”



Figure 29. Impact trauma on adult mandible: post-mortem “old” impact trauma is indicated by the red arrow and modern excavation damage by blue arrow (Photo M. Liston).



Figure 30. Impact trauma on adult right tibia: post-mortem “old” impact trauma is indicated by the red arrows and modern excavation damage by blue arrows (Photo M. Liston).

bone because bones maintain their moisture content for some time after death of an individual (Wieberg and Wescott, 2008). In the Eretrian collection, fracture surfaces are rough which is characteristic of “dry” bone fractures. Long bones, crania and mandibles contain evidence of points of impact and flake defects as well (Fig 31-34). However, a few long bones, like the adult right tibia in Figure 30 do have breakage



Figure 31. Juvenile Left Tibia with Multiple Flake Defects (Photo P. Weerasinghe).



Figure 32. Adult metacarpals with right angled fractures (Photo P. Weerasinghe).

patterns that have resulted in obtuse and acute angles which are characteristic of “fresh” bone fractures. It is possible that when some of these bones received the impact trauma, some collagen was still present in the bones, but the flesh had fully decayed. However, the homogenous colour

of fracture surfaces and the cortical bone, the rough fracture surfaces, and evidence of flake defects on these long bones, suggest that most of the bones received the impact trauma while they were “dry”, perhaps as a result of shovels hitting the bone surfaces during exhumations of these individuals. Although it is not possible to know the exact time after death in which these bones received these points of impact trauma, it is certain that enough time had passed for the collagen matrix to begin degrading.

The pressure exerted from the fall of large rocks such as the ones that were used to cover the entrance of the well would have resulted in breaks as well. Further studies should be conducted to evaluate the specific ways rock fall may impact the breakage patterns of bones that remain buried under the soil surface. Bones may absorb moisture from the environment causing dry bones to appear and mimic qualities of fresh bone (King, 2017). Since the conditions of the well was



Figure 33. Adult mandible with impact trauma (red arrow), posterior view (Photo P. Weerasinghe).



Figure 34. Adult frontal with impact trauma (red arrow) (Photo P. Weerasinghe).

damp, it is possible that once the bones were dumped in the well, the bones went through a re-hydration process. If these re-hydrated bones received trauma, patterns of breakage may reflect those seen on “fresh” bone. Assessment of the impact trauma suggests that these skeletal remains had received the impact trauma after their initial burial and before they entered the well.

Missing elements of bone

Many of the elements of bone were missing. For example, metaphyses and epiphyses of long bones were often missing with only the diaphyses present. Larger bones that preserve well in the archaeological record such as femora, tibiae and humeri were frequent compared to the number of radii or fibulae. The number of right elements of bone were also consistently higher than the left elements of bone (Refer to Table 3 and Table 4 for an inventory of selected skeletal elements). The contents of the well were 100% water sieved. Thus, the missing bones could not be a result of recovery techniques. The presence of the small bones such as hand and foot phalanges in the collection suggest that the recovery process was completed thoroughly. It is likely that these missing elements of bone never made it into the well.

Chi square tests were performed using socscistatistics.com to evaluate whether the adult and juvenile skeletal elements recovered from the well were specially selected for burial or if elements were missing due to random chance. The chi square tests (Table 10 through Table 13) do not indicate a statistically significant difference and thus elements of bone probably were not intentionally selected for burial. The elements may be missing due to random chance. However, the consistent lack of some elements like left bones and prominence of some elements like right bones should not be ignored. The Gymnasium well collection may not be a large enough sample size to generate reliable results, since an association between categories may appear significant for a larger sample size but may be insignificant in a smaller sample (Thomas, 1986). Further

research should be conducted to explore this discrepancy between results of chi square tests and the observed quantitative results of right and left elements of bone.

Bone	Right	Left	Row Totals
Humerus	11 (10.91) [0.00]	8 (8.09) [0.00]	19
Radius	6 (6.89) [0.11]	6 (5.11) [0.15]	12
Ulna	7 (5.74) [0.28]	3 (4.26) [0.37]	10
Clavicle	7 (7.46) [0.03]	6 (5.54) [0.04]	13
Column Totals	31	23	64 (Grand Total)

The chi-square statistic is 0.9871. The p-value is .804377. The result is not significant at $p < .05$.

Table 10. Chi square test for missing elements -upper body, adults.

Bone	Right	Left	Row Total
Femur	15 (15.05) [0.00]	12 (11.95) [0.00]	27
Tibia	12 (12.26) [0.01]	10 (9.74) [0.01]	22
Fibula	7 (6.69) [0.01]	5 (5.31) [0.02]	12
Column Totals	34	27	61 (Grand Total)

The chi-square statistic is 0.0458. The p-value is .977356. The result is not significant at $p < .05$.

Table 11. Chi square tests for missing elements-lower body, adults.

Bone	Right	Left	Row Totals
Humerus	5 (5.57) [0.06]	3 (2.43) [0.13]	8
Radius	4 (4.17) [0.01]	2 (1.83) [0.02]	6
Ulna	5 (4.17) [0.16]	1 (1.83) [0.37]	6
Clavicle	2 (2.09) [0.00]	1 (0.91) [0.01]	3
Column Totals	16	7	23 (Grand Total)

The chi-square statistic is 0.7615. The p-value is .858644. The result is not significant at $p < .05$.

Table 12. Chi square test for missing elements- Upper body, juveniles.

Bone	Right	Left	Row Totals
Femur	4 (3.29) [0.15]	3 (3.71) [0.13]	7
Tibia	3 (3.29) [0.03]	4 (3.71) [0.02]	7
Fibula	1 (1.41) [0.12]	2 (1.59) [0.11]	3
Column Totals	8	9	17 (Grand Total)

The chi-square statistic is 0.5622. The p-value is .754964. The result is not significant at $p < .05$.

Table 13. Chi-square statistic for missing elements-lower body, juveniles.

Taken together, the post-mortem impact trauma and the missing elements of bone suggest that the adult and juvenile individuals went into the well as skeletonized remains, not intact

bodies. It also suggests that these individuals were exhumed after some time had passed since their deaths and that these deposits in the well were secondary burials. Smaller bones like hand and foot bones are less frequently recovered in secondary burials as they are often lost when the skeletons are moved. However, the gymnasium well collection does contain hand and foot bones. The presence of these bones, however, does not suggest that they entered the well as intact limbs or mummified feet and hands. The collection contains only a small number of adult and juvenile hand and feet bones. A few of the adult metacarpals (Figure 32) also contain post-mortem impact trauma indicating that they were skeletonized bones when they went into the well.

Points of Impact

Points of impact on long bones and crania were mapped onto a model skeleton based on the overall locations of trauma (Figure 35). On adults, these impact points mostly appear on the anterior lateral and medial portions of bone. The anterior surface contained 28 impact points and the posterior surface had received 23 impact points. Chi square test (Table 14) conducted using socscistatistics.com, indicate that this difference between anterior and posterior impact points is not statistically significant. The null hypothesis, which is that there is no relationship between anterior and posterior impact points stands. If the individuals were buried on their back, the anterior skeleton would have received the most impact points. The right posterior radius had received multiple impacts. This may be because of placement of the hands. It is possible that the right lower arm was placed on top of the left and as a result the right radius and ulna received these impact points as opposed to both arms and/or the left arm. When the individual had crossed the right arm over the left, these points on the posterior lower arm will be on the anterior surface as the arm would have been rotated.

Impact points on juvenile remains were mapped as well (Figure 36). the anterior surface had received 14 impact points and the posterior surface had received 13 impact points. The Chi square test (Table 15) does not suggest a statistically significant difference for anterior and posterior impact points for juveniles either. There seem to be no pattern between the location of impact points on adult and juvenile remains. In Greece, reuse of burial spaces is common even in modern times. It is possible that the juvenile and adult remains were moved aside to make space for other deceased members. As a result, points of impact may not always fall on the anterior surface of the skeleton.

Bone	Anterior	Posterior	Row Totals
Skull	8 (8.17) [0.00]	8 (7.83) [0.00]	16
Upper Arm	4 (3.57) [0.05]	3 (3.43) [0.05]	7
Lower Arm	6 (6.13) [0.00]	6 (5.87) [0.00]	12
Lower Leg	6 (6.13) [0.00]	6 (5.87) [0.00]	12
Column Totals	24	23	47 (Grand Total)

The chi-square statistic is 0.1216. The p-value is .98912. The result is not significant at $p < .05$.

Table 14. Chi square tests for impact trauma-adults.

Bone	Anterior	Posterior	Row Totals
Upper Arm	1 (1.00) [0.00]	1 (1.00) [0.00]	2
Lower Arm	1 (1.00) [0.00]	1 (1.00) [0.00]	2
Upper Leg	2 (2.50) [0.10]	3 (2.50) [0.10]	5
Lower Leg	8 (7.50) [0.03]	7 (7.50) [0.03]	15
Column Totals	12	12	24 (Grand Total)

The chi-square statistic is 0.2667. The p-value is .966171. The result is not significant at $p < .05$.

Table 15. Chi square test for impact trauma-juveniles.



Figure 35. Overall location of impact trauma, adults (Photo P. Weerasinghe).



Figure 36. Overall location of impact trauma-juveniles (Photo P. Weerasinghe).

2.9 Discussion

Tsaliki suggests five criteria for identification of deviant burials. Table 16 compares Tsaliki's criteria against the findings of this study to determine whether the gymnasium well could be considered a "deviant" form of burial. Even though graves were to be found outside of

city limits, skeletal deposits in wells within cities are a common phenomenon in Greek archaeology (Papadopoulos 2000). Thus, this practice of disposing the dead may not be completely “unusual” in a Greek context. The Eretrian gymnasium well does not exhibit any evidence that suggests that this burial was performed in response to a catastrophic event (i.e. famine, war, plague). During these events, getting rid of cadavers within a short period of time is key and thus they are more often primary burials rather than secondary burials. If the individuals were deposited in the well as a result of a catastrophic event, they would not exhibit signs of post-mortem impact trauma on bone. The inhumations do contain signs of impact trauma, but these may not be a result of “unusual” ritual activity as exhumation of burials were common in Greece. It is likely that these marks were acquired as the skeletal remains were being hit by shovels in the exhumation process. The skeletal material does not indicate any evidence of crime or torture. The individuals were certainly not alive while the impact trauma occurred as they occur on “dry” bone as opposed to “fresh” bone. The gymnasium well deposit is not a “deviant” form of burial according to the criteria introduced by Tsaliki.

Tsaliki’s criteria for identification of deviant burials	Is the Gymnasium well deposit a “deviant” burial?
-Burials in unusual places	-Burials within wells are common throughout Greece
-Mass burials evident of a crisis	-May not indicate a crisis as these may not result in secondary burials
-Signs of ritual activity on bone and at the burial location (i.e. cut marks, artefacts)	-Signs of impact trauma from the exhumation process
-Evidence of torture	-Impact trauma occur on “dry” bone
-instances of inhumation in regions where cremations are prominent and vice-versa	-The were inhumations in an area where inhumations did occur

Table 16. Burial type of Eretrian gymnasium well deposit.

In archaeological literature of necrophobia, burials covered with stones are often interpreted as measures that were taken by the living to make sure the dead remained within their

graves. However, the large rocks found at the opening of the well (Figure 5) may have served a different function. The gymnasium was already abandoned at this point in history (Ackerman et al., 2018). Since the well was accessible only from the road north of the gymnasium, it would have been out of sight. The well also contained bronze statue fragments and butchered animal remains. While the bronze statue may have come from the gymnasium, the butchered animal bone does not have any association with the life of the gymnasium. Thus, it is possible that this well was being used as a site of “garbage disposal” after the gymnasium was abandoned (Ackerman et al., 2018). The rocks at the opening of the well may have been used to cut off access to the well. This would have effectively stopped the practise of throwing unwanted objects and skeletal material down the well.

Researchers have suggested lack of social status and evidence of pathology as reasons for skeletal remains in wells (Little and Papadopoulos 1998; Liston et al. 2018). For example, social exclusion as a result of behavioural changes associated with a head injury was concluded as the reason for why AA288 individual was deposited at an Athenian Iron age well (Little and Papadopoulos 1998). The Agora ‘Bone Well’ also contained remains of an adult male with hereditary hemochromatosis, a child that exhibited signs of cribra orbitalia and an older infant with multiple traumatic injuries indicative of battered child syndrome (Liston et al. 2018). It is possible that individuals from Eretria who exhibited signs of leprosy were deposited in the well as a result of their pathology.

Leprosy is the result of the bacterium, *Mycobacterium leprae*. The bacteria affect peripheral nerves (i.e. motor, sensory and autonomic) leading to paralysis and loss of sensation in the hands and feet (Roberts, 2011). Infections of the feet and lower legs are common in leprosy individuals because of loss of feeling. The individuals would have experienced persistent

nasal discharge, loss of incisor teeth as a result of destruction of alveolar process, hoarseness of voice and in extreme cases blindness (Roberts, 2011; Roberts and Manchester, 1995). These afflictions would have made these individuals visibly different from the rest of the population. It is possible that these individuals were socially alienated both in life and in death as a result. However, it is important to recognize that leprosy patients may not have been treated differently throughout history because of their disease. Much of our current understandings of past social attitudes toward leprosy individuals are influenced by biblical references to the disease (Roberts and Manchester, 1995). According fourth century Christian theologians however, the touch of leprosy patients held redemptive power and many affluent members of society even built leprosariums so that their sins would be pardoned (Holman, 1999). Third century Eretrians may have had similar attitudes toward people with the disease. At the least, these individuals may not have been considered “social outcasts” or “deviants” because of their pathology. Their burial treatment was not because of pathologies evident on bone.

The gymnasium well deposit is a secondary burial. All instances of skeletal deposits in the other wells mentioned in this thesis are primary deposits other than the Hellenistic well at Messene (Bourbou and Themelis, 2010). The post-mortem impact trauma on bone suggest that these individuals remained buried for a time before they entered the well. It is likely that these were “old” burials that Eretrians had found within the city walls and gotten rid of the remains by dumping them down the well. These individuals would not have had living relatives if they had died long before the Eretrians of the Roman period and thus reburial may not have been considered an option. The adult and juveniles were found within higher contexts than the infants. The presence of infants in lower levels of the well suggests that the well was already being used for disposing human remains at this time and the community was probably aware of the well as a

possible location for disposing human remains. With the well diameter at 1 m and the depth of the two contexts (FK696 and FK697) about 50 cm (Figure 5), the total volume of the space containing these bones was only 0.39m³. This is an extremely tight space for skeletal remains from approximately 29 adults and 7 juveniles. It is possible that these individuals went into the well, within a short period of time or even together. If these remains derive from old burials, the term “deviant” may not be applicable to these individuals. According to the criteria introduced by Tsaliki, this burial at the gymnasium well also is not a “deviant” form of burial. The gymnasium well burial could be classified as variation of a normative burial.

The sample is biased in the sense that the majority of it is made up of males between 35-50. It could also be that females were treated differently in connection to leprosy or were less likely to be viewed as “deviants” if the individuals were indeed deposited at the well for their deviancy. As a result of lack of time available, extensive analyses of the pelvic and thoracic cavity were not possible. Although these elements were heavily broken and estimating sex using the pelvis was not possible, they would have provided more information particularly in regard to the post-mortem impact trauma patterns. Although assembling complete skeletons was not possible, the collection did provide important information about the possible identities of Eretrian individuals.

2.10 Conclusion

The level of breakage, the post-mortem trauma on bone, and the missing elements of bone suggest that the adult and juvenile individuals were deposited in the well as skeletonized individuals. The deposit was also a secondary internment. Roman social attitudes toward leprosy do not suggest that these individuals were necessarily considered “social outcasts” or “deviants”. Their burial treatment was not necessarily the result of the pathology evident on their bone. It is

more likely that the Eretrians during the Roman period had found these burials within city walls and had disposed of them in the well. Although the gymnasium well burial is a secondary burial found inside city limits, the social attitudes toward leprosy patients, the prevalence of skeletal deposits in wells and the possibility that these were “old” burials, indicate that this is not a “deviant” form of burial and instead a variation of a “normative” form of burial. The term “deviant” automatically attracts negative connotations. Individuals recovered from “deviant” burials are also viewed as people who had exhibited negative social personae whether in life or at death. To minimize these inherent biases, the use of the term “deviant” should be avoided when describing types of burials, although it is a commonly used term.

Dates of the well were established using coins of Caracalla, but these dates may not correspond with the skeletal deposit as these individuals were possibly left buried at another location for some time before they were finally deposited in the well. The skeletal remains could be carbon dated in order to explore this avenue further. The process for submitting approval for conducting destructive methods of analysis is a highly regulated and a lengthy process. The time that was available for my research would not have permitted this step to be included in the research. In the future, research on these skeletal remains could include radiocarbon dating and completing the inventories of the dentition and the thoracic and pelvic remains. In addition, this research will contribute to a more accurate understanding of the phenomenon of skeletons in wells.

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