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**Social Complexity at the Time of Urbanization: A 'Grave' Perspective — Late Pottery Neolithic to Early Bronze Age Northern Mesopotamia (6400-2000 BCE)**

**Deniz Enverova**

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SOCIAL COMPLEXITY AT THE TIME OF URBANIZATION:  
A 'GRAVE' PERSPECTIVE — LATE POTTERY NEOLITHIC TO EARLY BRONZE  
AGE NORTHERN MESOPOTAMIA (6400-2000 BCE)

A Dissertation

Submitted to the Graduate School  
of the University of Notre Dame  
in Partial Fulfillment of the Requirements  
for the Degree of

Doctor of Philosophy

by

Deniz Alev Enverova

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Abstract

by

Deniz A. Enverova

This work focuses on the transition from the Late Pottery Neolithic to the Early Bronze Age in Mesopotamia (6400-200 BCE), with a particular emphasis on North Mesopotamian developments. I use mortuary data from this time period in order to understand how people were buried and to what extent these practices reflected social structures as understood from the rest of the archaeological record. Cortical bone thickness and density are examined in concert with the mortuary data in order to understand long-term changes in people's mobility and/or activity patterns, as well as internal structures that differentiated between the sexes.

This inquiry is especially framed in the context of urbanization that occurred once during the middle of the 4<sup>th</sup> Millennium BCE and once again in the middle of the 3<sup>rd</sup>. How mortuary practices and the human body were influenced by the changing dynamics of shifts in settlement patterns, use of space, and the reduced mobility of people who had specialized tasks to perform is at the hearth of this study. Thus, I am examining how

social differentiation is or is not reflected in the ritualized behavior of burying the dead through the lens of 3000 years, and how we can possibly learn about these changes by employing human long bone cortical studies.

In order to contextualize my findings, I model North/South Mesopotamian interactions, North Mesopotamian social organization, and elite power as a heterarchical system. The use of heterarchy instead of hierarchical to characterize northern Mesopotamian societies allows me to reconcile burial patterns that are observed, explain the lack or presence of wealth in certain graves, and link these findings to the rest of the archaeological record. Heterarchy gives a richer understanding into why societies go through phases of centralization, decentralization, and collapse and allows for a more flexible approach by which to investigate social complexity.

This is for Hazell and Turan-  
the dinosaurs.

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## CHAPTER 1: INTRODUCTION

*Now, what is the sleep that has taken hold of you?  
Turn to me, you! You are not listening to me!  
But he cannot lift his head.  
I touch his heart, but it does not beat at all.  
(Gilgamesh VIII; Dalley, 1989: 93)*

Death was not a happy event, nor was the afterlife a consolation for the dying and their close ones in the ancient Near East. In this case, what would acts of burying the dead have looked like? In the absence of a true concept of the afterlife, what purpose, if any, did objects placed in graves serve? This work intends to answer these questions and investigate how social developments and trends appear through the lens of mortuary rites in ancient societies. Referencing the Binford/Saxe program (Binford, 1971; Saxe, 1970), I use Mesopotamian burial records and compare them to the rest of the archaeological record. From the 7th millennium BC to the 3rd millennium BC (~6500-2000 BC), I examine how burials and their contents mirror their corresponding social circumstances in sites across northern Mesopotamia in response to changes in social complexity throughout this period.

Mesopotamia is a place of many firsts. It is the first region in the world where we see writing, the first instance of urbanization, the initial wave of agricultural revolution alongside the neolitization process. My concern with the region arises from the fact that cultural developments occurred in a manner that connected the past with the future, and until the Middle Bronze Age, no invasive cultural phenomenon was observed. Thus, as someone who wants to follow and understand mortuary developments in the backdrop of social structure, I know that a level of continuum existed in the region. This is also useful when trying to interpret cultural elements that appear "suddenly" on the archaeological horizon—it must be understood that Early Bronze Age cultural or social features were already in place in the Neolithic. While Mesopotamia had a considerable level of variability, commonalities throughout the whole region always existed. Thus, indigenous variation to culture should be seen as a variation of cultural trends and not as fully unique aspects that come from outside of the region. In the context of mortuary practices, Mesopotamia offers a chronologically and geographically rich perspective. Here, I examine questions of social complexity as they are reflected in the creation of social memory through the act of mortuary rituals. The following paragraphs present an overview of the chapters in this work.

In chapter 2, I give a cultural history overview of each period in question here—Neolithic, Chalcolithic, and the Early Bronze Age. In particular, I outline environmental, economic, architectural, settlement, and sociocultural factors that characterized these periods. This serves to ground my later arguments in archaeological findings. After this discussion, I outline how social complexity and mortuary practices have been treated in



previous research in the recent and distant past. Social complexity is examined in terms of how long-distance trade between the South and the North affected social development. I outline how the use of metals served to propagate economic cycles and functioned as an ideological tool that emanated status when deposited in burials. This chapter also introduces how long bone geometry has been used as a measure of human movement and development and how previous anthropologists have applied such data to understand the complexity of ancient societies.

The second half of the background chapter is concerned with outlining how I look at social complexity in the following chapters. I challenge the usefulness of the act of understanding how complex a society is and then present ways that we should investigate the concept archaeologically. I propose the heterarchical model/system as a useful method that gives analytical power to the understanding of social structure. I outline how mortuary practices and the consumption of metals will be used as a proxy to ask such questions. Within the context of heterarchy, I challenge the use of World Systems Theory in the Mesopotamian scenario. Finally, I present how I will use cross-sectional geometry in this work as means of studying social development (this is different; the other paragraph presents how bone geometry has been used by others, and later on in the chapter, which is what I am talking about here, I talk about how I will use it).

Chapter 3 intends to introduce the data that I use in chapters 4-6 to present and analyze mortuary rituals in Syrian and Anatolian sites from the Late Pottery Neolithic to the Early Bronze Age. The chapter begins by introducing the structural layout of each of these next three chapters. I present tables that outline the chronological, demographical,

and artifactual nature of the mortuary data used. I introduce what terminology will be used in data presentation and the limitations of this study in terms of methodology and available data. I end with some theoretical frameworks of burial analysis that shaped my approach in the next chapters.

Chapters 4-6 are structurally identical. They aim to present the data that I have collected from various burials by period and then contextualize those findings in the social setting as understood by archeological and sometimes textual evidence. This data presentation looks for patterns in mortuary practices from three perspectives: use of artifacts in relation to grave types and demographics, grave types in relation to artifact deposition and demographics, and demographic breakdown in various grave types and association with artifacts. Though these questions are similar, this approach allows me to focus on the three mortuary features separately in order to emphasize patterns and relationships between artifacts, demographics, and grave types. After the findings are presented, I orient the discussion in terms of why artifacts were interred in burials, what structured burial practices, and to what degree they reflected each period's social structure.

In chapter 4, special topics of concern are fragmentation and burning rituals, which defined the nature of many of the burials that we see during the Late Pottery Neolithic. I use this phenomenon to frame my discussion of how these burials should be understood. Chapter 5 deals with the Chalcolithic period graves, which I divide into Ubaid and Uruk as chronological markers rather than cultural impositions. Of special concern in the Ubaid are the overwhelming number of infant burials and the lack of dead

during the Uruk. I discuss how by the end of this period, the religious foundations that will shape coming periods are already visible archaeologically and correspond to social differentiation trends.

Chapter 6 deals with the major period of concern, the Early Bronze Age, where textual, as well as archeological evidence, gives us an understanding of how society functioned. In this chapter, I bring in textual evidence and interpret my mortuary findings against the backdrop of how Mesopotamian cultures interpreted the act of dying and their feelings about death. I show that mortuary practices as well as elite conspicuous consumption of metals should be viewed as connected to religious symbolism. It was through this ideology that social differentiation was both expressed yet masked in burial practices.

The Chapter 7, my final data chapter, departs from archaeological analysis and focuses on human biological markers of inequality. Here, I compare cortical geometry from humeri and femora from Hakemi Use, Titriş Höyük, and Bakla Tepe to see if social developments from the Neolithic to the Early Bronze Age resulted in differences in physiology. First, I give a brief archaeological overview of the tree sites in order to contextualize the findings. Then, I present the methods that were used to acquire and process cortical bone measurements and the statistical tools used to analyze the data. Next, I present the results in a series of tables and their descriptions. In the discussion, I interpret the data by focusing on the differences between the sexes between and within each site. I conclude by linking my findings to what is known archaeologically.

Chapter 8, the concluding chapter, serves to bring together the findings discussed in the previous chapters and frame them within a discussion of heterarchy. I begin by giving a culmination of what my findings and arguments are. Then, I answer the questions that I posed about social complexity in Chapter 2, specifically from the point of view of Greater Mesopotamia. I begin a discussion of heterarchy by presenting it as a toolkit. In three defining characteristics of this model, I use my data to evaluate the applicability of heterarchy in the study of social complexity. Finally, I present what was learned and its usefulness in understanding mortuary practices, social complexity, and developments in Mesopotamia after the Early Bronze Age.

This research both examines how mortuary practices were influenced by social structures based on differences in status and investigates how those structures were reflected in the creation of the mortuary record. The places chosen for making graves, the enactment of rituals associated with burying the dead, post-interment rituals, and the act of memory-making are all influenced by the internal inequalities and perceptions of relationships that existed in societies.

In this work, heterarchy is used as a model to understand social structures in northern Mesopotamia, but it is also “tested” to see how suitable this model is based on the mortuary evidence collected here and the rest of the archaeological knowledge. This model is useful in analyzing long-term change, the sudden appearance of unfamiliar cultural elements, and contextualizing events such as social collapse. Heterarchy serves as a tool to understand changes in the burial record through time as well as

inconsistencies between what graves show versus what we know about social status and the complexity of society at any given time.

CHAPTER 2: :  
BACKGROUND: PREVIOUS RESEARCH, SETTING, AND THE RESEARCH  
POTENTIAL OF MESOPOTAMIA

This chapter presents a brief overview of the archaeological, cultural, and environmental settings of Upper Mesopotamia during a major transition period between the Late Pottery Neolithic and the Early Bronze Age (6100- 2000 BC). This chapter focuses on several tasks. First, I provide an archaeological background of the areas and periods covered, including settlement style and aspects of material culture. I do not, however, engage with material surrounding burial practices here since that topic will be discussed in detail in the next chapter. Second, I present and outline the main theoretical concerns and questions that arise from this case study and present broader data analysis in the following chapters.

## **2.1 Archaeological Overview of the Region and Its Social Context**

### *2.1.1 Chronology and Culture History*

In this work, Late Pottery Neolithic refers to the Pottery or Ceramic Neolithic, and the chronology follows Anatolian sequences. I follow the chronological characterization of Tekin (2018, 2019), Plug et. al., (2014), Kansa et. al., (2009) and Nieuwenhuyse (2013). The archaeological chronology of Greater Mesopotamia varies depending on region and settlement. For example, as seen in Table 2.1, the Ubaid presence at sites in northern Syria is not the same as it is at southeastern Anatolia in terms of time. Archaeologically, the Ubaid starts after the Neolithic and precedes Early Bronze Age I, but Early Bronze I starts at different points within Mesopotamia. Of course, this issue stems from the fact that ceramic repertoire is still used to track cultural change/movement of people and that absolute dates are accommodated to this. For example, the Halaf period is dated to 5900-5300BC, but at SabiAbyad in the Balikh Valley starting in 6000BC, we find Samarran pottery with mixed characteristics. These 100 years are treated as a transitional period because they do not fit into cultural categories (Nieuwenhuyse, 2000; Suleiman and Nieuwenhuyse, 1999). If one looks at southeastern Anatolia, however, the Halaf is not much of a presence during what would be the Late Pottery Neolithic. Here, the culture initiates what would be the Early Chalcolithic, but for Syria, the Halaf is associated with Late Pottery Neolithic cultures.

TABLE 2.1:  
THE CHRONOLOGY OF MESOPOTAMIAN WITH CORRESPONDING  
ANATOLIAN SITES

Date BC	Chronology	SE/ E Anatolian Sites	NW Syria	N Syria	Middle Euphrates	Balikh	N Iraq	S. Mesopotamia
~6500	Final PPNB- Late Pottery Neolithic	Hakemi Use; Mazraa-Teleilat II; Yumuktepe XXXIII	Amuq As; Tell El Kerkh 6-1		Abu Hureyra IIC; Bouqras 7-1	Sabi Abyad 11	Kultepe	
6400-6100	Pre Halaf/ Samarra	Tell Kurdu; Hakemi Use; TurbeHoyuk;	Amuq Bs		KosakShamali; Halula 'Pre-Halaf'	Sabi Abyad 8-10	Sotto	Samarra
6100	Transition al Samarra/ Halaf	Yumuktepe XXVII; Hakemi Use; TurbeHoyuk; Grike Kese			Baghouz	Sabi Abyad 6	YarimT epe I	
6000	Hassuna	TurbeHoyuk; Grike Kese				Sabi Abyad 1-3		Tell Hassuna
5900	Early Halaf/ Samarra/ Hassuna	TurbeHoyuk; Karavelyan; Grike Kese;						



TABLE 2.1 (CONTINUED)

Date BC	Chronology	SE/ E Anatolian Sites	NW Syria	N Syria	Middle Euphrates	Balikh	N Iraq	S. Mesopotamia
5800-5700 5600-5500	End of Samarra /Middle Halaf/ Hassuna	TurbeHoyuk; Karavelyan; Grike Kese; Domuztepe;	Amuq C sites	Cagar Bazar; Tell Halaf	Amarna; Halula			
5500-5300	Late Halaf/ Hassuna	Grike Kese		Tell Halaf				
5300	End of Hassuna/ Halaf - Ubaid Transition	Domuztepe; Salat Tepe	Amuq D sites	Tell Halaf			YarimT epe II; Arpaciya	
5200-5000	Halaf- Ubaid Transition or Ubaid 0-1 in the south		Kurdu; Amuq E	Gawra XVII-XIX	KosakSamal i 17-13; KosakSamal i 12-10;	Hamman IV A		
5000-4700	Ubaid 2-3			TepeGawra XV-XVI		Hamman IV B		
4700-4400	Ubaid 4	Salat Tepe	Ras Shamra IIIC-IIIB;	Abada I-II; Gawra XIII; Leilan VIb;	KosakShamali 9-4	Hamman el-Turkman IVC		
4300-4200	Post- Ubaid/ Terminal Ubaid	Salat Tepe; Arslantepe;	Tell Afis	Gawra XII	Brak CH leveling fill	Hamman el-Turkman IV D		
4000	LC 2	Salat Tepe; Korucutepe; Arslantepe;		Gawra IX-XIA	Brak TW 19-18	Hamman el-Turkman V		

TABLE 2.1 (CONTINUED)

Date BC	Chronology	SE/ E Anatolian Sites	NW Syria	N Syria	Middle Euphrates	Balikh	N Iraq	S. Mesopotamia
3800	Late LC 2/ Early Uruk in the South	Salat Tepe; Arslantepe;		Leilan V; Gawra VIII	Brak TW 17-14;			Early Uruk
3600-3500	Late LC 3/early LC 4/ Middle Uruk	Arslantepe (VII);			Brak TW 13			Middle Uruk
3400	LC 4/ Middle - Late Uruk	Hacinebi A Muslumantepe; Tepecik	Amuq F	Leilan IV				
3200	Late LC 5/ Late Uruk	Carchemish; Arslantepe (VIA); Hacinebi A; HassekHoyuk 5			Brak TW 12			Late Uruk
3000	EBA I	Asagi Salat; Carchemish; Arslantepe (VIB); HassekHoyuk 3a	Amuq G		Brak TW 11-1	Hammamet-Turkman VI East		Jamdet Nasr
2800	EBA IB	Carchemish; Arslantepe; HassekHoyuk 3b	Amuq H					Early Dynastic I
2700	EBA IB	Carchemish; Arslantepe;	Hama K 5-1					Early Dynastic II
2600	EBA II	Carchemish; Gedikli; Titriş Höyük				Chuera IB		

TABLE 2.1 (CONTINUED)

Date BC	Chronology	SE/E Anatolian Sites	NW Syria	N Syria	Middle Euphrates	Balikh	N Iraq	S. Mesopotamia
2500-2400	EBA III	Oylumhöyük ; Carchemish; Arslantepe; Titriş Höyük;			Banat IV	Chuera IC		Early Dynastic IIIa
2400	EBA III	Carchemish; Arslantepe; Titriş Höyük;						Early Dynastic IIIb
2300	EBA III	Carchemish; Arslantepe; Titriş Höyük;	Amuq I		Banat III	Chuera ID		
2200	EBA III	Carchemish; Arslantepe; Titriş Höyük;				Chuera IE		Akkad
2100	EBA III	Carchemish; Arslantepe; Titriş Höyük;	Amuq J		Banat II	Hammam et-Turkman VI West		
2000	EBA III	Carchemish; Arslantepe;						Ur III

Table 2.1 shows the most important sites that provide a ceramic sequence. Breaks in dates are periods of hiatus.

Another issue that should be pointed out is that researchers only have a poor understanding of the period after the Neolithic. In Anatolia, the period from roughly 7000BC to 6000BC is called the Pottery Neolithic, a time when people first used ceramic containers. It is important to note that 7000 BC is not when ceramics were invented but rather when they began to be widely used and can be observed archaeologically (Sagona and Zimansky, 2010). There is no reason to think that people did not know how to make pottery earlier; the slow integration of ceramic vessels and their sparse use may imply that they were not considered to be overly useful. Surely, this was because, initially, they co-existed alongside woven vessels. After around 6000BC, cultural practices among Mesopotamian people, including subsistence practices, settlement patterns, and technology, remained stable.

A bigger issue for the region is that the chronology for northern Mesopotamia is based on southern Mesopotamian sites, with some settlements having been dated by radiocarbon 14, but not others. Likewise, some sites have comparable stratigraphic levels that can be linked securely to large type-sites (Uruk for example), and some do not. Near Eastern populations have always been, despite various degrees of being settled and agricultural, multi-ethnic, partly mobile, and incredibly regionally variable (Akkermans and Schwartz, 2003: 103-105). This is problematic because sites are highly diverse, and some were too briefly occupied to firmly identify the period of occupation, which often results in the invisibility of sites.

Related to the site visibility problem, the main cultural groups in existence in Mesopotamia always blended with the local traditions of more mobile groups. This is archaeologically problematic because local and mobile groups are relatively invisible to

researchers, and it is difficult to understand the variation that is observed in ceramics. Do we see regional variation of Halaf or are we seeing Halaf mixed with a local group's tradition? The answer probably lies somewhere in the middle.

The chronology used here is based on a technological periodization: Neolithic-Chalcolithic-Early Bronze (Yener, 2000; Sagona and Zimansky, 2010). For the purpose of this work, this sequence of periods makes the chronological units more usable when following metallurgical trends. The chronology used here draws upon the southeastern Anatolian sector of northern Mesopotamia rather than the Syrian and Iranian in ceramic sequences. This fact is most significant in the transitions from period to period, especially the start and end of the Halaf. In the following sections, I introduce each period, its dating, and its cultural attributes.

#### *2.1.2 Late Pottery Neolithic (6500-6000 BC):*

In southeastern Anatolia and Upper Mesopotamia in general, archaeological research and analysis are largely focused on settlements in an alluvial setting (Fig. 2.1). Especially in the case of Anatolia, northern villages often are not even acknowledged as a regional variation of Late Pottery Neolithic life, let alone treated as important in reconstructing the transition of villages to urban cities that characterizes the area in the Uruk period and Early Bronze Age (Ozdogan, 2013: 377-378). Even though it has become clear that there is indeed a substantial amount of material to be investigated in southeastern Anatolia, historically, researchers have focused on the western and central parts of the country. The reasons for this are twofold: these sites are much more accessible, and, archaeologically, they are connected to the Mediterranean sphere of

influence. Nevertheless, in the past 20 years especially, much material has come to light, largely due to the intense dam building in the area (Ozdogan, 2015) (Figure 2.2).

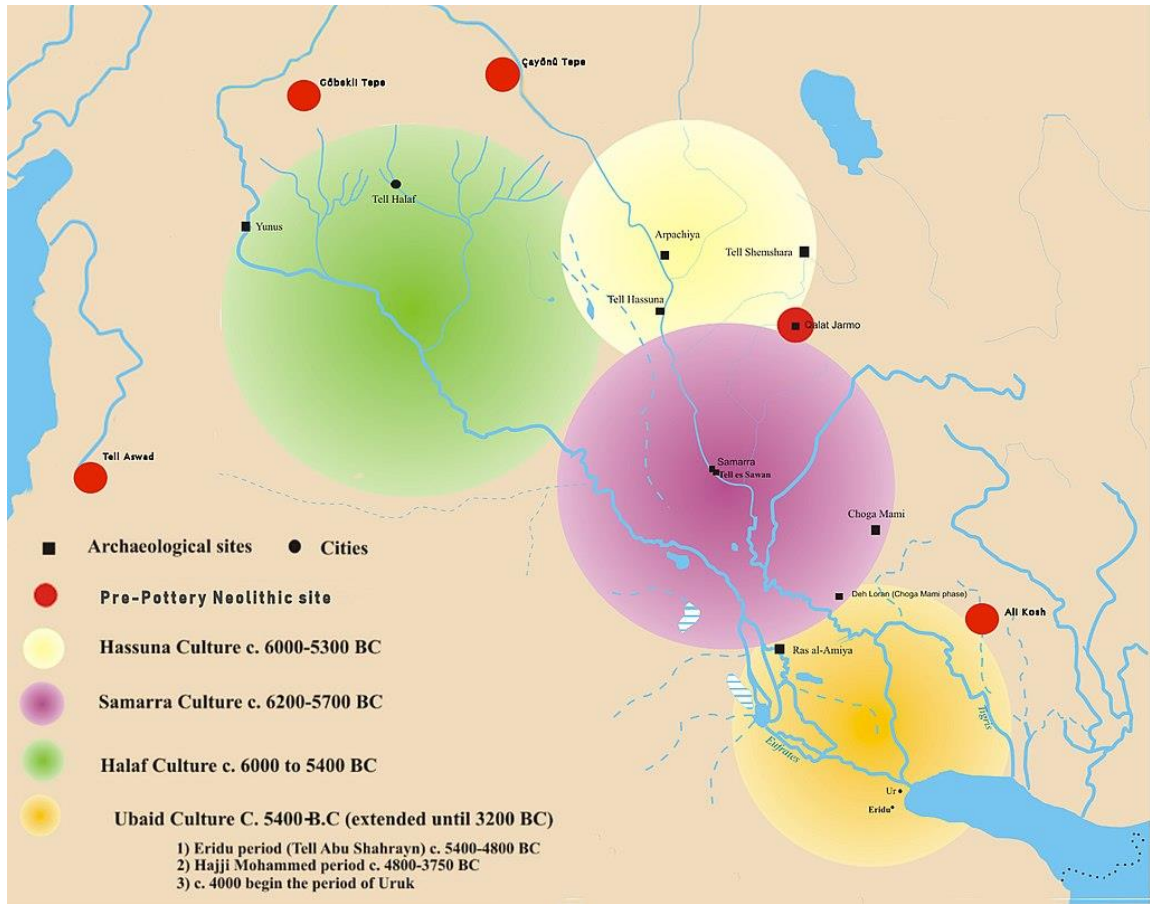


Fig. 2.1: Map of southern Mesopotamia, roughly showing the sphere of strongest influence of the major Late Pottery Neolithic cultures. Adapted from Wikipedia contributors, 2019.  
[https://en.wikipedia.org/wiki/Halaf\\_culture](https://en.wikipedia.org/wiki/Halaf_culture)

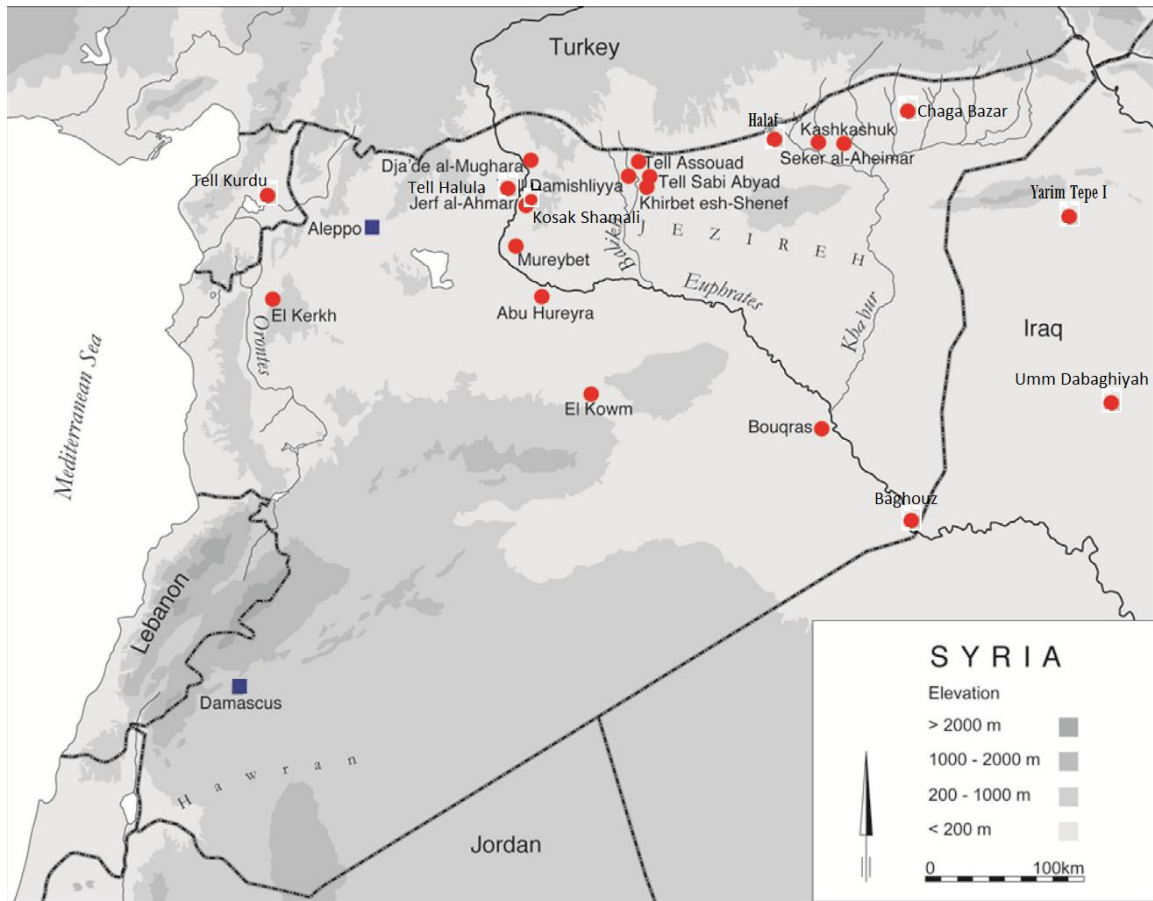


Fig. 2.2: Important sites in Greater Mesopotamia mentioned in the text. Modified from Nieuwenhuyse et. al., 2015: 31.

As noted, the introduction of pottery took place around 7000 BC with the appearance of the Dark Faced Burnished Ware. As Sagona and Zimansky (2010: 11-12; 82) discuss, these ceramics are not always dark-faced or burnished. There are regional variations and some discrepancies about when we should characterize the pottery Neolithic as "late" vs. "early," if at all. In this case, I distinguish between the earlier and later phases of the pottery Neolithic for three reasons: 1) the presence of the Pre-Halaf, or

local (ceramic) culture, in Anatolia that can be discerned around 6500 BC, 2) the intensification of both the number and style of ceramic vessels used around 6500 BC, and 3) the spread of Halaf culture across northern Syria and southeastern Anatolia from the Iranian highlands from 6000 BC onwards. The period before 6000 BC is characterized by the Hassuna (6000-5300 BC) and Samarra (6200-5700 BC) pottery cultures, which overlap with the Halaf when it first appears around 5900 BC. These cultural styles gain their names from Tell Samarra, Tell Hassuna, and Tell Halaf—the type sites (Von Oppenheim, 1931; Mallowan and Rose, 1935; Perkins, 1949; Woolley, 1934).

#### 2.1.2.1 Samarra-Hassuna

Samarra pottery is characterized by elaborate, finely painted fine ware featuring complex geometric repetitive patterns (Fig.2.3). Samarra pottery appears in the lower Mesopotamian regions that are centered in northern and central Iraq and eastern Syria, south of the rain-fed uplands where the Hassuna and Halaf dominated in the Syrio-Jezireh plains. Tell Samarra, Tell es Sawan, and Choga Mish are important sites that provide a solid sequence of ceramic variation. Samarran settlements tend to be 5-6 ha in size and clustered a few km apart (Oates, 1980). This pottery can be interpreted as the transitional sequence between the Dark Faced Burnished Ware forms and the celebrated Halafian style. At least at Tell Baghouz and Tell SabiAbyad, Samarra pottery appears in the upper layers before true early Halafian styles do (Von Oppenheim 1931; Du Plat Taylor et al., 1950; Thompson and Mallowan, 1933; Perkins, 1949).





Fig. 2.3: Samarra fine ware on display, 6000 BC, courtesy of the Vorderasiatisches Museum.

Samarra architecture is easy to recognize with its predictable T-shaped or tripartite plan and rectangular-shaped houses with a large courtyard surrounded by multiple smaller square rooms (Bernbeck, 1995; Banning, 1996). The construction material of choice was usually mud bricks. Some settlements were demarcated, like at Tell es-Sawwan, where a ditch partially surrounded a settlement (Oates, 1973; Matthews, 2000). It is important to note that there is a lack of communal storage facilities at Samarran sites. This absence has led to the interpretation that Samarra communities were more family-oriented than communally-focused compared with their Hassuna contemporaries. This may not necessarily be the case, as we do not know what is

considered "family" in these societies or how food distribution was carried out (Frangipane, 2007a; Kubba, 1998).

Hassuna material culture is sometimes referred to as Proto-Halaf or Transitional Sammara, but this is more relevant to the Balikh Valley and the Middle Euphrates region. Yarim Tepe (level I), Tell Shemshara, Arpachiya, and Tell Hassuna are the most important settlements (Campbell, 1992; Le Miere, 1986). The pottery tradition associated with an earlier formative period called the Proto-Hassuna lasted over 700 years, and like the Samarra, displayed specific ceramic forms and decorative motives. The true Hassuna sequence is not particularly clear, but it is dominated by incised ware and seems to be restricted to northern Iraq (Nishiaki, 2001). Compared to the Samarra settlements, the Hassuna center is in the dry area suitable to farming in the highlands of northern Mesopotamia. Though the inhabited area was extensive, most settlements were no more than 2 ha (Brereton, 2013).

Late Pottery Neolithic (hereafter LPN) communities were seasonal, highly mobile, and regionally diverse. Most of the settlements were small and sporadic. Only the largest ones could be considered to have been settled continuously, but they were still probably inhabited seasonally. Thus, cultural boundaries are very blurred; we should not think of these groups as separate entities but as highly mixed and fluid groups that co-existed in the landscape. After 6000 BC, the Halaf culture becomes the dominant influence in southeastern Anatolia, but it is not always distinguishable from the Sammara and the Hassuna in Syria and Iraq.

Hassuna architecture, as best represented at Yarim Tepe I and Tell Sabi Abyad (Level 6), consists of irregular building plans, which were made using pise-tauf

techniques. Settlement organization was limited compared to the Samarra period. Buildings were organized around small rectangular rooms that were numerous, clustered, and very often lacking doors/entrances. In this case, it is quite possible that these structures were entered from the roof and were used as storage (Akkermans and Verhoeven, 1995). Silos/granaries were also built inside houses and surrounding areas. Hassuna sites can also feature circular tholoi-like structures (the Halafian house form that will be discussed in the next section) at the corner of buildings, with examples at Tell Sabi Abyad and, to a lesser extent, at Yarim Tepe I (Akkermans, 2010; 2013). The Burnt Village featured at Tell Sabi Abyad is an exemplary architectural unit that, according to Akkermans, indicates the tholoi had a short life and were simply replaced (1995). Only the largest structures show signs of being inhabited for prolonged periods, judging by the repeated remodeling of their central hearths.

Clay was an important medium for northern Mesopotamian societies. It was used in modeling ceramic vessels as well as the manufacturing of detailed and painted zoomorphic and anthropomorphic figurines and sling missiles (Azoury and Bergman, 1980). It is notable how much attention was devoted to the decorative and ornamental aesthetic aspects of material culture, especially with respect to lavish pendants, amulets, and, of course, ceramics. At some Samarran sites like Choga Mami, finely-painted and detailed figurines made from stone and clay display this demonstrative artistic trend (Oates, 1969: 127-129). Tell es-Sawwan, El-Wailly, and Abu Es-Soof (1965) report specialization in stone working, which is attested by the hundreds of alabaster vessels usually used in burials or as cached items. Another important group of artifacts that came from this period were sealings and clay tokens. These are found at Sammaran sites. This

was certainly connected to a lack of need, since as discussed, these sites did not prioritize communal storage areas (Akkermans and Duistermaat, 1994; Collet and Spoor, 1996).

Typical groundstone tools that are usually associated with food preparation and processing, such as hoes, slabs, mortars, and pestles, are found at most sites (Akkermans, 2003: 131). The type of stone tool industry linked with knapping is viewed as impoverished. The quantity, quality, and size of lithic tools all decrease. Generally, the flaked artifacts present during this period are simple, small flakes, scrapers, and blades—all of which can be considered sickle implements. Burins and arrowheads were still found but much reduced in percentage. Ceramic vessel decorations show painted headless figures that are hunting animals with slingshots, not bows and arrows. Thus, we can view the lack of emphasis on these artifacts as a change in weapon preference (Copeland, 1989; Braidwood et. al., 1952: 19-20).

LPN metalworking was essentially ornamental. Technological exploration revolved around the creation of beads, pendants, and rings made by cold hammering native copper nuggets. Natural copper ores such as malachite and copper oxide were also extracted and made into beads. Merpert (1993: 123) has found both objects and copper ore at Yarim Tepe I. Early evidence of metal working is found in Tell Ramad in northern Syria, Tell Sabi Abyad, Tell es-Sawwan, Hacilar, and Mersin (see Moorey, 1994 for a detailed description of specific evidence of metallurgy).

LPN groups exploited and cultivated their landscape's food resources, such as einkorn, 2-row barley, emmer wheat, and halved barley. Sammaran communities also consumed all of these goods in addition to lentils and flax (Oates, 1976: 67-69; Potts, 1997: 58-62). To a lesser extent, sheep, pigs, cattle, and goats were domesticated.

Primarily, the focus was still on hunting and gathering. Strategy-wise, the Hassuna were in the highlands of Mesopotamia, so they practiced dry farming, relying on rainfall to support crops. The alluvial planes of southern Mesopotamia were much more productive, but they required a greater investment of resources. Sammaran communities established their settlements in these zones, supporting a generally larger population than their Hassuna counterparts by employing irrigation to bring water from the rivers to the farming zones (Frangipane, 2007: 164). Material culture in these areas includes plows, and it is very plausible that draft animals were used to work the land (Oates and Oates, 1976).

### *2.1.3 Early Chalcolithic/ Halaf (5900-5400/5300 BC)*

The Chalcolithic is defined by a chronological change and a new material culture (Fig. 2.4). I would argue that the first part of the period may not exist at all, at least in southeastern Turkey. The Early Chalcolithic (EC) is virtually indistinguishable from the LPN (Yakar, 1991; 1994; Schoop, 2005). Subsistence practices, technologies, and lifestyles were essentially the same in the region, and so was the material culture. In particular, the Halaf is quite interesting. The name refers to the chronological period from the beginning of the 6<sup>th</sup> Millennium BC to about 5300 BC. It is also the material cultural package identified in the region during this period. Finally, it is the name of the particular ceramic culture associated with the rest of the material culture and the period. However, the Halafian presence, though seemingly distinct, could easily fit into any LPN culture. For instance, many chronologies (see Akkermans and Schwartz, 2003) mark the Halaf as an LPN occurrence. This may not work for southeastern Anatolian Halaf because this

chronology sandwiches southeastern Anatolia with the Syrian and southern Mesopotamian ceramic sequences. However, they are not as well established, nor do they fit comfortably within this framework. The same can be said for the central and western Anatolian Chalcolithic, which are loosely dated with the Aegean sequence. For this discussion, I place the Halaf at the start of the EC due to the exploration of metals during this period. Following Sagona and Zimansky (2010), I use the adoption of copper production, specifically, to define the Chalcolithic. I do acknowledge the possibility of cultural continuity. At many sites, 500 years from what would be the start of the Chalcolithic could be considered part of the LPN (Schoop, 2005).

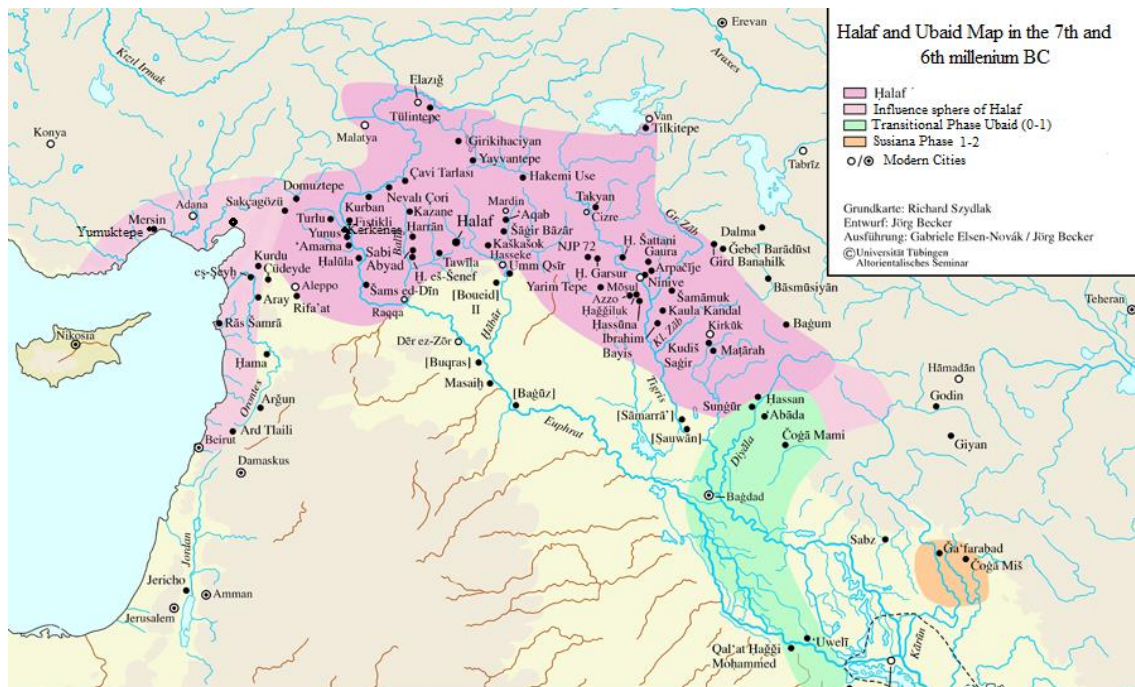


Fig. 2.4: Map of Halaf and Ubaid sites, and sphere of influence.  
Reproduced from Becker, 2013: 244.

#### 2.1.3.1 Settlement and Landscape

Once the Halaf influence spread from the Syrio-Iraqi Jeziereh, it covered a very diverse landscape and habitats from low valleys to foothills. Settlers seemed to gravitate towards fertile land and proximity to water sources (Hole and Johnson, 1986-1987).

These groups are characterized by their tendency to move. In fact, most of the Halaf settlements were less than a hectare in size and almost always intermittently occupied.

This was also evident from the no more than 1-2m of vertical accumulation of Halafian occupation levels at most sites. People probably moved to follow and exploit resources that changed with the seasons. For example, large herds entered their territory in winter and autumn, and this was when they were most likely to be hunted. Most recently,

Fletcher et. al. (2015) discuss how Halaf communities may have come together to combine efforts for large hunting feasts, butchering, and processing the remains.

Interestingly, the largest Halaf sites are in southeastern Anatolia, ranging from around 20-12 hectares, such as Domuztepe and Takyan at Silopi. Even at these sites, it is clear that though animals were kept and the typical domesticated plants (discussed above) were exploited, these groups still relied on hunting and pastoral life-ways. No evidence of irrigation has been found at Halaf sites.

Typical architecture within a Halafian settlement was the round room building, which could include a rectangular attachment resembling a keyhole. These so-called tholoi had domestic installations inside them such as fireplaces and areas for food preparation. At Khirbet esh-Shenef, the whole settlement consisted of tholoi that were used for diverse purposes such as storage, kitchens, and stables (Akkermans and Wittman, 1993). Building with niches and using white plaster on the walls was very

common (examples of the early levels can be found at Sabi Abyad and Khirbet esh-Shenef) (fig.1.2). The auxiliary structures were arranged asymmetrically in a tripartite manner around the circular structures. Many small and doorless rectangular compartments flanked the larger rooms. As with the LPN, these features most certainly served as storage rooms that were entered from the roof. Similar, too, is the fact that most of these elements were used and then replaced with newer versions (Von Wickede and Herbordt, 1988). Finally, Halaf houses varied notably from site to site. For example, although circular structures were predominant, rectangular houses were still in use, and construction materials may have varied as well based on habitation scenes depicted on pottery (Fig.2.5).



Fig. 2.5: Round houses/ Tholoi from Area E7 and F7 at Khirbet esh-Shenef. Reproduced from Akkermans and Wittmann, 1993: pg. 147, Fig. 3.





Fig. 2.6: Human scenes from Tell Halaf. Reproduced from Schmidt, 1943: Tafel LX.3 (12b), Campbell, 2010: Fig.18.7.a (12c), and Robert, 2010: Planche 4.39.1; Domuztepe pot, reproduced from Kansa et. al. 2009: 910, Fig. 5 (12e).

### 2.1.3.2 Material Culture

As it was during the LPN tradition, and just like their Hassuna/ Samarra contemporaries, people created naturalistic-painted fine pottery during the Halaf period.

In contrast to the earlier groups, they explored painting on the internal surface of the vessels. The surface background is buff to orange in painted red, brown, orange, and black. Designs are floral, geometric, and highly repetitive. Everyday-life scenes are not uncommon, showing scenes of people in houses, hunting, and amongst nature. The vessels are not always painted but are generally very beautiful, feature complex forms, and have thin walls (see Fig. 2.6: 12b-e).

Other aspects of material culture include naked, painted female figurines. They were finely made and detailed. They are usually found around and in the houses and have many forms, such as a figure holding hands between the breasts, hands extended upward, or in the case at Bouqras, seated mother goddess-like figures, some with stump arms (see examples from YarimTepe II, Merpert and Munchaev, 1993). At Tell Sabi Abyad, small figurines were found in caches together with sealings and tokens (Akkermans et. al., 2006). This may hint towards the idea that these objects occupied more than one sociocultural sphere. Halafian societies seem to have engaged in rituals that involved the purposeful destruction of objects, evidenced by pit depositions at Tell el-Kerkh in western Syria and Yarim Tepe II (Merpert et. al., 1981; Tsuneki, 1997). At Bouqras and Sabi Abyadhigh, quality animal stone vessels were probably used during some ritual in which the animal is "killed," which is evidenced by the small stone that was inserted into the animal while the clay was still wet (Akkermans and Schwartz, 2003: 144-145).

All the regular objects connected to agriculture and food processing were found at these sites, including sickle implements, plows, and hoes. Stone and bone tools remained in use, including vessels, burins, scrapers, drills, borers, etc. (Ozbal et. al., 2004: 56-59; Bernbeck and Pollock, 2003: 47-48). Halaf sites produce ample evidence of textile and

basketry, and the large number of ceramic spindle whorls, loom weights, and decorative motives painted on the figurines reminiscent of clothing further attests to the prevalence of these crafts (Akkermans and Verhoeven, 1995: 12). The lithic industry continues to conform to LPN trends, but projectile points are a rarity at this point. These were replaced by small and simple short-tanged Haparsa points and transverse arrowheads, which were possibly used with poison (Issaron, 1983: 156-157). This change reflects the growing preference towards the slingshot and a different bow technology (Azoury and Bergman, 1980). Well-made stone mace heads also suggest a changing preference in weapons. Items like these surely had different meanings within different contexts.

Tokens, seals, and sealings also deserve a mention, for they clearly played an important role in Halaf society. Seals were made from every medium available (except for metal) and were used to stamp pots, baskets, and probably bags, as evidenced by the excavations at Tell Sabi Abyad (Duistermaat, 1996). Such objects are usually used as evidence for long-distance trade, but here they are more telling of a record-keeping system connected with the distribution of food and/or secondary products that surely existed in these communities and intensified by the end of the 6th millennium BC.

Long-distance trade is indicated by the goods that societies were bringing in, such as cedar wood, marine shells, and tabular flint from the Levant as well as many stones, metals, and obsidian from diverse Anatolian sources (Van Zeist and Waterbolk-Van Rooijen, 1996). The obsidian and shells were used to create various beads, pendants, and amulets that continued to reflect people's affinity for ornamentation and display. Another popular craft and building medium that continued to be used during the Halaf was bitumen, which was sourced at Hit (Connan et. al., 2004). Despite access to resources,

Halaf metalworking was not technically different or more diverse than the preceding period. An exception to this might be a few needles and pins at Hacilar and Mersin (Yener, 2000). Sites that provide evidence of metalworking during this period are Tell Sabi Abyad, Ghagar Bazar, Yarim II, and Arpachiyah (Merpert and Munchaev, 1993). Of course, one has to wonder how much of the metalwork is Halafian and how much is due to local cultures.

#### 2.1.3.3 The Spread of Halaf

The Halaf is largely a culture characterized by its pottery. Thus, the extent to which it was ethnically or culturally different from all the other groups in the region is a matter of material variation (Nieuwenhuyse, 2016: 846-847). It is often found to have intermixed with regionally local culture, and it is difficult to distinguish Halaf from local traditions. Many of the previously inhabited sites show a continuation in habitation, such as Kultepe and Tell Maghzaliyah (Bedar, 1993: 63-64).

The Halaf is the first Mesopotamian cultural style to enter Anatolia, originating from the Syrio-Iraqi Jezireh. The Halaf was initially encountered during the 1911-1929 excavations at Tell Halaf, as noted by Mallart. The true type site, however, became Arpachiyah at the northern Iraqi border (Hijara, 1980). Other important Halafian sites in the region that appear in later studies are Tell Sabi Abyad, Yarim II, Domuztepe, and Kazane Hoyuk (Akkermans and Le Miere, 1992; Merpert and Munchaev, 1993; Coursey et. al., 1998). Territory-wise, the sphere of influence is huge: type pottery has been found as far North as the Lake Van region in Anatolia, western Syria, and even further West in Turkey at Can Hasan and Mersin. In the South, it reached the Tigris basin near modern

Baghdad. The broad Halaf phenomenon can be viewed as the spread of a technological idea.

The spread of people during the Halaf period should be understood not as a forceful coalition or a migration of people across Mesopotamia, but as a form of diffusion based on pre-existing cultural affinities and likeliness. For example, the Halafian tholoi already had its precursors in LPN communities in the area, so it should not be viewed as an invasive and unfamiliar element (Akkermans and Le Miere, 1992). While explaining the origin of the Halafian horizon, Campbell (2007) argues that its appearance was probably due to a high degree of social contacts between Mesopotamian regions and, of course, contacts with contemporary Hassuna and Summara groups.

This hypothesis finds support in the way that Halaf culture presented itself in southeastern Turkey, in particular; it is immediately obvious that the whole Halafian cultural package was not entirely adopted into the local settlements. As mentioned before, there is already a great degree of variation between how Halaf material looks from site to site. Furthermore, except for the ceramic tradition and the appearance of tholoi here and there, archaeologically, there is nothing really that can alert us to a Halaf presence. For example, the naked, plump figurines that were so distinctive and abundant at most type sites, including Tell Halaf, were not adopted at Anatolian sites (Gessher, 2011).

Domuztepe is one of the largest and most well-studied Halaf sites in Turkey, and it exemplified just how naturally Halaf traditions fit into the local cultural scene. Halaf pottery was intermixed with local Black Burnished styles; some were imported and some were locally made. Buildings with tholoi structures were found, but many did not have

this typical house feature. Objectively speaking, though Halaf material is present at the site, Domuztepe cannot be considered a Halafian site per se (Campbell, 2007: 107).

#### 2.1.4 Middle Chalcolithic/ Ubaid Phase 0-4 (5300-4200 BC)

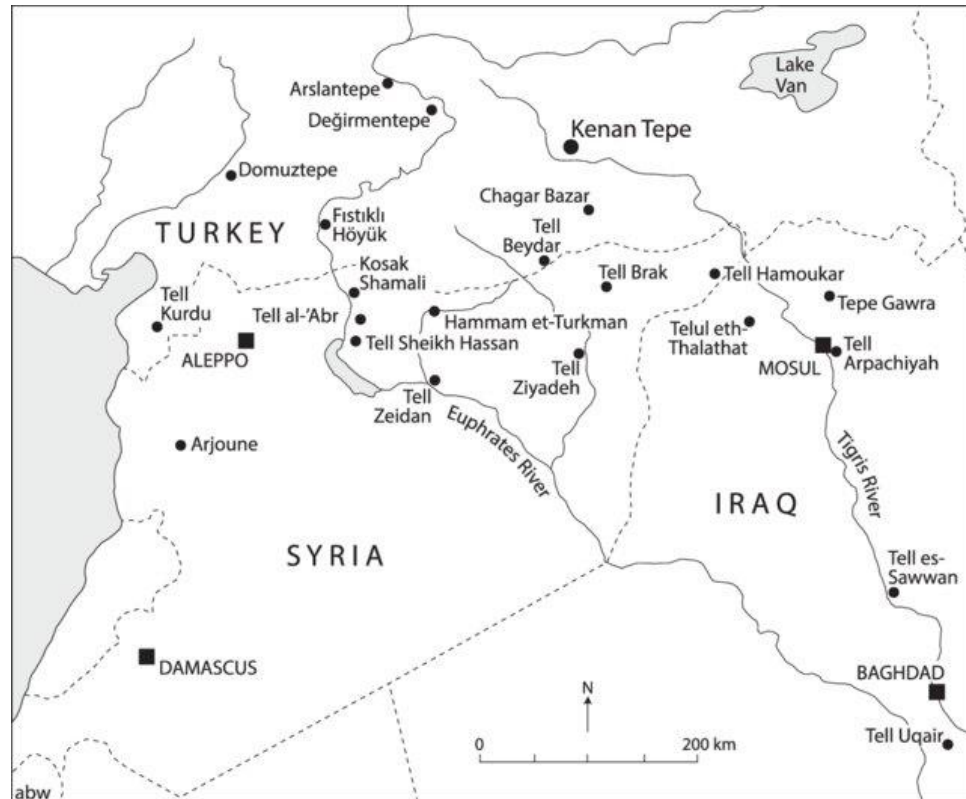


Fig. 2.7: Main Ubaid (0-4) sites across northern Mesopotamia.  
Reproduced from Carter and Philip, 2010: viii-ix.

Ubaid culture was first noticed at Eridu and Tell al-Oueilli, South of Baghdad, dating to the early 6th millennium BC (Hoult, 1978, 1994). Starting around 5300 BC, this culture spread into northern Syria, southeast Anatolia, northern Levant, and the Arabian Gulf. However, in southeastern Anatolia, Ubaid is often dated in its last two phases, 3

and 4, starting around 4500 BC (Stein, 2010: 24). There is a lack of clarity about whether or not we can talk about the Ubaid before this period.

Some chronological problems arise in the Middle Chalcolithic period in southeastern Anatolia (Fig. 2.7). The main one is the uncertainty surrounding when this period started. Some sites in northern Syria and Anatolia give earlier dates for what may be called the "transitional" phase, such as Tell Turlu, Kurdu, and Domuztepe, which are areas that Campbell and Fletcher (2010) have pointed to while discussing the difficulties of defining this period chronologically. This phase is unclear, and the presence of Ubaid-style ceramics is not secure. Because of this, for many sites South of the Taurus, the period after 5300 BC is ambiguous.

#### 2.1.4.1 Settlement and Landscape

Ubaid settlements were still small, most ranging from 1-3ha, generally with one larger site per region. Tell Kurdu, for example, was 15ha in the Amuq plains. Unlike the Halaf, even the smallest settlements were densely settled with plenty of vertical build-up (Jasim, 1985: 201; Wright, 1981: 325). Ubaid people created different settlements compared to groups from other periods. As was the case before, Chalcolithic settlements had their own character in every region.

Ubaid settlements were situated in locations that took advantage of dry farming, and people tended to settle in established Halafian sites in northern Syria and southeastern Anatolia. They exploited the regularly available crops. At Kenan Tepe in Turkey, archeobotanical analysis has indicated the consumption of durum wheat, barley, einkorn, and emmer wheat (Parker et. al., 2009). Zooarchaeological studies demonstrate a

preference towards sheep and goat herding instead of pig and cattle (Gonrichon and Helmer, 2003). Price (2016) has argued that instead of capitalizing on pigs, people in prehistoric Mesopotamia exploited pigs during highly-ritualized events such as feasts. This stands in contrast to the southern Mesopotamian sites, where irrigation farming was practiced and plow animals were used to work the land.

Ubaid people also built their houses in different ways. These houses are believed to revolve around a large social unit, such as the family vs. the community. Furthermore, the way space was compartmentalized is thought to show that the new social order resulted in women being more isolated from communal tasks than men (Forest, 1996; Wengrow, 1998). Such interpretations, of course, assume that women performed certain tasks more than men, such as producing wool products and cooking.

The building material of choice was pise or mudbrick, and houses featured a tripartite plan that was regular and rectangular. Construction techniques included niched walls, window slits, and buttresses (Kubba, 1998). Settlements were made up of separate house units instead of an endless building plan. In northern Mesopotamia however, this is not always the case. At Degirmentepe, for example, the houses were clumped together and quite irregular. Some sites feature grill structures that allow for airflow under certain buildings, which are thought to be granaries (Akkermans and Schwartz, 2003). Houses tended to feature a large main room with a central hearth flanked with many small rooms dedicated to various tasks. This compartmentalization has led to various interpretations about the role of privacy and communal space. At Eridu, a large multi-featured communal building with alters and platforms, might be considered a shrine, but this has yet to be fully proved (Sievertson, 2010).



#### 2.1.4.2 Material Culture

The Ubaid departs from the Halaf with the replacement of the fine and elaborate ware with simple and thick geometric designs. Overall, as the Ubaid progressed, painted pottery was produced less frequently and simple wheel-made non-painted vessels took their place. This period is also characterized by a more prolific amount of pottery, surely aided by the employment of the slow-turning wheel (Hendrickson and Thuesen, 1989). The intensification of production is also attested to at sites like Tell Ziyadeh, where a mudbrick pottery kiln was excavated (Bernean, 1994). An important technological feat was the addition of chaff to the pottery fabric. This made the vessels more resistant to heat, gave more control during baking, and reduced firing time. The trade-off was cruder, thicker ceramics (Schwartz, 1988).

The diagnostic artifact for the Ubaid is the one-piece terracotta sickle. Other sickles that were used included small flint blades and sickles with flint implements (Benco, 1992: 119-121). Evidence from this period shows poor flintknapping skills, for most sickle blades were made by smashing a flint core with a stone with minimal reworking. Obsidian is still found but in insignificant amounts. Metal smiths continued to produce various types of trinkets, but at this point, people started to produce imitations of larger weapons (Moory, 1994). At Can Hassan, a high-quality, solid mace head with a shaft hole was found in Level IIB, dating to 5000 BC. The object was crafted from cold beating copper around the eventual shaft. Similar large objects were found at eastern Anatolian sites, as well as axes and chisels from Mersin. At Norshuntepe, Tell Kurdu, and Degirmentepe, ternary bronzes show experimentation with alloying, the use of

polymetallic ores, or the use of flux (Yener, 2000). Nonetheless, evidence points to a greater understanding and a leap towards new technology.

It is important to note the difference between the evidence of metallurgy in the North versus alluvial Mesopotamia. The latter Ubaid sites have none of the technical implements or metal forms, while at sites like Degirmentepe in the uplands, there are more complex forms as well as evidence of production such as furnace fragments, crucibles, and slag remains (Gurdil, 2010: 365; 2005: 281-282; Esin, 1989). Sites like Eridu, Ur, and Nineveh have limited evidence from a few objects found in graves that imitated stone tools like chisels and other blade forms (Hole, 2010: 231).

#### 2.1.4.3 The Spread of Ubaid Cultural Package

The nature of the spread of southern Mesopotamian culture has been a topic of debate. One of the arguments for the end of the Halaf and the coming of the Ubaid is that even though these people had been in the same cultural sphere for centuries, the Ubaid cultural package was ultimately superior to the Halafian (Forest, 1996). Another view is that the Ubaid was not a new presence, but rather the natural result of social change (Campbell et. al, 1999; Davidson, 1977). Today, most scholars agree that the Ubaid was the result of the migration of ideas and people. It is clear that trade routes that existed to the South and the North helped harbor the cultural melting pot that stimulated these developments. Important Anatolian sites are Degirmentepe (Gurdil, 2010), Kenan Tepe (Graham and Smith, 2013), and Caba Hoyuk (French, 1988).

### *2.1.5 The Uruk Expansion (LC 0-5: 4200-3000 BC)*

Late Chalcolithic period studies focus on a cultural expansion out of southern Mesopotamia referred to as the Uruk (Algaze et. al., 1989) (Fig. 2.8). Unlike the Halaf and Ubaid cultural phenomena, this period is characterized by very particular administrative architecture, iconography, and proto-cuneiform tablets (Sagona and Zimansky, 2010: 146). Most of these characteristics have been defined at the type site of Uruk (modern-day Warka and biblical Erech), which has single-handedly constructed our understanding of ceramic typology, material culture, and architectural plans (Boehmer, 1991). The most important and defining feature of Uruk is the fact that it features a fully developed urbanized plan with a settlement hierarchy that features a central palace/the main temple and various residential features.



Fig. 2.8: Map showing the distribution and spread of Uruk sites from type site. Modified from Wikipedia. Zunkir, 2019.

A problem that characterizes this cultural horizon is the fact that Uruk is the only large site in the South that one can talk about, not because other sites of this kind did not exist, but because the horizontal and vertical exposure at other sites is lacking. This is partly an issue of intensive survey efforts that have been focused on the North. The other problem is the geological processes of site formation that characterizes the South. Due to alleviation, Aeolian sand deposits, and river meandering, smaller Uruk sites and the earlier layers of larger settlements are currently under tens of meters of deposits, making their exposure difficult (Wilkinson, 2000: 243-244). This is certainly an issue at Uruk,

where only levels V-IV (final Uruk) have been explored, and this exploration is limited to the Eanna and Kullaba precincts (Nissen, 2002).

Textual evidence does not fill the gaps in our knowledge. Like Uruk, the vast archives of proto-cuneiform tablets (Uruk IV-type script) are what provide us with most of our information about the Middle and Late Uruk periods. These texts give no information whatsoever about the archaeological context and economic activity beyond the immediate temple that the texts belong to (Van De Mieroop, 2000: 42). In summary, scholars are left without an understanding of the evolution of economic strategies, the early character of Uruk cities, the development of urban planning in the area, or how these changed through time.

#### 2.1.5.1 The Urban Revolution

Without a doubt, the defining characteristic of the Uruk as a cultural phenomenon is the urban character of its settlements. However, the urbanization efforts of the North and the South could be seen simultaneously beginning at the start of the 4<sup>th</sup> millennium BC even before the period of Uruk expansion out of the South around 3300 BC (Algaze, 2008). Thus, urban development cannot be viewed as associated with Uruk cultural trends as much as a chronological reality of the region. While the exponential growth and development of these cities continued in the South, these trends came to a halt around 3500-3400 BC in the North.

#### 2.1.5.2 Urban Planning and the Uruk Expansion.

In the phases immediately before Uruk contact (LC1-2) with the North, evidence of population agglomeration could be seen at sites like Tell Brak (Ur, 2010). One of the most extensively excavated sites in the North and greater Mesopotamia, Brak stood at 55 ha with a central mound and small settlement clusters, expanding to 130 ha in LC3-4 (Ur et. al., 2007). The site's importance stems from the fact that it is the only site where the effort of extensive horizontal exposure has concentrated on non-administrative architecture.

While Brak's sophisticated economic system, which was based on the acquisition, production, and distribution of obsidian artifacts, is a testament to the autonomy of the site, it is this autonomy that causes some like Algaze (2008: 118-120) to question Brak's place in discussions about urbanism. Tell Brak was a center with no additional smaller centers, and it lacked urban hierarchy. Recent surveys will be able to shed light on this issue, exposing how much or how little population density figured in the Brak hinterlands (Ur, 2010: 400).

Uruk LC1-2 periods are not well attested to in northern Mesopotamia. At Norsuntepe, the final layers reveal a Terminal-Ubaid ceramic horizon of Dark-Faced Burnished Ware that links up with Amuq D/E and then turns into Coba bowls, which are usually seen at Anti-Taurus sites (Gulcer, 2000). This site did not produce a building plan.

LC3 is best characterized by the early-4<sup>th</sup> millennium layers at Arslantepe (level VIA). In these early phases, the site was already extensive with evidence of urban planning that separated residential areas from administrative buildings (Frangipane,

2000). The western sector of the site features highly visible monumental architecture with thick walls built by edging two rows of mudbrick and then filling in the space with mud and mudbrick fragments. These walls were plastered and painted in black and red. The plastered mudbrick columns resembled those at Tell Brak (Sagona and Zimansky, 2010: 150). Structures A850-842 are a series of oblong rooms that showed evidence of being used as a production area due to the ochre and stone knapping debitage (Frangipane, 2001: 329). Other buildings looked as if they were transferred straight from the alluvium of Iraq, with niches, a tripartite plan, and a fireplace set into a podium at the center of the building's floor.

LC4 is attested to at Hacinebi B, following a purely local Hacinebi A layer. This is characterized by an unfortified settlement that divides domestic contexts into local Hacinebi material concentrated in the North and West as well as foreign Uruk in the North (Stein, 2001: 285). This cohabitation lasted well into the final phase of LC4 until about 3300 BC, when attention turns to Arslantepe again in LC5.

Arslantepe VIA deposits represent LC5 and lay right above Arslantepe VII levels. This occupation showed that Arslantepe was engulfed by southern Mesopotamian influence, in particular the Late Uruk exchange network. The most imposing structures during this phase were the series of administrative buildings (I-IV) called the "palace," though elites probably did not reside there as much as use the space for administrative and public functions (Frangipane, 1997). The complex featured Temples A and B, which were almost identical and stood on the edge of niched storerooms that flanked the sides of a long road accessible by a monumental gate (Figure 2.9). Temple B shows a strong link with the South in its *cella* and concentric lozenge motifs in relief, which are found at

Uruk temples in Level III. Temple A was built after Temple B as part of the Building I complex. This feature had an extensive number of boar, cattle, and goat remains that were found on and around a bench (Frangipane, 1997: 51). The bench and the basin located nearby were heavily plastered like the rest of the rooms. The niched rooms at the entrance were decorated with a circular-stamped motif in red and black to contrast the white background.



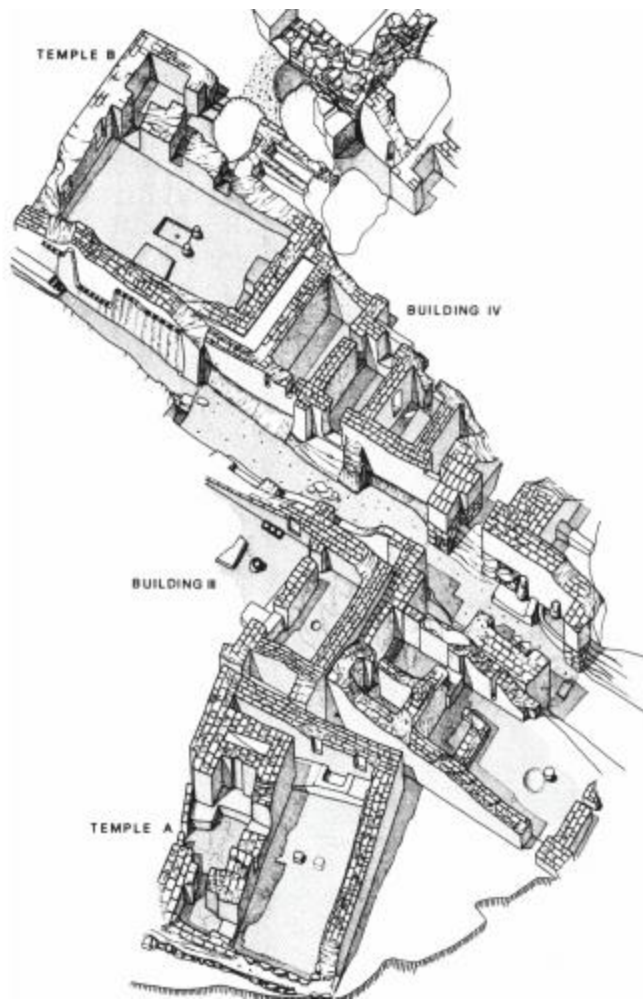


Fig. 2.9: An isometric view of complex I-IV at Arslantepe.  
Reproduced from Frangipane, 1997: 51, Fig.2b.

### 2.1.5.3 Material Culture

The artifact assemblage characteristic of Uruk is first attested to by the presence of a ceramic assemblage. Ceramic vessels during the LC could be local Uruk imports, a local style that is influenced, or a local imitation of Uruk styles. At Hacinebi, two modes of this presentation could be observed—in the Uruk quarters, a full assemblage of forms was found, including grit-tempered, beveled-rim bowls (many of which were dipped in bitumen imported from the Deh Luran plains in the South), but the rest of the site featured Amuq F chaff-tempered vessels (Stein, 2001).

Uruk artifact assemblage included an important set of administrative tools. Weights for measurement as well as cylinder seals were all found at Hacinebi and Arslantepe by LC4. The most iconic of the administrative kit of South Mesopotamia were impressed clay balls (*cratulae*), jar sealings, hollow clay balls with tokens, and tablets (Stein, 2012: 144). At Arslantepe, *cratulae* are found in the thousands as concentrations in various rooms, marking permission or ownership over doors, storerooms, and certain containers (Stein, 2012: 144). This system of administration was a testament to the complex transactions and record keeping that Uruk merchants conducted and palace officials kept track of.

Another tell-tell Uruk material is the bitumen dipped ceramic wall cone. These cones served decorative purposes in temples and niched facades, where they were embedded in mudbrick walls. Their colorful bases stuck out and produced a mosaic-like effect (Stein et. al., 1996: 207). Baked clay sickles are also part of the repertoire of Uruk material culture.

In addition to the accounting and administrative materials that we recovered from Uruk-contact sites, feats in metallurgy attest to the growing integration and scale of the Mesopotamian exchange network. Extensive evidence of metal consumption and production was found, with copper coming in from the Ergani mines (Özbal, 1996) and silver from the Keban area (Seeliger et. al., 1985). Copper processing artifacts such as a tuyere, slag, crucibles, open-faced casting molds, and four smelting pit furnaces were found at Hacinebi and attested to the knowledge of copper smelting and alloying. Artifacts from a typical repertoire included pendants, pins, earrings, and chisels (Stein, 2001: 277). The most impressive metal find of the Uruk phase was at Arslantepe, where a hoard of 21 arsenical copper items was found hanging on the wall in Room A 113 at Building III (Frangipane, 2017). The seven swords, in particular, attest to the knowledge of inlay and manipulation of metal for aesthetic purposes.

#### 2.1.5.4 The End of the First Urban Revolution

After about 3100 BC, Uruk systems in the South and North destabilized, resulting in a loss of urban character in previously established cities. Reasons for the decline of a Mesopotamian-wide system or urbanization and social stratification has been attributed to factors such as overirrigation and agricultural overintensification (Algaze, 2008). Changes in climatic factors have also been the subject of recent inquiries, which cite how changing rainfall patterns may have contributed to the inability of people to produce enough food for growing Uruk centers (Charles et. al., 2010). Whatever the cause, it is obvious that communities feared some threat judging by the imposing fortification

structures that appeared at some sites like Sheikh Hassan and Jabuba Kabira (Akkermans and Schwartz, 2010: 208).

Uruk contact sites began to lose signs of Uruk influence, implying that Uruk contacts or presence were not as strong. In contrast, local material culture persisted at sites such as Hacinebi, Tepe Gawra, and Arslantepe (Algaze, 2008). In the South, overall population decline, abandonment, and a general lack of centralization characterized the region. The Uruk precincts were leveled and changed later to conform to a completely different plan (Akkermans and Swartz, 2010: 209). All over Mesopotamia, interest turned away from the South. The following Early Bronze Age I period was once again focused on indigenous development in the North.

2.1.6 *The Early Bronze Age I-III/IV (3000-2000 BC):*

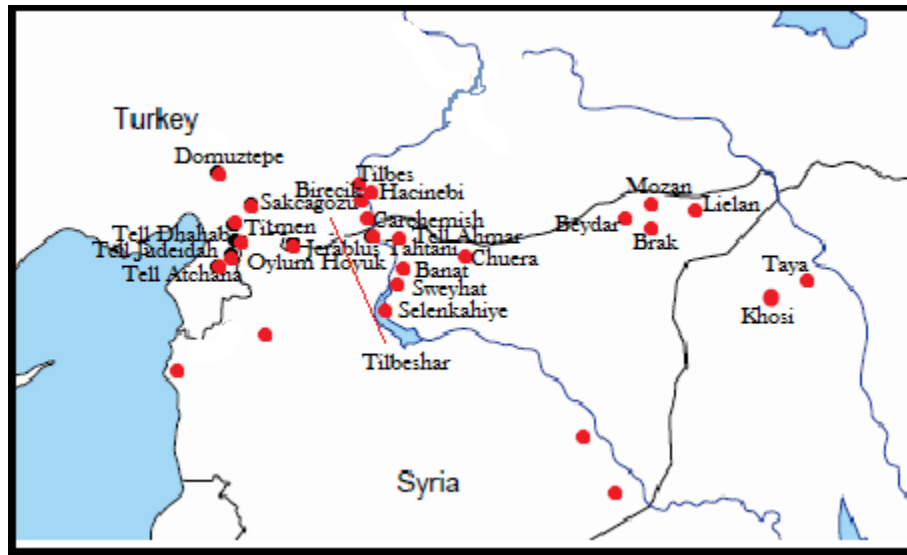


Fig. 2.10 Map shows major Anatolian sites west of the Euphrates and Syrian northern Mesopotamia. Base map from <https://d-maps.com/>

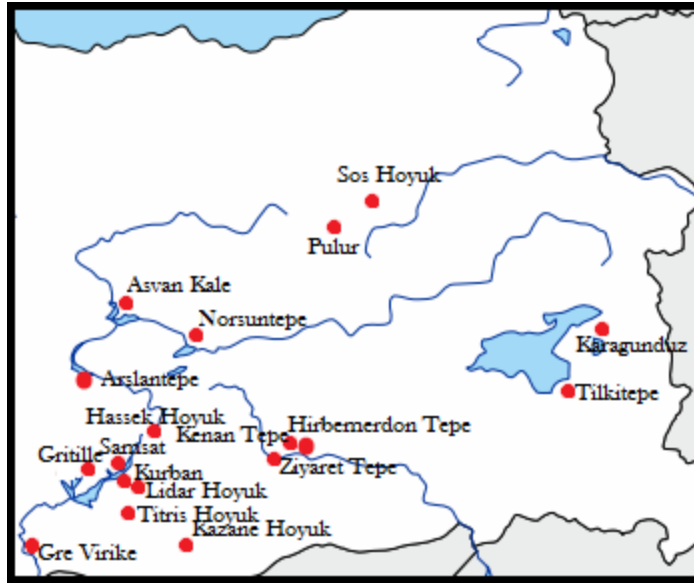


Fig. 2.11: Map shows major Anatolian sites in the Lower and Upper Turkish Euphrates and East Anatolia. Base map from <https://d-maps.com/>

The Early Bronze Age can be divided into three periods: EBA I, II, and III. They represent the varied trajectory of development during this period across Anatolia. In stark contrast with southern Mesopotamia, after the 4th millennium BC, northern centers did not follow the trajectory towards urban growth and political centralization in an uninterrupted manner (Algaze, 2007: 68-73). During this period, northern and southern Mesopotamia cannot be viewed as in concert anymore, for even northern Syria experienced a drastic transformation (Schwartz, 1994; Algaze, 1999). Unlike the North, some southern kingdoms like Mari and Ebla emerged starting in the early 3<sup>rd</sup> millennium BC and employed Semitic writings in cuneiform to record kingly affairs and mobilize huge resources for the upkeep of sheep, trade, and military endeavors (Akermans and

Schwartz, 2003: 222). It is from these communications between elites of the region that we know about the internal politics of the Tigris and Euphrates sector of Mesopotamia.

I include eastern Anatolian in this discussion (Fig. 2.9 and 2.10). This region normally falls outside of the Mesopotamian sphere of influence, but I follow its EBA development because pre-Bronze Age contacts included some of these sites, such as Tilkitepe (Burney, 1958). It is important to emphasize that during the EBA, the further from the immediate Turkish Lower Euphrates one gets, the more settlements are influenced by or at least show elements of internal and northern Anatolian cultural groups like Kura-Araxis and the Trans-Caucas (Kohl, 2009).

#### *2.1.7 Early Bronze Age I-II (3200-2600 BC)*

Immediately following the Uruk collapse or retraction in northern Mesopotamia, the region as a whole experienced a very obvious and fast-paced abandonment of settlements. Many of the settlements were completely abandoned like Samsat and Hassek, while others were still occupied, such as Carchemish, Tilmen, and Kenan Tepe (Wilkinson, 1990). Settlements such as Kurban Hoyuk continued to shrink in size from 4ha to 1ha. Hassek Hoyuk dispersed into small houses, and the previous walled settlement disappeared (Behm and Blanche, 1984).

Generally, the whole region experienced a ruralization event. According to surveys in the area, the number of settlements increased, but all of these new sites were small villages. They lacked any settlement or building hierarchy (Çevik, 2007; Rothman and Fuensanta, 2003). They tended to be located on land that was not previously

inhabited by Chalcolithic people. For example, in the Carchemish area, two-thirds of the surveyed sites were newly founded in the EBA (Ökse, 2011).

Much regional variation exists in the sense of developmental trajectories in the widespread settlements. The Lower Turkish Euphrates has always been sensitive towards parallel developments from Greater Mesopotamia, and in the later EBA phases, the emergence of true cities testifies to this. Even during the early phases of the EBA, Samsat and Carchemish dominated the region (Rothman and Fuensanta, 2003: 597). What had changed was a shift in the trade routes, as these were now focused on Kabur and the Tigris basin (Algaze, 1999). Euphrates ties were not severed judging by the amount of metal wealth in many EBA graves.

In the Turkish Upper Euphrates, Arslantepe and Norsuntepe dissolved into many small pastoral villages. Public structures that characterized the cities before, such as the palace and temple, disappeared. This part of Anatolia was not influenced by Mesopotamia as directly, and when it was, much of the material culture was intermixed with the Trans Caucasian presence in the Malatya plains (Frangipane, 2001).

We know very little about the eastern Anatolian people who were just on the fringe of Mesopotamian influence above the Taurus highlands. These communities were interacting with the Kura-Araxis people from the North. The main site during the EBA I-II here was Sos Hoyuk, but we know very little about the site, as only a limited area of the settlement was exposed (Sagona and Sagona, 2000).



#### 2.1.7.1 Architecture and Settlement

Overall, trends in the early EBA point to the disappearance of public architecture and fortification systems. In the Turkish Upper Euphrates, Arslantepe had an irregularly planned village made up of rectangular huts with rounded corners. The main choice of construction technique was wattle and daub, while mud brick was rare. Posthole arrangements suggest that animals were kept in pens. As the period progressed, the use of mud brick became increasingly preferred (Frangipane, 2001). The settlements at Norsuntepe, Tepecik, and Tulintepe did not follow this pattern. The most informative is Norsuntepe, where mud brick on stone foundation surrounded singular rectilinear houses made of mud brick. The settlement turns into pits during the EBA IB (a later phase of the earliest phase of EBA). In the next phase, some round house architecture shifted to rectangular multi-roomed buildings. By the end of EBA I, Norsuntepe resembled Trans Caucas-style settlements, with wattle daub construction, installations such as benches, and horned central hearths (Hauptmann, 2000; Sagona 1993). Another example of a local settlement can be seen at Pülür. Isikli (2007) discusses the so-called *Anatolischs Siedlungsschema*. It featured a very typical Kura-Araxes-style settlement of houses next to each other with a central court. Inside the houses, highly-stylized and anthropomorphically-decorated central hearths were often found (Kosay, 1976).

Researchers know very little about the architecture of eastern Anatolia, and what we do know largely comes from the settlement of Söğüt Höyük. The EBA I starts with a few floor plans and hearths. During EBA II, single-roomed houses made from mud brick appear with a Kura Araxes-style hearth in the middle of the structure. This also disappears at the end of the EBA II, and the start of EBA III presents us with only pits (Sagona and

Sagona, 2000). This region remains poorly excavated and overlooked in scholarship, and horizontally-oriented excavations exposed very little.

#### *2.1.8 Early Bronze Age II-III (2600-2000 BC)*

After about 2600/2500 BC, the process that had contributed to centralization loss and the collapse of urban centers all over northern Mesopotamia came to a halt. This change brought the second urban revolution after hundreds of years of "darkness" (Yakar, 1999). During this time, the largest centers that were established grew into true cities that turned out to be even more outstanding than the first urban phenomenon in the LC. Urbanized settlements had well-organized and intentional city plans. The main settlements had large farming hinterlands and grazing fields that were tied to and controlled by the site. Cooper (2006) showed that these types of sites had many satellite communities, but they were not necessarily under direct political control. Centers were fortified, and inside one could distinguish between city neighborhoods. A clear differentiation of architecture is seen between religious, administrative, production/economic, and domestic spaces. A four-tiered hierarchy between settlements is easily recognized archaeologically (Sagona and Zimansky, 2010). A new style of architecture appeared with buildings in Antis that included niches, especially in larger public buildings.

In the later phases of the EBA, the role of the king was defined. We know this from the southern Mesopotamian written records in which the relationships of kings are often discussed. Relations with Mesopotamia were renewed but changed. The major question for archaeologists is, "why were local communities not able to recover from

urban collapse for so long after the Uruk retraction?” It is even more pressing to understand that extent to which a southern presence stimulated an urbanization process during this second wave of urbanization (Akkermans and Schwartz, 2003). This issue is complicated by the fact that many regions still demonstrated organizational differences. For example, the Turkish Lower Euphrates was characterized by urbanism and cities. The Turkish Upper Euphrates is best described as highly centralized but not quite urban. Finally, the eastern Anatolian region could not be considered anything but rural until about the first millennium BC.

#### 2.1.8.1 Architecture and Settlement

By EBA III in the Turkish Lower Euphrates, Titriş Höyük (43ha), Samsat, Lidar, and Kazane (100ha) were fully urbanized. That is to say, the settlements were characterized by an Inner City, Outer Town, Lower Town, a central temple, a system of roads, and a standardized and predictable urban plan. They featured high mounds where the king/ruler resided amidst what are administrative buildings. Lower on the mound were large public buildings that served various functions such providing a venue for religious practices. Streets pass between different neighborhoods of the residential quarters, which are in the lower parts of the settlement. Domestic units engaged with many production activities such as the renewal of sickle blades, winemaking, flint knapping of Canaanian blades, and textile production (Hauptmann, 1987).

The Turkish Upper Euphrates was dominated by the settlement of Norsuntepe from 2500 BC onwards, when it reached its settlement height (Hauptmann, 1987). It also had a palatial center on the top of the mound, but the nature of this center was different. It

was a production/economic center, for it was dominated by buildings with storage rooms and diverse workshops. This is further supported by a large number of huge storage jars in Storeroom 7 (Hauptmann, 1987). Arslantepe was similar to Norsuntepe but never grew as large, and it was much more influenced by the Kura-Araxes style, as described above at Pulur. A striking difference between the two settlements is the former's cultic temples. Though not as centralized or administrative, Arslantepe was an organized and permanent settlement in the EBA (Sagona and Sagona 2000; Caneva and Palmieri, 1983). Similarly, eastern Anatolia's Sos Hoyuk continued to experience a more direct Kura-Araxes influence. By the end of this period, the settlement had multi-roomed houses built from mud brick. The most characteristic feature of these structures are their portable hearths, which evolved into horseshoe-shaped spikes; likewise, the central room stationary hearths undergo this transformation (Longford et. al., 2009).

#### 2.1.8.2 Material Culture

The material culture of the Bronze Age is partially defined by a rapid expansion of metalworking. This shift increased the number of items, the context in which they occurred, and the importance of metals in the sociopolitical and symbolic spheres of these cultures (Kulakoğlu and Öztürk, 2015). Trade networks were reorganized and now faced the Khabur basin, but they still engaged with the Euphrates basin. The focus of metal production turned towards the central parts of Anatolia (Massa and Palmisano, 2018). As smithing technology developed in southeastern Anatolia, the sense of mobility sparked by widespread mechanisms of trade and the movement of people brought knowledge and technology of metalworking to the central parts of Anatolia.

Though experimentation with metals existed in Anatolia millennia before the 3rd millennium BC, and smelting metal to create bronze alloys had already been widely used in the Chalcolithic, it is during this time that true bronzes started to be created. Smiths were able to smelt and combine copper and tin ores to standardize the content of tin alloy in the bronze, which resulted in 2-4% tin inclusions in bronze objects (Yakar, 2000). The tin content was variable, and experimentation achieved the colored effects of bronze surfaces. Other techniques and logistical problems were refined or solved, such as inlaying, the ring within ring technique, filigree, repousse, and soldering. The most impactful technology employed, however, was the development of stone molds and the lost wax technique, which enabled the reproduction and mass production of standardized forms of weaponry objects (Yakar, 2000; Kelly and Buccellati, 1990).

Important sites have provided evidence of engagement with metals. At Norsuntepe, structures associated with metal production were found, such as crucibles and an axe mold. Similar evidence is present at Gavur Hoyuk (Duru, 1979). During this period, metalworking technology was widespread all over Mesopotamia. The high quantity and variability in styles of bronze objects found in graves from settlements around the Biricek Dam area and Carchemish indicate extensive use of metal technology. At Arslantepe, a hoard of metal items, including weapons, was found in the Royal Tomb from the EBA I period (Frangipane, 1998). While the Kastel-Goltepe complex demonstrates that southeastern Anatolia was rich in ores, the region never achieved the level of industrialization and centralization of metal production that the southern settlements were able to attain (Cooper, 2006).

Ceramics were also varied and showed changes in local assemblages within the EBA. In the Lower Turkish Euphrates, the biggest change was the replacement of Chaff Tempered Ware with the grit-tempered Plain Simple Ware of the period, which featured bowls with rim elaborations and the addition of different forms. The Ninevite 5 ceramic assemblage is also common in this region. In the Upper Turkish Euphrates, the red-black pottery of the Trans-Caucasian type appears (Sagona, 2004). In eastern Anatolia, there is evidence of a mixture of ceramic design styles. Delicate and lustrous ceramics with painted shapes emerge as the new ceramic cultures of Martkopi, Trialet, and Beden. They are incised, elaborate, and black, and the latter style is often polished with graphite, imitating a metallic sheen (Piro, 2009; Howell-Meurs, 2001).

#### 2.1.8.3 The End of the Bronze Age and the Akkadian Empire

Towards the last part of the EBA, the Akkadian Empire (2330-2150) in southern Mesopotamia becomes history's first true empire under the King of Sargon (2310-2273BC) (Akkermans and Swartz, 2009). With the capital at Akkad, Sargon was the first to unite vast territories politically, ideologically, and economically (Sagona, 2006). Around 2300 to 2200 BC, the span of Akkadian control engulfed the northern part of the Euphrates River in Anatolia (Gibbons, 1993).

The Akkadian kingship of Sargon and, later, his grandson Naram-Sin (2246-2190 BC) became symbols of ideological power and the concept of a king for many of the Near Eastern cultures. The Hittites of central Anatolia often referred to great deeds that their kings had done and likened them to Sargon and Naram-Sin's feats. In Mesopotamia,

the Akkadian writings were kept for centuries and copied, highlighting their special ideological place in the Near Eastern concept of rule.

The interactions that the Akkads had in Anatolian Mesopotamia were mostly forceful, unlike the other cultural presences in the previous periods. This is because, according to textual evidence from the Akkadians, their main motivation for expanding territory was the acquisition and control of resources. This included the establishment of enclaves and garrisons as a strategy of control. With the Anti-Taurus sectors of Anatolia, the Akkads traded and raided when needed. Southeastern Anatolia likely had a similar interaction with the empire, since trade in this case was not symmetrical but instead based on a central polity-periphery power play (Algaze, 1993; Bachhuber, 2013).

The problem with the Akkadian Empire and understanding its involvement with Anatolia is two-fold. As already mentioned, Akkadian texts were kept and copied for nearly a thousand years after the fall of the empire, so their accuracy must be scrutinized. The second and even more pressing problem is that with the start of these administrative and kingly tablets, we encounter the never-ending question of Near Eastern scholars: “where is the place?”

Akkad, the capital of the Akkadians, surely existed, but archaeologists have never been able to identify the settlement. This is a problem, of course, because Akkadian culture is currently defined based on texts without any type-site for settlement and material culture. Because of this, Akkadian presence at EBA settlements is difficult to recognize. From direct evidence based on texts, we know that the Akkadians were at Ebla, Tell Brak, and Mari, with enclaves and garrisons at Mari, Brak, and Nuzi (Milano, 1995; Margueron, 1993; Oates and Oates, 1989). The most compelling material signature

of the Akkadians is the use of flat mud bricks and some cylinder seals (Gibson and McMahon, 1997). Even then, this recognition is based on the fact that these objects and styles appear different than what is expected. Akkadian inscriptions mention places like Senaminda, Hahhun, and Talhat, which must be in Anatolia based on the routes and scenery described. For these reasons, nothing is certain about the effects that the Akkads had on the last centuries of the EBA.

At the end of the EBA, we find evidence for the abandonment of settlements and significant changes in social and economic practices. A few centers in southern Mesopotamia and northern Syria like Ebla and Mari were not abandoned, but overall, mass abandonment and destruction characterized the region. Kurban Hoyuk contracted to 1/6 of its earlier size, and Titriş Höyük was abandoned; overall, regional settlement systems were abandoned. A big reason for this must have been the 4.2ka BP event (~2200 BC), which resulted in a series of droughts, rainfall unpredictability, cooler water temperatures, and, consequently, abnormal flooding patterns of the Tigris and Euphrates (Weiss, 1993; Easton and Weininger, 2018). This event correlates well with the deterioration of the EBA way of life all over the Mediterranean. As a result, communities not only felt the stress of climatic events but may have also experienced violence and instability as warfare became endemic.

Given this brief overview of the cultural and material context of the Late Pottery Neolithic to the Early Bronze Age chronological span, I will now present some previous work that has been done on the study of the social complexity of Mesopotamia. I will discuss the main drivers of cultural change within the respective theoretical framework. Finally, when relevant, I will explain how my work will engage with these works.



## 2.2 Directions and Previous Research

### 2.2.1 *Social Complexity and Social Differentiation: The Mesopotamian Story*

We know that Mesopotamian societies were complex, but this fact is not useful in understanding variations. For example, northern Mesopotamian sites in the 4th millennium BC experienced the kind of urban growth, social development, and institutional segmentation that was also present in the southern centers. However, it is no archaeological mystery that the upland sites could never capture power to quite the same level as their alluvial counterparts. At Arslantepe, the use of seals and record-keeping is attested to, but the use of cylinder seals that could communicate more complex administrative messages was never used to its full potential. I seek to understand the differences between northern and southern Mesopotamia in a way that can help us define how social complexity functions in that region.

This work is concerned with social complexity in its broadest sense examined from the broadest place and time possible. But what is social complexity? I believe it to be an elusive concept and difficult to capture. For this discussion, and following Dietrich et. al., (2017) and Frangipane (2007, 2012), I use this term to describe the way a group of humans lived—their way of life was complex. The importance of social complexity lies in the fact that it can define how a social unit, say a village, conceptualizes internal power relationships and how expressed these relationships are. Applying an archaeological lens to the issue, I am especially interested in what the mortuary rituals and styles will look like in this case study. Social complexity here is taken to describe the intricate relationships people form in social settings. These relationships then form institutions,

social elements, and communities that also function with respect to one another and coordinate complex tasks on different scales. Archeologically, we cannot always see social complexity, but we acknowledge that it is there through our analysis of cultural practices. What we may see is marked social differentiation expressed through internal power relationships and unequal access to resources.

The distinction between social differentiation and social complexity is important to define here. Social differentiation serves to define how different units or elements are organized within the same system. Social differentiation can be manifested in the different tasks that humans engage in, differential access to food and housing, and the ability to mobilize resources. These inequalities may be expressed in the various rituals that people can engage with. In this work, I study social differentiation as it is expressed in both mortuary practices such as the location, grave type, and objects that the dead were buried with and cortical bone thickness and density, which are used as proxies in understanding differences in lifestyles that people experienced. I will not measure social differentiation because I have no way of quantifying it. The differentiation of a social group is only one aspect of social complexity because humans interact in a complex of ways that we call culture. Thus, social complexity is used to evoke the Mesopotamian system, which I deal with here, and social differentiation is the means that I use to study one aspect of this system to understand social complexity as a whole. With this investigation into mortuary rituals and cortical bone studies of northern Mesopotamian communities, I aim to identify social differentiation in order to understand how social complexity is expressed by the cultural practices of burying the dead. In the following

sections, I introduce the theoretical frameworks by which social complexity has been discussed in Mesopotamia to anchor my findings in the next four chapters.

### *2.2.2 Environmental Predispositions as a Driver of Change*

Even though urbanized communities evolved in the South and North at roughly the same time, they had distinct developmental trajectories. As already discussed, the communities in southern Mesopotamia had rainfall that was less predictable and had to rely more on hunting or irrigation (Wilkinson, 2004). Wilkinson (2004) used modern projections of rainfall in northern Syria's Tell es-Sweyhat to calculate what happened to crop stability in the 3rd millennium BC. His study convincingly shows that crop failure would occur every five years if farmers only relied on rainfall, even in that area of northern Mesopotamia (Wilkinson, 1994). Communities surely offset these odds by applying land use strategies such as fallowing or fertilizing with manure (bird droppings). The settlements located a bit North towards the Turkish border had a greater opportunity to plan as the region receives 300-400mm of rain annually (Van Loon, 2001).

Ultimately, the use of irrigation by the southern sites to carry water over farmland enabled early farmers to reduce crop failure and allowed for greater productivity since fallowing was not needed (Davies, 2009). This allowed for the centers to support a larger population than their northern counterparts, forcing earlier cities to find effective ways of managing expanding populations. It is a fact that while the North experienced periods of expansion and contraction of settlements, once the southern Mesopotamian cities were established, they kept growing exponentially.

Southern Mesopotamian settlements also had the advantage of being connected to the rest of Mesopotamia by waterways (Hritz and Wilkinson, 2006). Northern Mesopotamia could never really mobilize resources and administrative tasks as easily throughout the region because it could not integrate its settlements into an easily accessible network. This issue was exacerbated by the difficulty that smaller northern settlements had communicating with nearby centers. The corona settlement pattern popular in the South, characterized by a main center that is partly surrounded by a corona of smaller settlements, did not exist in the North.

Southern Mesopotamian regions were resource-poor in contrast with southeast Anatolia for example, where various metals, obsidian, and precious stones were exported very early on (Stein and Özbal, 2007). However, the southern sites monopolized those trade routes and ensured a steady supply of resources. The biggest product that these states relied on was the industrialization of sheep and its secondary product, wool. Success was not based on the acquisition of textiles and their use, but rather the use of labor. It is here that elites were able to amass huge efforts to control all aspects of production, which resulted in a centralized system of control on an industrial scale (Algaze, 2008).

### 2.2.3 *Social Complexity and Mortuary Practices*

In many ways, the discovery of the "Royal Tombs" at Alacahoyukhas prompted researchers to develop integrative, anthropological studies concerning the linkage of Bronze Age burial practices and social status. The rich and standardized repertoire of seven tombs and the publication of the excavation reports have inspired scholars to explore social questions related to the appearance of elites, conspicuous consumption, and evidence of migration due to the non-local presence of material in the mortuary record (Ozguc and Akok, 1958; Kosay, 1944, 1951; Mellink, 1970; Arik, 1937 and Gursan-Salzman, 1992).

Philip (1988) and Zimmermann (2007) argue that based on the very distinct manner in which Alacahoyuk individuals were buried in the EBA II-III phase and the fact that gold and bronze hoards were appearing all over Mesopotamia and central parts of Anatolia such as at Horoztepe, Hacilar, Arslantepe, Ur, and Troy, change had occurred in the EBA social structure. While recognizing the need to address social changes, many of these initial studies did no more than compare type and style. As Laneri (2007: 241) has remarked, very few studies "consider(s) the change in funerary practices as part of a broader transformation of a given socio-cultural scenario." But, with the discovery of new sites in the past century, such as Titriş Höyük, Zeytinli, Arslantepe, and Baklatepe, archaeology took an exciting turn that has opened the door for a more integrative and outward-looking approach within the field.

The socio-cultural dynamics that shaped the last half of the 4th millennium BC, such as the establishment of Uruk colonies in southeast Anatolia and the huge expansion

of power from southern Mesopotamian elites, can be traced back to 3rd millennium BC developments in the area (Algaze, 2001). After a significant decrease in the territory of the southern cities around 3000 BC, the Anatolian area was left with small and scattered villages (Algaze, 1993). Over the next 500 years, some of those sites, such as Titriş Höyük, benefited from their geographically advantageous rain-fed position and became city-states. Work at the site from the past several decades has shown that Titriş Höyük went through many periods of contractions and expansions during its lifetime (~3000 - 2100 BC), providing archaeologists with the opportunity to study changes through time and correlate them with larger social events (Nishimura, 2014). The settlement is made even more remarkable by the fact that the multiple occupation levels had corresponding burials. Here, it is important to note the shift from extramural and intramural burials to the cemetery, which is a topic that sparked anthropological interest when Matney (2005) noted that the placement of the dead in and out of the settlement correlated with community-wide events.

Analysis of the practice of intramural (buried inside or in the vicinity of the settlement) and extramural burial (buried outside or in the vicinity of the settlement) is an important topic in anthropology (Algaze et. al., 1995). Burial practices are purposeful and certainly not random acts. A society's decision to change the location they buried their dead is entangled in a web of ritual, belief, and the conceptualization of an individuals' place in society (Carter and Parker, 1995; Laneri, 1999, 2002; Peltenburg, 2007). In the context of Titriş Höyük, this relationship outlines larger changes in social organization, settlement structure, and political relations and reveals how these factors influenced burial styles.

During the first half of the 3rd millennium BC, Titriş Höyük had an extramural cemetery that combined the styles of pithos burials that are usually reserved for children and the more common cist graves that are used for everyone else. The burial inventory was usually accompanied by the typical Syro-Anatolian repertoire of ceramics as well as a variety of decorative pins and needles. In addition, the recovered stone female figurines testify to cultural contact with western Anatolia. During this time, the settlement of Titriş Höyük was at its peak and included an Outer Town that was dedicated to different types of craft specialization and a Lower Town with elite houses. A few centuries later, Titriş Höyük experienced significant downsizing after the abandonment of the suburban area. At this point, the site was surrounded by a large stone fortification wall. Along with the downsizing, the whole settlement began to show urbanization trends such as the standardized construction of roads and typical 2nd millennium BC Mesopotamia-style houses. Many of the specialized production centers were moved inside of buildings. Communal chamber burials also became part of the intramural repertoire and were specifically connected to the household or residency (Laneri, 2011a)

Laneri (2011a, 2011b) points out that these chamber burials were monumental, usually included a dromos (long passageway leading to a main compartment), and held a visible position from the street. Most importantly, they were communal in nature and included a few individuals per grave. The stairs, connections to waterways in some cases, and the inclusions of western goods usually associated with drinking and feasting, such as the depas cups usually found at Troy that feature a rounded base and two curved handles, signaled a tradition of ritual probably associated with wine. During this period, wine production gained an important economic and sacred role in Mesopotamia (Laneri,

2002). Laneri believes that the centralization of household power and kin-based ties resulted from political changes that fueled the need to erect a fortification system, downsize the city, and ultimately develop a system that capitalized on household-based economies. Laneri's (2007) study of burial customs at Titriş Höyük emphasizes how their changes indicate and correlate with transformations of social organization that placed power within the household lineages.

Other studies on the topic have made exciting strides in the push towards a more anthropological and integrative approach to understanding the complexities between the rest of the archaeological record and mortuary practices. A group of such studies focuses on material differences in the different contexts of the household and graves. Stork (2017) proposes that metals served a liquid and sacrificial value in the grave and household contexts, especially between the end of the Chalcolithic and the EBA. By examining the use of metals as ways of expressing status differently, Stork was able to establish an important regional difference between settlements located North and South of the Taurus Mountains. He argued that communities in the North used large quantities of metal to display status through conspicuous consumption. He linked this practice to the growing centralization of communities in the North by identifying it as a way of reinforcing the power of the new central authority. Nashimura (2015) has taken a similar approach to comparing the use of material culture from household floors and the graves at Titriş Höyük. By analyzing the ceramic vessel types and numbers, Stork concludes that at Titriş Höyük, the inhabitants treated the dead in chamber tombs as a central part of everyday life. This interpretation supports Laneri's argument that power during the EBA tended to turn towards the family and the household.



Additional research conducted by scholars such as Cevik (2007) and Frangipane (2010, 2007) has explored how exceptional tombs may reflect socioeconomic and political changes in Mesopotamia and how these influenced Anatolia in return. Cevik (2007) and Frangipane (2010, 2007) have done extensive work on modeling the complex political situation in Mesopotamian Anatolia by distinguishing between centralized and urbanized ranked societies. They argue that, for the most part, southeast Anatolia did not experience any real urbanization until the 3rd millennium BC, which left a more fragile system of power with horizontal rather than vertical stratification. Unlike the more expansive and stable systems of the southern Mesopotamian city-states, some settlements with a centralized palatial system and a system of administrative control, such as Arslantepe, did not expand in size. For the most part, Arslantepe was still a rural center. Arslantepe's royal tomb fits well within this system of complexity—the new style of burial appeals to the new *household* based elite systems in which the social power of the buried individual is linked to the expanding role of metal control (Frangipane, 2007).

Finally, it should be pointed out that bioarchaeological research can help researchers understand how human health was influenced by social changes through time. Recent examinations by Erdal (2006) and Erdal (2012) have expanded on the role that skeletal remains play in analyses of the grave. By including bioarchaeological data that goes beyond simple demographics and sex identification, we can learn about the socio-cultural influences that shaped burials. The dead who have been ignored for so long are once again a vital part of understanding how social complexity is expressed in mortuary practices.

#### *2.2.4 Social Complexity in the Context of Long-Distance Trade*

Long distance trade and social hierarchy are deeply connected, as metallurgy would not develop without its integration into a larger Anatolian trade system. This is, of course, a huge topic with a substantial amount of theoretical framework spanning World Systems Theory. In this discussion, long-distance trade is examined only as it pertains to the metal trade, and I will start with changes in technology that occurred starting in 5500 BC.

Discussions about long-distance trade usually concentrate on the EBA because trade was expansive, influential, and presumably reflects the mobility of a wider range of material culture. The long-distance trade story, however, starts much earlier in the Early Neolithic in the 8th millennium BC when people in settlements such as Çayönü were making beads from malachite (Özdoğan and Özdoğan, 1999). Metal trade in Turkey was possible since people had access to the metalliferous deposits in numerous mountain ranges such as the Black Sea Pontic and the Taurus. Archaeological evidence demonstrates that these settlements were part of a larger social network. Scholars like Yener (2000) argue that societies around the resource-rich lowlands developed into more complex societies early on given their access to resources to create objects.

Metallurgical production requires at least two or more tiers of production. Much of the research fails to address the extraction of ore/mining, the transportation of ores, an intermediate step of ore preparation that produces ingots, and the transportation of materials to the final destination where an object is produced (Lehner and Yener, 2014). Many cultural factors must be in place to allow for complex metal production. In this case, the emergence of complex settlement systems by the end of the LPN in Anatolia

both stimulated and contributed to the increasingly large networks of trade. These pre-existing exchange networks that characterized Anatolia from the EN were able to integrate not only the new metal objects and ores but also the technological skills that the metals industry presented (Marfoe, 1987).

Anatolia has long been, and is still, referred to as a cultural land-bridge or frontier between Mesopotamia and the Aegean (Glatz and Matthew, 2005). Thus, in the rhetoric of world-systems models of Wallerstein (1989), Anatolia's role was periphery to a core: Anatolia's place in this complex network was to produce raw materials for the benefit of the growing states of Greater Mesopotamia. It is within this context that we can understand its regional development (Oates, 1993). This implies that without demand from Mesopotamia, the need for metallurgy would have ceased, dampening the development of social complexity in Anatolia.

Archaeological evidence, however, provides an alternative to the argument that Mesopotamian needs created social and political complexity. Evidence from LPN/EC contexts shows that the shift from using metals to produce small ornamental items to using them to create large and utilitarian tools like weapons predated Uruk contact. Moreover, people in central and western Anatolian regions, such those who lived in the settlements at Can Hasan and Mersin, were producing large-scale objects, such as the solid mace-head with a shaft hole, as early as the 5th millenium BC. Thus, they were producing metal items outside of the southern Mesopotamian zone of influence (Esin, 1969). This focus on production continued to be the case even after the Ubaid colonies appeared. This evidence should be contrasted against the Ubaid lowlands, which

experienced an intense rise in social stratification but offer limited evidence of metallurgy and production technologies (Moorey, 1985).

### *2.2.5 Social Complexity and Metals*

The social complexity of human societies has long been entangled with metals. Childe (1951), who gave us models of some of the earliest categorizations of how human societies experience changes, partially organized his cultural evolution divisions around the technology of metalwork. To Childe, metallurgy was associated with the idea of civilization and the belief that more civilized people possess more advanced technology. This concept of diffusion emphasized the spread of such technology from the hub of civilization to the less civilized in order of metalwork complexity. For Childe (1936), the origin was from Mesopotamia to Europe. In contrast, Frankfort (1928) argued for the out-of-Europe model.

The production of metal artifacts is not the only element that concerns social changes influencing centralization and ranked organization. Production, use, and status/wealth display are aspects of social complexity that dictate how metals are perceived in society. Yakar (2011), for example, has examined the use of metals in the Horoztepe and Alacahoyuk royal tombs—such as the sitting woman figurine and the presence of spindles—as evidence of identity display, relying on the Binford-Saxe approach to understand the complexities of social roles (Saxe, 1971; Binford, 1971).

More direct approaches to examining social complexity and how it is influenced by metal production and use explore how these materials were used and distributed in various contexts (Stork, 2012). Similar to my focus here, these studies focus on

recognizing metal use as a means of assessing ranking or differentiation to ultimately understand social complexity. For example, Stork (2017) explores how metals from the EBA are used in graves and settlement from the LPN to the EBA to better understand changing perceptions of value. To do this, he examines metals in terms of their sacred versus fluid social value. In a similar study (Stork, 2012), he compares the type of metals used in graves in the EBA and interprets the changing repertoire as a shift in ideology and status display.

This concept of elite status and display is one of the more widespread topics of metal studies in Anatolia. Zimmermann (2016, 2009) and Caneva and Palmieri (1983) use insights from archeometallurgy to understand how the growing elite used metals to show status or wealth during the EBA. Chemical analysis on metals from various royal tombs such as Horoztepe and Arslantepe show the unusual wastefulness of tin in the production of bronze objects. The manipulation of alloys and the use of tin in such high quantities (12% in one example) implied that the smiths were manipulating the appearance of the object past its utilitarian function. This behavior is viewed as the conspicuous consumption of elites who could afford to remove large quantities of metals from circulation. Archeometallurgical studies have massive potential to enlighten us on the movement and use of metals, though a more varied metals repertoire to test is currently lacking. Having provided a short overview of some of the directions mortuary archaeology in Anatolia has taken, I will now move on to discuss the biological link between social change and bone morphology.

## **2.3 Cross-Sectional Geometry of Human Long Bones**

### *2.3.1 Previous Research*

Most of the properties that we know about the relationship between cortical thickness, density, and mechanical loading come from non-human primates and other animal studies (Abram et. al., 1988, Nicholson et. al., Noble et. al., 2003; 2006 Ravosa et. al., 2007, 2008; Sugiyama et. al., 2008; Suniaga et. al., 2018). Anthropological studies using this parameter began as a means of potentially answering questions about early human growth and development. One important study of this kind considered ontogenetic factors in a Neanderthal infant's tibia from the Shanidar cave in Iraq. The results were compared to what we know about modern human infants. They showed that the Neanderthal infant had a comparable cross-section geometry to a modern human's, thus implying that humans and Neanderthals have a similar developmental pattern (Cowgill et. al., 2007).

Ontogenetic studies have been done on human sub-adults and continue to be fundamental in understanding the effects and variation of mechanical bone-loading on long bones. Research into this issue helps us understand variation and patterns of bone growth, as well as other impact factors. Gosman et. al. (2013) have conducted studies with large sample sizes of cortical thickness and varying shapes of bones from sub-adults and examined how the bone changes over time depending on the age and location of the cross-section along the shaft. They were able to show that there are different periods with increased rates of cortical deposition. The concept of cortical drift proposes that shape changes with age too, starting as almost perfectly circular. Almost immediately after a

child mobilizes and exhibits a mechanical load on the bones, the rate of cortical deposition increases. The resulting shape will differ based on the child's axis of movement, amount of movement, and terrain (Becker et. al., 2020; Montoya-Sanhueza and Chinsamy, 2017). This implies that when studying variation between bone cross-sections in young children, we should not discount variation as normal before accounting for these variables.

Cortical thickness and density are positively correlated to levels of activity and mobility that put strain on bones (Franks et al., 2017; Kohn et. al., 2009; Ravosa et al., 2016; Wallace et. al., 2010). In this case, humeral and femoral bones are of interest. Humeral bones might be able to show changes that occurred on cortical architecture as the result of strenuous activities linked to the use of the arms, and similar changes in femora can show differences in activities that may be related to mobility and terrain. As the transition from the Late Pottery Neolithic to the Early Bronze Age occurred, it is expected that mobility and social roles were differentiated amongst members of the community. Thus, studies of the cortical bone in the long bones can indicate social changes that have resulted in morphological markers.

In archaeology, this topic gained interest because of its ability to answer questions about social shifts in settlement patterns, subsistence, and mobility. The expectation is that once humans became less mobile and more dedicated to the production of their food, the cortical bone strength decreased overall because that type of lifestyle was less strenuous on the bone compared to when people were constantly moving and hunting/collecting food (Stock, 2006). However, it is often a much more complicated picture than that, with a significant amount of variation between populations (Bridges,

1996). Studies of the neolithization of Europe are good examples that demonstrate how useful cross-sectional geometry can be in the study of human social change.

Interest surrounding studies of bone cross-sectional geometry has attracted the attention of archaeologists, especially the Çatalhöyük team. Here, studies were employed in a larger corpus of bioarchaeological investigations that were looking into population mobility patterns and sexual dimorphism (Larsen et. al., 2015). Cross-sectional studies of femora and tibia show that the population at Çatalhöyük experienced a shift in mobility and workload that was characterized by a decrease in cortical strength over time, especially during the Late Period, and that workload changes peaked in the Middle Period. This information was inferred by the decrease in cortical thickness in femoral and tibial bones over time. Studies in bone health and fracture rates related to the cortical integrity of the bone suggested that individuals had more or less equal access to nutrition. Comparing more modern populations to Çatalhöyük samples illustrates the importance of ontogenetic history in the context of mobility and activity's influence on post-cranial robusticity patterns. The study shows that when compared to the Denver population, Çatalhöyük individuals experienced a slower rate of cortical bone deposition and growth. These results suggest that the characteristics that define the mechanics of bone deposition develop early in childhood.

The literature on cortical thickness and its application in anthropology is still very limited and largely thematically represented in this survey. Studies like the ones discussed here present their findings on a biological level without discussing possible implications or the reasons that contextualize their findings—this is mostly outside the parameter of their inquiry. In my dissertation, I will not contribute methodologically or



theoretically to the field of biomechanics because this is outside my abilities. Instead, I wish to use data that is similar to these studies and contextualize my findings with other data in order to understand how they relate to changes in social complexity. In understanding patterns based on human bone values, I ultimately aim to reconstruct social structures and their functions. In the following sections, I outline the theoretical questions of this work.

## **2.4 Looking for a Theory: Why Was Mesopotamia Special?**

The discussion above set the archaeological scene of a very messy picture on a landscape full of varying ways of life. If we think of the way that people lived as a structure, this is easy enough to describe. However, we are not interested in just finding out what the structure itself is (a village, a city, or an urban center); rather, we want to know how socially complex it is. This is a dilemma because with what tools do anthropologists measure complexity? Is it a qualitative or a quantitative value? There is no agreement amongst anthropologists even about what to measure exactly. Complexity has become almost philosophical. To bring the case study back into the picture, from the LPN to the EBA, we see chiefs, leaders, warriors, kings, warkas—all terms used to describe the top tier of different organizations of power. Which one is the most complex? I would argue that the most complex society presents 1) the most powerful leader, which signals greater social differentiation, and 2) the leader who has the most to control. Of course, EBA societies would be the most complex here. Knowing which Mesopotamian phase is the most complex brings no new knowledge. To establish which one is the most complex in a comparative case is useless. Establishing how complex a society was is not

the question to ask. All societies were and are complex. I make the case that a worthy investigation should seek to find how and which material contexts best capture social complexity. In a sense, I wish to see how it is reflected in the archaeological record, not how much.

#### *2.4.1 How Do We Recognize Elements of Social Complexity? What Do They Look Like?*

The definition of power and where it lies should be the focus when studying complex Mesopotamian societies. It is social differentiation that allows us to understand the workings of social complexity through the archaeological record. Because power dynamics tend to be varied, are not always stable, often change through time and space, and are utilized in different ways, I propose that for my examination of the social dynamics in northern Mesopotamia from the Late Pottery Neolithic to the Early Bronze Age, the heterarchy model will give me the most analytical power with which to make sense of the constant nuances of complexity.

#### *2.4.2 Heterarchy As A Model and Condition: All Social Relationships are Complex*

Carole Crumley (1995: 3) defines heterarchy as “the relation of elements to one another when they are unranked or when they possess the potential for being ranked in several different ways.” Heterarchy does not dispel the existence of hierarchy; rather, it allows its influence and existence to shift both temporally and spatially within and between social units (Ehrenreich et. al., 1995). We can look at heterarchy in two ways. First, as a *condition/model* that can be used to describe and represent a not necessarily

hierarchically organized but still complex society. An example of this is the relationship between different institutions in a hunter-gatherer society. Social units are not ranked, but they have the ability to interact with one another in complex sets of venues. The second way that we can understand heterarchy is a system in which society cycled between periods of a more hierarchically organized state and periods of a less rigidly organized heterarchical state. A great example of this is the variable modes of centralization that a Mycanean palace was able to exert on its territory—sometimes it had full control over some aspects of society, sometimes the palatial system fell apart, and so on. While an element of hierarchy is included here, the important dynamic is that a state of organization and re-organization existed. The whole cycling between a more and less hierarchical structuring is a heterarchical system. In this case study, Upper Mesopotamia demonstrates an interesting predicament where we have elements that are highly hierarchical in nature, such as efforts towards urban planning and the differentiation of public space, compared with almost no differentiation in burial contexts in the area during the Late Chalcolithic or Ubaid periods (Betani, 2018). There is even more variation between sites, as described by Creekmore (2010). By employing heterarchy as a model (point 1 above) and sometimes as a system (point 2 above), I wish to examine such discrepancies, concentrating on what drives differences in the expression of power dynamics.

The plethora of processes that occurred between the LPN and the EBA, as outlined at the beginning of this chapter, are the perfect set of stages to look at while examining heterarchy. In particular, I am interested in exploring how differentiation through time and space, or vertically and horizontally (heterarchically modeled), is

materialized in the archaeological mortuary record. This period is characterized by the rapid yet unclear nature of the emergence of urbanism at certain sites in Upper Mesopotamia that go through numerous phases of expansion and contraction, presenting me with the unique opportunity to isolate social changes and correlate them with archaeological changes. I will engage with heterarchy and its implications for the burial data in my concluding chapter, where I will review how others have used it in the Mesopotamian context. Then, I will compare my data with the model.

#### *2.4.3 What Are We Studying?*

In this thesis, I explore the mechanisms that led northern Mesopotamian centers to urbanism. Thus, I distinguish between two types of state powers: one based on external forces (more centralized) and a second that is more locally based (more balanced) based on Levi's (1988) research on methods of government financing. In the Mesopotamian case, elites have always found their source of power externally, extending energy and control on long-distance trade where resources and ready products are acquired from vast distances (Oates, 2003). However, there must be a difference in these networks when comparing the North to the South, given the difference in urbanization trajectories.

Another important dilemma to consider is whether or not Mesopotamian institutions can be precisely defined and understood as regional manifestations (Benati, 2018). What are they? We do know that they are dependent on the elites and their mobilization of resources. Thus, power naturally lies within these institutions. Therefore, if we are to understand social complexity, we need to adopt a top-down approach while studying Mesopotamian institutions: focusing on the elites and their engagement with the

rest of society should be indicative of its complexities, how various levels of society and their institutions functioned, and how ranking was expressed in a system.

#### *2.4.4 Understanding Social Complexity Through Mortuary Practices*

I will follow in Frangipane and Porter's (2002) footsteps when analyzing single graves. Their effort to not only move outside of the grave and the settlement as a whole but to also look out towards neighboring social powers gives them a greater analytical and interpretive perspective. If I am interested in learning about social complexity, this approach will allow me to consider a wider range of influences and how they interact with one other.

As I have progressed in my studies, I have noticed that the word wealth and status are often used in a way that implies they mean the same thing. In this dissertation, I want to show how wealth is not always correlated with status. As I will be dealing with a period of dramatic display or mortuary rituals, it is easy to assume that the individuals buried in these cases are elite and wealthier than the rest of the population. This assumption does not allow me to analyze the complex social factors that play into the act of the deposition of such material culture. For example, Renfrew's (1986) study of the Varna cemetery in the Balkans, which showcases a similar instance of unusual deposition of metals and other objects of value, makes an argument for the need to distinguish between the two, as does the case with the so-called "chief" burial. The special treatment of the buried male stands out even among the rest of the already spectacular graves. However, is it correct to speak of wealth? As was the case with the Varna "chief," we need to consider that society is displaying status and not wealth or richness. I will

evaluate the concept of wealth and status critically so that I do not impose a concept that does not exist, like wealth accumulation or conspicuous consumption.

Related to this discussion, I want to propose another distinction that I will employ in my analysis of differentiation in mortuary practices. If I put on an earring, does this mean that I am wealthy? I am most likely to do so to decorate myself. However, I believe that in prehistory, especially during the Neolithic, people rarely did anything like decorating themselves without there being a more sacred reason. Thus, I will be taking a practice-theory approach to this situation and attempt to not make sharp distinctions between the utilitarian and the sacred realms of society (Fogelin, 2007; Nishimura, 2015). If I come across a skeleton with earrings, I will consider the "ornament" to be not only ornamental but also possibly an ideological marker. This type of distinction has very strong implications because it makes me consider that even if individuals in society had wealth (the earrings in this case), this did not mean that they necessarily possessed status.

I want to make it a point to contribute to the topic in a way that does not analyze from negatives: just because I may not see overt displays of social status and wealth, it does not mean that they are not there. For example, as we have seen at Titriş Höyük, chamber tombs seemed to become popular during the middle EBA as the result of a new kin-based elite system. These tombs are rather standardized and have a similar repertoire of artifacts. Does this mean that there was no social ranking in the system? Based on the fact that this is a time when new economies were created based on the control of raw materials such as lithics and metals, the appearance of new spaces for specialized production of goods, and trends towards centralization of power and urbanization in the region, this seems highly unlikely. If I approach this issue holistically by keeping the

larger sociocultural events in mind, I can argue that perhaps we are not seeing an overt display of status or wealth because the new chambers are for the household kin—why should they need a social display of wealth or status? Nishimura's study with the pots and her argument that burials were essentially integrated into a household's everyday life support this position. This is an exciting avenue for me to consider as I explore differences in social display of status between intramural and extramural graves. Finally, I want to emphasize the benefit of heterarchical theory here. It allows me to argue that *within* a household a hierarchy may not exist *between* its members, but this does not mean (and is not the case) that there was no competition between households. Thus, the heterarchical model allows to me consider two power relations in a system at once: between and within households.

Perhaps my greatest contribution to the discussion of social complexity's relationship to the creation of mortuary traditions will be my analysis of the cortical thickness and shape of individuals from graves from the LPN and EBA. By doing this research, I will be able to make deductions about mobility, bone strength, and activity patterns and determine how they varied in time and between and within sex. I will take a bio-cultural stance with respect to my analysis of the bones and strive to not skew my data based on modern notions of gender. Prehistoric studies of this sort lend themselves to that kind of analysis because scholars often do not have information about gender roles in societies (Stratton, 2016).

Finally, the fact that these samples will come from key sites discussed here, such as Titriş Höyük, will allow me to add to the large corpus of information that is already proving revolutionary for the way we consider the process of urbanization in the area.

Hakemi Use has still not been published about, so I will have to opportunity to conduct some of the first osteological analyses for one of the only LPN cemeteries found in southeast Anatolia. When integrated into the anthropological framework that I have outlined above, I hope that my research will make a unique contribution to mortuary studies both within and beyond the Anatolian context.

#### *2.4.5 Social Complexity and Metals: Where Does Power Lie?*

In my dissertation, I will utilize the potential of metals to provide me with information about the reciprocal relationship that rests between these materials and social complexity. Viewing metals as merely a craft inhibits us from understanding of their full impact. In Mesopotamia, metals were integral to creating a more hierarchical society that, in turn, allows for more complex use and technological developments. In this work, I categorize metals in graves as a tool by which to analyze differentiation. I will employ the idea that elites used metals for conspicuous consumption and explore how these rituals are contextualized in their cultural setting. Burying metals to demonstrate status will not mean anything if the society in which this is done does not partake in this ideology (Yalcin and Yalcin, 2013; Leusch et.al., 2017). I will return to the idea of status versus wealth as it is particularly interesting in the case of the elite: are they showing status, displaying wealth, or both?

Lastly, this work recognizes the work of Childe, who put forth a valuable approach towards understanding the role of metals in early societies. I would add, however, that in this case, his directionality of diffusion must shift—I will demonstrate archaeologically how advances in metallurgy started in Anatolia instead of South



Mesopotamia. In doing so, I want to push against the idea that the region was a lowland supplier of raw materials; instead, I will show how metals were not just a commodity that flowed in and out of Anatolia and demonstrate that societies there had an active role in the creation of new technologies that drove social complexities in a two-way relationship with Mesopotamia.

Metals have multiple uses and social roles, and many sectors of society are needed for the mobilization of production, consumption, and trade. Thus, I will use metals to analyze the complex social connections between trade, urbanization, and mortuary practices. Again, I will model these interactions on a heterarchical system in which I treat metals as the vehicle that mediates social change and influences. In turn, its developments and forms shift and accommodate the ever-changing system that is the LPN-EBA transition.

#### *2.4.6 Long-Distance Trade: Exchange of Material as a Method of Social Stratification*

In his critique of world-systems theory's application to ancient societies, Kohl (1987) viewed the situation in the Near East during the 3rd millennium BC as a constant criss-cross between the core regions and their hinterlands-peripheries that often formed overlaps in the territory. This more variable and dynamic model appeals to my heterarchical approach to studying social complexities. Treating the links between networks as always fluid instead of unilinear will allow for a better understanding of the various nodes of trade and how they influence social complexity. My approach to the Anatolian-Mesopotamian network is at odds with world-systems theory because the latter assumes a very passive role of the periphery as a resource supplier, as discussed above,

and it implies that the core always has power in a very asymmetrical fashion. It also does not answer questions like what was the motivation for the southern Ubaid sites (the core) to expand into the North (the periphery)—the always assumed need for acquisition of raw materials like metals fails to be supported over and over again. For analytical purposes, I am keener to use Stein's (1999) disparity model to conceptualize trade during the EBA in the 4th millennium BC. This model suggests that the further a core expands, the less power it can deploy due to disparities that occur in cost-production relations. It also emphasizes the sociocultural complexities that shape different networks. I acknowledge that this model is still very predictable, does not consider change in time and space, and assumes a state of symmetry. Regions interact reciprocally without dominating each other. In the case of Mesopotamia, we know, however, that states are more complex and many did exhibit power over others at different points in time.

By utilizing the heterarchical view of complex systems, this dynamic model can provide more analytical momentum to ever-changing social complexities and their influences. Long-distance trade is a very powerful venue by which to study social complexity. The acquisition of resources, their mobilization, and the organization of systems of exchange can only be achieved with power (Mann, 1996), and power can only exist in complex social systems. Thus, looking at the relationship between various sectors of Mesopotamia through heterarchical modeling allows interpretations of complexity to be more holistic and overreaching.

#### 2.4.7 *Looking Into Bones for Answers*

The Late Pottery Neolithic to Early Bronze Age transition in southeast Anatolia is said to mark a period of a fundamental transformation of everyday life and all aspects of society. Subsistence patterns became oriented towards the intensification of agricultural surplus and distribution replaced the rural lifestyle in the Neolithic that, though sometimes expansive, was still village-based (take Çatalhöyük, for example). Palatial systems emerged all over Mesopotamia and mobilized resources in the process of acquisition and redistribution. This aided in the appearance of more individuals who held elite statuses or were able to acquire enough wealth to shift power relations to form complex hierarchies. The main reason for this centralization of power came from the ability of Late Chalcolithic Halaf communities to integrate themselves into larger trade networks with the greater Near East. This resulted in the emergence of what is considered by some to be a true colonization process of settlers moving from South Mesopotamia into southeast Anatolia who established residency at sites such as Hacinebi (Stein, 1996). After these colonies retracted, the region began a process of centralization and/or urbanization that reorganized social relationships yet again. Finally, the expanding role of metals in craft specialization and the trade networks that benefited from them stimulated the system to become a metals-based industry.

These events might have happened as described, but the scale is still an area of debate amongst scholars. For example, how much did subsistence strategies change—many sites were still very rural during the EBA. Sites like Arslantepe that are usually mentioned in the rhetoric of urbanization are better viewed as highly centralized. Did

long-distance trade play an integral role in social formation, or was it a peripheral force for most of society? We know that hierarchical relationships existed, but the extent to which they were institutionalized and exactly what kind of new social roles emerged with the EBA are still unclear.

Social change, such as it is described above, speaks to a great level of differentiation between social units and the creation of a stratified society in which individuals do not have equal access to the same resources. Correspondingly, they may engage in different physical activities as a result of differentiated social status that has the potential to be reflected in certain physiological markers like bones. Bone formation, growth, and health were highly influenced by activity. It is also important to understand that people may have performed a plethora of activities, some of which influenced mobility, that would result in changes to cortical bone health and thickness. For example, as different sites specialized in various kinds of production (Tell Banat and flint for example), we can expect that those variations in activities may have affected the bones differently. Thus, we need to understand cortical bone values within the context of each site examined. If the social changes described above were so significant that lifestyles were altered, then cortical thickness and density should reflect those changes under the assumption that as bones experienced various loading and stresses, cortical response varied along the shaft (Frost, 2003; Larsen et.al., 1995; Meyer et. al., 2011; McDonald et. al., 2009; Shaw and Stock, 2008).

The biomechanical properties of human bones and humeri, tibiae, and femora, in particular, present anthropologists with a unique opportunity to study human population patterns of mobility and activity. Changes in size and density of cortical bone can give

clues about differences in activity intensity, load, and subsistence styles that people were engaging in. The basic assumption here is that the more stress and strain people put on certain bones, the thicker and denser the cortex will be.

By using cross-sectional studies of the architecture of cortical bone, I will be able to see if lifestyle changes contributed to differences in cortical bone morphology from the Late Pottery Neolithic to the Early Bronze Age. My questions deal with understanding the effects of shifts in social stratification and how it influences pre-urban and urban societies. The ability to involve a physiological marker that would directly address my question is an important step towards a sociocultural approach to bioarchaeological analysis. While cortical tissue mineral density is a highly explored subject in clinical studies on various animals, including mice and rabbits (see Chandler et. al., 2019; Ravosa et. al., 2006; Ravosa et. al., 2007; Ravosa et. al., 2008), this approach is non-existent in archaeology. Bone density has been applied in anthropological studies such as Agarwal (2001), Brickley and Agarwal (2003), and Agarwal and Grynepas (2009). While these case studies use trabecular bone to interpret behavioural patterns, long bone cortical tissue density has not been used in concert with cortical thickness in order to understand activity/mobility-related patterns. As I will discuss in chapter 7, biomineral density has the potential to respond to cortical bone loading in the same manner that cortical bone does. This study explores both in order to not only track chronological and sex-based differences, but also use two methods to inform my study. Approaching cortical change by testing for both thickness and density changes is a more holistic approach that will allow me to not merely add one more data point to compare, but rather give meaning and context to my findings. The results from the bone measurements and how they compare

with one other can only be understood by analyzing them against their social, temporal, and spatial contexts, as laid out above.

CHAPTER 3:  
PRELUDE: DEALING WITH THE DEAD: PROBLEMS AND SOLUTIONS TO  
CONSIDER WITH THE MESOPOTAMIAN MORTUARY RECORD

**3.1 How To Interpret the Dead: Theoretical Frameworks**

Before I dive into the data that I have gathered, it is necessary to briefly discuss theoretical frameworks from previous mortuary analysis. From these accounts of the Mesopotamian burial record during the period of interest here, it seems that there was a considerable amount of material culture, mostly in the form of vessels that were consumed during phases of funerary ritual. Many interpretations of material culture from grave contexts focus on the removal of objects from circulation and generally fall within three theoretical interpretive paths inspired by anthropological, economic, and sociological schools of thought: moral consumption, costly signaling, or evolutionary advantage.

Moral consumption here involves examples from ethnography, where consumption of material "wealth" is not viewed as serving the purpose of expressing social status or securing that kind of position (Miller, 2005). Wells and Davis-Salazar (2007) have discussed such practices as being embedded in ritualized behavior connected

to reproduction of social values. This is usually expressed in forms of hording, feasting, and funerary display. Such acts serve to propagate community ideology and systems of belief. Thus, in a sense, what is being consumed is invested into the long-term well-being of a group (Wells and Davis-Salazar, 2007: 208, 216).

Alternatively, Dunnell (1989) argues that conspicuous consumption is not economically profitable, and in this case, it might be advantageous from a Darwinian perspective of fitness if culturally defined as a social advantage. From his perspective, the energy and time put into creating and discarding objects are seen as having an effect on mate selection. To a certain extent, this is a roundabout way of arguing in favor of costly signaling theories because fitness could only be a social advantage in this case (Aranyosi, 1999: 359; Madsen et. al. 1999: 253; Kornbacher, 1999: 285). For example, Shennan (2008: 84) and Bliege Bird and Smith (2005: 224) argue that wasteful behavior can signal true attributes of underlying fitness that can create symbolic capital, like status. The problem that I find with this approach is that it requires costly signaling behaviors like feasts, lavish mortuary display, or building of public architecture be true representations of social fitness. Of course, this requirement cannot always be met, for people reach beyond their true resources to create lavish displays. I will engage with this concept, especially, as it pertains to the EBA material, where mortuary lavishness is common. Whether or not mortuary behavior reflects social structure is one of the main questions that needs to be investigated.

The most relevant questions to archaeology are, as already mentioned, linked to theories of conspicuous consumption. Veblen (1899) proposed the idea in *Theory of the Leisure Class*, which was based on Boas' studies of the Kwakiutl ceremonies based on



distribution. Later scholars like Trigg (2001) and Bleige-Brid and Smith (2005) use the concept of conspicuous consumption to argue that such displays of status could only be possible within certain social settings that give a platform to the display of wealth. In other words, this costly signaling could only occur within a community that transforms wealth into social status.

All forms of capital, whether they be social, symbolic, moral, or economic, essentially transform in one way or another into a social position whose parameters are defined by the ability to access social capital (whatever that might be) within a social context. Bourdieu (1977: 178; 1984), for example, argues that any capital in the end should be conceptualized as "rational" because it is easily converted into material capital and vice versa. However, this does not mean that costly signaling and its resulting capital can be converted into power. That transformative power depends on how the individual(s) can or cannot mobilize the acquired capital. The concept of capital, its expression, and how resources are mobilized is a key piece in my use of heterarchy in this thesis. I will especially highlight when and how resources were mobilized and centralized from the LPN through the EBA in order to understand how members of the social system used their material goods to create power. In this work, I will investigate if and to what extent people used mortuary rituals and the inclusion of grave goods in Northern Mesopotamia to create or demonstrate power.

There has been much critique amongst these schools of thought that mainly narrows down to the fact that evidence of conspicuous consumption does not truly signal social status (Bagwell and Bernheim, 1996; Bronner and de Hoog, 2018; Heffetz, 2011). I would argue that what it does signal is the ability to use wealth. In any system, two

processes have to exist: those that ensure social continuation and usually mask differences in status, and those that show or instill differences in status (Barth, 1990: 649; Weiner, 1992: 10). The problem is that removing wealth from circulation or giving and keeping strategies does not ensure that an individual will transform whatever difference into an effective relationship based on inequality. After all, these sanctions are based on mutual social understanding. Many of these theoretical frameworks are based on ethnographic accounts that underline the internal strain between these two social strategies (Parry and Block, 1989).

Recently, Campbell (1994) has argued against the simplified idea that conspicuous consumption serves as a tool to create inequality within a community. Instead, he argues in a vein similar to Weber (1964), that in order to understand the motives behind costly signaling, one needs to understand the system within which these acts of display take place. In other words, if people in a social system do not endorse acts that would further emphasize social inequality, conspicuous consumption should not be viewed as propagating inequality and power differentiations. This is the idea behind moral economies.

In archaeology, the idea of moral economies has not been emphasized as much as it has been in other fields, with the exception of works by Richard Bradley (1982; 1990; 1988) that look at the costly signaling of Bronze and Iron Age hoards in Europe. He argues that hoarding practices act as platforms that reduce available wealth and discourage competitive behavior. More recently, Brereton (2016) argues that in light of material consumption being a part of mortuary rites in the Neolithic and Late Chalcolithic in Mesopotamia, 1) mortuary practices keep established social status stable by removing

objects from circulation, which prevents the value of items from fluctuating (or prevents inflation) and limits their availability to competitors, 2) "wealth" that is discarded ensures long-term social reproduction by transforming into symbolic capital or intellectual property, and 3) similar to Campbell, display of wealth is regulated by other systems that enable or disable the meaning that these acts convey. This idea of conspicuous consumption and the critique that it has come under is incredibly interesting in the setting of mortuary display. I aim to study conspicuous consumption in context of the mortuary practices in each period, which do not all share the same social structure. Can we interpret burials that display vast quantities of materials, even wealth, as evidence of conspicuous consumption if that burial is not for the public? In other words, who is the show intended for?

Drawing on this body of scholarship, in the following chapters, I will discuss how the compiled evidence here, along with previous studies, can be analyzed using established anthropological frameworks. Primarily, I will focus on 1) how/if costly signaling reflects social status and ranking, 2) questions about whether or not ideas of moral capital are similar to Brereton's (i.e. more representative of motives behind mortuary wealth consumption) and what structures mortuary practices in the time periods examined, and 3) how heterarchical theory can be applied and aid in the analysis of material wealth used in burials. Chapters 4, 5, and 6 deal with the mortuary record of the Late Pottery Neolithic, the Chalcolithic, and the Early Bronze Age, respectively. Each chapter will aim to answer the three questions posed above.

### **3.2 Introducing the Data**

Before I present my data and findings from each time period, it is necessary to show how I have structured the analysis as well as the units that I used and discuss some vocabulary particularities. In this thesis, I present the burial practices that define each period examined here by highlighting general trends and important sites to demonstrate archaeological trends. The data from the sites span four time periods, specifically: Late Pottery Neolithic/Early Chalcolithic, Ubaid, Uruk, and the Early Bronze Age. The analysis of sites from these periods examines 1) the relationship of burial type to age/sex and artifact distribution in graves, 2) age/sex distribution in graves and its association with artifacts, and 3) artifact distribution in association with burial types and age/sex. Table 3.1 lists the chronological grave period from each site. Table 3.2 shows the distribution of individuals from each age category buried in the intramural and extramural graves at each of the sites. In the chapters that follow, burial practices will be discussed in respect to burial types, artifacts, and demographics. I will discuss and interpret the data that I have presented in concert with what is already known from other publications of the mortuary record, theoretical approaches to the material, the specific archaeological context, and textual evidence.

TABLE 3.1:  
SITES AND CHRONOLOGICAL DISTRIBUTION OF BURIALS

Site Names	Late Pottery Neolithic / Early Chalcolithic	Middle Chalcolithic/ Ubaid	Late Middle/ Late Chalcolithic/ Uruk	Early Bronze Age
Gerikihaciyan	X			
Tell Hazna	X			
Karavelyan	X			
Boztepe	X			
Tulintepe	X			
Mersin	X			
Domuztepe	X			
Tell el-Kerkh	X			
Turbe Höyük	X	X		
Salat Tepe		X	X	
Korucutepe			X	
Arslanteppe			X	
YeniceYani		X	X	
Muslumantepe			X	
Pirot Höyük			X	
Cattepe Höyük			X	
Tepecik			X	
Carchemish			X	X
Kenan Tepe		X	X	X
Oylum Höyük				X
Kenan Tepe				X
Gedikli				X
Tilmen Höyük				X
Saraga Höyük				X
<i>TOTAL:</i>	<i>9</i>	<i>4</i>	<i>10</i>	<i>7</i>

TABLE 3.2:

THE DISTRIBUTION OF INDIVIDUALS IN EACH TIME PERIOD, AT EACH SITE,  
FROM EACH AGE CATEGORY USED IN THIS STUDY

Time Period	Sites	Intramural Graves	Extramural Graves	Adult	Adolescent	Child	Infant	Unknown	Total Individuals
<b>Late Pottery Neolithic</b>	Gerikihacıyan	4	/	2	/	2	/	/	4
	Tell Hazna	1	/	/	/	/	1	/	1
	Karavelyan	1	/	/	1	/	/	/	1
	Boztepe	/	4	2	1	/	/	1	4
	Tulintepe	1	/	/	/	/	1	/	1
	Mersin	6	/	+3	/	1	1	1	+5
	Domuztepe	9	/	1	/	2	1	5	9
	Tell el-Kerkh	25	15	14	4	10	22	6-7	56-57
	Turbe Höyük	/	3	15	/	1	/	1	17
<b>Chalcolithic</b>	Turbe Höyük	1	/	/	/	/	1	/	1
	Salat Tepe	4	/	1	/	/	3	/	4
	Korucutepe	2	2	4	/	/	1	/	5
	Arsilantepe	4	/	/	/	1	1	2	4
	Yenice Yani	3	/	/	/	1	2	/	3
	Muslumantepe	9	/	/	/	/	9	/	9
	Pirot Höyük	9	/	1	/	/	8	/	9
	Cattepe Höyük	?	?	/	/	/	1	/	1
	Tepecik	1	/	/	/	/	1	/	1
	Carchemish	11	/	4	/	2	2	3	11
	Kenan Tepe	20	/	9	/	6	5	/	20
<b>Early Bronze Age</b>	Carchemish	15	/	/	/	2	/	+17	+19
	Kenan Tepe	3	/	/	/	3	/	/	3
	Oylum Höyük	/	46	11	/	13	12	10	46
	Asagi Salat	1	37	5	/	2	1	30	38
	Gedikli	/	46	1	/	/	/	45	46
	Tilmen Höyük	2	/	/	/	2	/	/	2
	Saraga Höyük	/	2	/	/	/	/	/	2
	TOTAL:	132	155	+73	6	48	73	+121-122	+422-423

### 3.3 Overview and Limitations

The complex interplay between heritage management, economic development, and politics in some way frame my study of mortuary practices and emerging Mesopotamian social complexity. For example, the sites that I have included in this dissertation were not chosen at random, and limitations with the data must be addressed here. Four important factors influenced the scope and directions of this analysis:

1. The bulk of Anatolian and northern Syrian sites are currently the result of salvage and regular excavations from development projects on the Tigris and the Euphrates Rivers. Thus, the results that are gathered from these operations are merely a sample of the true archaeological situation. For example, excavations at Tilbes and Tilmen Höyük attest to some new burial forms in the Anatolian sector and monumental architecture, but due to the nature of the salvage work, we cannot understand the greater context of the sites (Marchetti et al., 2010). Further excavations are not possible because these sites are now submerged.
2. Important EBA cemeteries containing large volumes of data have been well excavated, but this information has not been published yet. Some good examples of this are the extensive cemeteries at Lidar Höyük, which were excavated by H. Hauptmann between 1979 and 1987. The information found at Basur Höyük, which is currently under the directorship of Dr. Haluk Saglamtimur, has been partially published, but for the most part, a holistic presentation of what was excavated is lacking. Hacinebi, a key site for the Uruk and later EBA occupation of Anatolia, has been investigated for decades by Gil Stein, but not many publications about it exist. The long sequence of occupation as well as the varied record of burial styles has the potential to significantly contribute to questions about long-term change of customs. Hassek Höyük is another cemetery analogous to Lidar Höyük, which was excavated by Behm-Blanke and remains unfeatured in published scholarship. This site is important for the EBA narrative because it contains a high number of cist graves, some of which exemplify a later stage of the metals trade that came in from the Tigris basin trade routes. Lastly, hundreds of burials have been excavated at Hakemi Use, some of which I will discuss in the following chapters. They present the oldest and most numerous collections of southeastern Anatolian Late Pottery Neolithic burials, but information about these burial sites still remains unpublished. Thus, I want to emphasize the possibility that upon the systematic presentation of all of this data, the findings explored here may change with future publications.

3. Another important issue is that there is variation in the precision, detail, and overall consistency of excavations, recording, and publishing of these sites. In some cases, osteological material from older excavations was systematically and purposefully ignored and disposed of. In best-case scenarios, objects deemed valuable by the excavators are reported or burials that seem to be "rich" are described. Thus, I often cannot reconstruct any feature of the burial record based on the demographics in terms of both sex and age, even when based on excavation reports. Thankfully, in the past 20 years, the northern Mesopotamian sector has been heavily surveyed as a result of dam construction and economic development along the A limitation; but the methodological problem that I face with my own data is that the burial records from two of the sites used in the following chapter, Hakemi Use and Titriş Höyük, which would tie together with this work perfectly, are not published. Hakemi Use is excavated under the supervision of Dr. Halil Tekin with Hacettepe University in Ankara. Currently, the archaeology and the anthropology departments are preparing a mortuary monograph, which will feature detailed bioarchaeological and archaeological descriptions of each burial. Hopefully, in the next few years this information can be integrated into the work presented here. Titirs Höyük was excavated in the 90's by Algaze and then again in more recent years by Lenari. The burial records and osteological material from Hacettepe are also published.
4. With the vast amount of land surveyed, time spent on excavations in Mesopotamia as a whole, and the number and type of sites excavated, the problem of the missing dead is truly pressing. The discrepancy between individual settlement sizes and the corresponding burial numbers in of itself is perplexing. This is the case for the North and the South in all periods, with the exception of the Pre-Pottery Neolithic. For the Ubaid and Uruk periods, especially, the data is so scarce that we must not concentrate on what we are seeing but make deductions based on the absence of data.

Considering this last point 4), Hole (1989) has demonstrated that for the end of the 5th millennium BC, a reasonable annual birth rate is 50/1000 people for every 100 people stationary would result in ~500 deaths per century. This formula assumes that infants and adults have comparable death rates of about 2.5 individuals per year. Even if the assumption of the death rates between sub adults and adults was incorrect, the number of burials found at sites does not come close to the expected population size. Sites in lower Mesopotamia, such as Uruk, are even more problematic. By 3200 BC, the mega-



site of Uruk covered 250 hectares and was inhabited by a population in the estimate of 25000 to 50000 people (Algaze, 2008). Regardless of specific estimates, only one human bone scatter has been identified so far to account for the massive population at Uruk (Algaze, 2008). This supports the argument that there must have been cemeteries, which have yet to be found by archaeologists, and that researchers have a poor understanding of human demography. The largest site in the Susiana plain, Choga Mish, only had a few burials to represent the population from the beginning to the end of the Ubaid (Hole, 1989: 151-153; 164-165). In this study, I do not engage with the issue of cause of mortality, nor do I look to reconstruct household or community fertility rates. Some work has been done on this topic in Sabi Abyad, particularly with respect to identifying differentiated burial practices for those who may have died in a non-standard manner or held some special social position (Vos, 2012). Reconstructing fertility- and death-rate patterns in the Near East is something that will only take place far into the future for most regions and periods of Mesopotamia.

Considering the osteological paradox first posed by Wood et. al. (1992), I too have to make deductions based only on what I see. It has been almost a tradition to attribute the high number of sub-adult burials that we find at most sites starting in the Neolithic but steadily increasing in the Chalcolithic to high rates of mortality in that age group (Valk, 2016). This interpretation implies that the discrepancy between the number of adult and young subadult burials that we see is due to unintentional burial strategy caused by infant sickness or death at birth. I argue strongly against this premise and aim to show that, regardless of the mortality rates, sub-adults are intentionally overrepresented in the archaeological record of the houses due to the fact that they were

buried inside of houses, while adults are overrepresented extramurally in areas outside of the settlement that are always under-excavated. Having presented the limitations of the research here, I will discuss how my approach to the data can provide an insight into the meaning of Mesopotamian mortuary record from the Late Pottery Neolithic to the Early Bronze Age.

### **3.4 The Data**

I have collected data for the purpose of burial analysis from sites in northern Mesopotamia. With the exception of one site, all of them are from southeastern Turkey. The Late Pottery Neolithic site of Tell el-Kerkh in northwestern Syria had good and detailed data spanning multiple phases of occupation and allowed me to amplify my sample size and account for incompleteness in the data. This site has been extensively published and, especially in concert with Tepe Gawra, serves to inform many mortuary studies.

I have created a detailed inventory of the artifacts found in each of the graves catalogued, which enabled me to do micro-analyses of the presence, types, and distribution (see Appendix 1 for the full database). These kinds of micro-level studies focused on numbers and typologies of artifacts have been completed more recently by Selover (2015), Stork (2013), and Brereton (2016), who used both central Anatolian and Southern Mesopotamian sites for their study of artifact consumption in the mortuary context. The resulting database compiles available information into certain categories: grave number, location, burial type, and number of buried individuals, sex, age, osteological details, and other material characteristics. Table 3.3 provides a key for how I

have organized the mortuary data in the inventory and how I present it in the following sections. A blank entry in the database should reflect a lack of information from the published source. For instance, the category across all sites that is the most underrepresented is that of sex because this information is rarely published.

TABLE 3.3:  
TERMS USED IN THE DATABASE OF APPENDIX 1

<b>Category</b>	<b>Explanation of Category</b>
<b>Grave Designation</b>	This is the grave number that was assigned by the excavators. It may not always exist.
<b>Location</b>	Intramural/Extramural
<b>Style</b>	Burial type, such as a simple inhumation, cist, a tomb, etc.
<b>Number of Individuals</b>	How many individuals identified per grave.
<b>Sex</b>	M/F
<b>Age (yrs)</b>	Given age or age category if any
<b>Osteo. Findings</b>	Specific information regarding the skeletal remains
<b>Grave Furnishings</b>	Artifacts presence/absence
<b>Ceramics</b>	Vessels presence/ absence
<b>Metals</b>	Any object presence/ absence
<b>M. types</b>	If yes, what are the metal objects?
<b>Other</b>	Any other object category (ornamental, botanical, etc.) that is not a metal and not a ceramic vessel
<b>Comments</b>	Any relevant details

#### *3.4.1 Approaches To the Data and Presentation*

Before I present the data, it is necessary to make two comments. For the sake of simplicity, when possible I used the same style of tables, graphs, and figures. Data is

organized and analyzed in three categories for every period: burial types, artifacts, and demographics.

One important question is if the dead were buried inside or outside of the settlement. Intramural graves are those located inside the settlement. Extramural burials are defined as burials outside of the settlement boundary. Due to chronological particularities of the use of these terms, defining what these distinctions refer to is important for understanding how this data is organized in this work.

*Late Pottery Neolithic-* During the 7<sup>th</sup> millennium BC, individuals were buried inside, under, or around the houses. These burials are referred to as intramural (e.g., Hakemi Use). Burials that were outside of the vicinity of the settlements are referred to as extramural (e.g., Tell el-Kerkh).

*Chalcolithic-* Here, intramural burials refer to graves in, under, or around houses and other buildings that were not residential (e.g., Tell Ahmar). Extramural burials were those that were outside of the vicinity of the settlement or located in abandoned parts of the settlement—usually a mound (Tell Majnuna, a satellite of Banat, is an example).

*Early Bronze Age-* The definitions of extramural and intramural here are similar to their meaning for the Chalcolithic period. Intramural burials are those found in houses, under houses, or around houses and other non-residential features. Extramural are graves located outside of the vicinity of the settlement or in abandoned areas of the settlement. Titriş Höyük is a good example of both of those burial locations.

Burial types are an analytical unit that considers the state in which the body is interred. There are too many to list here, but they include some main forms such as pits, cists, inhumation vessels, and any constructed tombs. In this study, primary vs. secondary

burials are *not* burial types. They are some of the ways that the body is treated, and this is made clear in the analytical section of the data and in Appendix 1, in which the individual burials are listed. Burial types here refer to the style in which the dead are interred because this aligns with my macro approach to the data. For instance, if a secondary burial was in a cist tomb, I simply consider it a cist tomb. I find that splitting them into such categories is not informative for this type of data. Significantly, we do not know enough from the burial descriptions to be able to make the designation confidently. I describe this per relevance in the following sections. This is mostly important for Late Pottery Neolithic burial practices, where many styles are mixed and used in various ways. For example, a multiple burial may be a pit burial with secondary burials, primary burials, fragmentary burials, and skulls as elements.

While a secondary burial is always part of a burial type, I contrast this with inhumation burials, which could be considered a burial context instead of a burial type. In this study, inhumations are considered a burial type only if the context in which they were found was not associated with a known burial type: the body was not in a pit, not in a vessel, and not in any constructed burial structure, but were simply placed somewhere. In my use here, because of the presence of an inhumation as a burial itself (which is very often designated as a *simple* inhumation by the excavators of the sites), the inhumation itself is a burial type. However, if a pit contains an inhumation, for instance, this is recorded as a pit burial and not an inhumation.

Finally, multiple burials are not considered as a category of their own. Multiple burials occur at varying degrees throughout the periods of interest here, and I cannot say that they deserve a special designation as a burial type; however, since their presence is

of course indicative of the treatment of the dead, I have discussed and noted them when they occur. Multiple burials have necessitated the presentation of the data by *individuals* in addition to the frequency by which the grave occurs. For an instance, if one cist grave contained 10 individuals, all of those individuals are recorded as being associated with a cist grave.

As mentioned earlier, I also take a macro-scale approach to the way that I treat items found in graves. Instead of recording the frequency of artifacts across individual categories in every grave, I record the *presence* of artifacts in each grave. For example, if seven burials in a given period contained some varied number of metal weapons, I count this as seven burials containing metal weapons rather than counting the number of objects. Similarly, when considering frequency, if a single burial contained three individuals and metal weapons were present in that burial that I could not associate with any one individual in particular, I recorded that metal weapons were associated with three *individuals*. Thus, the frequency of artifacts is not considered in this study. Artifacts are always categorized in the same sub-categories in order to enable a more comprehensive discussion across the periods. In the table below, my use of artifact categories is defined (Table 3.4). Only the first five categories concern the Late Pottery Neolithic and the Ubaid since these periods did not produce burials containing metal items.

TABLE 3.4:  
TERMS USED TO GROUP ARTIFACTS INTO CATEGORIES

Category	Explanation of Category
<b>Non-Metal Ornaments</b>	Beads, pendants, dividers, idols, diadems, jewelry, hair pins/ball headed pins (non-metal)
<b>Non-Metal Tools</b>	Threading pins, grindstones, burins, awes, mirrors, chisels, spatulas, and such other non-combative items (non-metal)
<b>Ceramic Vessels</b>	Ceramic vessels (not stone, metal, bitumen, ivory, etc.)
<b>Non-Metal Stamps/Seals</b>	Stamps and seals (non-metal)
<b>Non-Metal Weapons</b>	Dagger, knives, ballista, spears, swords, and mace heads (non-metal)
<b>Unspecified Artifacts</b>	A small category of objects that do not fit into the other categories such as stone vessels and food items (non-metal)
<b>Metal Ornaments</b>	Beads, pendants, dividers, idols, plaques, discs, diadems, jewelry, hair pins/ball headed pins
<b>Metal Stamps/Seals</b>	Stamps and seals
<b>Metal Weapons</b>	Daggers, knives, spears, swords, and mace heads
<b>Metal Unspecified Artifacts</b>	A small category of metal objects that do not fit into the other categories such as staining from copper oxide in graves, ores, and slag

This analysis is structured by considering each of the sets of mortuary data in the same manner. Thus, I record and discuss 1) the number of times that each burial type occurs in each time period, 2) the number of times that each burial type is associated with each age group, 3) the number of times that an artifact category is associated with each burial type, and 4) the number of times that each artifact category is associated with each age group. I will not identify each burial category here because I present that data below. I include specific information per period and per burial type as they are discussed. For each of the three comparisons, I use a single table to make two comparisons. Thus, I employ and discuss six patterns of the mortuary data distribution: burials types per age



groups, burial types per artifact types, age group per artifact type, artifacts types per burial types, age groups per burial types, and artifact types per age group.

CHAPTER 4:  
LATE POTTERY NEOLITHIC/HALAF (6400-5400BC): THE FRAGMENTED  
ASPECTS OF MORTUARY RITUAL AND THE COSMOLOGY OF EARLY  
SETTLEMENTS

This chapter begins the examination of mortuary rituals with Late Pottery Neolithic practices. First, I aim to show what is already known from the mortuary record from previous explorations into this topic. Then, I will discuss what my findings show; and, finally, I will interpret my study of the Late Pottery Neolithic mortuary record in concert with the archaeological record in Greater Mesopotamia.

I will focus on what patterns are observed in mortuary practices and how/if they reflect Late Pottery Neolithic social trends. I will actively examine why artifacts are incorporated into some graves and not in others. Ultimately, I seek to understand how mortuary rituals speak to the institutional or social complexity within Late Pottery Neolithic settlements.

#### **4.1 Overview of the Late Pottery Neolithic Mortuary Practices**

Burial practices of the end of the 7th millennium and the Halaf overlap considerably, so it is difficult to create a distinction between local and Halafian

influences. For my purposes here, I will discuss the end of the Late Pottery Neolithic and the Early Chalcolithic as one phenomenon. The inhabitants of Upper Mesopotamia during this time were highly mobile. Settlement was based on seasonal occupation, and worked land used hoe cultivation in combination with environmental exploitation. Burial trends were highly variable and complex, and it is difficult to summarize them. Below is a brief summary of mortuary trends and a review of past literature.

By far, the most common method of burials for the LPN were inhumations for all ages but mostly adults in the form of simple shallow pits (Akermans and Schwartz, 2006; Breraton, 2013: Chp. 3). The interred was flexed in hocker (knees flexed against the chest and feet parallel to the floor as if the person was sitting) or even bound in some cases, like the inhumations at Tell Sabi Abyad (Akermans and Schwartz, 2006: 147). Adults and adolescents were excluded from vessel burials, but they were sometimes buried in bags or baskets, as was the case at Kenan Tepe (Parker et. al., 2009). Small children and infants were most often buried in vessels or pits dug into the floors of domestic structures or in their vicinity. At Yarim Tepe I/II, a defining site for the period, this practice is well represented (Hole, 1989). Adults are found mostly extramurally and were few in number intramurally.

LPN skeletal remains were very often assimilated into secondary practices that have to do with cremation, dismemberment, skull removal and stacking, and purposeful fragmentation of artifacts. Skull stacks, which had isolated skulls stacked or grouped close together, have been identified at Domuztepe, Hijara, Arpaciya, Tell Azzo I, and YarimTepe I/II (Merpert and Munchaev, 1993: 218-221; Campbell et. al., 1999). At Bouqras, skulls deformed through bandaging were found stacked in the corners of House

12 (Molleson and Campbell, 1995). At Yarim Tepe, the skulls were interred in pits in floors (Merpert and Munchaev, 1993: 218-22). At Arpaciya, sometimes skulls were interred like inhumations in pots (Hijara, 1978). These funerary displays of fragmented objects, bones, and skulls are so common that in reports archaeologists often express uncertainty about whether or not the feature is actually an intact burial, a trash deposit, a disturbed burial, or evidence of some other ritual. An example of this can be found at Tell es-Sawwan in the form of multi-roomed buildings where large numbers of disarticulated and fragmentary skeletons and similarly fragmented objects were excavated (Yokana, 1997).

Frangipane (2007) argues that there is nothing to indicate status differentiation in any burial category, though most of the data is from subadults. Grave goods consist of beads and pots, if any are found at all. Sometimes, other objects are found such as stone axes, stamp seals, and stone vessels, but they are by no means common. It is more likely that an adult will have an artifact than subadults, and that artifact is most often a ceramic vessel. Sometimes, ochre and charcoal were sprinkled on the body, which is a practice that may have ideological implications or some social differentiation based on prestige or other social roles (evidence of this kind of practice has been found at Turbe Hoyuk).

Though the picture we have of LPN burials is not rich by any stretch, it seems consistent and widespread enough that patterns can still be observed. Keeping these previous characteristics of burial practices in mind, I will first present and then compare my findings about these mortuary traditions.

## **4.2 Presenting the Data: Findings and Analysis**

The Late Pottery Neolithic and Halaf data used here for analysis come from eight sites in southeastern Turkey and Tell el-Kerkh in northwestern Syria (Table 3.1 and 4.1). These sites span from the earliest phases of the Summera/Hassuna to the second half of the 6th millennium BC 6600 - 5400BC. The choice of sites was based on 1) availability of published material, 2) quality of publication and consistency of data, and 3) previous studies completed on particular burials and sites. Almost all of the sites in the database, with the exception of Domuztepe and five of the burials at Tell Hazna and Boztepe, have never been included in academic studies related to the burial practices of this period. This has to do with the fact that burial publications are lacking and that existing data is still written in Turkish. The burials at Tell el-Kerkh represent the earlier period of the LPN burial customs, for which there are not many other sites with published data.

TABLE 4.1:  
AGE DISTRIBUTION AND BURIAL LOCATION FOR EACH LATE POTTERY  
NEOLITHIC SITE

Sites	Intramural Graves (IM)	Extramural Graves (EM)	Adult	Adolescent	Child	Infant	Unknown	TOTAL INDIVIDUALS
Gerikihaciyan	4	/	2	/	2	/	/	4
Tell Hazna	1	/	/	/	/	1	/	1
Karavelyan	1	/	/	1	/	/	/	1
Boztepe	/	4	2	1	/	/	1	4
Tulintepe	1	/	/	/	/	1	/	1
Mersin	6	/	+3	/	1	1	1	+5
Domuztepe	9	/	1	/	2	1	5	9
Tell el-Kerkh	26	30-31	14 (IM-2; EM-12)	4 (IM-1; EM-3)	10 (IM-2; EM-8)	22 (IM-21; EM-1)	6-7 (IM-0; EM-6-7)	56-57
Turbe Hoyuk	/	3	15	/	1	/	1	17
<b>TOTAL</b>	47	22	+37	6	16	26	14-15	+98-99

These Late Pottery Neolithic sites help us understand burial frequency by age at death. From a methodological standpoint, this is made possible through the good preservation of the skeleton. Surprisingly, the skeletons from the earlier periods are much better preserved compared to the earlier skeletons in the Turkish area of Mesopotamia. (Table 4.1). Secondly, the material mostly comes from regular excavations as opposed to

dam construction rescue excavations or surveys. There is some information about sex, though to a much lesser extent than age categories, due to the high instance of partial burials. I have presented that data here when possible.

It should be noted that archaeological reporting varies from site to site. At Tell el-Kerkh, for example, it was difficult to discern how multiple burials were buried. The context of where the group burial is described, but it is often unclear what exactly the burial style was and whether they were inhumated, in a pit, or in a cist. Similarly, when these burials had an artifact deposited, it was not mentioned in the reports if that artifact was associated with anyone in the group in particular. Judging from other contexts, I can assume here that for the LPN, in the case of a group burial, the artifacts should be understood as shared unless otherwise stated. Table 4.2 shows the artifacts recovered from the sites that I discuss here.

TABLE 4.2:  
ARTIFACT PRESENCE/ABSENCE (MARKED BY X) IN EACH BURIAL FROM  
EACH LATE POTTERY NEOLITHIC SITE

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non-Metal Unspecified Artifacts
<b>Tell el-Kerkh</b>	Locus 145						
<b>Tell el-Kerkh</b>	concentration 1					X	
<b>Tell el-Kerkh</b>	concentration 2	X					
<b>Tell el-Kerkh</b>	Locus 141						
<b>Tell el-Kerkh</b>	Locus 142						
<b>Tell el-Kerkh</b>	Locus 153				X		
<b>Tell el-Kerkh</b>	Locus 155						
<b>Tell el-Kerkh</b>	Locus 166						
<b>Tell el-Kerkh</b>	Locus 44						
<b>Tell el-Kerkh</b>	Locus 45						
<b>Tell el-Kerkh</b>	Locus 48						
<b>Tell el-Kerkh</b>	Locus 76						
<b>Tell el-Kerkh</b>	Str. 712	X			X		
<b>Tell el-Kerkh</b>	Str. 715	X			X		X
<b>Tell el-Kerkh</b>	Str. 725						
<b>Tell el-Kerkh</b>	Str. 726						
<b>Tell el-Kerkh</b>	Str. 729-1			X	X		
<b>Tell el-Kerkh</b>	Str. 729-2						



TABLE 4.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non-Metal Unspecified Artifacts
Tell el-Kerkh	Str. 729-3						
Tell el-Kerkh	Str. 732						X
Tell el-Kerkh	Str. 739	X					
Tell el-Kerkh	Str. 746						
Tell el-Kerkh	Str. 748						
Tell el-Kerkh	Str. 751	X		X			
Tell el-Kerkh	Str. 757		X				
Tell el-Kerkh	?						
Tell el-Kerkh	?						
Tell el-Kerkh	?						
Tell el-Kerkh	?						
Tell el-Kerkh	Locus 19						
Tell el-Kerkh	Locus 22-1					X	
Tell el-Kerkh	Locus 22-2						
Tell el-Kerkh	Locus 223						
Tell el-Kerkh	Locus 226						
Tell el-Kerkh	Locus 23					X	
Tell el-Kerkh	Locus 246						
Tell el-Kerkh	Locus 29						
Tell el-Kerkh	Locus 331					X	
Tell el-Kerkh	Locus 35						
Tell el-Kerkh	Locus 60						
Gericihayan	1						
Gericihayan	2						
Gericihayan	3						
Gericihayan	4						
TurbeHoyuk	M1					X	

TABLE 4.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non-Metal Unspecified Artifacts
<b>TurbeHoyuk</b>	M2					X	
<b>TurbeHoyuk</b>	M3						
<b>Tell Hazna</b>	?	X				X	X
<b>Karavelyan</b>	M-52					X	
<b>Boztepe</b>	1					X	
<b>Boztepe</b>	2			X		X	
<b>Boztepe</b>	3					X	
<b>Boztepe</b>	4					X	
<b>Domuztepe</b>	?						
<b>Domuztepe</b>	F1465						
<b>Domuztepe</b>	?						
<b>Domuztepe</b>	?						
<b>Domuztepe</b>	?					X	X
<b>Domuztepe</b>	?						
<b>Domuztepe</b>	?						
<b>Domuztepe</b>	F942						
<b>Domuztepe</b>	F868						
<b>Tulintepe</b>	1						
<b>Mersin</b>	XVII-1						
<b>Mersin</b>	XVII-2						
<b>Mersin</b>	XVIII						
<b>Mersin</b>	XIX-1						
<b>Mersin</b>	XIX-2						
<b>Mersin</b>	XIX-3					X	
<b>TOTAL:</b>	69	6	0	3	4	14	4

#### *4.2.1 Extramural and Intramural Burials*

Out of the 69 burials counted in this study, 47 are intramural and 22 are extramural (see Table 4.1). Extramural data is especially valuable because these types of interments are rare for the LPN. This discrepancy must be attributed to the fact that archaeologists who work in the Near East rarely excavate outside of settlements. Most extramural burials are either accidental finds or part of a more recent effort from scholars to broaden their understanding of the immediate settlement landscape (Bernbeck et. al., 2013). The biggest sample from extramural areas, which consists of 15 graves, comes from Tell el-Kerkh.

Based on excavated extramural burials from Syria and Turkey, it appears that subadults were buried in intramural locations and that adults were generally buried in cemeteries. Table 4.3, which was created by Kudas et. al. (2018: 19), describes the following sites in a way that allows us to compare and the age distribution of intramural burials (Tables 4.3). The only extramural burials we have are located at Tell Ain el-Kerkh (included here), where out of 240 individuals, 59 are studied. The results show that 33 are adult males (55.9%). In comparison, Tell Sabi Abyad featured 45 individuals who were almost all adults (Kudas et. al., 2018:19).

TABLE 4.3:  
LATE POTTERY NEOLITHIC INTRAMURAL GRAVES AND AGE  
DISTRIBUTION OF INDIVIDUALS

<b>Sites</b>	<b>Subadults</b>	<b>Adults</b>	<b><i>Totals:</i></b>
<b>Tell Sotto</b>	6	?	9
<b>YarimTepe I</b>	4	2	9
<b>Tell Hazna</b>	1	0	1
<b>Tell es-Sawwan</b>	56	21	77
<b>Hakemi Use</b>	55	?	95
<b>Salat Cami Yani</b>	11	0	11
<b>Tell Sabi Abyad</b>	24	8	32

Aside from the cemetery at Tell el-Kerkh, we lack data on extramural cases that could be compared with the intramural sites in Table 4.3. Given the large sample size of individuals in both contexts, however, it is fair to hypothesize that a relationship exists between age and burial location. It is probable that during the 7th/6th Millennium BC, burial practices corresponded with social structures that divided and attributed different qualities to certain age groups. This brings up the question of when a person transitions from infant to child and child to adult, which are both clearly important distinctions. Sex is inevitably related to this issue, as it loosely stands that more adult males were buried in extramural cemeteries and adult females were buried with children intramurally

(Akkermans and Schwartz, 2003; Erdal, 2013). For example, it seems that children who are younger than five or six years of age are often buried extramurally, but very young children are found intramurally, which suggests that there is a connection between age and when a person gained a social gender, until which point an offspring is associated with and/or regarded as holding the same social status as its mother (Erdal, personal communication). This type of social association can be observed in many Near Eastern villages today. This interpretation must be considered tentatively at this point simply because not all sites seem to follow this pattern, not to mention the low number of sexed individuals in Northern Mesopotamia and our lack of insight about LPN social roles.

#### *4.2.2 Burial Types*

Based on the data I have collected, I begin with a study of mortuary practices in terms of style and associated internments (Table 4.4). The Late Pottery Neolithic features a variety of burial types, which I present and analyze in the framing of grave types and the artifacts that they contained as well as grave types and the individuals from different age groups that they contained. The following two questions and associated graves will structure the discussion of burial types:

TABLE 4.4:  
LATE POTTERY NEOLITHIC BURIAL TYPES AND THEIR DISTRIBITON AT  
EACH SITE

Sites	Single Burial Graves	Multiple Burial Graves	Unknown Burial Graves	Cremation Of Any Burial Type	Pit	Simple/ Non Defined Inhumation	Vessel	Skull/ Fragment/ secondary	Cist	Mix of 2 or More Types
<b>Gerikihaciyen</b>	4	/				3		1		
<b>Tell Hazna</b>	1	/					1			
<b>Karavelyan</b>	1	/			1					
<b>Boztepe</b>	4	/			4					
<b>Tulintepe</b>	1	/				1				
<b>Mersin</b>	5	1		2	2	1		1		
<b>Domuztepe</b>	6	1	2		3	2		4		
<b>Tell el-Kerkh</b>	35	5		2	10	22	2	3		1
<b>Turbe Hoyuk</b>	1	2							3	
<b>TOTALS:</b>	58	9	2	4	20	29	3	9	3	1

1) What is the pattern of distribution of burial style based on age (Table 4.5)? The table shows how individuals in each age group are distributed by burial type. This table will be integrated into the following discussions on age groups with respect to burial type and burial type with respect to age groups.

TABLE 4.5:  
THE DISTRIBUTION OF INDIVIDUALS IN AGE CATEGORIES BASED ON LATE  
POTTERY NEOLITHIC BURIAL STYLES

Age Category	Cremation In Any Burial Form	Pit	Simple/ Unspecified Inhumations	Vessels	Skull/ Fragmentary/ Secondary	Cist
Adult	1	7	10		4	15
Infant	1	2	21	2		
Adolescent		1	1		3	
Child	2	7	3	1	3	1
Unknown	+	4	6-7		9	1
<b>TOTAL:</b>	<i>+4</i>	<i>21</i>	<i>41-42</i>	<i>3</i>	<i>19</i>	<i>17</i>

2) What is the pattern of distribution of burial style based on artifacts (Table 4.6)?

The following table shows the number of times that an artifact type is present in each grave type. This table will be used in the discussion of artifact types and their associations with grave types and grave types' association with graves.

TABLE 4.6:

LATE POTTERY NEOLITHIC ARTIFACT TYPE PRESENCE PER BURIAL TYPE

Burial Type	# of Burials	Non-Metal Beads	Non-Metal Tools	Non-Metal Stamps	Non-Metal Weapons	Ceramic Vessels	Non-Metallic Unspecified Artifacts
<b>Cremation</b>	4					2	
<b>Inhumation</b>	32	3	2			3	1
<b>Pit</b>	20	2	2	3	1	5	1
<b>Cist</b>	3					2	
<b>Secondary/ Frag./ skull</b>	6					1	1
<b>Vessel</b>	3	1				1	
<b>Mix</b>	1						
<b>TOTAL:</b>	6	6	4	3	1	14	3

presence of artifact types recovered from each burial type.

In this study, the artifact count refers to the presence of a category such as non-metal beads. Thus, if a pit contained five individuals with whom thousands of non-metal beads were buried, the case is recorded as one pit with one presence of beads. (Fig. 4.1). Moreover, individual burials are recorded by category in order to illustrate the age at death in association with grave types (Table 4.4). The five individuals with which the beads were found will be recorded as being associated with beads. This study does



account for the amount of an artifact in a grave type or associated with an age group. Thus, I do not count the number of artifacts in burials. Sometimes, some of these graves' burial style was designated as "multiple burial," which often featured a mix of styles. Thus, I had to designate such burials as a "mix" category. Table 4.7 shows the distribution of these multiple, single, and unknown burials amongst the different burial styles.

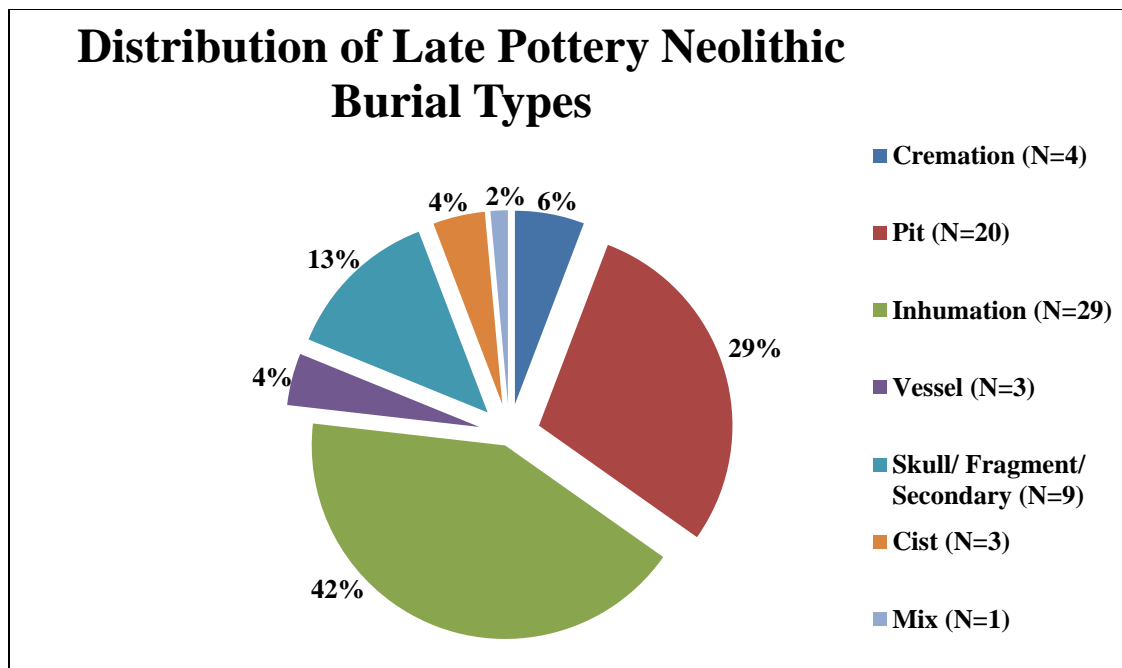


Fig. 4.1: Distribution of Late Pottery Neolithic burial types.

TABLE 4.7:  
PATTERN OF MULTIPLE VS. INDIVIDUAL GRACES IN ALL BURIAL TYPES

Burial Type	Multiple Burial	Single Burial	Unknown
Cremation Of Any Burial Type	1	3	/
Pit	/	19	1
Simple/ Non-Defined Inhumation	4	28	/
Vessel	/	3	/
Skull/Fragment/ Secondary	1	4	1
Cist	2	1	/
Mix of 2 or More Types	1	/	/

#### 4.2.2.1 Pit Burials and Inhumations

Archaeologists often record burial contexts in different ways. It is not always clear, for example, what the difference is between a pit inhumation and an inhumation. In this study, I follow the designations and have structured my data according to the categories used by excavators. Pit burials were simple graves made out of relatively deep and narrow cuts in the ground. Inhumations burials without the "pit" designation are probably more shallow deposits or simple inhumations that are found lying next to a feature, such as an oven. They are usually found on the floors of houses, around houses, or between the spaces of houses. Sometimes individuals were placed in a contracted

position, which would suggest that they were bound when they were buried (Verhoeven, 2000). Some burials have evidence of weaving imprints on the floor or the sides, possibly as the result of a matt or a bag in which the dead was placed on or in. In this sample, some of the pit inhumations were cremations and are now counted as cremation burials.

My sample included pit burials from Girikihacyan, Tulintepe, Tell el-Kerkh, Boztepe, Karavelyan, and Mersin (see Appendix 1). The most interesting instances are the burials around the so-called "Death Pit" (5550-5530BC) at Domuztepe (Campbell and Healey, 2011; Kansa et. al. 2009). They are a part of a series of secondary/partial burials and inhumations around the perimeter of the mass deposition of artifacts and fragmented human and animal remains, from which at least 40 human individuals were recovered. The Death Pit is a very complicated feature that archaeologists have interpreted as a place where a mass sacrifice, consumption (of artifacts, animals, humans, and plants), and a myriad of activities that created a social memory of the dramatic event likely occurred upon the creation of this feature. Thus, the burials of interest here that are next to but external to this feature should be seen as part of the structuring event that created this archaeological context.

In pit burials, every age group is included among those interred. The sample size is small, but the trend is similar to what is expected. Generally speaking, adults are present but generally unrepresented in LPN contexts. It is worth mentioning that the whole range of who is buried in these primary inhumations is still not fully understood because so many burials are secondary, partial, or only represented by skulls. Thus, they are sometimes situated in a context that is not just the inhumation itself and possess an additional association with other mortuary rituals.

Grave goods during the Late Pottery Neolithic period are scarce. While the full range of material culture is more or less represented in the inhumation pits, the number of artifacts usually ranges from one to two items at the most (Table 4.6). It is difficult to gauge the relationship between the burial type and artifact deposition because these inhumations are variable and overlap with other burial categories. For example, an inhumation in a pit can be a cremation, a partial burial, or a multiple burial. In this example, an artifact should be seen as belonging to everyone within a grave unit.

#### 4.2.2.2 Fragmentary, Secondary, Skulls, Cremations, and Multiple Burials



Fig. 4.2: Skull burial at Domuztepe. Modified from Carter et. al., 2003: 127, Fig. 13.

Late Pottery Neolithic burials are not easy to recognize because many times they are clearly entangled in more social ideologies than simply those of the mortuary realm, as will be discussed later in the chapter. The entanglement of many of the burial categories is a testament to this situation. Thus, for my purposes, I did not emphasize the

actual grave "container" but rather focused on the presence of these funerary nuances (cremation, fragmentation, inhumation, etc.).

Skull burials have been well attested to throughout the Near East since the pre-Pottery Neolithic periods, with examples from sites like Catalhoyuk, Ain Ghazal, and Pinarbasi (Baird et al. 2013; Heddow et. al., 2017; Kuijt 2000, 2001, 2008)). In this sample, three cist burials from Turbe Hoyuk add to the skull stacking tradition. They represent one or two primary inhumations in addition to six or seven more adult skulls. The use of ochre is also noted for the two designated as M1 and M2 (See Turbe Hoyuk in Appendix 1), further emphasizing the comingling of various rituals attested to in the region.

Skull burials are also found as "deposits," often implying their association or proximity to some other burial or feature (Campbell and Healey, 2011; Kansa et. al. 2009). This is illustrated at Domuztepe with a couple of inhumations, skull burials and other fragmentary deposits around the Death Pit. Deposits could also take the form of fragmented or incomplete remains and/or secondary burials (Fig.4.2).

Multiple burials can take the form of any of these more complex grave complexes and can include a few burial styles at once, for example inhumation, skull, and secondary burials. Multiple burials are seen at Tell el-Kerkh, Mersin, Domuztepe, and Girikihaciyan. These internments are quite common if we consider the fact that of the 69 burials, 9 are multiple and approximately 41 individuals are buried in such burials (Table 4.8). It seems that adults or older individuals were more likely to be interred in multiple burials than children and infants. In fact, from the compiled data at the Anatolian sites, out of the 37 burials with adults, only 24 were buried as single internments. It is also

interesting to note that adults were usually buried in a combination of inhumations with skulls at LPN sites; in all cases here, one or more skulls were placed with one more inhumations.

TABLE 4.8:  
DISTRIBUTION OF INDIVIDUALS BY AGE GROUP IN CATEGORIES OF  
MULTUPLE BURIALS

Age Category	Skulls	Cremations	Inhumations
<b>Adult</b>	16	2	5
<b>Adolescent</b>	3		
<b>Infant</b>			5
<b>Child</b>	3		
<b>Unknown</b>			7
<b>Totals</b>	32	0	12

Cremations are also a complicated category. They occur in multiple burials at Mersin, for example, but also in many other burials. I would venture to connect this practice with the popular and deliberate practice of fragmentation and dismemberment of the human body, which was then set on fire. For this purpose, I find this category to be closely related to the fragmentary and skull burials. This is seen at Domuztepe in the Death Pit and also in the graves along the parameter and at the sites of Tell el- Kerkh and Mersin.

Artifacts in the form of beads or a vessel are also included in cases where there are multiple burials, but only if there is adult inhumation. Thus, fragmentary or secondary

burials that tend to belong to younger individuals had no associated artifacts. In fact, the only exception occurs at Domuztepe, where a bowl and a pig's skull are interred next to a subadult body.

#### 4.2.2.3 Vessel Burials

From the sample that I gathered, only three burials were in vessels. I counted only the inhumations or fragmentary burials in this category, since, as I mentioned earlier, cremated remains are discussed separately below. Two of the vessel burials are from Tell el-Kerkh, and one is from Tell Hazna. The low number of vessel burials is somewhat surprising given the fact that they are found quite often at sites in Iraq and Syria as well as Tell Sotto, Arpaciya, and Yarim I (Hijara, 1978; Merpart et. al., 1976: 79; Munchaev and Murpart, 1981: 273-274). At many of these sites, burial vessels served to accommodate the ritual of skull burials, with a notable exception at Yarim Tepe I, where vessels were used to hold inhumations of mostly children (Merpart and Munchaev, 1976: 79; Munchaev and Murpart, 1981: 273-274). The three burials from this sample also contained one young child and two infants (Table 4.3).

#### 4.2.2.4 Cist Burials



Fig. 4.3: M1 & M2 cist burials at Turbe Hoyuk. (Sağlamtimur, 2012: 404 , Res.3)

At Turbe Hoyuk, three cist burials are reported. I have not come across this particular burial type at other sites. I think that they have them at Tell el-Kerkh as well. These cists were not dug into the ground, as is customary for such graves, but instead consist of a demarcated space formed by embedded stone slabs in the ground, with human remains placed into the resulting compartment (Fig. 4.3). It is unclear if they were originally covered with another slab because all three burials were highly disturbed. Altogether, the Turbe Hoyuk graves contain the remains of 17 individuals interred as a skull burial and inhumation (Fig. 4.4). With the exception of one individual with unknown age and one child, all of the other individuals from the cists were adults. Out of the adults, 4 skulls belong to males and three to females (Kodas et. al., 2018). It seems that the burials described strongly prefer adults over subadults.



From the three graves, only two artifacts were recovered. A vase of Hassuna style was found in M1, and a bowl also typical of Hassuna was found in M2. These vessels were not associated with anyone in particular but were instead found within the cist burial's open space. This is consistent with the discussion above and the observation that these type of burials with partial and multiple internments do not have many artifacts.

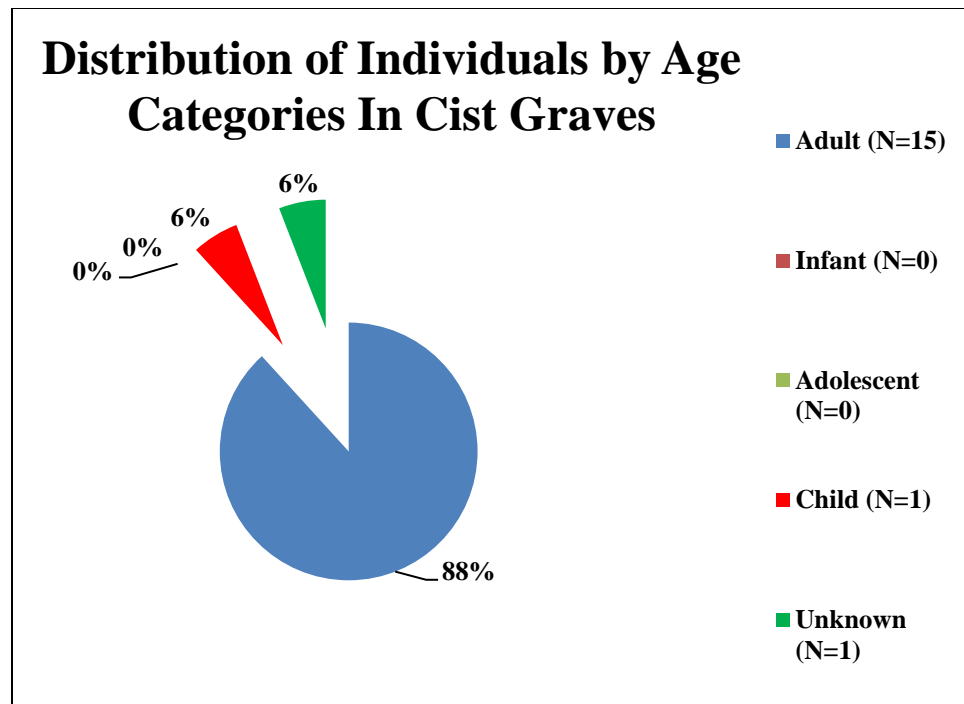


Fig. 4.4. Graph shows the number of individuals from each age category that were buried in the three cist graves at Turbe Hoyuk (Kodas et. al., 2018).

#### 4.2.3 *Artifacts*

In the following section, I examine the type and the distribution of artifacts amongst the burial data represented in this sample. I use the following questions and tables in order to guide this analysis, framing my analysis of artifacts in graves from the perspective of their association with burial styles and their association with different age groups:

1) What is/is there a pattern of distribution of artifacts based on burial style? Refer to Table 4.6 above and the discussion about burial styles in relation to artifacts in the previous section.

2) What is/is there a pattern of distribution of artifacts based on age group categories (Table 4.9)? The table below shows the number of times that an artifact type occurs with each individual by age category.

TABLE 4.9:  
LATE POTTERY NEOLITHIC ARTIFACT TYPE PRESENCE PER-INDIVIDUALS  
IN EACH AGE CATEGORY

Age Category	Total # of Individuals	Non-Metal Beads	Non-Metal Tools	Non-Metal Stamps	Non-Metal Weapons	Ceramic Vessel	Unspecified Non-Metallic Artifacts
<b>Adult</b>	37	3	3	2		20	2
<b>Infant</b>	26	2			1	4	1
<b>Child</b>	17	1	1	1		2	1
<b>Adolescent</b>	5					1	
<b>Unknown</b>	14					3	

Presence of artifact types recovered from burials of individuals in each age category.

I have not counted the number of artifacts per burial, but rather the number of times an artifact type occurs per burial. For example, if a grave contained 1000 ceramic vessels, I count ceramic vessels as found in 1 grave (1 presence), not the number (1000) of these artifacts. This approach allows me to understand artifact deposition on a macro scale.

As seen in Table 4.9, most vessels were found deposited with some but not all age groups. Beads did not occur as necklaces, but as isolated beads like at Tell el-Kerkh, where unique beads from different stones were often found. Tools were mostly in the forms of lithic blades from flint and obsidian as well as a bone awl in a single grave at

Tell el-Kerkh. A single grave at the Tell el-Kerkh cemetery also contained an Amuq flint point, which was most certainly a weapon. The "unspecified" category in Table 4.8 included faunal and botanical remains, but most often stone vessels, which seemed to make an appearance during this period and continued to feature in burial inventories into the Chalcolithic.

Lastly, stamps and seals are also an important category of finds to acknowledge. These objects were made from stone and sometimes clay and were associated with the trends of the new lifeways associated with a more settled lifestyle. At sites like Arpaciya and Tell Sabi Abyad, where these artifacts were bountiful, archaeologists have begun to view them as reflecting new forms of property and ownership (Atakuman, 2013; Denham, 2013; Duistermaat, 2016). Aside from this application, the stamps and seals can also be seen as decorative or ornamental artifacts because they were usually worn or carried with the owner. In this sense, it is not entirely wrong to think of these artifacts as bearing some distinctive status.

As expected, adults were buried with the most artifacts. In a total of 37 adults, 30 of them have artifacts, whereas less than half of the represented individuals from the other categories have any (Table 4.8). In general, adult graves have more artifacts than burials of other age groups. The artifact types are distributed similarly amongst the age groups, with ceramic vessels being the most frequently occurring artifact.

#### 4.2.4 *Demographics*

In the following section, I examine the individuals that make up the LPN sample.

I aim to answer the following questions:

1) What is/is there a pattern of distribution of age based on burial style (Table 4.4)? See the table above in the discussion of burial style for individuals in each age group.

2) What is/is there a pattern of distribution of age group based on artifacts (Table 4.8)? See the table above in the discussion of artifact type distribution per individual in each age group.

This study included 99 individuals (Figure 4.5). Fourteen individuals could not be categorized by age. Of the sample of 99 individuals, 20 individuals were sexed (8 female and 12 male). Based on what is known from the LPN populations in northern Mesopotamia, sex did not play a major role in deciding where one was buried, with one exception that will be discussed below in the discussion (Tsuneki, 2011). The sample here also does not give the impression that there is an over-representation of one group over the other.

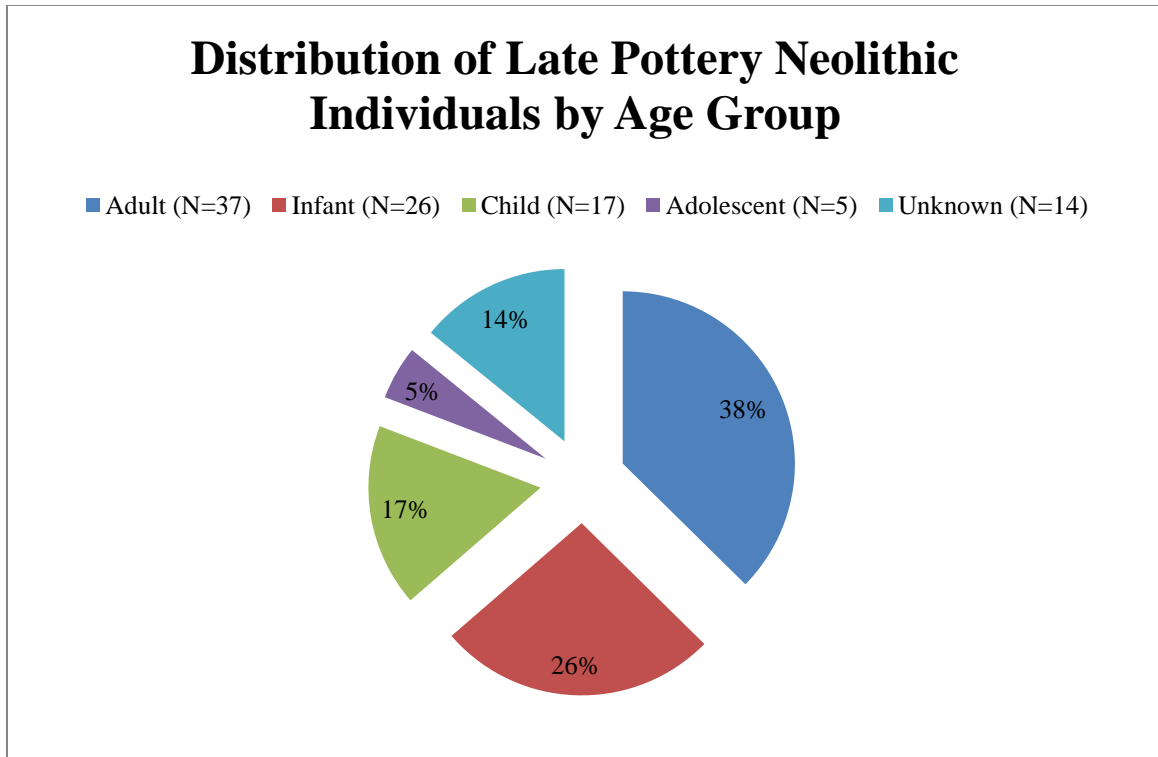


Fig. 4.5: Demographic representation of individuals from the LPN sites in this study.

As already mentioned in Table 4.1, adults are the most numerous age group represented by this sample. Adults are found in every grave context except for vessel burials, but there are only 3 such burials in total. Given that 9 out of the +37 adult burials are intramural per my findings, my sample follows previously established patterns of cemetery locations vs. intramural internments in relation to age at death and burial location (see section 4.2.1 above): adult burials are more likely to be extramural. My analysis also suggests that adults are more likely to be found in group burials, fragmentary, secondary, or skull stacks. The data collected here also shows a strong preference for infant inhumations compared to any other age group. With the exception

of infant burials, the data should be viewed as non-discriminatory towards other age categories.

With respect to artifacts, it is clear that ceramic vessels are the most numerous artifact buried amongst any age group (Fig. 4.6). Infants have the least number of artifacts in their graves, and these are generally limited to ornaments and ceramics. As is expected, infants did not have any stamps, whereas a child over the age of 5-6 at Tell el-Kerkh did have one. This observation may imply that a person of that age already had some social capital or the ability to have possessions since stamp seals are connected with the concept of ownership (Denham, 2013; Duistermaat, 2010). In terms of both burial type and burial inventory, the older a child is, the more likely their burial site is to resemble the trends of adult burials (see Table 4.4 and 4.8). An interesting observation in this data is that there is a lack of adolescents (only five are accounted for here). This pattern may have more to do with the way that they were categorized as "adult" or "child" than a lower death rate or differentiated burial customs.

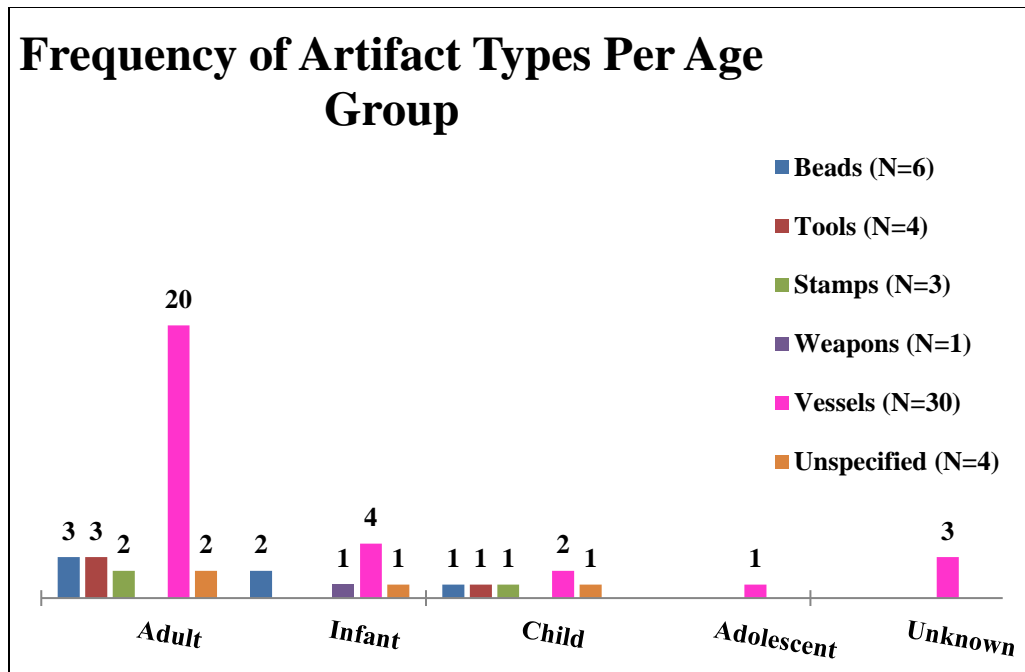


Fig. 4.6: Frequency of artifact types in association with each age group (sites, or groups of sites).

### 4.3 Discussion of Late Pottery Neolithic Burial Practices

Having presented and described my dataset, I will now move onto the analytical portion of this discussion. Here, I will refer to both my data and findings from Upper Mesopotamia in the interpretation of the variety of mortuary rituals and how they reflect their social context.

I have structured this discussion to include Late Pottery Neolithic and Halaf traditions for the sake of maintaining consistency with the data presentation. Mortuary traditions conflated many beliefs and aspects of belief. One testament to this is the varied ways in which individuals could be buried, be it an internment container or how the



human was buried. More important here is the treatment of the human body in a fashion similar to other artifacts and bones in the Neolithic (Breraton, 2013; Kansa et. al., 2009; Merpert and Munchaev, 1987). Synthesis of burial techniques in both the Hassuna Samarra and the Halaf do not show a major break in practices from the 7th to the 6th millennium BC. The variety of ways to treat the dead, the lack of adults (especially in the settlements), and the prolific number of subadults in the settlements were persistent trends (for a review of the Hassuna Samarra, see Hole's chapter in *Upon This Foundation: The Ubaid Reconsidered* (1989) and Oat's (1978) interpretation of how the burial record connects to other social practices during the 6th millennium BC). Halafian burial trends have been extensively discussed by Akkermans (1989 and 1993), Breniquet (1996), and Merpert and Munchaev as part of the Soviet explorations of Mesopotamia that took place during the 70's (1969; 1973; 1993; 1999).

In all of these publications, it is possible to discern the nature of how the human body was treated during the LPN. While some burials (like the majority of subadults in this sample) were intact, many of the remains were used for other customs that may or may not have been linked to the burying of the dead. The discussion of the Death Pit above is one such example. In the following section, I will review some of the sites with these kinds examples and discuss them in light of my findings. Next, I will consider why artifacts were buried and how they structured the mortuary ritual of LPN societies.

#### 4.3.1 *Fragmentation, Decapitation, Burning, and Dismembering*

An important observation that I feel the need to emphasize here is that during excavations of the late 7th and early 6th millennium BC-levels at various sites, it is often difficult to understand if something is a burial, an accidental feature, a secondary burial, a disturbed burial, or a combination of everything. This is made even more difficult when we factor in that the burials were often recovered from midden or rubbish contexts because human remains were intermingled with many other material remains. This situation is not only true for northern Mesopotamia but also the Near East and the Balkans during the Neolithic (Bacvarov and Gorzych, 2018; Chapman, 2000; Merpert and Munchaev, 1993; Kansa et. al., 2009).

A quick review of the archaeological record shows various instances where this practice of fragmentation and deposition occurs. At Yarim Tepe II, Merpert and Munchaev (1993: 144-145) describe "deposits" that consist of piles of purposefully- and no doubt ritually broken objects like vessels, animal bones, and ornaments that are intermixed with ash and charcoal. Of significant note here is an anthropomorphic vessel that was purposefully fragmented and burned along with an alabaster cup and a stamp seal. Right next to these artifacts were human remains, which were handled the same way as the artifact, save for the absence of an anthropomorphic vessel. At Tell es-Sawwan, the early burials include hundreds of alabaster vessels, figurines, mace heads, and ornamental items (al-A'dami, 1968:60; El-Wailly and Abu es-Soof, 1965: 22). The human remains were often disarticulated here with only skulls present or skulls missing and, again, appear to just be a part of the chaotic mix in these burials.

The burials at Domuztepe can be conceptualized as part of the fragmenting rituals as we consider their definite connection to the Death Pit. The pit was located next to the so-called "Red Terrace," which was given its name due to the red soil brought onto the scene. The Death Pit was part of a triad of features, which include the Burnt Structure and the Ditch. There, humans and animals were killed, processed, cooked, eaten, and thrown haphazardly into a pit with the typical material culture of ceramic vessels, ornaments, many stamp seals, ash, and charcoal. This massive structure remained exposed, displaying the mixture of bodies and artifacts, which portrayed some message to the community members of Domuztepe (Campbell et. al., 1999). In the data presented here, the material external to the Death Pit burials added to this image, with the partial skulls, cremations, and deposits playing into the symbolic innuendo of this undoubtedly unforgettable social memory—created, as Croucher and Campbell (2009; 10) argue, in a way that called upon most of the senses.

In this same vein, the other burials that I have discussed here from Turbe Hoyuk, Mersin, and Tell el-Kerkh can best be understood in the tradition of fragmentation, dismemberment, burning, and decapitation. But, what tradition was this? What did it do, or what was it for? One thing is clear here: the concept of the individual that had died disappeared when such treatment was preformed, be it because the destruction of the body was almost always significant or because it was integrated into a complex set of other rituals that were not performed *for* the dead. Either way, the focus in these burial contexts was clearly not only *on* the deceased. It is important to emphasize that the dead of the LPN were often used in rituals that were not about them as individuals.

Thus, I argue here that one way we have to look at Neolithic burial practices of Northern Mesopotamia involves accepting a lack of individuality and singular identity (i.e. the role that a person sees themselves in, both individually and within a community) in graves. As we have seen, graves from this period cannot simply be considered a monument to the deceased. Further, we have seen that these practices are embedded into a myriad of rituals that also happen to involve the human body, which did not hold the same meaning in the LPN:-

This brings about an important discussion of the concept of self in the Neolithic. As people from a modern society in the western world, it is often difficult to imagine the non-existence of a "self," or more precisely an individual, in any case, but especially at death. Our experience focuses on individual wellbeing, individual growth, independence, and so on. The independent experience of the individual is a modern concept (Butler, 1993; Bloch 1988: 16). It is more likely that for the people of the Near East, the communal experience dominated over the individual narrative, and independence was something defined by a collective sense of success and achievement (Croucher and Campell, 2009; Kuijt, 2008; Kuijt et. al., 2011). Strathern (1988) discusses the concept of the "dividual" instead of the individual based on research of personhood in Melanesia. She argues that society relationships and social negotiations create gendered aspects of personhood. The identity of an individual is not so much a factor as the bodies and parts that make up the "dividual." Animals, objects, and other humans create the multifaceted experience of a body, which in of itself is a communal object. This analogy is reminiscent of the fragmentation, burning, and disarticulating practices of the LPN people, which essentially removed individuality from the body.

By treating the body in such a way, the concept of gender is challenged because gender is difficult to define without the individual. Again, I would like to draw attention to the fact that both female- and male-sexed individuals are found in the burial forms discussed here. How gender in the Neolithic affected decisions about how a burial was performed is not clear archaeologically. Robb and Harris (2017) argue that during the Neolithic, gender was very fluid and that while people performed gendered roles, they were not necessarily considered to be a certain gender in all situations. As such, the body at death could be used to perform many functions of ritual without having an identity or gender attached to it. Simply put, the body could be molded into whatever act and role its society needed, whether in life or at death.

I would suggest based on the evidence at hand that in the Late Pottery Neolithic, people viewed the human body in a way that is similar to how Strathern frames it: as essentially an object that had properties, not unlike a ceramic vessel. At Tell el-Kerkh, a few of the contexts in which burials were found were in "ritual pits"—negative features in which objects and animal bones were indistinguishable from human bone. At Kurban Hoyuk, too, fragmentary burials show the interchangeable use of vessels or bones, which were used in much the same manner. At Yarim Tepe, it is interesting to note that sometimes anthropomorphic vessels and figurines are dismembered and fragmented in much the same way that human bodies are. Merpert and Munchaev (1987: pl. VII) describe the female vessel in the form of a figurine smashed and structurally deposited with ash, charcoal, and other artifacts.

I would go as far as to suggest that anthropomorphic objects could replace and do whatever the human body was meant to do in these contexts. Works by Nakamura and

Meskel (2009) and Verhoeven (2007) support this notion through their engagement with Near Eastern detachable figurines, which were constructed with the idea that heads, especially, could be removed, replaced, and interchanged. These figurines have long been understood to be substitutes in that they performed a function in rituals that a live human figure would have filled (Kuijt and Chesson, 2004; 2007). Vessels themselves could be understood as the human body. Painted ceramic forms were widespread throughout the region and surely imitated previously-used reed-grass decorative motifs (Campbell, 2012). Further, some of the designs that we see are identical to human body painting and tattooing, as evidenced by figurines and anthropomorphic vessels (Campbell, 2008: 65-68). In a sense, through burial practices we are able to see that, for the people of the Neolithic, human roles could be performed by other humans, vessels, figurines, and animals.

From this discussion, burials can be interpreted as part of a widespread belief and understanding of ritual that involves a larger sphere of society. Even though standard burials are found as we would expect them, the fact that we know the human body can play and stand for different elements in a given ritual alerts us to the possibility that a burial was organized by the living. At this time, we do not have enough information to understand how and why some burials were selected to play into the dismemberment and fragmentary rituals discussed here. I do not think that the issue lies in the lack of evidence; rather, it is a matter of not having access to the cosmo-mythological realm of the Neolithic people, which could be interpreted as a religion. If there was something particular to the individuals selected, this cannot be found in the archaeological record.

Breniquet (1996: 104-106) argues that while the pits and vessel burials are what we should consider typical, the secondary burials with dismemberment and burning are "deviant" and represent a special treatment reserved for members of society with a higher social standing. In my view, such a distinguishing characteristic did not exist. I would venture to say that bones of the dead were accessible as needed because when they were interred, they were integrated into a deeper communal context. This is because at death and in life, bodies occupied different ideological places. Thus, the role of the body at death was different than that which it served in life. As I have discussed here, there is strong evidence to suggest that at death the human body could act like any other object if needed. The high rate of secondary burials that we see during this period is consistent with this interpretation. Breraton (2016: 195-196) cites 26% of subadults and 38% of adults for the Samarra Hassuna and a similar pattern in the Halaf, with 32% of subadults and 37% of adults who were given in secondary burials across Greater Mesopotamia. This would suggest that graves were disturbed and appropriated without much discrimination quite often in various contexts. Again, this would imply that an individual's life did not necessarily influence how their body was handled after their life was over. Simply put, whatever portion from the original number that existed, over 50% of the buried simply could not all be special or of higher status, as Breniquet (1990) has suggested.

In sum, I have argued here that human bodies were most likely not sentimentally attached to an individual or a certain identity that was held in life. Thus, it is very likely that the body became a material that was communally shared and distributed at death. It was not seen to be very different from a vessel or a figurine that could easily have served

the same role. In this way, many of the LPN burials in the sample that I presented here and most other LPN sites should be viewed not as human graves but as human remains subsumed into another ritual. This is not to say that I believe there was a clear line between life and death for the people of the Neolithic. Nevertheless, judging by the repetitive and bountiful archaeological record of the diverse systems in which the human body was literally borrowed, I can argue that LPN members of society were not always just put in a grave.

If bodies and the identity of those who possessed them were not attached to a concept of the individual, then the dead of the LPN were integrated into a communal narrative (Kuijt, 2017; Van Huyssteen, 2015). This narrative probably played into complex social rituals that had more than one intention and became spaces of remembrance for future generations. If this was the case and the buried were not remembered as individuals (though they might have been remembered as members of society), how should we interpret the artifacts that they were buried with? Are they for the dead?

#### *4.3.2 Why Are Artifacts Interred?*

Why were artifacts included with the dead, and what did they mean? More specifically, are they a reflection of who the people were in life, or do they speak of the social role that they had? Parker Pearson (1999) argues that mortuary rites and deposited material culture were perhaps more representative of those that were doing the burying rather than the persons that were being buried. In the Late Pottery Neolithic of Northern Mesopotamia, it seems like both possibilities were at play.



Brereton (2016: 200) argues that instead of creating a platform for status display, the deposition of material culture in burials is related to a morally legitimate system of short-term acquisition behavior that served as a means to create long-term cycles of social reproduction. In this sense, Brereton sees competitive behavior as dangerous to a system in which *group* identity and collective social order are valuable. The problem I find with this interpretation is that the idea that collective social order and identity were a priority in the LPN is a priori assumption. I agree with Brereton that the consumption of material culture in these early burials was probably not an overt attempt to remove wealth from circulation in order to legitimize status and create inequality based on difference. However, I do not think that the material is deposited to create social capital for the sake of long-term social reproduction. Given that many humans in burials were treated like they were objects and quite literally undistinguished in their treatment, we cannot assume that the objects translated into the accumulation of wealth for people in these societies.

As discussed in the previous section, we know that during the Hassuna, Samarra, and Halaf periods, human remains were often used in contexts that one would struggle to categorize as graves; instead, they should be understood as integrated into other rituals that involved burning, smashing, and structuring many forms of material. In this context, we should consider the concept of wealth consumption in the Neolithic. Wealth here is taken to mean an accumulation of some material that has social value, but this accumulation need not translate into the possession of a certain rank. It is clear that value, identity, and engendered characteristics are part of a process that is mitigated and based on ritualized activities that dictate these attributes and that this occurs in a system where a person and their body are not necessarily seen as more valuable or in any way different

from a vessel. This was especially true at death, where we have seen that the body was treated like an object or stood as a substitute that served the role of a variety of objects. Thus, arguments such as Brereton's (2011: 174) that assert that funerary consumption "provide moral context whereby material wealth or resources can be legitimately withdrawn from circulation" can be problematic because they treat objects in burials as wealth. Brereton agrees that practices of fragmentation and burning treat human remains in a manner that is unrecognizable from other objects. In this case, the humans interred and those that do the interring, to echo Pearson (1999), cannot be treating objects as wealth because the human is part of the process. In other words, dead humans cannot be a platform for the consumption of wealth when they themselves are 'consumed' (used) in the same manner as the object that supposedly accumulates wealth. Instead, we should consider that objects, humans, and animals intermingled in a very complex mythological understanding of the world where meaning, value, and gender were fluid, assigned to each in various ways, and could be exchanged and substituted. If objects were not wealth, in the LPN they were part of a larger system of belief in the same manner that humans often were, and both come to play a similar role in certain occasions. Therefore, this was a system that dictated how people are treated after death, one that was based not on wealth but on value, which is a subjective perception of the desirability of an item or material.

Towards the transitional phases of the LPN (6200-6000BC), consumption of material goods in graves decreased according to recent investigations by Brereton, and this period coincided with the appearance of sealing and stamping practices in Northern Mesopotamia that were used to stamp goods within the context of communal storage

areas. Rowlands (1998: 229-230) views these types of possessive practices as a mechanism of acquisitive behavior in which a person stamps a collective good in a communal setting and removes the stored item(s) from circulation. Brereton (2013) views the sealing of goods and burial goods as a form of temporary display and accumulation of wealth, which were morally justified scenarios in societies where such behavior would otherwise be harmful.

An issue that arises with these interpretations is that it is unclear what the difference between communally-stored goods and communally-stored goods stamped with a personal seal really was. Isn't a communally-stored food item also removed from circulation? Did a storage container behave differently if it was stamped? Looking at the situation objectively, we cannot know from an archaeological perspective if once something was deemed the property of a person, it functioned in a way that is similar to the modern understanding of this concept—that is to say, is personal property in the Neolithic personal? I would venture to argue that, taken in concert with the fluid sense of identity, self, and personhood, personal property might not really be personal. This is emphasized by the fact that these personally-stamped goods were found in communal storages. Simply put, in the context of stamping storage goods, we cannot know if the act of stamping a silo did or did not remove it from circulation. A few individuals in the data presented here had stamp seals, and they were not differentiated from the rest of the burials in any other way. Thus, the act of stamping may not be a simple transaction of ownership or the appropriation of goods.

The case with stamps and seals also raises the issue of how public any of these situations were. I think there is sufficient reason to believe that burial acts involved

public display based on the way that bodies were involved in a wider set of ritualized behaviors and the fact that the communities were relatively small and death was something that was rarely a secret in a community under normal circumstances. In contrast, the publicity surrounding stamping is largely unknown. Did people stamp goods in a ritualized communal setting and then close them in food storage facilities, or did they go into the storage facilities and identify some vessels to stamp? How showy were these acts? We can get some clues from some remarkable contexts in which a large number of stamp seals have been recovered, like at the Burnt Village and other buildings at Tell Sabi Abyad (Akkermans and Duistermaat, 2004). Here, close to 100 seals and tokens have been found in communal food storage rooms in association with vessels, figurines, axes, and food storage containers. Though not yet understood, we must ask how contexts with this much material culture are different from others. It is unlikely that these scenarios are status indicators, for as Akkermans and Duistermaat (2004: 5) point out, with 77 different stamping signs being used, it becomes difficult to argue that elites were doing the stamping. Similar to the argument about using select individuals for other rituals as a marker of status, too many individuals were involved, and, in this case, too many symbols. At the end of the 7th and the beginning of the 6th millennium BC, it seems that the pastoral groups that temporarily settled and explored agriculture/animal domestication thought the year clashed with the inevitable need to deal with ownership, position, and rights. In this respect, I suggest that these stamping mechanisms may not just be systems that designate private property and/or accumulate wealth, but also serve to showcase contribution to the collective good. Focusing on the case at Tell Sabi Abyad, 77 individuals may have participated in the creation of a feature that held large amounts

of artifacts and food storage vessels. In any case, it is substantiated that during this period, ideas about property, ownership, and value became more important in LPN communities. Whether or not these ideas functioned within the fabric of society in recognizable ways is a different question.

Based on what we already know from burial data and the series of graves that are presented here, we can see that during the Neolithic, differences in mortuary behavior are found in the age of the individual buried and the location of their grave and not in the material culture found with the dead. There is substantial evidence that in the LPN most subadults burials are located within the settlement and around or inside houses, and adults were often extramurally interred. Alternatively, I have also discussed the way that material culture was not used to mark social status in a way that would indicate social ranking in burials. Similarly, in the rest of the archaeological context, the extensive use of property marking with stamps and seals suggests that the aim might not have been to acquire wealth and showcase it. Thus, we must view the issue of social status as based on life stages rather than inequality created as a result of asymmetrical ownership, control, and consumption of material goods (Kuijt, 1996; Kuijt et. al., 2011). I suggest that we turn away from concepts of material wealth as the driving force behind social inequality in the LPN and towards its role as an agent that shaped the mortuary record.

#### *4.3.3 What Factors Structure Late Pottery Neolithic Burial Rituals?*

The high rate of infant and child burials in comparison with other members of society has been interpreted as the result of a higher death rate amongst these groups compared to adults/adolescents (Akkermans, 1989; 1993). Though death rates might

have been high, I strongly argue against this interpretation. Given that adults were predominantly buried extramurally and we do not have many extramural graves to begin with, the understanding of rates of death and dying become skewed in favor of subadults. In rare cases like Tell el-Kerkh, where we can compare intramural and extramural burials, the number of subadults and adults was about the same. At Hakemi Use, which is not included in the analysis of this chapter but is discussed in chapter 7, I have observed that, when taken together, intramural and extramural graves show a more even distribution of males-females and adults vs. subadults. Akkermanns (1993) also suggests that infants, specifically, were buried in the houses at Tell el-Kerkh because they were not yet integrated into the settlements' social system in any meaningful way. Infants probably held a liminal position in society. Thus, while this idea relates to the social context of young subadults, it does provide insight into the mortuary profile of the period. Recent approaches to explaining these trends in funerary practices in the Near Eastern Neolithic have centered around the cognitive and symbolic aspects of burial that result in a more functional practice of social cohesion and ancestor worship. Cauvin (2000: 65-72) has extensively discussed how changes in the "psycho-cultural realm" were rooted in a newfound belief that gods existed and motivated humans to settle and domesticate. Funerary rituals were the social glue that legitimized and propagated this new collective consciousness. It is unclear, however, where this new idea of the gods appeared from, which has been a cause for criticism by anthropologists like Watkins (2001) and Hodder (2001).

Hodder (2001) recognizes the importance of the symbolic and cognitive elements involved in the agricultural revolution that Cauvin raises; however, he centers the

symbolic cognition on the *domos* (home) based on contextual analysis of the archaeological record in European societies, which were places where the dangers of daily life were, in a sense, tamed. Death is one of these dangers. By burying the dead in the house, Neolithic societies mitigated danger by turning the *domos* into a tool for social transformation and the creation of symbolic behavior (1990). I will turn to the importance of the house later, but Hodder's and Cauvin's ideas about symbolic and cognitive transformations lend themselves to creating broad metaphors that act to simplify binary concepts (wild and domestic, for example), making these approaches highly interpretive.

Watkins (2001) builds upon these ideas to turn symbolism into a more functional force in society. He believes that external "symbolic storage" in the form of systems of information storage—like writing systems—was the result of investing more and more in material symbolism—like the settlement. The more sedentary people became, the more "symbolic storage" structured social institutions and beliefs (Donald 1991; Watkins, 2004; 2005; 2010).

Building upon these frameworks, Kuijt and Verhoeven have recently developed more functional approaches to interpreting mortuary practices. Kuijt (1994; 2000; 2002) has focused on the secondary mortuary rituals of the PPN that involved skull removal, plastering, and fragmentation of bodies. He has argued extensively that these acts solidified social relations and perpetuated a new social order imposed on early settlements by population and social stresses. The need to participate in highly-ritualized mortuary and related rituals reinforced kinship ties and household lines (Kuijt and Goring-Morris, 2002). Thus, mortuary ritual is seen as a form of ancestor veneration. To return to Kuijt's (2008) argument, he has turned towards the investigation of memory-

making and the creation of collective symbolic references in mortuary display. Similar to the discussion above, he argues that mortuary rituals stripped people of their identity in life, integrated them into a system of shared symbolic values, promoted notions of community, and reinforced the social order. Rituals of ancestor veneration and the perpetuation of communal ideology were surely relevant in the LPN period, for we must not think that as time progressed, people abandoned practices. Engagement with skulls and secondary burials continued to attest to this (Bonogofsky, 2005; Croucher, 2006; Haddow and Knüsel, 2017; Özbek, 2009).

However, we must consider the cosmological and mythological positioning of the people in the LPN as situated in their environment. When looking for burials in or out of settlements while speaking of the missing dead and the discrepancy between adults and infants, I want to emphasize that LPN groups were largely mobile communities. With the exception of sites like Domuztepe, it should not be overlooked that we are discussing the burial practices of sites about a hectare in size that were, in most cases, at least partly seasonally occupied (Akkermans and Swartz, 2003). Burial practices need to be considered in this perspective because when it comes to numbers, there is no need to look for the dead only in the settlements. The duality of lifestyle has to be acknowledged. On one hand, LPN people were settled and engaged more and more with agricultural tasks, but on the other hand, some continued to hunt and led a semi-mobile, and/or pastoral lifestyle. In addition, while some settlements might have fully embraced agricultural lifeways materially (Hakemi Use for example), this does not mean that their customs of ritual and mythology were built around this more recent lifestyle.



I believe that it is not out of the question that these people had a rich system of beliefs, symbolic knowledge, memory, and mythologies that they could have accessed depending on which stage of the year or activity they were involved in. For example, during the time of pastoral and nomadic activities (end of fall to winter), members of LPN communities may have evoked ideologies that had to do with mobility, animal herding, mountains, and so on vs. those that involved sowing and reaping. From this position, structured relations established within the settlement probably did not change but functioned differently. I imagine that whatever inequalities based on privilege and power existed within a village probably did not apply during periods of nomadic and pastoral endeavors. Furthermore, burial practices could have varied during times of detachment from settled life. Thus, based on this change in lifestyle, when we look for the dead, we might be looking in the wrong place and for the wrong custom. The dead may be missing if they were not buried in an expected manner beyond settlements, as would be the case if they were thrown in a body of water or left out on a special boulder. It is interesting to note, for example, that even at large sites like Domuztepe, other than the Death Pit and its parameters, so far no other burials have been identified. It is possible that people were practicing ritualized mortuary behavior based on a completely separate set of beliefs. As more sites are investigated in the Near East, it will be possible to explore when and which individuals were associated with the settlement and which were not. I believe that it is important to establish if the whole community left Halafian settlements during migratory times or only a portion. Could this be the case at Domuztepe? Such an investigation will hint at yet another level of social differentiation within LPN societies.

To return to the question of what structures graves in the LPN, I argue that what structures burial practices beyond ancestor worship and symbolic remembering and forgetting are notions of fertility, reproduction, and binary relationships between the female and male sex. If gendered relationships were fluid and flexible, then within the context of the house and household activities, people assumed female gendered roles. The notion that this was a driving force in Neolithic households has been proposed before, predominantly by archaeologists who have looked at Catalhoyuk as a reference to Neolithic Near Eastern societies but whose ideas have fallen out of favor compared to more recent works that emphasize non-western ideas about the body, gender, and imagery (Gimbutas 1989, 1991; Mellaart et al. 1989; Meskell 1995; in contrast see Meskell, 1998; Nakamura and Meskell, 2009).

Though ideas about mother goddesses and cults of the female are probably idealized, I would like to return to the idea that fertility and reproduction were at the heart of what a LPN settler concerned themselves with in Mesopotamia. During the later periods of the LPN, most settlements relied more and more on agricultural surplus and the ability to control their environment, animals, and fields. I cannot conceive of a scenario in which people did not make the association between plowing the soil and then reaping its fruit and between the cyclical mating of animals/humans and the resulting offspring and did not attach a cosmological ideology anchored in these processes, on which their lifestyle depended. Fertility of the animals and of the land was vital, and these elements surely had an assigned gender.

In modern ethnographical accounts, for example in Delaney's (1991) discussion of a southeastern Turkish village, the idea continues to exist that the seed is placed in the

soil and that the soil grows the seed. The seed is, of course, the male element and the soil is the female—more specifically, the womb. To return to symbolic metaphor making, it would be a stretch to assume that LPN communities did not make the connection between the ground that they were plowing, the animals they were breeding, and the humans they were making. Engendered objects and ideas in the LPN were flexible and complex, and I am not making a case here that the female and male sexes assumed their corresponding gender in everyday life, but I am arguing that when it came to reproduction, they *understood* that to procreate, male and female *sexed* individuals had to be involved, and they assumed their corresponding genders in the process.

We can see evidence for the importance of the female-male dichotomy in LPN imagery. Figurines with elaborately decorated and indicative features that participate in dismembering and fragmentation rituals signal rituals involving these ideologies. For example, many clay figurines in the Balkans are made to break and be broken by splitting them suggestively between the legs. These ritualized cache pits (or as Brereton often calls them, "ritual object burials" that do not contain humans but objects) contain such figurines (Campbell, 2006; Chapman, 2013; Freikman, 2015; Garfinkel, 1994; Gimbutas, 1989; Kuijt, 2017; Kuijt and Chesson, 2004; Naumov, 2008).

Clay vessels, anthropomorphic or not, have a long history of being associated with the human body and human life in general. Maybe even more than with figurines, we can see the reference to humans in anthropomorphic clay vessels, a reference that surely existed in ceramic vessels in general (Croucher, 2012; 2010; Campbell, 2007: 8). The association is so strong that Campbell (2000) actually mentions that archaeologists at

Domuztepe often confused ceramic vessels and stones with skulls in the Death Pit, further emphasizing the substitutability between a ceramic object and the human body.

From the evidence presented above, we have already seen how a vessel could serve as a substitute for the human body in both smashing and stacking as if recreating a skull stack. In this way, perhaps we can interpret anthropomorphic vessels like those at Yarim Tepe as enacting a certain gendered role: given that they are all different and emphasize different body parts and attributes, in the case of burials, they may be serving a specific purpose. If this is the case, then we must also view burials with humans as possessing the potential to serve different rituals and evoke specific effects. While the concept of gender is probably lost after the performance of the ritual, we may take the anthropomorphic vessels at life or before destruction to hold an individual persona similar to a human at life.

Ethnographically, we know that they can serve as a reference for many parts of the body and, in this manner, propagate certain ideologies and gendered practices (Thomas, 1999: 97; Barley, 1994; Gosselain, 1999: 212). I want to emphasize here that infants and small children were often buried in rounded vessels and in some cases placed around or in dome-shaped ovens. In the case of the infants, this may be suggestive of them being returned to the womb or back with the mother. Ovens themselves are notoriously embedded with gendered and non-gendered ideologies involving rebirth, fire, the womb, and the process of cooking. Associations between infants and pottery or ovens that stand as metaphors for wombs have been found not only in the Near East, but also in the Aegean, Central Anatolia, and Balkans (Perlès 2001, 301-302).

I return to the following question: why are all these infants and children buried in the house? The Neolithic house was a place of birth, death, reproduction, and production. In of itself, it was a microenvironment that embodied the ideology that was integrated into the village as a whole. I argue that the house was seen as an element connected to fertility in Neolithic societies because it was space associated with production and preparation—this is not to say that it was women that prepared and produced since how gender played into these spaces is unclear (Hamilton, 2000; Bolger, 2010). The house was not only a place where people lived, but also a space where ideas about social values and symbols were constantly reinforced and performed. This could be achieved by establishing areas that were ideologically dominated by activities like weaving, baking, food preparation, and oven-tending. By creating areas that were dominated by ideas of production/reproduction/preparation, the house acted as a space for these acts and the genders associated with them. Many ceramic house models are also styled as anthropomorphic and always emphasize hyper-sexualized or exaggerated features like a bulging belly, a "womb," or genitals (the door of the house) (Naumov, 2007). As these roles were carried out in the house by the people of LPN communities, ideas about gender and its role in society became reinforced. As already mentioned, in societies with a comparable social organization, the child is often associated with its mother until a certain age, after which it assumes some socially ascribed role based on its sex and gender. Thus, if a child died, it stayed with its mother; it stayed with the house. When it came to adults, it seems like more than just age and gender were at play. Whether it was gender-related or attributed to fertility concepts, a possible preference to bury females (at some sites) and subadults in the house existed in LPN societies (Kodaş et. al., 2018). If

females were buried in the house and the house is associated with this gender, then male LPN burials must be searched for outside of the house. In the LPN of Northern Mesopotamia, male sex is referenced only extramurally and in connection with agricultural activities. Admittedly, unlike the PPN or LPN in Central Anatolia, what archaeologists would consider reflecting male gendered iconography is very rare in the LPN of Northern Mesopotamia and mostly restricted to stamp seals in phallic forms (Atakuman, 2013). Male figurines are almost completely absent from the artifact assemblages (see Kuijt, 2017a, 2017b; Kuijt and Chesson 2004; 2007). This is not an indication that the male element was not of importance in these societies. The over-emphasis on and exaggeration of the female body can be taken as a reference of male fertility, where males are associated with the drive of communal fertility.

Certainly, the situation was much more complicated than this, but I want to simplify and emphasize that in these early agricultural societies, the deciding factor behind who was buried where and how was first sex and gender and then age (see section 4.2.1 above and Akkermans and Schwartz, 2003; Erdal, 2013; Tsuneki 2011). Thus, if we are to look at a source of social inequality that resulted in differentiated treatment in a community, this is where we should start. We can find evidence for this if we turn to the previous periods, PPNA and PPNB, where all members of society are represented almost equally at first and we start seeing more infants by the PPNB. Then during the LPN, we see a trend where many males were probably buried extramurally and infants and small children were buried within or around the house (Guerrero et., al., 2008; Erdal, personal communication). This progression corresponds to the degree of societies and their involvement in agricultural activities. I believe that agricultural intensification set up a

system in which differences between females and males became emphasized symbolically and began to be performed in the everyday life of the village. This is not to say that one was able to yield more social capital than the other, but only that conceptually-speaking, gendered roles were created that permeated and, in turn, structured religious and ideological aspects of society, such as death and the treatment of the dead.

Anecdotally to all of this, I emphasize that there were many elements at play other than gender and age. Many of these settlements engaged in activities of subsistence parallel to agriculture, like hunting. Thus, imagery or symbolism surrounding fertility or bountifulness that references these activities must not be overlooked. In these cases, gender play may or may not have shifted, or one could be emphasized over the other. In this sense, the wide array of burial practices in LPN Northern Mesopotamia could be explained by the varied use of symbolic ideologies related to the parallel realities of these communities. On one hand, society tried to reproduce and conserve its established ideologies like hunting and seasonal migration. On the other hand, and perhaps oppositionally, society tried to deal with new population pressures, settlement cohesion, and a completely different subsistence pattern based on a constructed environment. Burial traditions can be conceived of as being constantly molded by the tensions of settled and mobile life-ways.

CHAPTER 5:  
THE CHALCOLITHIC: UBAID AND URUK (5300-3000 BCE) THE MORTUARY  
RITUALS OF THE FIRST CITIES THE DAWN OF THE POLYTHEISTIC  
TRADITIONS OF THE NEAR EAST

By the end of the Chalcolithic, in the Near East and Mesopotamia specifically, the explosion of every trend that was brewing in the Late Neolithic took place. Agriculture intensified to the point of an entanglement with the economic system that further perpetuated the growth of these societies. At the same time, settled life began to change in different locations in northern and southern Mesopotamia, and people had to deal with concepts of space, place, and home in ways that they had never had to before. While some Chalcolithic groups began to form settlements that resulted in the accumulation of occupational levels in vertical stratigraphy, most communities were still highly mobile. As I outlined in Chapter 2, the use of space in houses was reconfigured and compartmentalized, separating everyday activities. In this period, the dedication of a place or structure to religion begins to feature in larger settlements. In this context, I present the data from this time period while seeking to understand how it enlightens the above-described events.



## **5.1 Overview of the Ubaid (5300- 4200BC) Mortuary Practices**

For this period, we begin to lack demographic information, and it difficult to know whether I can attribute this missing data to excavations or truly differentiated burial practices. Regardless, it is clear that by the 5th millennium BC, the diversity of LN mortuary habits had diminished. The variation of burial forms and the simplicity of burials themselves resemble the simplicity of household material culture that can be seen in pottery and figurines. The reduction was a trend, exemplified by the standardization of production of pottery that now looked remarkably similar and simple (Schwartz, 1988 and Akkermans, 1988). Painted examples were still in use and often found in mortuary contexts, but they are more homogenized compared to the Neolithic.

From a custom that most certainly originated in the earlier part of the 6th millennium BC, adults seem to be buried predominantly in designated communal burial grounds that were in the periphery or unoccupied areas of settlements. The infants were buried in vessels or simple pits and were interred somewhere within or in the vicinity of domestic structures. It is common to interpret children and infant graves as somehow related to production, administrative, or even religious areas of a house or building. For example, at Tepe Gawra there are at least 3 different clusters of small children and infants in some of the larger houses, some of which could be evidence of sacrifice according to Tobler (1935), while at Degirmantepe in southeastern Anatolia near Malatya, it seems they were buried in rooms that produced material evidence of metallurgical activities. At Tell Abad, infants were found interred in rooms dedicated to administrative duties.

Inhumations were the predominant form of burial. Some instances of cremation have been reported at Yarim Tepe. The dead were often covered with reeds or mats, and large ceramic shreds cover vessel burials. Adults are usually buried in pits and cists, which could be elaborate and stand like tombs, such as those seen at Tepecik and Korucutepe. Foundation burials seem to play some social role within the house and other buildings and occur for all age groups. Kenan Tepe and Degirmantepe have examples of these variations of burials from varied contexts.

Secondary burial practices, such as those we have seen in the Late Neolithic, were falling out of favor. However, in the few instances of extramural burials, we can see that rites of partial internments such as skull stacking were still practiced, as was the case at Eridu for instance. Unlike the Neolithic, the human body was buried in a manner that distinguished it from other acts, such as a disposal, some other ritual, or accidental burials. A testament of this was the standardization of placing one person lying on their side in a crouching position. Graves seemed to be oriented facing north, in accordance with the houses lined east-west or northwest-southeast.

This trend of more structured burials extended not only to the positioning of graves but to mortuary customs as a whole. The Ubaid represents a long period of rather conservative traditions in all aspects of society that show an effort to emphasize a communal ideology (Akkermans, 1989: 353-359). The customs of burying objects with the dead is not as rich as in previous periods, but when it does occur, it also follows a standard, as Akkermans describes (1989: 356-357). According to him, infants usually do not have associated artifacts, and children sometimes have beads. Young adult burials could be more varied with one bowl and beads being the standard, but beads only, bowl

only, or a jar, bowl, and beads were possible combinations. The adults' grave repertoire is similar to the adolescents', where some combination of a bowl and a jar is expected, but no beads are interred. Instead, it is common to find some other artifact type in the place of beads, such as a blade, ornament, or an axe. Objects in all inhumations are placed at the feet. To summarize, I generalize vessels as being associated with adults and beads as being linked with children.

Tepe Gawra provides the most continuous layers of occupation and allows us to trace burial practices through the development of the Chalcolithic. As the Chalcolithic progresses into the end of the Ubaid, we can see that—at least at Gawra—pit inhumations start to have some sort of cover, such as mats. Burial goods were no longer just found at the feet of the dead, and the skeletons are placed on either side. Along with the appearance of constructed libn mud-brick tombs from the last levels XV-VIII, the inventory of adult burials becomes more varied (Tobler, 1935; Akkermans 1989: 357). Overall, from the beginning to the end of the Ubaid, differentiation of burials based on social status is hardly relevant, and sex did not seem to feature as a discriminatory factor, not only because of the lack of sexing of the skeletons but also due to the minimal variation between adult burials. The only discriminating factor between how people were buried continued to be age.

## 5.2 Overview of Uruk/Late Chalcolithic (LC1-5) (4200-3000BC) Mortuary Practices.

The first 200 or so years of the terminal period or the Ubaid/Uruk transition are virtually a continuation of the mortuary practices of the Ubaid. After this, new trends began to emerge as a result of the spread of the Uruk colonies. I want to emphasize that the Uruk should not be considered a phenomenon in Anatolia until the LC4-5 (mid to late 4th millennium BC). Just as it was in the Ubaid, the earlier trends of the period were largely the result of indigenous cultural practices. Unlike the Ubaid, which also spanned over 1000 years, the Uruk was a very dynamic and transformative phenomenon, not in the least because it marked the first true instance of concurrent urban development in the South and North.

Tepe Gawra provides the most informative evidence to understand general trends for this period. Excavations show that until the early 4th millennium (LC1-3), infant graves buried in sealed vessels within domestic structures remained the norm. Adults were clearly interred extramurally where excavations are lacking since they only make up one forth of the burial record and come from very few sites, like Korucutepe and Gawra. Adults are buried in the *libn* tombs, pits, and tombs. At Gawra, Tobler (1935) lists 20 adults from external burial grounds. At Korucutepe, rather rich adult burials in built-tombs were constructed away from the settlement in an unoccupied area. At the same time, infant burials at Gawra show the partitioning of high amounts of wealth in non-domestic buildings or those with prolonged use. For example, it is clear that the bigger houses that have been used for the longest periods held the most infants (Brereton, 2016; 2013). In addition to stone vessels, the materials interred with infants included beads,

necklaces, pendants, and other forms of ornaments made from gold, silver, copper, and various precious and semi-precious stones such as lapis, carnelian, and turquoise (see inventory for a detailed description of the burials). At Hacinebi, Stein (2001: 273) reports silver rings, a highly valued metal, in an infant jar burial. Rings of that sort are thought to have been used as a medium for some form of exchange. This silver is the earliest use of Anatolian silver; however, this pattern is not observed at southern Mesopotamian sites, where Uruk sites, in general, are rare.

In the middle of the Uruk period (around 3800 BC), age-related burial customs started to diverge from the previous Ubaid period, and infants and adults were more likely to be found buried in the same space of the settlement. Sometimes adults were found closest to the household or in proximity to children, and sometimes sporadic graves of infants were found on the outskirts of the settlement amongst adult burials. Tepe Gawra, Kenan Tepe, and Hacinebi are examples of these changing trends (Forest, 1983; Peasnell, 1999; Tobler, 1950; Stein et. al., 1998). Formal cemeteries have yet to be discovered, and the extensive excavations in Gawra at least failed to produce one despite sufficient probing. It is an interesting observation that the one location with no overlap between adult and subadults burials restricts the burial of infants to areas of production. These are zones external to the household and can appropriately be described as workshops. This pattern has been observed at Tell Kosak Samali (Koizumi and Sudo 2001), Tepe Gawra (Tobler, 1950), and Tell Brak (McMahon and Oates, 2007).

Infants were usually buried in jars placed in pits and, rarely, in brick-lined pits. At this time, the use of libn tombs at Tepe Gawra and other constructed tombs correlate with a richer and more robust grave inventory. Though most individuals across all ages

were not offered an object in the grave, for the first time, some adult burials show varying and distinct signs of wealth. In Level X at Gawra, the richest and most elaborate graves were usually in libn tombs located in open and visible areas that were external to the households and not associated with them. Most importantly, these burials are of adults. As can be seen from the inventory, not only did adults in those tombs receive the whole range of material culture that could be deposited in graves, but the amount of these materials was also staggering. Some graves like 109, 114, and 102 received thousands of artifacts made from shells, metal, and precious stones (Peasnell, 2002; Brereton, 2016).

It seems that the last half of the 4th millennium BC presents a drop in the recorded number of burials we have all over Mesopotamia, which has stumped archaeologists because this is the height of the Uruk colonies, a period in which their influence became widespread, enclaves were created, and urban efforts flourished. So where have the dead of the cities gone? Infant burials are still found in settlements, though in lesser numbers, as at Tell Brak. Algaze (2008) has proposed that the inability to close the gap in the mortuary record is due to the location of the rest of the population, which was probably interred in the outskirts of settlements and has consequently been destroyed or are just not accessible to archaeologists. Charvat (2002) and Black and Green (1992) offer river disposal or offsite exposure for de-fleshing as explanations, which are comparable to the concurrent traditions of Transcaucasia neighbors.

Brereton (2013) and McMahon and Stone (2013) have recently proposed that the dead might be interred at designated trash heaps or satellite mounds. Excavations from the edge of the Outer Town at Brak on the mound Tell Majnuna have produced four mass burials of at least 67 individuals, representing everyone but infants. These burials were

either interred in the trash heaps in pits or haphazardly thrown amongst the fragmented material culture, animal bones, ash, and charcoal. A feast had likely occurred on the site of these burials around the time of internment. This treatment of the dead and the fact that most individuals were disarticulated and that their bodies show signs of de-fleshing and skull removal recall LPN burial practices. These are preliminary findings and further interpretation is warranted, but the possibility of looking for the dead in similar mounds is something to explore (McMahon and Stone, 2013).

### **5.3 Presenting the Data: Findings and Analysis**

The Chalcolithic burial assemblage discussed here is a mix of Ubaid and Uruk. I have chosen to combine them in the discussion because 1) of significant cultural continuity between the two and 2) the fact that many of the sites are dated within a range that encompasses both periods, so it is impossible to establish a chronological association grave-by-grave. These concerns pertain, especially, to burial types.

The sites for the data presented here come from sites mentioned in Turkish reports or mentioned in survey publications (Table 5.1). The burials from Korucutepe are quite well-known and discussed in many publications but were included here to demonstrate trends that are discussed in the next section. The sites that represent the Ubaid data here are Yenice Yani, Turbe Hoyuk, Salat Tepe, and Kenan Tepe. The LC phase is from Carchemish, Kenan Tepe, Arslantepe, Cattepe Hoyuk, Muslumantepe, Korucutepe, and Tepeceik. Most of the demographic information is included in this sample, but the sex of the individuals is very rarely stated because of conservation issues and because mostly subadults are represented. This situation limits any meaningful analysis based on sex.

From these sites, Table 5.2 shows the breakdown of artifact presence and absence in each category in every grave used in this study. The relationship between artifacts, grave types, and age groups will be discussed in detail here.

TABLE 5.1:  
BURIAL LOCATION AND THE DEMOGRAPHIC DISTRIBUTION OF  
INDIVIDUALS IN ALL CHALCOLITHIC SITES

Sites	Intramural Graves	Extramural Graves	Adult	Adolescent	Child	Infant	Unknown	Total Individuals
<b>Turbe Hoyuk</b>	1	/	/	/	/	1	/	1
<b>Salat Tepe</b>	4	/	1	/	/	3	/	4
<b>Korucutepe</b>	2	2	4	/	/	1	/	5
<b>Arslantepe</b>	4	/	/	/	1	1	2	4
<b>Yenice Yani</b>	3	/	/	/	1	2	/	3
<b>Muslumantepe</b>	9	/	/	/	/	9	/	9
<b>Pirot Hoyuk</b>	9	/	1	/	/	8	/	9
<b>Cattepe Hoyuk</b>	?	?	/	/	/	1	/	1
<b>Tepecik</b>	1	/	/	/	/	1	/	1
<b>Carchemish</b>	11	/	4	/	2	2	3	11
<b>Kenan Tepe</b>	20	/	9	/	6	5	/	20
<b>TOTAL:</b>	64	2	19	/	10	11	5	68



TABLE 5.2:  
UBAID AND URUK ARTIFACT PRESENE/ABSENCE INVENTROY AT EACH  
SITE AND EACH BURIAL

Sites	Grave Identification	Non Metal Ornaments	Non Metal Tools	Non Metal Stamp/ Seals	Non Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Kenan Tepe	D.5.5221											
Kenan Tepe	D.8.162											
Kenan Tepe	D.8.54	X	X									
Kenan Tepe	D.8.90											
Kenan Tepe	E.5											
Kenan Tepe	D.4.4128											
Kenan Tepe	D.6.145	X										
Kenan Tepe	D.6.155											
Kenan Tepe	E.2.174											
Salat Tepe	64/G	X										
Salat Tepe	9G/G											
Salat Tepe	?											
Salat Tepe	107/G		X									
Turbe Hoyuk	?											
Tepecik	?											
Tepecik	?											
Tepecik	?											
Korucutepe	J12											

TABLE 5.2 (CONTINUED)

Sites	Grave Identification	Non Metal Ornaments	Non Metal Tools	Non Metal Stamp/ Seals	Non Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Korucutepe	K12-3	X				X		X	X			
Korucutepe	K12-4, 5	X				X		X		X	X	
Korucutepe	K12-1											X
Arslantepe	?	X										
Arslantepe	?	X										
Arslantepe	?											
Arslantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Muslumantepe	?											
Pirot Hoyuk	1											
Pirot Hoyuk	2											
Pirot Hoyuk	3											
Pirot Hoyuk	4											
Pirot Hoyuk	5					X						
Pirot Hoyuk	6											
Pirot Hoyuk	7											
Pirot Hoyuk	Burial 2						X					
Pirot Hoyuk	8											
Cattepe Hoyuk	?											
Tepecik	?	X										
Kenan Tepe	F.X			X		X						
Kenan Tepe	F.19											
Kenan Tepe	F.21											

TABLE 5.2 (CONTINUED)

Sites	Grave Identification	Non Metal Ornaments	Non Metal Tools	Non Metal Stamp/ Seals	Non Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Kenan Tepe	F.7.7148											
Kenan Tepe	F.7.7150											
Kenan Tepe	F.7.7221											X
Kenan Tepe	F.9											
Kenan Tepe	F.22					X		X				
Kenan Tepe	F.7.7104											
Kenan Tepe	F.7.7200											
Carchemish	#1											
Carchemish	#2											
Carchemish	#3					X						
Carchemish	#4					X						
Carchemish	#5					X						
Carchemish	#6					X						
Carchemish	#7											
Carchemish	#8											
Carchemish	#9											
Carchemish	#10											
Carchemish	#11					X						
TOTAL:	66	8	2	1	0	10	1	3	1	1	1	2

Artifact presence shown by 'X', per site per burial included in this analysis. Ubaid sites (bold) and Uruk (not in bold).

All of the sites that I just presented are partially excavated settlements and do not allow me to understand the scope of settlement structure and expansion. Most of these sites were small and do not show the full scope of urban-oriented settlement patterns that appeared during the Uruk. An exception to this is Arslantepe, where the course of development is clear, and of course, Carchemish, judging from its continuous occupation. In the case of the latter, however, Woolley did not leave us with much knowledge of the Chalcolithic period.

In contrast, the sites that I use in the analysis could be considered mega sites. Tepe Gawra and Abada both have extensive records of excavation and systematic research as part of regular excavations. The reasons that I use them are twofold: one, these sites provide the most holistic understanding of what happens to the archaeological record in concert with mortuary practices. Second, burial practices of this period are quite similar across Mesopotamia, and I am confident about using these sites as tools by which to deduct an interpretive framework that reflects the burials that I use in this study. The sections that follow examine the burial record of the sites in question based on burial types, artifacts deposited with the dead, and the demographic make-up of the dead. Interpretation of this data that is supported by records at Tell Abada, Tepe Gawra, and others follows.

### *5.3.1 Burial Types*

Here, I discuss and compare data that is relevant to burial style as a means of establishing any trends in the Chalcolithic mortuary record. Burial types from all the sites

examined are presented in Table 5.3. Based on the amount and nature of my data, I ask the following questions:

TABLE 5.3

CHALCOLITHIC GRAVE TYPES AND THEIR DISTRIBUTION AT EACH SITE

Sites	Vessel	Basket	Wall/ Foundation	Inhumation	Mud Brick	Pit	Lined Pit	Unknown	TOTAL:
<b>Turbe Hoyuk</b>	1								<i>1</i>
<b>Salat Tepe</b>	1			1	2				<i>4</i>
<b>Korucutepe</b>	1				2	1			<i>4</i>
<b>Arslantepe</b>	1			3					<i>4</i>
<b>Yenice Yani</b>			1			2			<i>3</i>
<b>Muslumantepe</b>	9								<i>9</i>
<b>Pirot Hoyuk</b>	8			1					<i>9</i>
<b>Cattepe Hoyuk</b>	1								<i>1</i>
<b>Tepecik</b>							1		<i>1</i>
<b>Carchemish</b>	11								<i>11</i>
<b>Kenan Tepe</b>	3	3	3			6	3	1	<i>19</i>
<b>TOTAL:</b>	<i>36</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>4</i>	<i>9</i>	<i>4</i>	<i>1</i>	<i>66</i>

1) What is the pattern of distribution of burial types based on age? Table 5.4 and 5.5 below show the distribution of individuals who are associated with each burial-type category in Ubaid and Uruk burials, respectively.

TABLE 5.4:  
THE DISTRIBUTION OF INDIVIDUALS FROM EACH AGE GROUP IN  
DIFFERENT BURIAL TYPES- UBAID.

Age Group	Vessel	Basket	Wall/Foundation	Inhumation	Mud	Pit	Total
<b>Adult (N=1)</b>			1				<i>1</i>
<b>Adolescent (N=1)</b>				1			<i>1</i>
<b>Child (N=4)</b>		1	3				<i>4</i>
<b>Infant (N=11)</b>	5	2			2	2	<i>11</i>
<b>Total:17</b>	<i>5</i>	<i>3</i>	<i>4</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>17</i>

TABLE 5.5:  
THE DISTRIBUTION OF INDIVIDUALS FROM EACH AGE GROUP IN  
DIFFERENT BURIAL TYPES- URUK

Age Group	Vessel	Mud Brick	Inhumation	Lined Pit	Pit	Unknown	Total
<b>Adult (N=16)</b>	4	3	1	1	6	1	16
<b>Child (N=6)</b>	3		1	1	1		6
<b>Infant (N=26)</b>	22			1	3		26
<b>Unknown (N=5)</b>	3		2				5
<b>Total (N=53)</b>	32	3	4	3	10	1	53

2) What is the pattern of distribution of burial types based on artifacts? Here, Table 5.6 and 5.7 show how artifact presence is distributed in each burial type in Ubaid and Uruk graves, respectively.

TABLE 5.6:  
ARTIFACT FREQUENCY FROM ALL BURIAL TYPES- UBAID

Burial Types	Total # of Burials	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Unspecified Artifacts
Vessel	5		1				
Basket	3	1					
Wall/Foundation	4						
Inhumation	1						
Mud	2	1					
Pit	2	1	1				
<b>TOTAL:</b>	17	3	2	0	0	0	0

Frequency of artifact types recovered from different burial types- Ubaid.



TABLE 5.7:  
ARTIFACT FREQUENCY FROM ALL BURIAL TYPES- URUK

Burial Types	Total Number of Burials	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Undefined Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Undefined Artifacts
<b>Mud Brick</b>	2	3				2		3	1	1	1	
<b>Lined Pit</b>	3	1					1					1
<b>Inhumation</b>	4	2										
<b>Vessel</b>	32					5	1					1
<b>Pit</b>	9			1		2		1				
<b>Unknown</b>	1											
<b><i>TOTAL:</i></b>	<i>50</i>	<i>3</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>9</i>	<i>2</i>	<i>4</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>2</i>

Frequency of artifact types recovered from different burial types - Uruk.

Except for two burials from the Uruk period (one a Kenan Tepe pit burial and the other a mud brick chamber from Korucutepe), all of the graves contained one individual. Thus, in the Ubaid, we have 17 graves for 17 individuals, and for the Uruk sample, 51 graves represent 53 internments (Fig. 5.1 and 5.2 respectively).

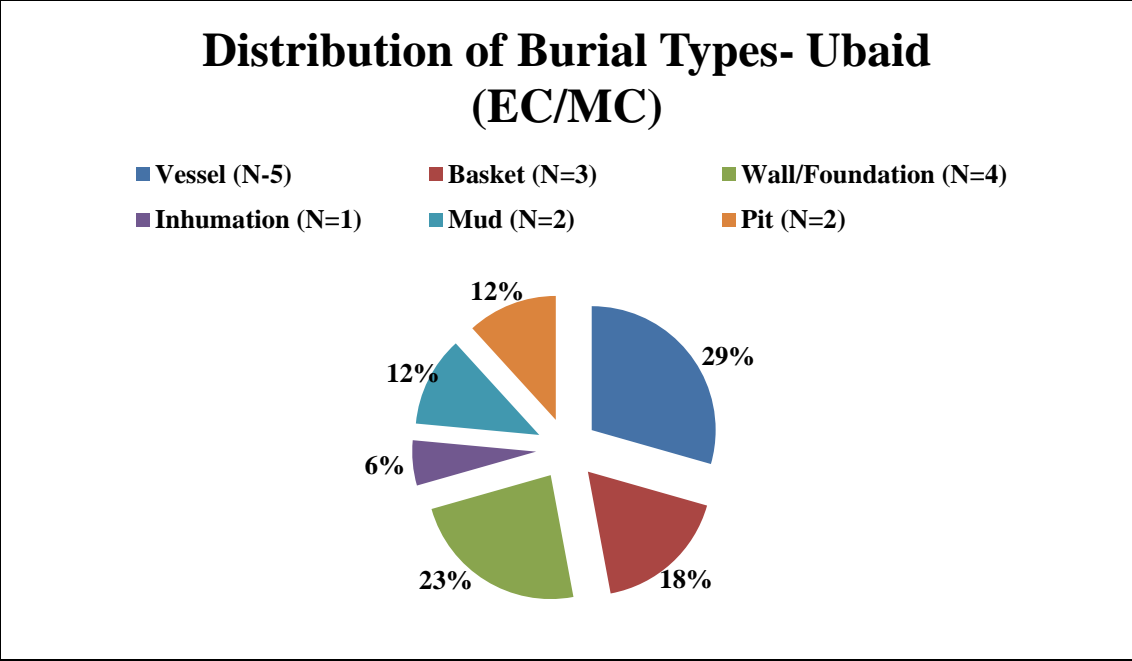


Fig. 5.1: Distribution of burial types from the Ubaid.

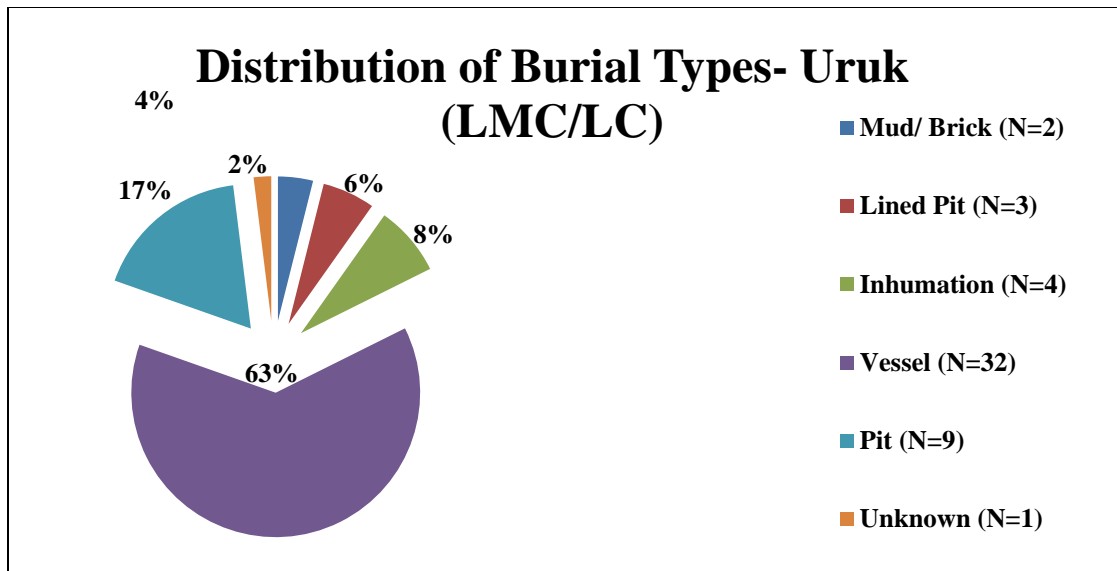


Fig. 5.2: Distribution of burial types from the Uruk.

In the following sections, I examine the data that I collected in each of the burial types that I have discussed for both the Ubaid and Uruk periods. I will compare the relationships between burial type, the people buried, and the artifacts that they were buried with.

#### 5.3.1.1 Vessel Burials



Fig. 5.3: Ubaid infant burial at Kenan Tepe. Reproduced from Parker et. al. 2009: 147, Fig. 17).

As can be seen above, the most numerous types of internments throughout the Chalcolithic were various forms of vessel burials (Fig. 5.3). The high number can be explained by the fact that they often belong to child and infant burials which, as will be discussed, are the most numerous group to be interred. Carchemish, Kenan Tepe, and Musluman Tepe provide the biggest sample of these burials here (Table 5.3). Ubaid- and Uruk-period vessel burials are essentially identical, save for the fact that they use their period's ceramic style for the ceremony. The burials in this study are very prevalent at other Chalcolithic sites, such as Tell Abada, Tepe Gawra, and Yarim Tepe. It was

customary to seal the top of these vessels with a bowl, plate, a combination of bowl and plate, or a fragment of a vessel. Interestingly, at Carchemish early forms of champagne cups were broken, and their bowl was used as a lid. At Kenan Tepe, the vessel burial is incorporated into other forms (i.e. burying the vessel into a pit, using mats or bags to wrap the urns, and placing such containers into or under walls). The later so-called foundation burials/wall burials will be discussed as a separate category.

For the Ubaid, five vessel burials are reported. The only find in these burials is the obsidian mirror from the infant vessel grave from Turbe Hoyuk. This item is unique when compared to other infant vessel burials because mirrors are usually associated with adults, and so far, another parallel has not been found. I do not categorize the ceramic forms used for lids as inventory items in their own right.

In the later phases of the Chalcolithic, vessel burials contain few artifacts. This is an expected pattern across Mesopotamia, but it should be noted that during this period, Tepe Gawra has infants and children in vessels with a burial repertoire, which consists exclusively of ornaments, mostly in the form of beads. The 32 Uruk vessels do not usually contain artifacts, and as is illustrated in Table 5.7, only five burials contained fragments from other ceramic vessels that were not lids. The one metal artifact counted in an infant burial from Korucutepe is not an object but ore, and the association is not conclusive. Finding metal artifacts in infant vessel burials is not unheard of and has been noted at Hacinebi, for instance, where metal rings were found with an infant (Stein, 2001: 273), and at Gawra, where the beads are copper or gold in some cases.

Ubaid vessel burials are all infants, but the Uruk were more diverse (Table 5.4 and 5.5). Adult vessel burials are also known to have taken place at Gawra starting in the

LC2, which is consistent with the pattern observed here. Interestingly, adolescent vessel burials are not found in the Ubaid or Uruk from the period 5400-3000 BC in Mesopotamia, except for a single burial that Brereton reports (2013: 307). I believe this can be explained by the low number of adolescents reported overall and that when adolescents burials do occur, they are often treated as adults, and adults are sometimes buried in vessels.

#### 5.3.1.2 Inhumations



Fig. 5.4: Arslantepe, LC3/4 child inhumation. Reproduced from Anadolu Agency, October 2019.

The only inhumation from the Ubaid reported here is from Salat Tepe, and it is the only adolescent from the whole Chalcolithic sample. Given that this burial form should be quite standard throughout the Ubaid, I believe the reason that it is not represented here is the small sample size of my data. Alternatively, a lot of the times,

burials are inhumations, but they are also something else, such as a foundation burial or a mud brick inhumation. As discussed in Chapter 3, this burial category is used as a burial type here since it is used to describe the way that burials are interred in many reports and is not a category that lacks a detailed description. In this case, reports were specific enough to assign other burial categories. In the lower layers at Tepe Gawra, inhumation burials are often reported as "simple inhumations" versus inhumation in a pit or a wall, for example. In the Uruk period, the second most common burials are inhumations, which belong predominantly to adults, but here I only have four inhumations, which again, is probably due to the lack of more specific descriptions in the reports (Table 5.3 and Fig. 5.4). Most inhumations come from Arslantepe, and one is from Pirot Hoyuk, which was an inhumation in a domed oven.

The inhumations in this study were void of artifacts, except for the two Uruk inhumations from Arslantepe of a child and an unknown individual that contain beaded ornaments (see Appendix A). I cannot assess whether this is consistent with other Ubaid or Uruk sites because of the small sample. At Tepe Gawra, simple inhumations contained stone vessels and similar beads.

#### 5.3.1.3 Pit Burials- Variations

Simple burials in pits diminish considerably in the Chalcolithic, especially when compared with the Neolithic. In the Ubaid sample, the two pit burials are from Kenan Tepe. In one case, an infant was placed in a basket or some reed matting and interred in the prepared pit. In the other, a pit where the remains of an infant were placed was dug

and plastered into a house floor. The Uruk pit burials are more numerous and distributed amongst most age groups (Table 5.5). The difference between children and infants was not strict, but it seems that adults were more likely to be given an inhumation in a pit. This trend can be observed at Tepe Gawra, where adults were most likely to be buried in pits and were sometimes wrapped in reed matting (Rothman, 2001).

Pit burials were sometimes lined, which was the case with the plaster-lined pit at Kenan Tepe burial D.8.54 (see appendix). Lined pits appear more often in the later Uruk phases, where we have two more from Kenan Tepe, where one adult and one child were buried in mud brick-lined pits. Yenice Yani also has this kind of a child burial, again, with the use of mud brick. At Tepe Gawra, the increase in lined pit burials is also noted past 4300 BC with the transition to the Uruk levels.

Objects in these burials were not numerous in the Ubaid (see Table 5.6). During later parts of the Chalcolithic, as illustrated in Table 5.7, some finds appear in pits and lined pits. Based on what we see from the archaeological record of burials in the region, these should be treated as exceptions, not a standard. The most interesting find here, and certainly rare for a child burial in a pit, is the cylinder seal from the child pit burial at Kenan Tepe. These types of seals are usually found in constructed tombs, such as the libn mudbrick types.

#### 5.3.1.4 Mud-Brick Constructed Tombs

Some tombs that are similar to the Tepe Gawra libn graves are the mud-brick constructed structures that we find at the extramural burials at Korucutepe. These two tombs contained three individuals in total, all of them adults. As Table 5.7 shows, these



burials were richly furnished with every category of object used in this analysis, including tools, weapons, ornaments, and a stamp seal made of metal. These graves are also important because they represent extramural adult burials. Given the general absence of such graves, and considering the rich libn adult burials of contemporary Tepe Gawra, we can get a picture of what the missing dead's mortuary customs might have looked like. These burials are truly what is missing from the picture of Mesopotamian Chalcolithic burial practices.

### 5.3.2 *Artifacts*

In this section, I examine the artifacts from Ubaid and Uruk burials that were found in this sample. I use the same set of questions as that appeared in the previous section to guide my analysis and organize the information.

1) What is the pattern of distribution of artifacts based on burial types (see Tables 5.6- 5.7)?

2) What is the pattern of distribution of artifacts based on age group categories?

The two tables below illustrate the presence of artifact types as they are associated with individuals from each age group (Table 5.8 and 5.9)

TABLE 5.8  
PRESEMCE OF ARTIFACT TYPES PER AGE GROUP- UBAID

Age Category	Total # of Individuals	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/Seals	Non-Metal Weapons	Ceramic Vessels	Non-Metal Unspecified Artifacts
Adult	1						
Adolescent	1						
Child	4						
Infant	11	3	2				
TOTAL:	17	3	2	0	0	0	0

TABLE 5.9  
PRESENCE OF ARTIFACT TYPE PER AGE GROUP- URUK

Age Category	Total # of Individuals	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessels	Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
<b>Adult</b>	16	3				4		4	1	1	1	1
<b>Adolescent</b>	0											
<b>Child</b>	6	1		1		1						
<b>Infant</b>	26	1				2	1					1
<b>Unknown</b>	5	1				2						
<b>TOTAL:</b>	53	6	0	1	0	9	1	4	1	1	1	2

Artifacts in the Ubaid period are found with infants only, though those are few, with one infant from Turbe Hoyuk, two from Kenan Tepe, and one from Salat Tepe. Thus, out of 11 Ubaid infants, four were buried with artifacts. This pattern is rather standard throughout Mesopotamia, especially with respect to the ornaments in those burials that were interred within a house structure. One exceptional find here is the obsidian mirror from Turbe Hoyuk (objects like this are unheard-of in Ubaid burials, let alone infant ones).

As is expected and consistent with the pattern observed at other sites with Uruk levels, ornaments and vessels become the predominant objects for internment with the

dead. The pattern that I record here also reflects an increase in the deposition of metals in graves compared to earlier periods. Even with the small sample size, I believe that I capture what the distribution of artifacts is known to be based on other sites (Table 5.9 and Fig. 5.5). Metal artifacts also seem to be evenly distributed amongst the metal artifact categories, as is seen in Table 5.9. It is significant to note that here the weapons from Korucutepe represent the earliest instances of metal weapons in burials, a trend that would continue. The mace head, interestingly made from raw iron, is the only iron artifact of its kind that has been found from this time period. A mace head of the same type is known to be held by anthropomorphic clay figurines with elongated crania from the Ubaid, which will be discussed later in the chapter.

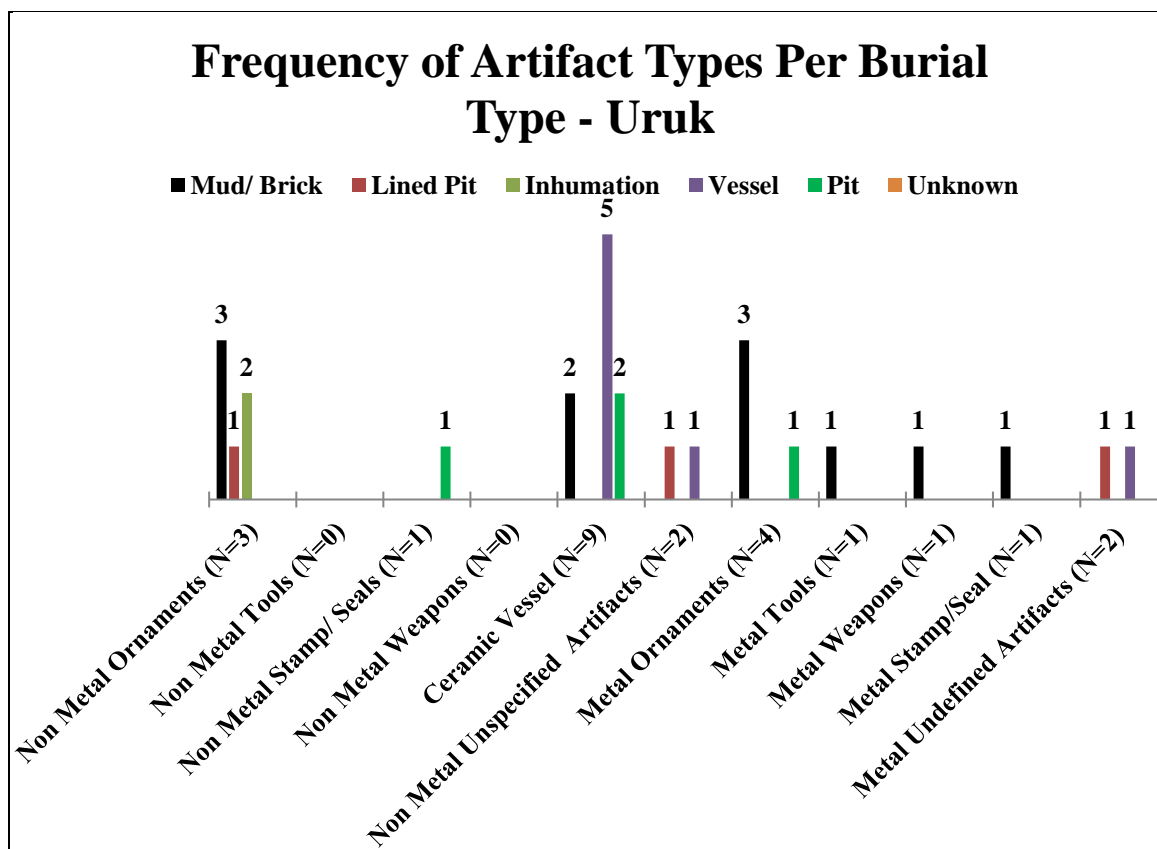


Fig. 5.5: Frequency of Uruk artifact types recovered from all burials.

How artifacts are connected to burial types is unclear based on my data. I have recorded only four burials with any artifacts from the Ubaid, and as discussed, they are all from infants in a pit, a basket burial, and a vessel. Uruk burials types do not have a pattern that corresponds to artifacts, as can be seen above in Fig. 5.5. The one grave type that stands out here in terms of artifact distribution is the inhumation. These burials are only four in number, so given the small sample size, I do not believe this is a real pattern. In addition, these are probably pit inhumations rather than simple inhumations and were

most likely not clearly designated in reports. Thus, there is no need to associate ornaments (which are almost always beads) with inhumation burials. This is because in Ubaid and Uruk burials, as will be discussed in the following section, age is most likely the biggest driver of differentiated burial treatment.

As I have already hinted at, my data is consistent with what is expected for the Ubaid, when infants are more likely to receive grave goods in the form of some beads or a string of beads. The Uruk distribution of artifacts in accordance with age groups shows that adults are more likely to be buried with vessels, ornaments, and metal items. In contrast with the Ubaid, Uruk adults are more likely to be interred with an artifact, namely a vessel (Table 5.9, and Fig. 5.6). Though my sample is small, these findings are very consistent with established Uruk patterns, especially from Tepe Gawra. It is also significant to note that tools are not very popular objects in these graves, and if they are present, they are found with adults.

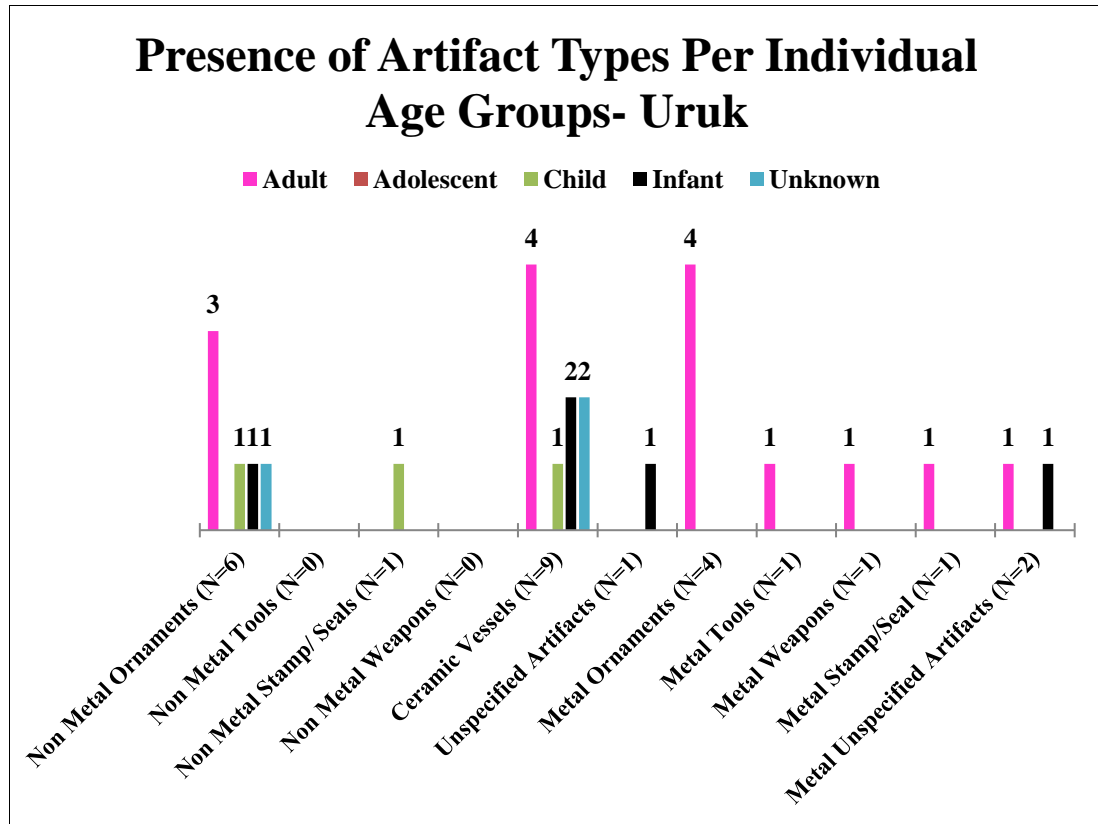


Fig. 5.6: The presence of artifact types associated with individuals in each age group- Uruk.

Metal artifacts have already been discussed in terms of grave distribution at Korucutepe. These items are relatively rare, and they are quite diverse (Fig. 5.7). The trend of personal ornamentation that seems to be very relevant during the Uruk period is supported by the metal's inventory, which also shows that jewelry and ornamental pins were consumed more than any other object (Brereton, 2016: Chp. 5).

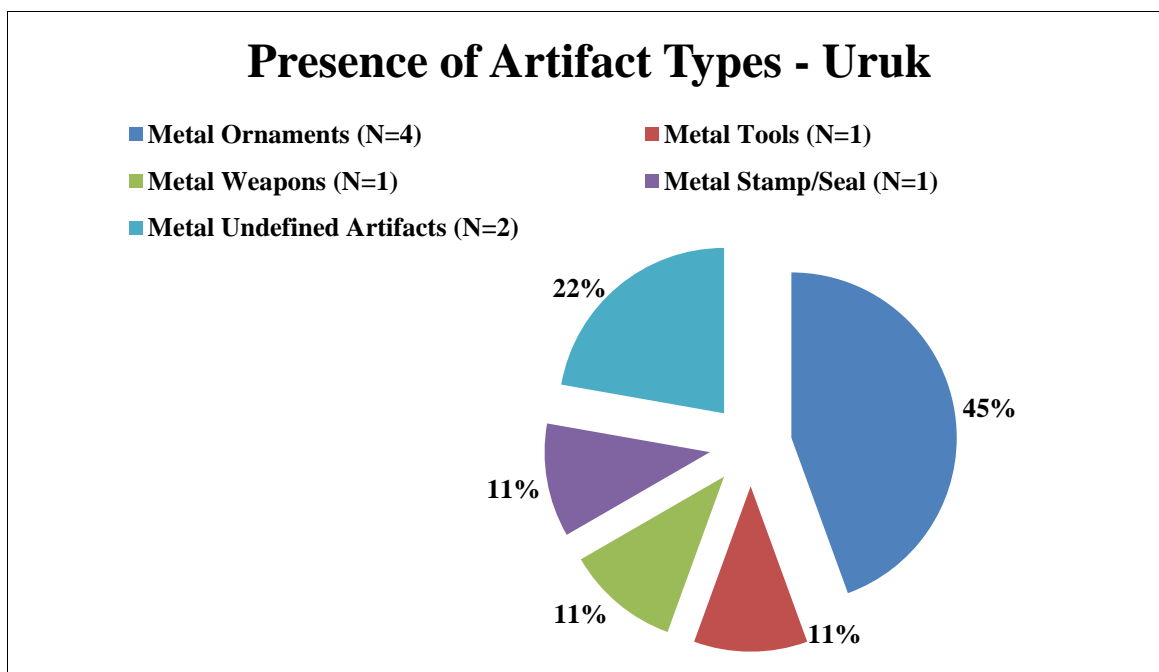


Fig. 5.7: Presence of artifact types from all burial types- Uruk.

### 5.3.3 Demographics

I have discussed distribution and patterns of burial types with respect to artifacts and demographics and artifacts with respect to burial types and demographics. I will now turn to established age categories in order to approach the question from the perspective of burial differentiation that is based on biological age. Information based on biological sex that would allow me to approach this question is absent or too scant. I do address this question in the discussion sections that follow.

1) What is the pattern of distribution of burial style based on age groups (Table 5.4 and 5.5)?



2) What is the pattern of distribution of artifacts based on age group categories (Table 5.8 and 5.9)?

With only 17 individuals from the Ubaid, I am not sure that I can identify a pattern here. However, the underrepresentation of everyone but infants is consistent with what we find at other Ubaid sites, like Tell Abada and Gawra. Also, I think it is significant that all of these are intramural burials, which further supports the strength of this data sample since Ubaid intramural burials tend to be those of infants and small children (Fig. 5.8 and Table 5.1). The Uruk distribution of the buried favors both infants and adults from a sample of 57 individuals (Fig. 5.9). At Tepe Gawra, this is often observed, and if we refer to the inventory, we can see that as time goes on, it becomes more common to bury adults intramurally. My dataset represents burials from the very start and the end of the Uruk, which is why the adults and the infants seem comparable. What is lacking here is a sequence comparable to Tepe Gawra at an Anatolian site, from which the development of such burial trends can be traced. I say this because I argue here that age is the main source of burial differentiation (which is also social), so such a sequence would be important for future research.

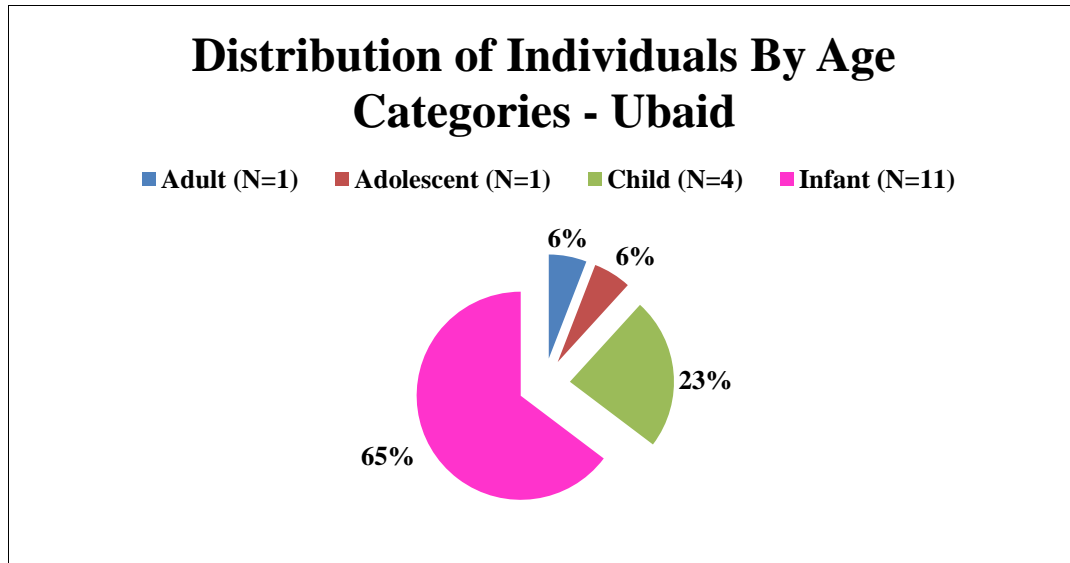


Fig. 5.8: Distribution of individuals by age category- Ubaid.

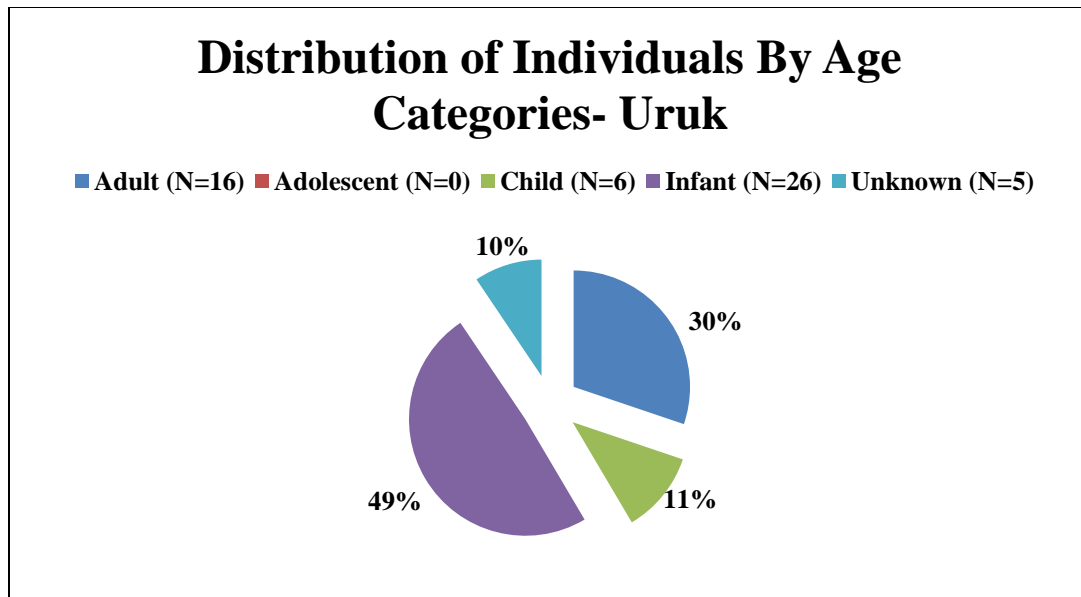


Fig. 5.9: Distribution of individuals by age category- Uruk.

As I have already explained, infants are buried in various ways intramurally, with the occasional mingling of adults in similar internments. In the Uruk phases, it seems that the burials are still diverse and encompass most age groups, but the infant burials become confined to vessel burials (Fig. 5.10). I want to suggest here that Uruk mortuary practices are, to a large extent, a continuation of the Ubaid's, so this should not be seen as a pattern confined to Uruk. Tell Abada as well as Degirmentepe attest to the extensive use of infant burials in vessels during the Ubaid period. Thus, this custom is neither novel to the Uruk, nor does it end with it.

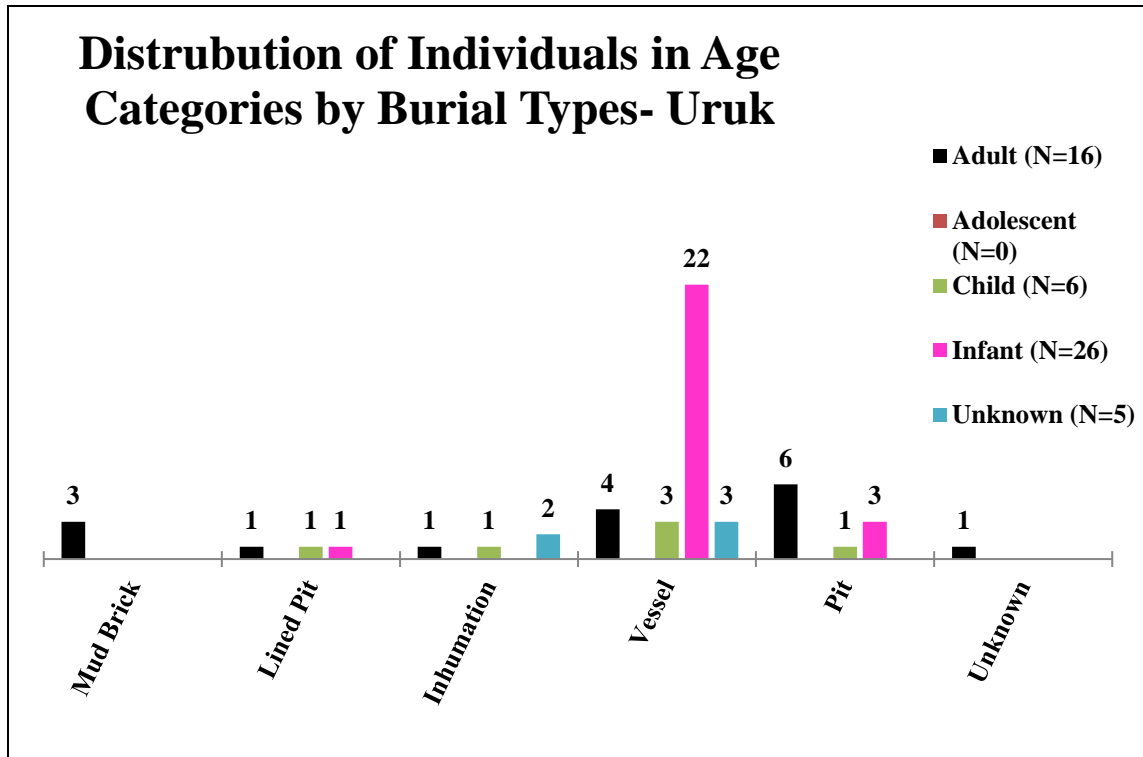


Fig. 5.10: Distribution of individuals from each age group in each burial type- Uruk.

To return to the question of artifacts from the perspective of biological age, it is very clear that what controls artifact distribution is not burial type but demographics. Fig 5.11 shows that in most categories of artifacts, it is the adults who are most likely to have them, and this is especially true for metal items. While the Ubaid graves tend to offer more ornaments to the infants, Uruk graves diversify in the consumption of artifacts, provide more vessel burials to adults, and expand on the tendency to showcase the dead by burying them with an elaborate dress, which is attested to by pins, needles, and

jewelry. For the first time here, we see 'rich' adult burials. This trend continued into the Early Bronze Age, along with the focus on metal regalia.

#### **5.4 Discussion of Ubaid (Middle to Late Chalcolithic) Burial Practices**

To situate Ubaid burials in one cultural context is even more complicated than trying to do so for the LPN, if only for the fact that I cannot understand when the mortuary rituals analyzed are those of local populations or under the Ubaid influence of Southern Mesopotamia. Does it matter to the argument here? If it was the case that southern and northern Mesopotamia differed significantly with respect to what they did with their dead from what we can see archaeologically, then it is necessary to identify what is from the South and what is native to the North. However, in the Chalcolithic, we do not have information from southern mortuary practices to be able to conjure a set of traits that we can distinguish as such. Given what we do see (that is, a similar set of practices in the South and in the North), I will assume that the Ubaid and local variations of populations that concern burial customs do not matter for this discussion. This is also a very complex period, archaeologically-speaking. It is complicated by many archaeological debates, such as ceramic periodization, transitions and continuation levels into the Uruk, presentation in the South vs. the North, and the appearance of religious architecture in the late 5th millennium BC. Regardless of the type-sites that we usually discuss, such as Gawra, Tell Abada, and Arpachiyah, the people whose material culture we call Ubaid were still mobile and opportunistic hunters. Settled life is a greater factor of life than the previous period, but it is undeniable that most of the sites we have are small camps or seasonal areas of occupation.

#### 5.4.1 *Revisiting the Missing Dead*

One of the outstanding features here is the missing dead. It has already been mentioned that this is a defining feature of the Ubaid period in terms of how it appears archaeologically. How should this shortcoming be interpreted? Of course, Ubaid sites are not fully exposed, and excavations are localized, but this cannot be the only explanation. Tell Abada, for example, is an extensively excavated site, and the parameters have been probed; however, a cemetery has not been discovered (Jasmin, 1983: 181-182). Why is this the situation? What does the missing data mean?

Instead of resorting to explanations of archaeological inadequacies, I believe that the lack of data is due to the differentiation of mortuary practices. In *Upon This Foundation: The Ubaid Reconsidered*, Adams, Wright, Hole, and Nissen (1989: 198) have discussed how at survey and little sites, excessive amounts of ceramics appear in otherwise archaeologically barren areas. These are areas usually subject to looting and agricultural development, so it is not difficult to believe that many burials have been lost due to these kinds of practices. What we are finding in terms of ceramics is what has been left from formal graves. In addition, there is no archeological basis to believe that everyone in Ubaid society received a formal burial. Thus, part of the issue might be that we are looking for something that we recognize, but we cannot find that which we do not know: in this case, another burial form.

The fact that we have missing dead is not drastically different from the previous period, as surely this was the case then too. In fact, Ubaid burial practices and cultural developments should be anchored to the LPN, which was the origin of many cultural traits. The most important divergence from the LPN in the Ubaid is the clear age division

based on which burial location is chosen. Infants were always buried somewhere associated with the settlement, whether in connection with some architectural feature or not, and adults are almost exclusively excluded from direct association with architectural units.

#### 5.4.2 *Why Are Artifacts Interred With the Dead?*

The question of importance for the Ubaid should be why are artifacts *not* interred with the dead? During a time of clear advances in technological developments, much of the archaeological material that remains at sites does not find its way into 5th-4th millennium BC graves. The biggest drive behind these innovations is the growing sphere of interaction and influence of Ubaid culture (Stein and Ozbal, 2007: 33; Matteus and Fazeli, 2004). The drive behind the movement of goods in the form of trade aided the development of more and more sophisticated accounting systems. These appear in the form of seals, stamps, and proto tablets at sites like Tell Abada and Degirmantepe. At the latter, stamp impressions on storage vessels from certain tripartite house rooms even matched stamps found throughout the site (Esin, 1985: 255; Yener, 2000: 43).

So far, we know the range of goods circulating in Mesopotamia and beyond, but there is a problem. During this period of bountifulness of artifacts, only a limited range made their way into people's graves, and most of the time they did not. As we can see from the inventory of the Ubaid, there are only four objects for 17 people. Counter to what is expected, the infants here have a vessel and a tool, but the sample size is very limited. Nevertheless, in order to understand why any artifacts were consumed, the pattern in which they were consumed should be the biggest clue. To start with the biggest

difference that appears between children and adults, in general, adults are found with a combination of serving vessels, and children/infants are found with an ornament.

The vessels buried beside people are an important clue to understanding how people received differentiated treatment. Vessels for the adults are found *in* the burial, whereas vessels for subadults *contain* them. Beads are found with children and infants but rarely with adults. I interpret this variation as the result of a differentiated concept of the place of infants versus the place of adults in the Middle/Late Chalcolithic and not as a status or wealth indicator. At sites like Degirmantepe, Eridu, and Tell Abada, there is evidence of activities surrounding secondary production of goods like beer and other foodstuffs. Focusing on Eridu, Periselle (1985: 8) has discussed that certain graves contained cuts of meat and fish, or these goods were deposited on top of the burial structure. At Degirmantepe, tables, benches, and large quantities of vessels similar to those we see in graves also suggest an emphasis on the dwelling residence surrounding consumption of foodstuff. Gurdil (2005: 177-179) and Helwing (2003) have extensively discussed the distribution of space at the site for ceremonial and religious purposes, so I will not go over it here; but I want to bring attention to the idea that this period of clear advances and intensification of the production of goods based on agricultural byproducts must have had an impact that seeped in many aspects of life, and most certainly death.

Adults in Ubaid burials had at least one vessel. In the case of graves with more than one vessel, it is usual that one would be for pouring and/or serving. Based on the 177 burials at Eridu, one of the few known external cemeteries, Wright and Pollock (1987) have conducted a careful analysis on the ceramics contained in the burials and have estimated that there is an association between the increased appearance of vessels in



graves and the use of libn tomb burials, a new kind of burial type also seen at Gawra and Salat Tepe, as discussed here. This burial type is loosely associated with more elaborate burial goods (though still quite limited) and the tendency to contain multiple internments. The same pattern can be observed at the Ubaid cemetery at Ur, where two mud brick tombs show evidence of differentiated treatment and multiple burials (Wright and Pollock, 1987: 327; Woolley, 1955). Thus, I argue that the vessels we see with the dead may not just be burial gifts but are perhaps a part of emerging mortuary rituals that were now concerned with consumption of food and drink. I believe that ceramics should be understood, at least in part, as evidence of activities surrounding feeding and/or feasting with the dead. Whether this happened at the sites of burial or occurred elsewhere and goods were brought to the dead, one cannot say based on what we know archaeologically. Further evidence to support my notion is the possibility that at least in some southern Mesopotamian sites like Susa and perhaps Tell Abada, ceramics may have been manufactured at some location to be provisioned to the dead. If this is the case, then the vessels should be seen as markers of a social event and not simply a grave gift.

For the small children and subadults, it is the absence of this material that is important. Clearly, this part of the population was often excluded from the ideology surrounding feasting and food for the dead. Infants were rarely buried with any objects, but most of all, they did not have vessels. Thus, it is reasonable to argue that the cultural traditions or beliefs that guided libation ceremonies or some form of food offerings did not place the infant in a position where they needed or deserved it. Currently, there is no venue by which I can investigate how the roles of age played out in corresponding actions in life and death for the Ubaid, but it is important to recognize that they existed.

Based on these interpretations, I can argue that objects in graves at this time do not signal status differentiation based on wealth or status, which lines up with the rest of the archaeological record, at least in Northern Mesopotamia, which will be discussed in more detail below.

As discussed in the previous section on the LPN, vessels were interpreted as an index for the body and as objects that could be exchanged or substituted for a human fragment. This behavior is no longer observed during the Ubaid, for objects no longer played the role of humans. One exception to this change is that, in the case of infants in vessels, the buried may have symbolically referenced materials that were integrated into the household. In this next section, I build the argument that while adult burials of the Ubaid were associated with the products of raw materials (as evidence shows libation and feasting activities in connection to the adults), buried infants were connected with their production.

#### *5.4.3 What Structures Ubaid Burials?*

While the motives that structure how adults are interred are elusive since adult burials are vastly unrepresented, especially in southeastern Anatolia, there are valid clues that can be used to evaluate what at least some infants were associated with at death. As already mentioned in previous sections, the Ubaid period started to feature infants in residential structures being buried in areas particularly connected with some production activity. At Kenan Tepe, as can be seen from the appendix, infant burials were either built directly into work areas, such as cooking kilns or food processing surfaces, or were found

in areas with material remains from production, such as burial D.8.162, which was found with many grindstones, hammer stone fragments, and kilns.

Another comparable example comes from Degirmentepe. Located in the southern floodplain of the Euphrates near Malatya, the site provides some of the earliest evidence of more advanced metallurgical technologies such as forging, smelting, and alloying of arsenical copper bronzes by the 5th millennium BC (Lehner and Yener, 2014). Such leaps in technology are clearly achieved in the northern highlands at sites that are within proximity to polymetallic ores from the Central Taurus range, such as the Ergani vein. In contrast, it is evident that southern Mesopotamian sites did not engage with production, but instead consumed these artifacts, as is evident by the total lack of production-based materials one would expect, such as crucibles, slag, and blooms. At Ur, a Late Ubaid (5) grave contained a copper spearhead. From the Susa A cemetery, 55 copper axes, 11 copper disks, a needle, a bruin, and a chisel were recovered, all clearly manufactured in the style of the Anatolian highlands (Hole, 1989:196; Wooley, 1955: 20-21).

Evidence of production at the aforementioned site Degirmentepe is best seen in the specialized but otherwise domestic hearths that were used for expected activities such as cooking and also as a smelting installations for copper. Further evidence of engagement with the processing of metals is found in the large quantities of slag, ore, metal fragments, crucibles, and grindstones, such as those from Building I (Yener, 2000). Otherwise domestic in character, this structure yielded materials related to metallurgy from every room. These rooms not only provide evidence of involvement in metal extraction and working, but they are also some of the same rooms discussed above that featured ritualized functions. Wall paintings with sun-like motifs made from copper ore

and smelting by-product pigments (limonite, iron ore, malachite, etc), basins, podiums, and the integration of human fragments within structures (a human mandible was built within the oven in Building D) attest to the ritualized activities that occurred. Five out of the eight tripartite structures that were excavated were also associated with burials of predominantly children and infants.

These sub-adult burials were located in the flanking side rooms of the central hall of tripartite structures, though a few are in the central hall, such as the example in building DU: 34, where individuals were interred in pits (8), silos (5), walls (5), pots (14), and 7 unclear methods of internment. Brereton (2013) has only two adults, but I was unable to find a record of them in the excavation reports, Brereton's provided burial inventory, or Ozbek's (2001) analysis of the skeletal remains. Nevertheless, these infants were buried in areas of the settlement that produced evidence of metalworking and stamp seals as well places that had an association with food storage and preparation. The latter is also observed at Tell Abada, where infants placed in food storage containers were sealed with gypsum and plaster, both baked and unbaked, as if they were cooked food or prepared to be cooked (Jasim, 1985: 35).

The other group of burials at the site is associated with foundation or infrastructural burials that seems to be integrated into the very fabric of the house. This practice is observed at other Ubaid sites across Mesopotamia, such as Kenan Tepe. In one instance, an adult female burial in a pot was placed into a wall during a building phase of a cell room, which was remodeled multiple times over a few generations (Parker et. al., 2008: 108-109). Another burial of a child was interred between the 2nd and 3rd phase of the construction of a foundational wall of another cellular building. A sub-adult was also

found laying *on* one of the mud-brick cell room floors, and on top of it, the foundation wall was erected during a period of occupation (Fig. 5.12). Such practices are found in many sites during this time, including Tell Kosak Shamali in Syria, where a child pot burial was integrated into a wall of a building that was remodeled at least three times after the remains were interred. At Yarim II, infants are found deposited at the foundational level of some buildings. Similarly, in the Hamrin of central Iraq, at Tell Abu Husaini, 19 out of the 22 pot burials were interred in foundational architecture and beneath house floors. Significantly, every single domestic structure at the site was associated with infant burials (Chiocchetti, 2007: 117-118; Tusa, 1980: 227).

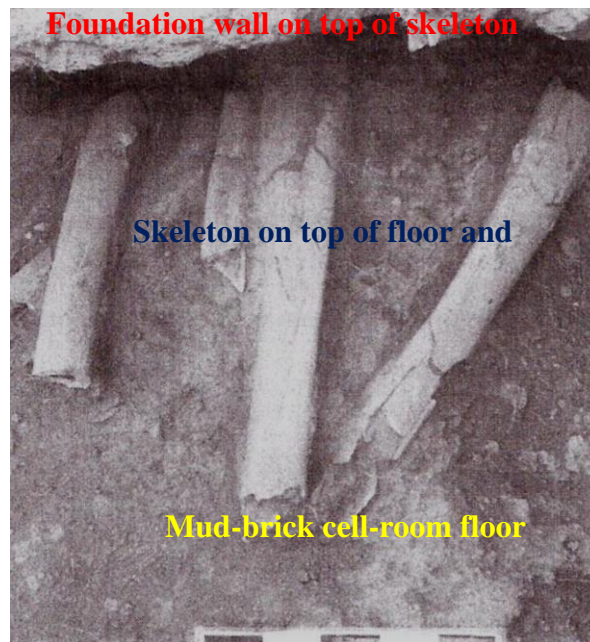


Fig. 5.11: Kenan Tepe, Ubaid burial L90. Modified from Parker et. al., 2008, Fig.6.

In the Hamrin region, Tell Abada shows that infants resided in other realms of the house, namely, those used for administration and storage. Ten buildings were found from extensive excavations that revealed Ubaid 2 and 3 occupational levels, represented by Level II and I respectively. Level II was exposed in the focus Building A and Building I. Building I did not contain any burials and stood out from the rest of the structures at Abada with its differentiated architectural layout of four parallel rows of rooms and courtyards (Bernbeck, 1995: 46). Most likely, this building was used as a storage facility and a sheepfold (Jasim, 1989: 83-84). What is significant is that this unit was not a domestic feature, and just like at Degirmentepe, such buildings did not contain infant internments. Building A, however, contained about half (59) of the 129 burials found at the site. In Level II, 32 burials were in Building A, and 16 were found scattered across the site. In Level I, however, very few burials are scattered across the site, and out of the 49 burials associated with the occupational phase, 18 become concentrated in Building F and 27 in A (Hole, 1989: 197; Jasim, 1989: Fig. 28) (Fig. 5.14).

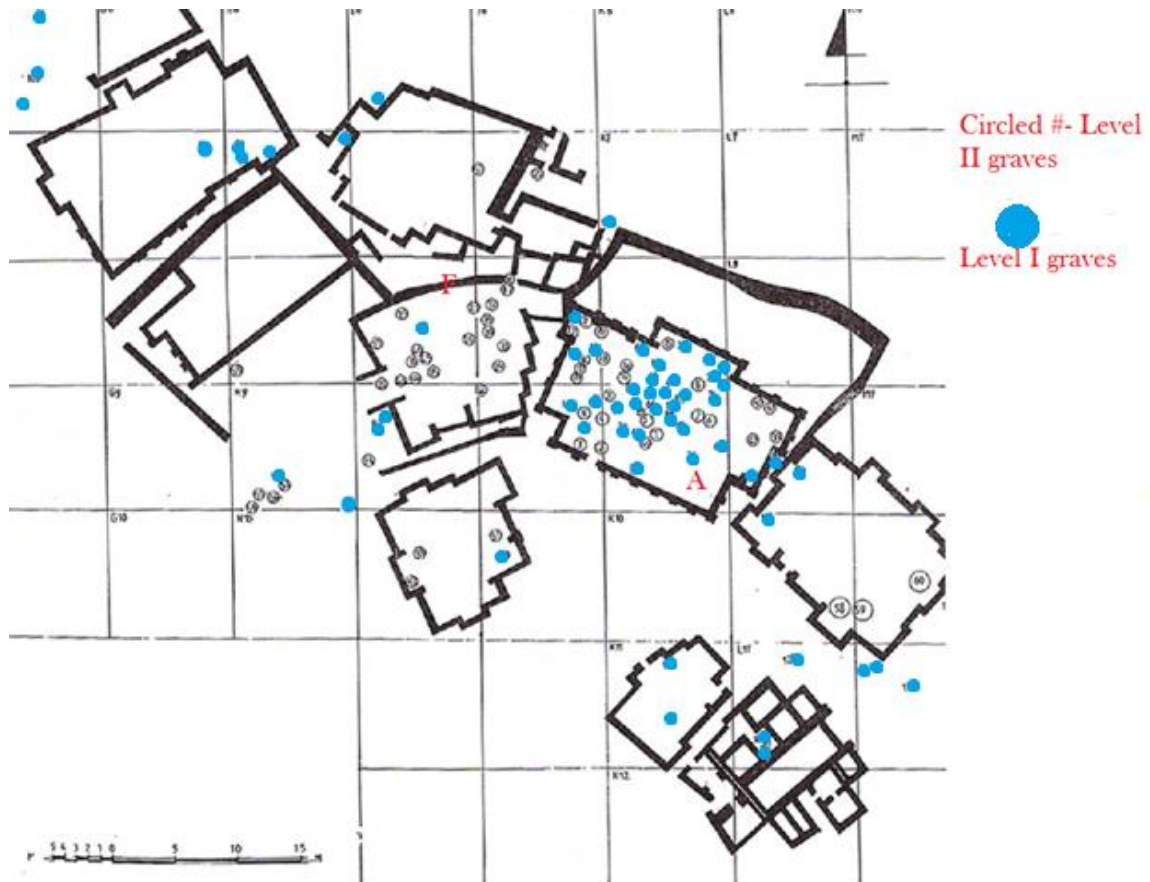


Fig. 5.12: Tell Abada plan, showing infant burials. Modified from Jasim (1985: Fig. 28).

What is significant about the Abada graves distribution is the difference in building activities. Building A is noted for its elaborate system of compartments, central room, and cellars. From the building alone, 90 clay tokens were recovered, which must have served as some kind of transactional tool (Schmandt-Besserat, 1992). The infants here were sealed in large ceramic vessels with plaster and/or gypsum. It was suggested above that this method of infant burial resembled a food preparation technique, but ethnographically, we know this to be a food storage or an administering method (Jasim,

1985: 35). Just how different this sealing method is from the covering of the mouth of the vessel with another vessel should be questioned. There is the possibility that this is a more symbolic or religious practice observed during the Neolithic that was connected to purity or a concept of danger and ghosts surrounding a child's death, as is discussed by Richards (1996: 182-183) or Gottlieb (2004: 93-94). Of course, all of these acts, as is often the case, may have been performed for all of the reasons discussed here.

Based on the case studies from Kenan Tepe, Degirmentepe, and Tell Abada discussed here, I can argue that infant and small child burial practices revolved around concepts of production, storage, and economic infrastructure. Infant burial rituals were structured around and in turn, structured daily practices based on the household, the house life-cycle, production/bountifulness, and administration. Thus, infants were buried outside the houses not because they were not important for society as a whole, but because they became integrated into a very specific ideology about the function of the household, which in the Ubaid was undergoing radical changes. Furthermore, I believe that it is at this time that the production of a certain good, namely metals, became involved in a system of systematic religious belief and practice, which further infiltrated concepts of wealth, power, and social legitimacy. This will be further discussed in the following sections.

I have no insight into the direct ideological processes that connected babies' deaths and household happenings over 6000 years ago, so I cannot offer an explicit explanation about the thought process or the social venue that resulted in the tendency to inter infants in houses; however, I can make some deductions based on the archaeological record. Part of this deduction stems from the fact that burying dead babies in pots and



the house is a fact of life from the very beginning of settled life, not only in the Near East, but in the Balkans as well (for an extensive and comparative discussion of such infant burials, see Bacvarov, 2018). The Ubaid period should be seen as at least partially continuing the traditions of centuries past. Even though the meaning may have changed regarding why people do what they do, burial practices were something easily reproduced without necessarily understanding why. For example, we color eggs for Easter, but how many of us do it while keeping the idea in mind that we are re-enacting Jesus' blood dripping on a newly laid hen's egg? Simply put, the burial of infants in close proximity to the household is something deeply embedded in the prehistoric traditions of a wide region, and this is a reason for why it continued to occur in the Ubaid .

Connected to the idea of inherited traditions, I discussed in the LPN section how ideas of fertility, reproduction, gender, and sex structured burial practices and other aspects of settled life. These concepts surely continued into the Ubaid, but, of course, must have been transformed in time, space, and with different social pressures. While the social pressures of the LPN grew from the struggles that people were facing as a result of a more settled lifestyle that required them to control the environment to a certain extent, these pressures were even more pronounced during the Ubaid, when some of the larger villagers began to invest more and more into agricultural subsistence. This investment became the base for extended trade networks that further integrated Northern Mesopotamia into a wide geographical area. Secondary farming and dietary diversification created new venues for people who were still mobile to become tied to settled life, create versatile social relationships, and, of course, social roles. It is through this context that the focus on production should be considered.

Above, I proposed that this push to create and diversify technologies and products was not only a profound aspect of Ubaid life but also a sacred one. I argue that the infant burials we find at settlements connected to areas of production and storage were conceptualized to tie into the emerging religious thought systems of Mesopotamia as a whole. This argument warrants the question, “why babies?” The answer that I offer is twofold. First, I have argued in the previous chapter that babies have to be connected to ideas of fertility, reproduction, and regeneration, which, as I discussed, had been a concern since the Neolithic. It is not difficult to imagine that their existence is mysterious or magical. To draw the parallel, the conception, production, and development of a baby has transformative properties, just like many of the raw materials people were working with. Cooking dough in a fire to make bread resembles the process of conception, which is still a symbolic reference often drawn in many Near Eastern and European villages while referencing babies, reproduction, and food. Thus, it could be argued that children and infants were drawn into a symbolic repertoire of association with aspects of life that were now focal to everyday life and seemed to mimic the process of reproduction, which presents multiple transformative stages shrouded in processes that may have been seen as mystical or magical.

To give an example, the smelting of metal involved many steps, investment, and involvement with fire, which may look like a functional process from the modern eye, but for prehistoric people, it was clouded with mysticism and wonder (Esin 1989: 137; Helwing 2003: 71). Evidence of the relationship between ritualized activity, metal production, and infants can be found at Degirmentepe, where these elements were connected through buildings, infant burials, and associated metal smelting activities.

Yener (2000) has extensively discussed evidence of ritualized activities surrounding mining, smelting, and metalworking at production sites, such as the Kestel and Golbasi mines. Further evidence of the ritualization of metal production can be seen from the excavation of these mines (which provide material similar to that which was found at Degirmentepe) and a few dozen burials spanning the Chalcolithic.

The connection between infants, rituals, and products can also be seen at Abada and its large collection of infants in food storage vessels (Fig. 5.15). As mentioned earlier, it should not be overlooked that the treatment of infants is comparable to the treatment of foodstuff. Ethnographic examples can also provide examples of how humans at death undergo similar processing techniques. For example, the Berewan of Borneo ferment rice and produce wine in a fashion that is identical to how they treat the dead body from the point of death, decomposition, and burial (Huntington and Metcalf, 1979: 55-57, 8; Metcalf, 1987: 96-97). At Abada, the babies sealed in gypsum and plaster mimic the baking of the vessel, the storage of goods, and the preparation for a transaction that would occur during a trade.



Fig. 5.13: Food containers from Tell Abada used to store infants.  
Reproduced from Jasim (1983).

The role of infants in the burial rituals was also connected to the fact that they were not yet members of society in the way adults were. We can see from the burial record that at a certain stage of development, just like in the Pottery Neolithic, they became different members of society. In a society where, based on what we know, children did not acquire status from their parents, babies went through an unknown period, and it is in this period that they play into rituals surrounding the production of goods, keeping of goods, and household infrastructural incorporation. We do know that with agriculture, infant death rates must have been comparatively high, and this reality influenced how babies were conceptualized. Lancy (2014) has proposed the idea of "delayed personhood," which is based on a study of 200 cross-cultural case studies that span from modern times to the Mesolithic and from hunter-gatherer to industrialized

societies. He examined how populations differentiated infants at burial based on their conceptualization of children into the larger social context. Lancy found that people who hold off of attachment to babies until a more certain stage in their development or otherwise withhold normative behavior towards them (such as for an adult), also tend to treat them in a non-standard way at the death when compared to the rest of the group. I have also spoken to villagers, particularly women in southeastern and southern Turkey, who have expressed that they wait to name them until they are sure that they will live, usually past the age of two. Similarly, they have shared that they cannot love the baby "yet." Though the difference in time is significant, ideology in the region runs temporally and spatially. Thus, it is not impossible to look at infant burials also as the result of them not being a proper human yet. Perhaps it is during this time that they are attributed with more mystical properties that allow the adults to perform religious and ritualized rites based on the association between infants and processes of transformation of raw material and the home.

#### *5.4.3 Burials as a Proxy to Social Organization in the Ubaid? It's Complicated.*

One of the most debated features of the Ubaid period is its complexity. To summarize this issue, which is beyond the scope of this thesis, there are two dominant ways to read the archaeology of the Ubaid. The first is to emphasize those features of Ubaid settlements that have the potential to create institutionalized hierarchies based on the distribution and mobilization of commodities. The increase in production that I have emphasized here is used to support for this argument (Sudo, 2010). For an extensive review of this model of Ubaid societal organization and its supporting archaeological

evidence, see Stein (1994), Stein and Rothman (1994), Forest (1996), Pollock (1999), and Wright (1984). In the model, it is accepted that the Ubaid was a two-tier chiefdom system, and, consequently, elites originating from clans had preferential access to more resources, which they used to establish their standing in society. Archaeologically, bigger houses versus smaller houses were used to distinguish the residence of the richer and the poorer members of a community. By controlling local resources, elites were able to manipulate local surplus and tap into trade networks. The fact that these elites do not engage with luxury items is seen as a deliberate choice that ensured that the community was bound under a framework of sharing and distribution that further ensures proximity to wealth for the chief. One of the main methods for distribution and mobilizing power for the Ubaid elites would have been the temple. It served the chief to morally legitimize power and mobilize it through the facade of religious ritual.

The other take on Ubaid social organization cannot find the chief. A classic chiefdom does warrant a distributive economy based on wealth and staple finance, but as explained above, Stein (1994) essentially substitutes this model with a religious tribute. Nevertheless, it remains a fact that until the very end of the Ubaid, most settlements are too small to speak of chiefdoms, and architectural, material, and burial traditions are essentially unchanging, showing very little variation. There is absolutely no wealth consumption or evidence of differentiated status in death or life, except for the house sizes. This alone cannot be a base on which to argue for the presence of a chief given the fact that we have house size and style differentiation 8000 years ago in Early Neolithic societies, even in the Balkans (Nikolov, 2019). In this reading of Ubaid society, the organization was more or less comparable to the LPN, and any hierarchical functions of

leaders were temporary or situational. This position is supported by Akkermans (1989), Hole (1983), and Jasim (1985) based on their excavations at Ubaid sites.

So what do burials bring to the table in terms of helping us understand social complexity? Are they representative of the social organization, and do they show differentiated status based on power? Or do they tend to mask differences that we observe through other archaeological material? First, I want to draw attention to the fact that it is during this period that social differentiation based on status and power even warrants an inquiry. As I have discussed, in the LPN, mortuary practices were diverse and encompassed many realms of society and were not means by which to express wealth or status. The archaeological record of the LPN reflects this lack of differentiation between burials, households, and artifactual material culture.

In the Ubaid, as we see, the possibility of social ranking is a concern, mostly due to what we know archaeologically from the southern sites. I argue that we should see mortuary practices in the Ubaid as evidence of a society in which the chief is largely non-existent. The most obvious data here is that adult cemeteries from the South and North like Eridu, Ur, Arpaciya, and Tell Kashkashok II show us that the 225 adults buried off-site were provided with a fine dining set and nothing else (numbers taken from Brereton, 2013). The infants buried in architectural features also have no material goods based on which to identify a differentiation. Judging from the burial evidence, it is difficult to imagine that a social organization based on marked status existed or that status was transmitted through kin. In that case, we would expect to see those infant burials integrated into mortuary rituals that emphasized the community versus life phase (infant, child, adult, etc.). Of course, lack of evidence here cannot mean that such differences

were not masked at death, but I lean on what is already known archeologically to make this deduction.

It is necessary to recognize that many of the expectations or traditions that we see in the North may be a case of influence from the South. The process would not be defined as cultural emulation, but rather an infiltration, particularly of religious and elite ideology. Even in the absence of defined elites in the North, their ideology can be strong within the sphere of influence of Mesopotamia. Though it would be wrong to deny the localized and indigenous nature of many sites that fall in the Ubaid horizon of influence, especially during the earlier periods, many of the elements that we archaeologists look for and recognize in the North are sought out because they are known in the South. The problem is that a lot of things are different in the South. From the scale of settlement size to the emergence of proto tablets, everything in terms of development moved much faster in the South than in the North. A particular case of concern is the existence of shrines and temples that existed in lower Mesopotamia since the late 5th millennium BC. In contrast, in the North, there remains to be a single architectural unit we can classify as a temple, or for the lack of distinction from residential features, be it for the absence of such architecture. What we do see are familiar elements such as the tripartite and niched construction, podia, benches, specialized ovens, etc. in features that are very much residential in nature (see above; Tell Abada and Degirmentepe, for example). Simply put, any deduction about elite emergence in the South and their dealings with temple economies would be very difficult to apply to Upper Mesopotamia. Having said that, very few Ubaid sites exist in the South that we know of because they are so deeply buried under sediment that excavations proved difficult, but from what we see, the burials in the



South are identical in nature and contents to those discussed here. Thus, whatever powerelites were able to establish in the South was not reflected in their burial customs.

Looking at intramural infant burials, I suggest that finding a means of differentiating those buried is possible. For the LPN, I had proposed that one of the earliest bases for social structuring was that between males and females. I believe that there is evidence to make this assertion for Ubaid child and infant burial practices.

Looking at the distribution of infants in Building A and Building F of Level I and in the discussion of 5th millennium BC burial practices, Forest asserted that the two buildings were different based on the contents. Building A had an administrative nature and F had a production/storage function, which he proposed were male and female elements. The infants that were buried in A were male and those everywhere else were predominantly female because the "boys" were centered around the chief's house. Nissen (1989) says:

At Abada there is a very special distribution of the graves: half for Building A, probably the building (belonging to) the head of the village for several reasons: the architectural features of the building, the material it contains, including tokens, and only in this building, and the (concentration) of graves. It is not only the house of the head of the village but probably the one who built it... The distribution of infant tombs is very strange. Actually, there are two halves. While one-half of the infants is evenly distributed within the whole settlement, the other half is concentrated within two buildings, actually: A and F in Level 1. I think that this division is related to sex. I think that males are mainly in Building A. I have said elsewhere that the 'Ubaidian buildings were divided into two parts according to sex. In the case of Building A of Abad, it is easy to see the difference between the northern and southern parts. It's not, truly not the same contents. You find pottery in the south, you find tokens to the north. I have reasons to say that the male part is the northern part, the northern wing. And the concentration of infant graves is only in the central and northern wings. Then you find the female infants, scattered in the settlement because they are not considered important by the people. And the males, the boys, are gathered within the chief house.

(Nissen, comments in Forest, 1989: 195)

Nissen's argument is intuitive and based on the interpretation of the archaeological context. Having no *a priori* reason to make this assumption, Forest's

argument falls short, not in the least because we have no evidence-base on which we can gender the different buildings other than the activities that one must assume had to do with administration. However, the idea that there is a differentiated treatment between female and male babies might not be completely useless. Özbek (2003) has provided evidence of intentional cranial deformation in 13 out of the 31 skeletons found at Degirmentepe that could be studied. All the infants and children that could be used for this study (which needed fairly complete crania) showed evidence of this practice, which is by no means novel in the Near East. Özbek showed that the process began with one wide band around the frontal that wrapped around and under the occipital and was applied shortly after birth. Then, past the age of one, a second bandage was added perpendicularly to the former modification.

We do have evidence of cranial deformation from other sites from all over the Near East and Levant, and this practice has been attested to since the Pre Pottery Neolithic (Kuijt et. al., 2008). From Anatolia and Mesopotamia, we have additional evidence of cranial deformation during the Chalcolithic from Seyh Hoyuk (Senyurek and Tunakan, 1951), Kurban Hoyuk (Alpagut, 1986), Eridu (Lorentz, 2010: 128), Arpachiyah (Molleson and Campbell, 1995), and Seh Gabi in Iran (mentioned in Özbek, 2003) and Choga Mish (Ortner, 1996: 319-320). It is understood that such practices might show status, identity, or ethnic differentiation between these groups. During a time of extensive connectivity between groups within and across wide geographical areas, this might have been an important distinction for people at some sites to make, especially at Degirmentepe, given that it functioned as a network node and a production center (Esin, 1989).

An interesting pattern emerges from some of the sites. The study found that all of the children who lived long enough for the bone to deform had their heads bandaged, save for one, which was probably a male. This raises the question—is there some distinction between the male and the female children that are buried in these settlements that we cannot see? Özbek's study is impossible to correlate to Gurdil's list of burials, so I cannot argue for the distribution of modified versus non-modified skulls; thus, I cannot speak of the validity of Forest's impression. However, some sites in Northern Mesopotamia do show the same pattern as Seyh Hoyuk, where only the adult females show skull modification. From the ophidian figurines of the Ubaid, we can attest to this practice in babies (both females and males) who show a clear and elongated head. The female figurines are clothed from the waist down, holding their waist or a nursing infant, and the males are holding their sides, are naked from the waist down, and hold a shaft or some rod (Fig. 5.16). Differences here are stylistically non-existent, and even the adornment is the same, but the activities represented are differentiated.

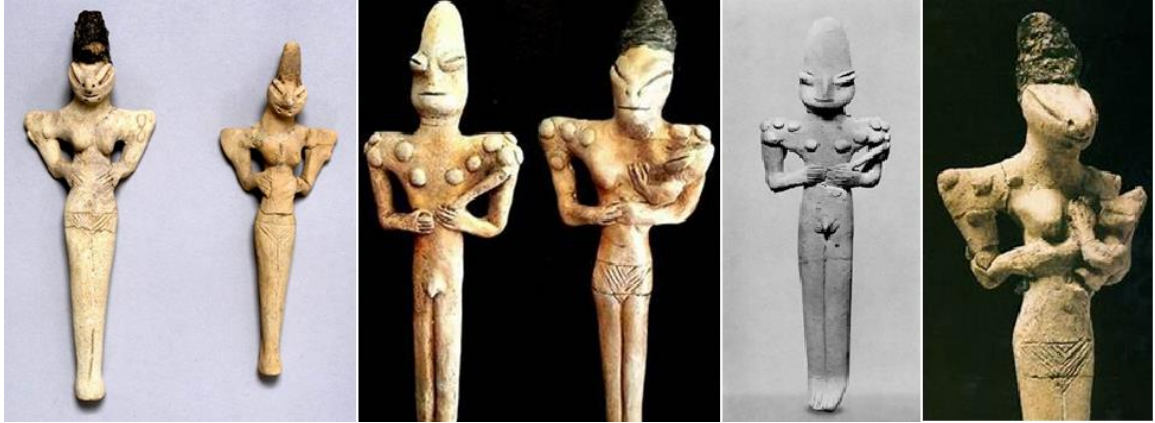


Fig. 5.14: Ubaidian figurines from Tell al Ubaid and unknown provenance show female and male forms (courtesy of The British Museum).

It would be rash to argue based on what we know that infants were differentiated spatially for burials. Nevertheless, it is difficult to make interpretations about infant burials based on the imagery of adults because these images are highly stylized. For example, we know that not everyone's head was deformed, but in every portrait it is. Also, there is a difference between the way that male and female heads are shown. Thus, this representation can be interpreted as depicting ideologies rather than realities (Deams and Croucher, 2007; Stein, 2014: 56-58; Campbell and Daems, 2017: 581-583). The Degirmentepe samples allowed for the study of cranial deformation because of their exceptional preservation, but at other sites, burials have not been preserved well enough to enable such inquiries. Many of the samples that we have or have had have never been analyzed. Thus, questions involving the spatial distribution of infant burials based on sex and other differentiated treatment are still left to be answered in the future as more material comes to light.

Finally, I want to warn against taking all that we see in burials as normative behavior. After all, many of the dead are missing. I do not think it is realistic to expect every dead baby to be buried in special units of the house or every adult to receive a formal burial extramurally. It seems that it is highly probable that a large number of the population might have not received a burial per se. Just as I discussed for the LPN, groups that moved may have had a different way of discarding their dead. Thus, what we see in Ubaid settlements should not be viewed as the only form of mortuary practice that existed.

The Ubaid period was a culmination of the geographical and cultural phenomenon that was a continuation of the developments that took place during the Neolithic both in the North and the South. In this section, I examined the burial practices of subadults, in particular, and questioned why they figured into the intramural archaeological record while the adults figured into the extramural. I have argued here that small children were likely integrated into a specific system of belief connected to the processing and preparation of agricultural byproducts as well as metallurgy. Adults, on the other hand, are often found outside of the living realms and were associated with products resulting from the processing of agricultural byproducts. In this society, adults most likely occupied a different social realm than subadults because they did not share the same level of integration in society. As I have proposed, we do not have evidence of an institutionalized elite system that could support a chief system, in which case babies would inherit status from their relatives. In the absence of this social level, the most visible social role that we can see archaeologically is one that is defined by age, as it was in the Neolithic. Though discussions on sex and gender are shaky for the Chalcolithic,

material culture shows us that (at least based on sex) males and females had different roles. We find evidence for this in the obvious difference of what male figurines are shown to be doing versus the female counterparts, whose sex is clearly expressed in the ophaid figurines (Fig. 5.16). How this was translated or if it translated into the burial practices is still unknown for both subadults and adults. In the next centuries, this changes, and young children figure more often into burial customs shared by adults, as I argue in the following discussion of the Uruk cultural sphere.

### **5.5 Discussion of Uruk (Late Chalcolithic) Burial Practices**

I would argue that, in the case of mortuary practices, the biggest problem lies in the fact that burials are known from just a couple of sites from the North. During the Uruk periods of the Late Chalcolithic, interpretation of the archaeological record is usually burdened by regional ambiguity, disagreement about how Uruk influence should be interpreted, when it should be brought into question, and where. In the South, where the Uruk prototype is found, there are barely any sites, let alone burials. The issue is so perplexing that even Algaze in his thorough volume on Uruk emergence, economy, and urbanism, wholly avoids the topic (2008). Akkerman and Schwartz (2003), too, in their review of the archaeology of Syria, give a review of the burial customs of every period but the Uruk's.

Brereton inventories the burials across Mesopotamia and counts only 174 burials after 3800 BC, a period after which urbanism takes off (2013: 375). During this period of the first urban revolution, it is expected that since more people were at the settlements, more people would die, but this is not what we see across the region. There should be

tens of thousands of bodies buried, but despite the efforts of archaeologists to look for them during regular excavations and surveys, they have not found. Given the discrepancy between the scale of known occupation and the burial record, I would argue that many graves have been subject to looting, especially in antiquity. As I have mentioned, at Uruk, perhaps over 25000 people lived at the site, but the dead are absent. Given the extended occupation of the site, it is very probable that many graves were dug up, first by the Warka workman and then in subsequent periods as well. After all, at this point, there was enough in some graves to warrant a looter's interest.

The initial phases of the LPC or the Uruk in the South are poorly understood archaeologically in general and especially when it comes to the burial record. Recent excavations in the North, especially, have shown that despite the looming Uruk influence from the South, at least until LPC3 (around 3600BC), the archaeological record should be viewed as the result of indigenous and local development. For example, Arslantepe is a prime developing urban center in Anatolia's Malatya with completely local features and influences until the very end of the settlement's life (Frangipane, 1997; Stein, 2001; Ur et. al., 2007).

It is truly difficult to generalize about what happens during mortuary rituals in Mesopotamia as a whole, especially since we mostly have burials from the North. Much of the rest were random and singular graves from sites with longer occupations or survey encounters. One of the only extensively-researched settlements that can be used to trace the development of LC burial practices is Tepe Gawra in northern Iraq. To analyze any trends, I will often refer to Tepe Gawra, which currently has the largest number of Late Chalcolithic burials partially published and described.

### 5.5.1 *Why Were Artifacts Interred?*

First, I want to preface this discussion by saying that from LC1-LC3 (4100-3700 BC), there is a sharp rise in the number of objects and the number of people interred with lavish objects. However, with 390 burials coming from Tepe Gawra, this view is highly skewed. One hundred and three individuals were recorded to have at least beads in their inventory, and almost everyone was accompanied by a minimum of one vessel. This repertoire is not representative of other sites, however. For example, the only site with more than a few graves that we can speak of—Qualinj Agha in the lowlands—shows a single rich adult burial from 47e. Infants have no grave goods, while at Tepe Gawra from Level XII to Level X and then again in Level VIII/IX, children's graves have the wealthiest burials. Thus, Tepe Gawra is not necessarily representative of other LC settlements.

In LC1/ELC2, a continuation from the earlier Ubaid traditions can be seen where predominantly children and infants are found buried in residential buildings (see Tepe Gawra graves G36-106 to 7-026 in appendix). In these levels, however, some burials show an increase and elaboration of burial structures, such as the more frequent use of *libn* and stone cist tombs (Peasnell, 2002). The burials are concentrated in two specific buildings. In one there is evidence of food product based on the large quantities of cooking vessels and the association with a large oven. In the other, more household items such as spatulas, spindle whorls, and grinding stones were found (Rothman, 2002: 86). What stands out is that some burials were afforded lavish ornamentation, still mostly in the form of beads. These beads, however, were made from a variety of materials, such as gold, ivory, obsidian, and shell. These burials are contemporary with grave 64/G from



Salat Tepe, in which an infant is buried with over a thousand beads made from different colored stones.

Continuing to follow the trends at Gawra, Level X/XA (LC2) departs from the previous settlement organization with a segregation of buildings based on their function. Activities connected to religion, crafts, administration, dwelling, were now performed in separate buildings throughout the settlement (Rothman, 2009: 38) (Fig. 5.17). Houses or structures with residential function were not as elaborate or numerous as they were in the previous periods and did not hold clusters of burials (Rothman, 2009: 24).

The burials from 107 graves with 108 individuals are still mostly of subadults (Rothman, 2009: 89). Though the internments are not clustered anywhere in particular, it seems that the richest graves are concentrated in what has been described by Rothman (2009: 24) as a temple or cult building and in part of an administrative building in 5S. The temple is a large tripartite structure with a portico entrance, a large hearth, podium, a vessel embedded into the central floor of the building, and a niched back wall that faced the entrance. The other tripartite building was a secular and public building that had some domestic or production contents (Rothman, 2002: 93-96). These two buildings represent the wealthiest burials from this level, as can be seen from the Gawra appendix (Burials 142, 266, 180, 181, 142). The grave inventory shows that out of the 89 subadults, 31 have burial goods that consist of more than a ceramic vessel. It is significant to note that here still, not a single adult has a comparable burial.



Fig. 5.15: Level XI/XA Tepe Gawra settlement plan distribution.  
Reproduced from Rothman, 2009: 38, Fig. 7.

The materials interred in graves largely continue to follow the previous trend of ornamental lavishness in subadult graves. As can be seen from the contents of the burial, the materials used included more gold and copper, and more graves had such goods. Silver and copper rings in an infant grave are found at Hacinebi. Though often seen as serving ornamental purposes, I think that it is more appropriate to interpret rings as monetary/currency. They are used in this way in imagery representations and are often

found in groups of two (see Korucutepe in the inventory, grave K12-3). Other infant burials have been found in LC (4200BC), most recently at Crai Resh in Sinjar, where an infant was adorned with a carnelian, lapis, and gold bracelet (Kepinski, 2008: 288). At Tell Brak, infant burials are interpreted as being associated with a ritual deposit in important settlement areas and are viewed as a foundation deposit. For example, in the Basalt Threshold Building in Area TW, three neonates were buried with some eyeleted or spectacle idols, a popular and probably religious symbol at Brak that is also seen at Gawra. The area upon which this building was erected was leveled and prepared with a red pigment and infants' bodies. One of the infants was buried with over 1500 beads attached to some clothing made from obsidian, shell, soft stone, and mother of pearl (McMahon and Oates, 2007: 155; Oates, 2002: 119). Other notable infant burials are from Tell Qalinj Agha in northern Iraq. One infant was found with an obsidian kohl applicator with gold bands and gold beads. As was often seen in Gawra, another burial at Tell Brak was accompanied by gold rosette ornaments (Abu al-Soof, 1969).

The materials deposited at this point contained a much more varied repertoire of objects, such as tools, stamps, and stone vessels. The inclusion of weapons became more common, such as the slate axe head and mace head in burials 142 and 266, which were part of the repertoire of richer graves. Weapon interments were also found in the Korucutepe male burial K12-4, 5 with raw iron mace heads. The Korucutepe adult burials were some of the only ones found during this period in Turkey, as can be seen from the tables above, and they are a prelude to the Level X burials at Tepe Gawra.

In Level X at Gawra (see Late LC2 burials in appendix), the settlement was rearranged once again in a way where the special functions of the previous period

disappeared and craft production (to an extent) returned to the residential features that flanked the centralized temple building to the North. This can be confirmed by the presence of seals and stamps in these structures (Fig. 5.18) (Rothman, 2002: 121). The burials at this level were comparable to those found in the levels before, though more tended to be interred in libn burials, like six of the seven adult *libn* inhumations. This group of adult burials were clustered in a series of rooms that resembled smaller temple features, such as domed ovens, podia, and benches that were built right on top of the tombs. Just South of these structures, in an area of open visible space, four more libn tombs were placed. These two groups represent the wealthiest graves interred in this level at Gawra, and for the first time in Mesopotamian prehistory, they are for adults. Amongst the notable finds are items made from electrum, such as the wolf's head, rosettes, and pendants. In this period and the next, it is evident that graves with weapons tend to become more common. It is not that there are many of them (only five from LLC2 to the end of LC3), but they are found in groups of two and are more diversified with respect to material and form (see, for example, ceramic ballista in grave 52).

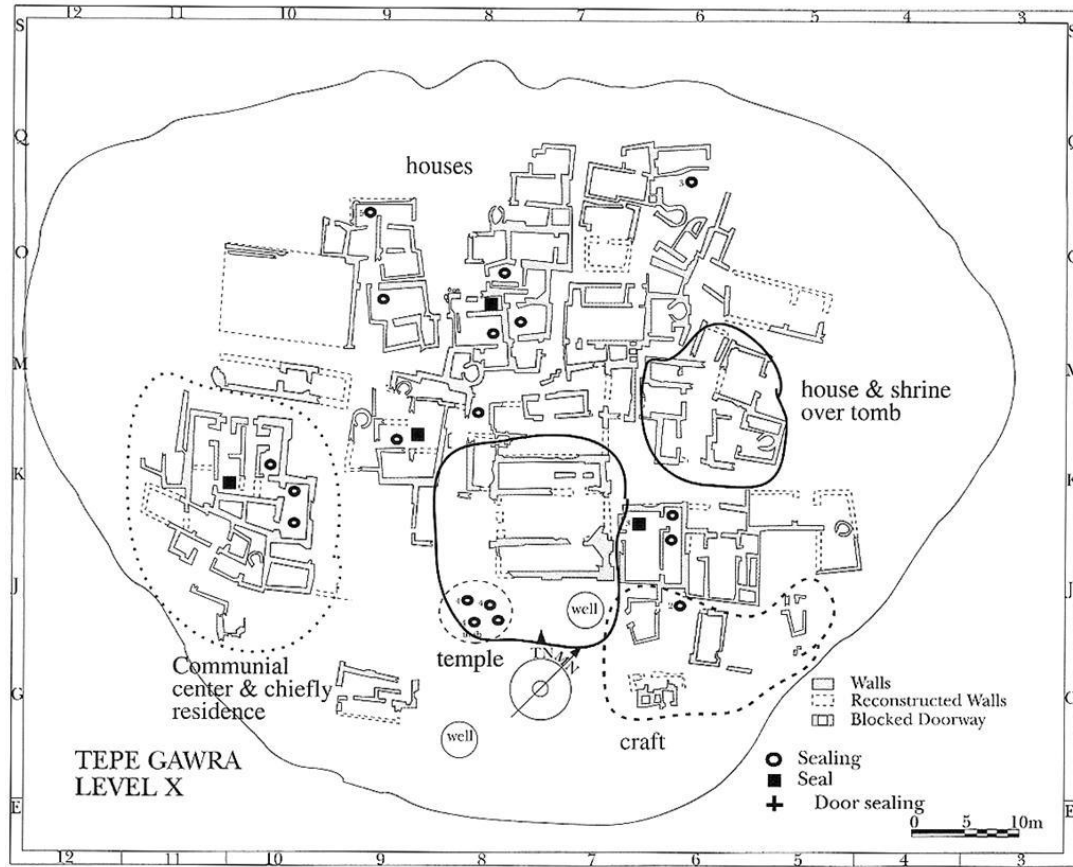


Fig. 5.16: Level X Tepe Gawra settlement plan distribution.  
Reproduced from Rothman, 2009: 38, Fig. 7.

From this discussion, we see that burials in the LC1-3 moved from residential buildings to structures of production or administrative function and then to those that had a religious function. In the earlier phases, infant burials with ornate, and expensive ornamentation began to appear; and then towards the end, both adults and infants are found in rich burials. From the materials that we find, it seems that object internment could be understood as serving display-related purposes. The oolite jars, ointment

containers, kohl applicators, and rich graves that show pigmentation were used during burial (at least at Gawra), but with the addition of the graves presented here, the assemblage speaks of a funerary display that involved a great deal of pampering of the body at death.

Such funerary displays can be interpreted in a few different ways. First, we can speak of the rise of elite individuals who could afford to show status by burying extended kin and infants with wealth, implying that elites could transfer their power (i.e. that it is inheritable) (Stein, 1999: 25; Kepinski, 2009: 123; Peasnell, 2002: 233; Rothman, 2001: 390-391). Brereton correctly points out that a big flaw with this line of thinking is the assumption that infant burials arise from a tradition of rich adult burials, from which they inherited power. As we have just seen, the opposite is true (Brereton, 2013: 341). I agree that a big aspect of the treatment of infant burials is their long tradition of intramural burial in association with household or other settlement features. As religious beliefs and settlement concepts evolved, these burials received a different treatment. I would argue that in the early stages of the LC, infants were perhaps adorned with luxury items because they became attached symbolically to the products that they were usually associated with. In the Ubaid period, infant and child burials followed the home, but the home was often a place of religious, dwelling, and production activities. As production and elaboration of artifacts intensified in the LC due to complex trade networks that allowed a steady flow of more raw materials than ever before, in a way that is not accessible for me to understand, child burials continued the tradition from the 5th millennium but also became associated with the display or the *consumption* of objects. I propose that infants were, to say it very simply, special. We already know that they were involved in foundational and

ritually-prepared areas in Abada and Tell Brak as well as many of the afore-mentioned sites across Mesopotamia. It is not a coincidence that the longest and largest structures during the Chalcolithic housed the most infant burials.

Brereton (2013: 345-349) builds upon Joyce's (1999) argument, which states that children have the possibility of disturbing or strengthening social relationships that are based on elite alliances that aim to expand or mobilize power. The death of a child was viewed as a danger to the strategy that families/kin applied in dealing with their authority over wealth. To Brereton, the death of a child provided a means by which to remove the contested wealth from circulation and essentially appeased the lineages by making wealth inalienable. By keeping it in the houses, material goods played into Weiner's (1992: 62) idea of the "kinship counterpart of keeping-while-giving." Though this may have been the result of such burial practices, I think the explanation offered by Brereton is post factum. It does not explain why we see what we do in burial records. He does, however, bring attention to the fact that burials are essentially concerned with display and corpse preparation.

I argue that for the first time in Mesopotamia, burials became a moment of communal display and a type of message propagation different from any other mortuary rites of the previous periods. Nishimura (2015) has discussed intramural burials at Titiş Höyük as evidently lacking in the lavish display, and this is interpreted not as evidence of poor households but rather a situation in which there is no need to showcase status or wealth because the burials were more or less centralized to be private. Building off of this idea, I believe that the people of the LC began to engage in mortuary ceremonies in which portraying something to the public became important and that this was

accomplished through the conspicuous consumption of materials that are known to be of value. I find support for this argument in the fact that every wealthy burial was buried in a type of public building at Gawra and Brak. Thus, visibility or the idea of drawing attention to the communal aspect is emphasized.

Child burials can be seen as embedded in a tradition that is more easily accessible to us simply because there have been more subadults buried than adults. Nevertheless, rich adult burials should be understood differently than rich infant burials because they were still clearly segregated from a common burial context, meaning that adults and infants occupied different social realms. For example, if infants were deemed to be magical or had the property of an offering, the same cannot be stated for adult burials that took place anywhere in Mesopotamia during this time. So what do we make of the adults? To answer this question, we must look at why wealth was deposited in graves and what people achieved by doing this.

Were burials simply displaying the wealth of elite groups? Or was it more of a show to achieve what Brereton suggested (i.e. a way of disposing of volatile inalienable wealth)? I do not think one has to choose between these two options and think that many factors could result in these kinds of burial patterns. One of the major factors that I see here is the growing influence of the South. Though the Uruk expansion was not yet in full throttle, Uruk material culture, symbolism, and ideology infiltrated many aspects of northern Mesopotamian settlements. We lack data from the South to understand what was happening with mortuary rituals there, but we do know that by the time Uruk was at its peak, much growth or institutions and settlement configurations had changed since the



Ubaid. I argue that one of the key factors that can explain the consumption of wealth that tied together children and adults had to be the institution of organized religion.

#### *5.5.2 What structured Late Chalcolithic burials?*

To understand how religion played into the burial trends of the Early and Middle Uruk/LC1-3, we have to look to the South in the Late Uruk in LC 4-5. As I have stated above, one of the drivers behind this has to be activities, rituals, and obligations towards a system of belief that involved the consumption of goods. We can see evidence of this system in iconography and settlements like Uruk. While the South gives little understanding of the everyday lifeways of the LC people, the excavated later periods of Uruk show extensive investment in architecture dedicated to Near Eastern deities that were later known as Anu and Eannana/Inanna, named the Anu Precinct and the Eannana Precinct respectively. The settlement plan at Uruk and details of architecture have been discussed extensively by Collins (2000), Perkins (1949), Nissen (2001), Heinrich (1982), and Lloyd and Safar (1943), and through many specifics about how the temple functioned in terms of its distributional properties, it is clear that the temples relied on lavishness, scale, and the use of luxury materials to showcase status. For example, the temple of Eannana used a combination of clay cones embedded in the walls, stones, and paintings to create a display that was most certainly a statement of power (Fig. 5.19).



Fig. 5.17: Temple of Eannana, the Pillar Temple—procession wallsuncovered showing colorful mosaic of color, cones, and stones. Reproduced from *MosaicBlues*, by Frederic Lecut, 2014.

Another testament to the value attached to material goods and their ability to make a statement about status, wealth, or power can be seen in Late Uruk imagery. In stamp seals, texts, and perhaps the most famous example, the Uruk Vase, some themes emerge (Fig. 5.20). The Warka Vase shows a male skirted figure, probably the same one that we see in the stamp seals below (Fig. 5.21), leading a procession of clothed figures and animals, followed by rows of naked standardized figures who carry vessels full of

goods. The main character is probably a political and religious leader, a king or king-priest that brings bountiful offerings to a deity in an elaborate dress and headdress (Chau, 2008). That deity is most certainly Innana/Eannana based on the depicted poles associated with her temple. The emphasis on fertility and fruitfulness can be gleaned from the alternating rams and ewes, which, according to Bahrani (2002), are there to highlight the male and female aspects of the scene.

The leader was often shown performing other roles, as evidenced by stamp seal impressions (Fig. 5.21). He feeds animals, engages in processions like the one depicted on the vase, receives goods in his role as a collector, and, most importantly, functions as a warrior that captures and combats others. The religious connotation and the overall symbolic association between the King and the warrior can be seen in the temple that stands in front of the prominent figure. This association between the king and his warrior or hero-like properties was incredibly important during this time because it witnessed the emergence of the veneration of territory expansion, the good hunt, war, and bringing back bounty. All of these elements are evident in the next period, but LC iconography confirms that these ideas were already present at least during the start of the 4th millennium BC and surely earlier. I argue that the appearance of weapons in adult male graves during this period can be associated with the ideology of status and power that emanated from almost every political/religious/economic institution. Looking forward, these trends continue, and weapons in graves became the most powerful statement of status in the EBA (Helwig, 2012).

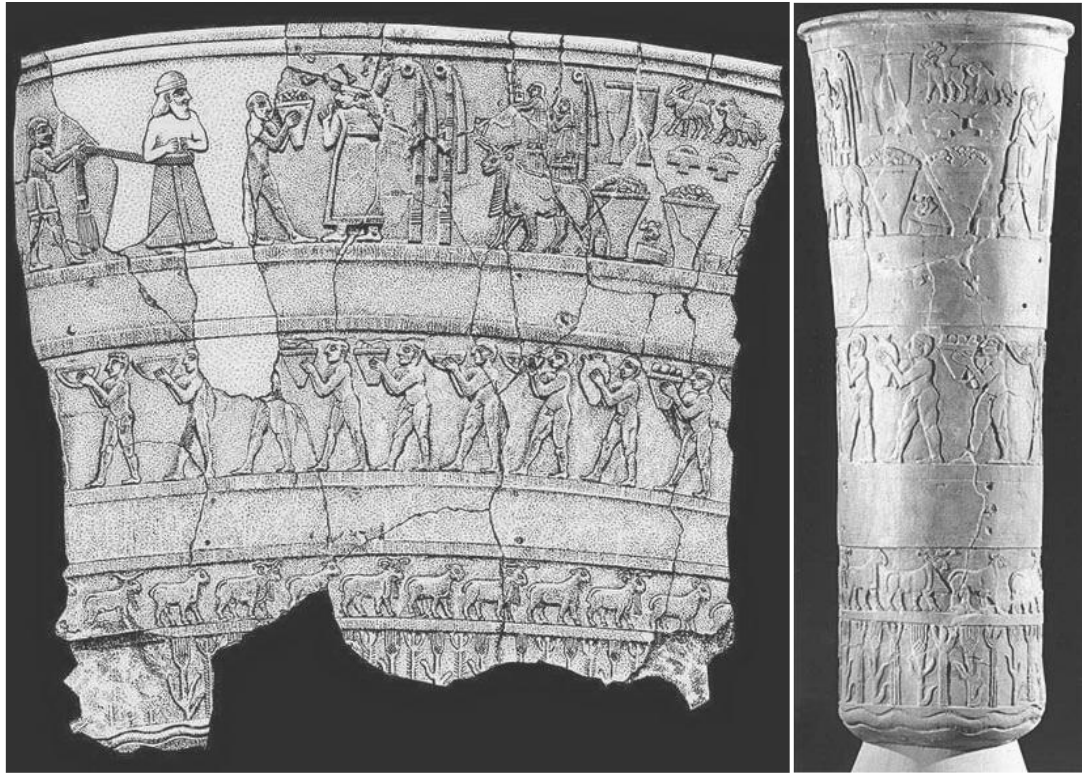


Fig. 5.18: The Warka Vase from the Eanna precinct at Uruk (Eanna III, 3000BC), Late Uruk/Jemdet Nasar Period. Reproduced from Brereton, 2013; 393, Fig. 10.1.

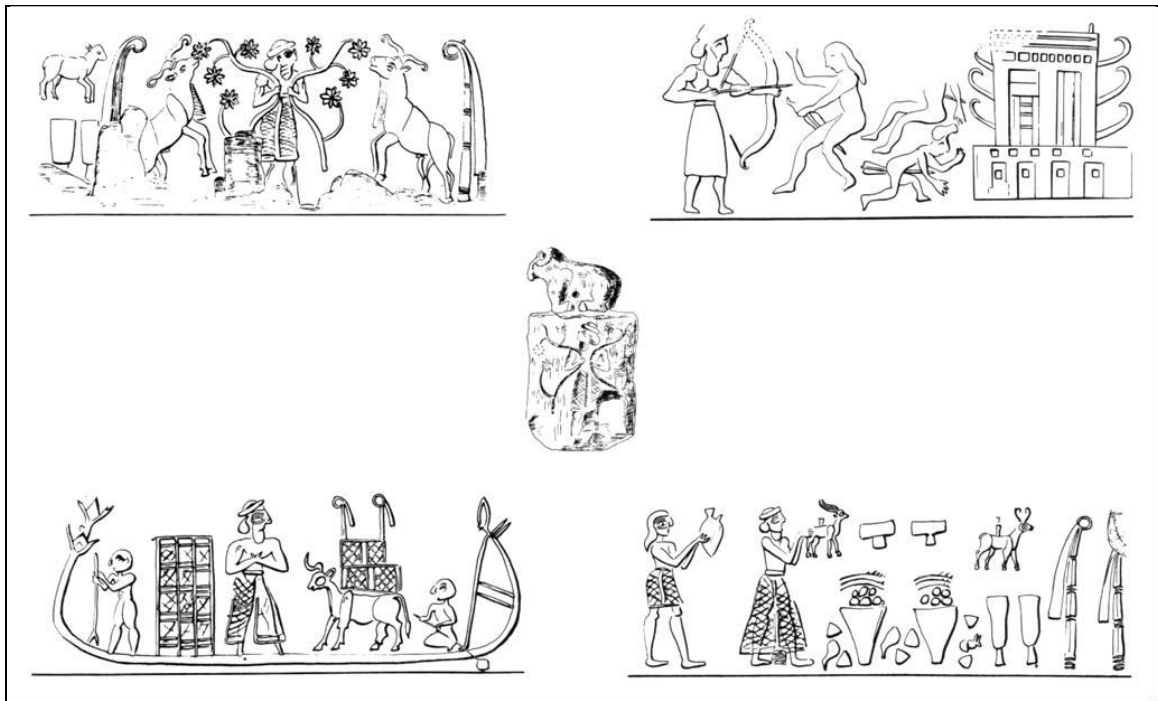


Fig. 5.19: Late Uruk cylinder seal impressions showing the priest/king performing his many roles. Reproduced from Wengrow, 2008: Fig. 7.

I have discussed how temples were used for the lavish display of expensive materials to showcase power and explained how contemporary iconography emphasizes a growing religion that was based on pooling and showing off valued goods. In addition, I have suggested that this religion was already showing signs of a symbolic connection between a powerful and forceful ruler. Though Near Eastern kings never gained a divine quality like their Egyptian counterparts did during this time, it is no debate that the king simultaneously served deities while also embodying some of their qualities (White, 1993; Ur, 2012; Hansen, 2013: 104). Weapons in adult burials in this context were a portrayal of an ideology that venerated deities that were, amongst other things, capable of violent

deeds. What we see is a system that used material culture as both decor and consumable goods to mobilize religious, economic, and political institutions. Finally, we can turn to the contents of the thousands of tablets that emerge during this period in both the South and North at sites like Aslantepe. The 4000 tablets' sole concern was the movement, production, and storage of various goods, many of which we find in burials or illustrated on wall paintings and cylinder seals (Frangipane et. al., 2010). Based on the evidence at hand, I propose that for the first time in Near Eastern history, objects structured mortuary rituals.

Another factor that must have influenced burial practices is the parallel emergence of cities, both in the South and in the North. As discussed in Chapter 2, this boom of urbanism came to a halt in the North but continued in the South after the middle of the 4th millennium BC. Both of these efforts towards a completely settled lifestyle seemed to play out similarly across Mesopotamia, and the burial record supports this notion. At Gawra, we can trace how the changing realities of the settlement planning pushed the subadult burials to shift in accordance with not the household, but the public buildings. Tell Brak shows that infant burials often served as offerings or foundation internments that were part of the new constructions of prominent public buildings. Of course, what is missing here are the adults, who probably continued to be offered a mostly extramural burial. Unlike before, the proximity to the settlement next to which they could be buried probably shifted with the emergence of cities. For example, at Arslantepe, there were at least three hierarchies—citadel, outer town, and lower town. To bury the dead, one must have had to exit the lower town and go into the fields. This might

explain the difficulty that archaeologists face with locating cemeteries during this period. In this light, urban planning could be seen as a reason for so many missing bodies.

### 5.5.3 *Where Are the Dead Upon the Rise of the First Cities?*

This is a fair question because not only do we barely encounter them, but the graves that we do have are also truly insignificant material-wise. Are objects not used to structure burials anymore? If we turn to the North, this may be a valid answer: they were not. Brereton argues that we can explain the lack of funerary consumption as evidence that these materials are channeled into religious institutions and deities rather than the dead (2013: 391). This is an interesting idea, but it is not supported by the archaeological record because changing the funerary practices by denying some of the dead grave paraphernalia would not result in an overall lack of burials in of themselves. In addition, the evidence of religious procession that is cited from the LC5 and Jemdet Nasr period must have been developing for millennia prior to this time. Religious practices did not occur randomly in the Near East; they had a developmental trajectory and history from the EN to the rise of monotheistic religions. For instance, in the EBA, the same processions, the same deities (with somewhat different names), the same temples, and many of the same cities with new kings emphasized corporate membership even more, but these EBA burials are nothing short of copious. Thus, I do not believe that we can explain the lack of wealth consumption in the mortuary record of the Late Uruk by accepting that it was moved to a different social sphere because these populations and religious and economic spheres were merged (Fowles, 2013: 4-12). Lastly, but certainly to the point, we know of two texts that, beyond debate, are from the transitional period

between Uruk and the EBA and show that petitioners requested wealth from a wealthier individual to be used in the burials of the petitioner's family members (Akkermans, 1989: 365). Such texts demonstrate that wealth consumption in graves continued to be a practice well after the rise of the first cities.

To return to the question at hand one more time, before we find their gold (wealth), we must find the dead. After about 3500BC—when cities in the North "abort" their efforts at urbanization, and the South began to establish colonial outposts in the North—the question of the missing dead is pressing. At 15 ha, Samsat in Turkey has produced 25 intramural graves of 28 infants buried in various pots under house floors. This is a continuation of previous traditions, but this time, there is an inventory of zero objects. Muslumantepe represents the LC4 period here, and the story is similar: pithoi with lids, infants under floors, and no associated objects. Of note are also the intramural LC4-5 graves from Arslantepe that had a few strings of beads. Finally, the 11 individuals from Kenan Tepe showed a lack of material culture but interestingly represented all age groups. Overall, it is not so much the contents of the graves that are problematic but rather the lack of graves. It seems that the more complex and populated settlements became, in total opposition to what one would expect, the simpler the graves became of fewer people.

This is a part of the explanation that I think is quite cliché: as these settlements became more and more centralized and society reflected a greater degree of institutionalized hierarchy, the concept of space for the living and space for the dead must have shifted. Households could not hold the remains of so many individuals, or they might have been restrained due to the space of buildings that were expanded or rebuilt.



Similarly, extramural burials could not always be placed in an abandoned area of the mound. A new type of space usage is evidenced by recent expeditions in area MTW at Majnuna—a satellite mound of Tell Brak (McMahon and Oates, 2007: 157-158). The mound was previously and correctly understood to be the trash heap of the Brak settlers, but excavations have been limited. Following an initial salvage excavation, human remains were found in layers of ash, broken ceramics, animal bones, and other broken objects. The skeletal remains of humans and animals were often disarticulated and even defleshed. Skull groupings were also found. In the EMA area of the mound, fully articulated and interred skeletons were also found. In all, the skeletal remains of at least 67 individuals of all sexes and ages were interred, notably with the absence of infants, some of which could still be found intramurally at Brak. Full publications still await, so we cannot answer questions about whether or not these were the victims of massacre or some other kind of violent death, but the normative burials suggest that at least some individuals might be buried in such locations (McMahon and Oates, 2007: 161-163). Such mounds have not been explored much in Mesopotamian expeditions, and it is possible that more graves could be found in such locations. Given the fact that there is evidence of feasting and multiple phases of internment, quite literally, on top of the dead, and the incredible resemblance of this archaeological situation to the Domuztepe Death Pit, I propose that it is feasible to view this deposit at Majnuna as part of older burial traditions that have already been noted in respect to the intramural sub-adult burials of the Neolithic and Ubaid.

Aside from the reconciliation of space and place for the dead, many other factors might have been at play. If the dead were moved further away from the settlement, it is

very likely that they are now destroyed. Likewise, I believe that the reason graves are so materially insignificant at this point is that the significant ones were robbed. It could not have been a secret to the people of the Late Uruk (and the EBA) what type of wealth went into graves since many of these funerary rituals were subject to public display. As was most likely the case at Warka, many graves were robbed not long after burial. Public display of wealth showed power and emphasized status, but it also cried 'wolf come and eat me.' It is a fact that if hundreds of thousands of graves were still buried in the low and highlands of Mesopotamia, we would be finding them. If we are not finding them, they are not there anymore. The fact that we see this lack of graves and their goods in both the South and the North may suggest that this is more of a problem for the South since they continued the established urbanization trajectory. In the North, however, at the very end of the Uruk period, the Anatolian sites dispersed and populations became quite mobile again. In this case, some of the burial record in the North has to be explained as the result of mortuary rituals more suited to seasonal settlers and pastoralists.

#### *5.5.4 Can We Use Burials as a Proxy to Understanding Social Structure in the Late Chalcolithic?*

To answer this question, I want to return to the Early Dynastic texts discussed above by Adams (Akkermans, 1989). It seems that observable wealth in graves in some cases might have been the power of a third party, in which case, it is worth asking if we could consider this to be a show of power? If one has to commission wealth for display, then that individual cannot institutionalize power since power is not in their hands. I argue that the wealth in burials of both adults and children should not necessarily be

taken as a testament of true institutionalized power and status, but rather the ideology of power. This situation should be especially true for the North—where the level of hierarchical segregation of social relationships never achieved the same dimensions as it did in the South, yet the burial customs are identical. Thus, in the North, especially when it came to child burials, the display of wealth can be understood as the efforts of elites and non-elites to emanate religious and kingship ideology derived from the South. Given the level of contact that we know existed between the lowlands and the highlands and the fact that relationships in Mesopotamia were established since the Neolithic, identical burial practices in the North likely imitated their southern counterparts. Weapons in burials can be understood in the same manner: the person buried was not necessarily a warrior but only played into the symbolic relationship established between a warrior and a leader. For the overwhelming majority of southern Mesopotamian burials, this social identity might have been true. However, understanding exactly how those who had power displayed it compared to the other tiers of society depends on finding a grave of a king-priest or some established elite. For the reasons discussed above, unfortunately, I believe this is highly unlikely because in over a 100 years of excavations in the Near East, not a single Uruk king has been found by archaeologists.

As I have shown, we cannot look for a direct relationship between the mortuary record and the social structure of the LC in Mesopotamia. Graves even in their most elaborate forms simply do not reflect the complexities of settlements and all their institutions. I conclude this discussion by proposing that those that had a true elite status based on power differentiation had archaeologically extraordinary graves, and those that had rich graves like the ones we saw at Korucutepe and Gawra had enough social capital

to at least acquire (not own) wealth to display at death. Motivation to play into the southern ideology might have been the result of cultural exchange, but so was the developing belief in the afterlife, which will be discussed in the next chapter.

CHAPTER 6:  
EARLY BRONZE AGE (3000-2000 BC) FROM THE RUINS OF THE URUK WORLD  
TO THE RISE OF KINGDOMS: BURIAL AND RELIGION IN THE AGE OF GODS  
AND HEROS

The coming of the Bronze Age in the Near East was not marked just by the increase in bronze use, but also by a conceptual change in how people structured their living environment and their relationships, which were increasingly dictated by the presence of varied social roles. On top of the social ladder stood the Gods, who, as will be discussed here, intervened not in the least in the way their subjects were buried.

### **6.1 Overview of the Early Bronze Age Mortuary Practices**

A clear distinction began to be displayed between those who held some status and those who did not. The way that this was done in of itself was variable yet standardized within each context (Cooper, 2006; Peltenburg, 2007). At least in the later phases of the period, urbanized lifeways surely influenced how and where burial practices played out. The biggest contribution to the categorization and understanding of mortuary practices should be attributed to Carter and Parker (1995). This study tried to sort out the question

of whether pottery styles corresponded to cultural ethnicities by correlating them with burial styles to establish a possible pattern.

During the 1st half of the EBA, extramural cemeteries are the norm, but recently, it has come to light that some sites like Carchemish have an intramural component (Algaze et. al., 1995). During the Middle EBA period, burials move intramurally, but extramural examples exist. The largest of these is Titriş Höyük, where 3 pithos and 41 cist burials were found around 400m to the West of the mound (Honca and Algaze, 1998). Though mid EBA (2600-2300BC) intramural burials have not been found at Titriş Höyük, this is not the standard pattern for most Syro-Mesopotamian sites (Lebean, 1996; Schwartz, 2016). During the later periods of the EBA, burials are found intramurally consistently, especially in chamber and cist tombs. Titriş Höyük serves as the best example for the LEBA, a period of settlement contraction during which burials began to be associated with domestic and public architecture (Laneri, 1999: 2013).

Burial types were varied and distributed along the North and South in various patterns, which will be presented later. The most simple of these were the pit burials, which were almost always unlined. They were either covered with earth or with a stone slab. Examples of these could be found at Oylum Hoyuk but are otherwise rare in the region; however, they are quite often encountered in the Anatolian sector. Cist graves with all their varieties are the most popular grave type in Turkey. At Asagi Salat, these burials have walls lined with stone slabs (Akçay, 2017; Basoglu et. al., 2013). Cist graves with mud brick-lined varieties at Gritille and Tell Ahmar and throughout the Turkish sector of the Euphrates in general are very common and usually have a top of one to three stone slabs. The standard is single internments, but at Titriş Höyük, Birecik, and perhaps

Carchemish, more than a single person per burial in some cases have been reported (Sertok and Ergec, 1999: 90; Woolley and Barnett, 1952: 221). It is possible that in some of these cases, the multiple internments are due to reuse rather than a case of multiple depositions of individuals.

Pithos or vessel burials are noted at the very beginning and end of the EBA. More often than not, they were used for children and were placed either vertically or horizontally. They were more common in Turkey than in other parts of Mesopotamia (Okse, 2002: 278; Sertok and Ergec, 1999: 90; Woolley and Barnett, 1952: 215-218). The vessels were usually found clustered or dispersed amongst cist tombs, like at Hassek Hoyuk and Titriş Höyük (Cooper, 2006: 244; Behm-Blancke, 1984).

Referred to as dolmens by Carter and Parker (1995: 107), the stone chamber tombs are a more complex category. These resemble some versions of lined cist burials, but many are lined with horizontal and cobbled stones and then closed at the top with monoliths. It is common to find more than one person buried in the chamber tombs. At Jerablus Tahtani (Peltenburg et. al., 2015: 67-95), they occurred anywhere in the settlement, mostly in levels III-IV.

Earth/rock-cut shaft graves are another category of burials cut into bedrock or earth and feature a vertical or slanted shaft that served as the entrance of the grave from the top. Shaft graves were not part of the 1st phases of EBA occupation but were frequently found in Syria (at Selenkahiye, for instance). These are variable types of tombs in terms of size, shape, and furnishings. Sometimes these graves could branch out into multiple chambers. A reference to a similar tomb from Tilbes Hoyuk exists, but the report has not been published to verify the possible existence of this grave type in

Anatolia (Fuensanta, 2007). Tomb H-3c at Halawa, for example, had benches that lined the interior walls, windows cut into the walls, and a "pillowed" bed. The grave was made to look like a bedroom. On the floor were seven males and an infant, and four individuals were laid out on the benches (Orthmann, 1981: Tof. 33). At Tell Banat, the shaft entered a chamber that then branched out into two narrower ones, both of which have an attached tunnel (Dornemann, 1979; Porter, 1995).

The largest and most exclusive burial types were the monumental shaft/chamber tombs. They were widespread in the Near East but have not been reported from Anatolia so far. As their name suggests, these were prominent monuments that were built in visible and high locations. Compared to the other styles, monumental tombs were larger, more difficult to construct, and built-up (versus dug out). Stones were shaped into a rectangular form and served to construct the chamber, shaft, and, in some instances, more than one room. Such structures had the intention of being used for a long time and held multiple internments. Not surprisingly, these graves held the richest burials in Northern Mesopotamia.

Some important examples of this architecture are seen at Jerablus Tahtani and Tomb 203 (Peltenburg et. al., 2000). Seventy-two people were buried in the tomb that was located at the entrance of the settlement and attached to the wall that separated it from the outskirts. It was then encapsulated in a prolonged mound made of earth, like a cocoon. The structure featured a main chamber and an annex that was entered through a bent shaft. Inside, at least 3 levels of internment could be registered.

Another exceptional case and probably the paramount of EBA tomb construction is the complex at Tell Ahmar in northern Syria—the Hypogeum (Thureau-Dangin and



Dunand, 1936). The chamber itself is 3x5x2m and accessed through a rectangular shaft. The floors were paved and the walls were gently corbelled. The structure was constructed with large stones fitted with smaller ones in the empty spaces that were created. Stairs signal the possibility that the structure had two more rooms attached to the main chamber (Roobeart and Bunnens, 1999:164- 165). Part of the structure seems to have sunk into the floor during its later phases. Inside the main chamber, there were two individuals buried with many bronze weapons and other items and surrounded by the largest cache of ceramics in any North Mesopotamian tomb.

Close to Tell Ahmar, the more recently discovered tombs at Umm el-Marra now add to the landscape of monumental burial features (Schwartz et. al., 2003). It is described by excavators as a "persistent visual landmark." The site features nine such complexes and their related installations dated from 2500-2200 BC and showed evidence of multiple episodes of internment. The tombs were all built with a stone foundation and then constructed up with mud-brick. Tomb 8 had two rooms and held two adult males with one infant, and Tomb 7 was dug into Tomb 6. The only subterranean internment did not have any associated artifacts except for a couple of vessels. The installations highlight an interesting aspect of EBA burials, like Installation E, which was dedicated to the burial of four upright horses. The front and hind legs were placed in compartments that kept the animals from collapsing. Installations B, C, and D all had standing elder horses, at least one human infant, and a sprouted ceramic vessel. A third installation type is described as simple pits with intermingled remains of ash and horses. Finally, a 4th type of installation contained human remains with a horse skeleton in the vicinity. This variety of acts

probably attest to different ritualized actions that accompanied or followed the main burial ceremony.

Demographics in the EBA represent everyone in terms of both sex and age. There is much overlap in burial customs, and unlike the previous periods, designations of a certain burial style for a certain sex or age group are no longer obvious. One exception we can consider here is pot burials that are usually reserved for children; interestingly, adults have been found at Jerablus Tahtani in ceramic vessels (Peltenburg et. al., 1995: 25). Engin (2008) also reports some adults buried in pots at Oylum Hoyuk's extramural cemetery, but here the infants were interred in cooking vessels, specifically, as will be discussed below.

During the EBA, most graves had artifacts as part of the burial. The most prolific funerary consumption occurs in the form of various types of ceramic vessels. They appear as heaps of pots, plates, cups, jars, vases, and champagne cups, and cooking vessels are generally less abundant. Given the display, they have been associated with a feasting activity connected to a libation ritual that accompanies the dead. Alternatively, the vessels are placed with the dead as part of a package that is meant to guide them in a procession in the afterlife (Cooper, 2006: 221).

Another numerous artifact is the bronze pin or needle that makes up the largest proportion of bronze finds in the entire EBA. Crossed pins might have secured shrouds of shawls like those seen at Mari on plaques (Zetter et. al., 1996: 20). These could also be personal ornaments on clothing. Bronze and copper weapons become associated with the more elaborate and richer graves. They include spears, swords, daggers, axes, mace heads, and knives. When they are found, they are usually linked with a dead individual

through their placement under the head. Weapons are mostly associated with males, at least at Halawa; though preservation on skeletons during this period is tragic, and sex cannot be established for many sites and burials (Orthmann, 1985: 54, 56). Furthermore, I would assert that given the fact that so many of the burials include more than one individual and children, perhaps viewing the weapons in such a light is unwarranted. Other metal finds are included in the repertoire of small artifacts, such as beads, statuettes, seals, stamps, various ornaments, and food/animal remains that are all made from various materials such as stones, shell, bone, gypsum, glass, gold, silver, copper, and electrum.

## **6.2 Mortuary Data: Analysis and Interpretation**

The EBA material used here for analysis comes from eight sites that are all on the North end of Mesopotamian influence and the Turkish sector of the Euphrates. These sites were chosen based on 1) availability/publication, 2) quality of the publication, and 3) previous engagement with the particular burials. For the sites of Kenan Tepe, Oylum Hoyuk, Asagi Salat, and all the miscellaneous sites except for Gre Virike and Tilmen, I have used excavation reports or dissertations that catalog otherwise unpublished burial data (Table 6.1). Table 6.2 shows the distribution of artifact types in all the burials that are used in this study. As was the case in the previous chapters, this information serves to generate the data that will be analyzed in the following sections when artifacts are relevant.

TABLE 6.1:  
DISTRIBUTION OF INDIVIDUALS BY AGE GROUP IN EACH EARLY BRONZE  
AGE SITE

Sites	Intramural Graves	Extramural Graves	Adult	Adolescent	Child	Infant	Unknown	Total Individuals
<b>Carchemish</b>	15	/	/	/	2	/	+17	+19
<b>Kenan Tepe</b>	3	/	/	/	3	/	/	3
<b>Oylum Hoyuk</b>	/	46	11	/	13	12	10	46
<b>Asagi Salat</b>	1	37	5	/	2	1	30	38
<b>Gedikli</b>	/	46	1	/	/	/	45	46
<b>Tilmen Hoyuk</b>	2	/	/	/	2	/	/	2
<b>Saraga Hoyuk</b>	/	2	/	/	/	/	2	2
<b>Gre Virike</b>			2	/	4	4	+7	+19
<b>TOTAL:</b>	21	131	19	0	26	17	+111	+173

TABLE 6.2:  
PRESENCE OF ARTIFACT TYPES PER GRAVE (REPRESENTED WITH X) IN  
EACH EARLY BRONZE AGE SITE

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Kenan Tepe	G.7.38											
Kenan Tepe	G.7.25											
Kenan Tepe	G.7.28											
Asagi Salat	M3					X						
Asagi Salat	M4							X				
Asagi Salat	M5							X				
Asagi Salat	M6	X										
Asagi Salat	M7											
Asagi Salat	M8											
Asagi Salat	M9					X	X					
Asagi Salat	M10						X					
Asagi Salat	M11											
Asagi Salat	M12					X						
Asagi Salat	M13	X										
Asagi Salat	M14	X				X	X	X				
Asagi Salat	M15					X	X					
Asagi Salat	M16	X										
Asagi Salat	M17					X						
Asagi Salat	M18					X		X				
Asagi Salat	M19											
Asagi Salat	M20											
Asagi Salat	M22											
Asagi Salat	M24											

TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Asagi Salat	M25											
Asagi Salat	M26		X			X						
Asagi Salat	M27											
Asagi Salat	M28											
Asagi Salat	M31					X		X				
Asagi Salat	M32	X				X						
Asagi Salat	M34					X		X				
Asagi Salat	M36											
Asagi Salat	M37	X				X						
Asagi Salat	M36					X		X				
Asagi Salat	M39											
Asagi Salat	M40	X				X		X				
Asagi Salat	M41											
Asagi Salat	M42					X						
Asagi Salat	M43											
Asagi Salat	M44											
Asagi Salat	M45	X				X						
Asagi Salat	M46					X						
Oylum Hoyuk	OYMez1					X	X	X	X	X		
Oylum Hoyuk	OYMez2					X						
Oylum Hoyuk	OYMez3					X						
Oylum Hoyuk	OYMez4					X		X	X			
Oylum Hoyuk	OYMez5					X						
Oylum Hoyuk	OYMez6					X		X				
Oylum Hoyuk	OYMez7					X			X			
Oylum Hoyuk	OYMez8			X		X		X	X		X	
Oylum Hoyuk	OYMez9					X		X	X			

TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Oylum Hoyuk	OYMez10	X		X		X		X	X			
Oylum Hoyuk	OYMez11					X			X			
Oylum Hoyuk	OYMez12					X						
Oylum Hoyuk	OYMez13					X				X		
Oylum Hoyuk	OYMez14	X	X			X			X			
Oylum Hoyuk	OYMez15					X			X			
Oylum Hoyuk	OYMez16					X		X				
Oylum Hoyuk	OYMez17					X		X	X			
Oylum Hoyuk	OYMez18					X	X	X	X			X
Oylum Hoyuk	OYMez19					X						
Oylum Hoyuk	OYMez20											
Oylum Hoyuk	OYMez21											
Oylum Hoyuk	OYMez22					X						
Oylum Hoyuk	OYMez23					X						
Oylum Hoyuk	OYMez24					X						
Oylum Hoyuk	OYMez25	X				X	X	X				
Oylum Hoyuk	OYMez26					X		X				
Oylum Hoyuk	OYMez27											
Oylum Hoyuk	OYMez28					X		X				
Oylum Hoyuk	OYMez29					X			X			
Oylum Hoyuk	OYMez30					X		X	X			

TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Oylum Hoyuk	OYMez31											
Oylum Hoyuk	OYMez32					X	X					
Oylum Hoyuk	OYMez33											
Oylum Hoyuk	OYMez34					X		X				
Oylum Hoyuk	OYMez35											
Oylum Hoyuk	OYMez36					X		X	X			
Oylum Hoyuk	OYMez37					X						
Oylum Hoyuk	OYMez38					X						
Oylum Hoyuk	OYMez39					X						
Oylum Hoyuk	OYMez40											
Oylum Hoyuk	OYMez41					X						
Oylum Hoyuk	OYMez42	X										
Oylum Hoyuk	OYMez43	X				X						
Oylum Hoyuk	OYMez44	X				X						
Oylum Hoyuk	OYMez45											
Oylum Hoyuk	OYMez46											
Charchemish	#1					X		X		X		
Charchemish	#2	X				X		X				X
Charchemish	#3					X						
Charchemish	#4					X						
Charchemish	#5					X						
Charchemish	#6	X				X		X				
Charchemish	#7	X				X		X	X	X		
Charchemish	#8					X		X				



TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Charchemish	#9	X				X		X	X	X		
Charchemish	#10		X			X		X				
Charchemish	#11	X				X		X				
Charchemish	#12	X				X		X				
Charchemish	#13	X				X		X		X		X
Charchemish	#14					X		X	X			
Charchemish	#15								X			
Gedikli	M1					X		X				
Gedikli	M2					X						
Gedikli	M3					X						
Gedikli	1					X		X				
Gedikli	2					X		X				
Gedikli	3					X		X				
Gedikli	4					X		X				
Gedikli	5					X		X				
Gedikli	6					X		X				
Gedikli	7					X		X				
Gedikli	8					X		X				
Gedikli	9					X		X				
Gedikli	10					X		X				
Gedikli	11					X		X				
Gedikli	12					X		X				
Gedikli	13					X		X				
Gedikli	14					X		X				
Gedikli	15					X		X				
Gedikli	16					X		X				
Gedikli	17					X		X				
Gedikli	18					X		X				
Gedikli	19					X		X				
Gedikli	20					X		X				
Gedikli	21					X		X				
Gedikli	22					X		X				

TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Gedikli	23					X		X				
Gedikli	24					X		X				
Gedikli	25					X		X				
Gedikli	26					X		X				
Gedikli	27					X		X				
Gedikli	28					X		X				
Gedikli	29					X		X				
Gedikli	30					X		X				
Gedikli	31					X		X				
Gedikli	32					X		X				
Gedikli	33					X		X				
Gedikli	34					X		X				
Gedikli	35					X		X				
Gedikli	36					X		X				
Gedikli	37					X		X				
Gedikli	38					X		X				
Gedikli	39					X		X				
Gedikli	40					X		X				
Gedikli	41					X		X				
Gedikli	42					X		X				
Gedikli	43					X		X				
Tilmen	M1	X										
Tilmen	M2											
Saraga Hoyuk	1					X						
Saraga Hoyuk	2					X						
Gre Virike	1											
Gre Virike	2											
Gre Virike	3					X						
Gre Virike	4							X				
Gre Virike	5	X						X				
Gre Virike	6	X						X				

TABLE 6.2 (CONTINUED)

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Gre Virike	7											
Gre Virike	8					X		X				
Gre Virike	9					X		X				
Gre Virike	10	X				X	X	X				
Gre Virike	11					X	X	X				
Gre Virike	12	X				X		X		X		
Gre Virike	13					X	X					
Gre Virike	14		X		X	X						
<b><i>TOTAL:</i></b>	<b><i>153</i></b>	<b><i>26</i></b>	<b><i>4</i></b>	<b><i>2</i></b>	<b><i>1</i></b>	<b><i>123</i></b>	<b><i>11</i></b>	<b><i>86</i></b>	<b><i>18</i></b>	<b><i>7</i></b>	<b><i>1</i></b>	<b><i>3</i></b>

The quality of the data was of great concern during this process because I could not control for the information presented—not just from sites, but within the sites themselves. For example, most of the sites here do not have detailed or any information about who is buried. Thus, the demographic information could not be included for every comparison in a way that would represent the whole sample. This is most likely due to the fact that many of these sites were excavated for decades and the reliability of the reports is the victim of excavation team changeover and the employment of different excavation styles. One example of this is the site of Carchemish, which I originally thought would have been a great contribution to the creation of the dataset. Its prominent position between the lower and middle Euphrates sector, its long history of occupation, and its absence of disturbance due to the lack of industrial growth that resulted from its location on the border of Syria and Turkey all made the site likely to contain both bioarchaeological and archaeological data. In the 1950s, Woolley discovered the 15 or so burials in the Inner Town of the Hittite center. He correctly identified these burials as EBA (as opposed to Late Bronze Age) and excavated and recorded them.

Once I dove into the reports, it became clear that some of these burials were documented while others were simply mentioned. The burial inventory was usually thorough, which was likely due to the fact that these were archaeologically rich burials. In contrast, the skeletal data was not even mentioned in many cases. Out of 15 burials and 18+ individuals, I only know that 2 of them were children. Some of these could not be sexed and aged because of the nature of the burials in communal cists, but this is only the surface of the issue. I visited the three museums in Ankara and one in Gaziantep where

the skeletal data should be stored, and no one had that information or the Hittite burials for that matter. These excavations were conducted with British Museum funds, but they would not have had access to the human remains. Through my conversations with some museum staff, I learned that Woolley essentially discarded some of the skeletal remains on-site, and when the rest of the skeletons got to the museum, they (i.e. the museum staff) "lost or threw them away."

This is most certainly the fate of many of the skeletal remains that were uncovered from excavations before the 1980s. Thus, I have tried to engage with more recent excavations, which brought on a new problem: publishing. As I mentioned before, some of the key sites that could be included here like Lidar, Hassek, the Biricik Dam, and Basur Hoyuk cannot be engaged with. Even Titriş Höyük, which is a site that I work with in the next chapter, has been investigated since the '90s and has had the anthropological analysis published, but the burials still need to be cataloged and described. With most of the more recently excavated sites, a new interest in bioarchaeological analysis has created a situation where the skeletal data is published separately from the archaeological data, and the latter never catches up. At this point, I turned to doctoral and master dissertations from Turkish students. Those volumes contained raw data that included a catalog of all the objects and the burials. Still, the data is at times incomplete because excavations continued on past the dissertations' dates or the students only had partial access to materials with which to work. In either case, the situations described formulated how I approached the data.

In this following section, I will examine the relationship between burials, artifacts, and those who are buried in an effort to expose and understand the arrangement of

material culture within the context of mortuary ritual. I will also contextualize my findings within the already established trends from Northern Mesopotamia.

#### *6.2.1 Burial Type*

The first type of data to discuss here is how burials were presented in the Early Bronze Age with respect to their distribution and contents. Based on the amount and nature of my data, I ask the following questions:

1) What is the pattern of distribution of burial style based on age? In Table 6.3 below, I show the distribution of individuals from each age group amongst the different burial types. This sample includes a large number of unknown individuals.

TABLE 6.3:  
DISTRIBUTION OF INDIVIDUALS BY BURIAL TYPES

Age Groups	Monumental Chamber	Chamber	Vessel	Cist (simple/ not lined)	Cist	Pit	Shaft	Total:
Adult	0	1	10	3	8	2	0	19
Infant	0	0	13	0	0	3	1	17
Child	0	1	12	2	5	4	2	26
?	3	3	51	18	32	4	0	111
Total	3	5	86	24	39	13	3	173

2) What is the pattern of distribution of burial style based on artifact presence?

Table 6.4 shows artifact type presence in each burial type. This table will be used to understand which burial types are more likely to contain which artifacts (if any) and the way that artifacts are partitioned in burials.

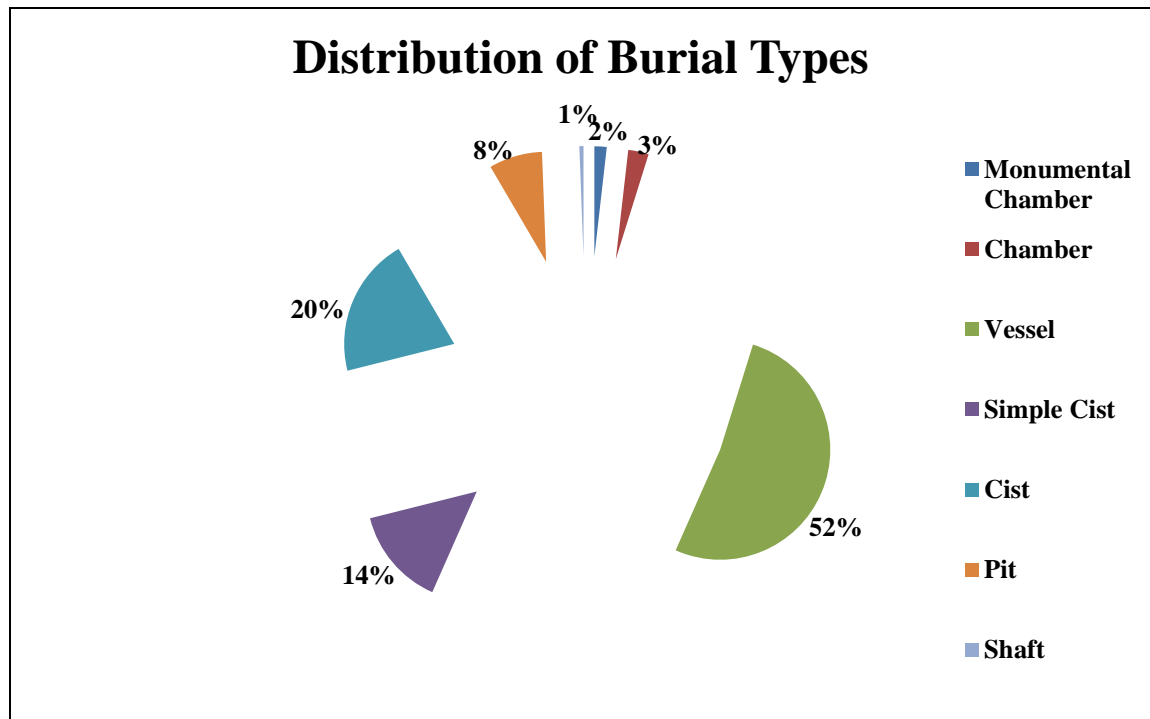
TABLE 6.4:  
PRESENCE OF ARTIFACT TYPES RECOVERED FROM DIFFERENT BURIAL  
TYPES.

Burial Types	Non-Metal Ornaments	Non-Metal Tools	Ceramic Vessels	Non-Metal Stamps/ Seals	Non-Metal Weapons	Unspecified Non Metallic Artifacts	Metal Ornaments	Metal Tools	Metal Stamp/ Seals	Metal Weapons	Unspecified Metallic Artifacts
<b>Pit</b>	3		7			1					
<b>Cist</b>	17	1	22	1		3	13	3		4	1
<b>Simple Cist</b>	6	2	10			1	7			2	1
<b>Chamber</b>	1	2	5		1	2	2	1		1	
<b>Shaft</b>	1	1	1			1	1				
<b>Monumental Chamber</b>	1		3		1	1	1			1	
<b>Vessel</b>	5	1	74	3		3	61	11	1	1	1
<b>TOTAL:</b>	<i>34</i>	<i>7</i>	<i>122</i>	<i>4</i>	<i>2</i>	<i>12</i>	<i>85</i>	<i>15</i>	<i>1</i>	<i>9</i>	<i>3</i>

Figure 6.1 shows the actual number of graves counted, without considering how many individuals are in the graves. For this data set, a minimum of 173 individuals are buried in 166 burials of various types, and six of these have more than one individual interred. In order to account for the fact that some graves contained more than one internment, I associated the burial type with every member of the burial. For example, if a cist tomb contained three individuals, I counted this as three individuals associated with a cist tomb within their age categories. The data gathered presents nothing surprising in



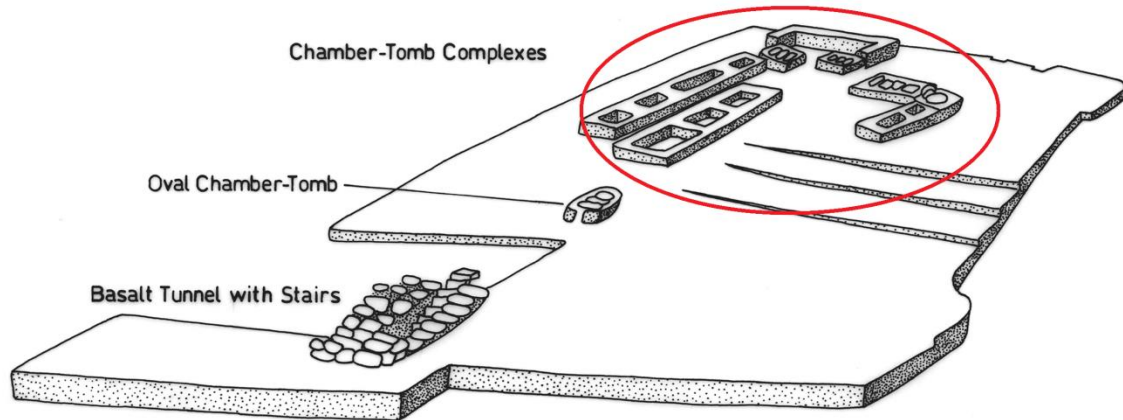
terms of burial styles, with one exception (see below). All the expected forms were represented here: vessel, pit, cists, shaft, and chamber burials.



Monumental Chamber	Chamber	Vessel	Simple Cist	Cist	Pit	Shaft	Total
3	5	86	24	34	13	1	166

Fig. 6.1: The distribution of all the burial types included in this study.

### 6.2.1.1 Monumental Burial Chamber and Shaft



#### RECONSTRUCTION OF PERIOD II

Fig. 6.2: Plan of Chamber Tombs at Gre Virike from Phase IIA as situated on the terrace, circled in red. Modified from Ökse, 2007. Figure 6.7, 97.

One exceptional burial seems to be the monumental burial chambers from Gre Virike on the Carchemish sector of the Euphrates (Figure 6.2). The site seems to be neither a settlement nor a cemetery but more of a ceremonial or religious center dated in two phases to EBA I/II (Phase I) and EBA III/IV (Phase IIA and IIB). The first phase features a terrace of mud-brick pavement that was cut into the natural slope by digging a 35m-wide pit into the mound base and covering it with rows of mud bricks. Based on Cooper (2007)'s recent work on the distribution of burial types along the Euphrates during the EBA, the monumental chamber tombs are not to be found North of the Syrio-

Turkish border. Based on my research, however, three of these tomb types seem to be registered at Gre Viriki from Phase IIA (Ökse, 2005). One of them is well preserved but disturbed by robber pits. The other two are severely damaged by later activity and robbers. These structures present with two to three rows of disconnected chambers that contain evidence of libation or other rituals linked to the burials, such as ash pits, hearths, artifacts for food processing, remains of domesticates like sheep, goats, and horses, large amounts of grains, and heaps of vessels and cups, some without bottoms (Ökse, 2005: 40-42).

Gre Virike reminds us of the monumental tombs at sites like Tell Banat, Tell Hadidi, and Jerablus Tahtani, Tomb 302 (Figure 6.3). All of these sites had attached chambers associated with the main burial space. Huge slabs of stone also covered these burials and served as doors to the chamber (Schwartz et al. 2003: 330). These tombs are characterized by monumental stonework, a prominent position on the site that is seen from afar, and a shaft entrance. Monumental chamber tombs were intended for a prolonged period of use and meant to accommodate rituals connected with activities such as feasting, sacrifice, and libations. Given the effort that must have been dedicated to the building of these structures and their associated complexes, the heaps of archaeological remains inside, their obvious grand state, and their relative rarity, these tombs should be viewed as dedicated to individuals with special social standing.

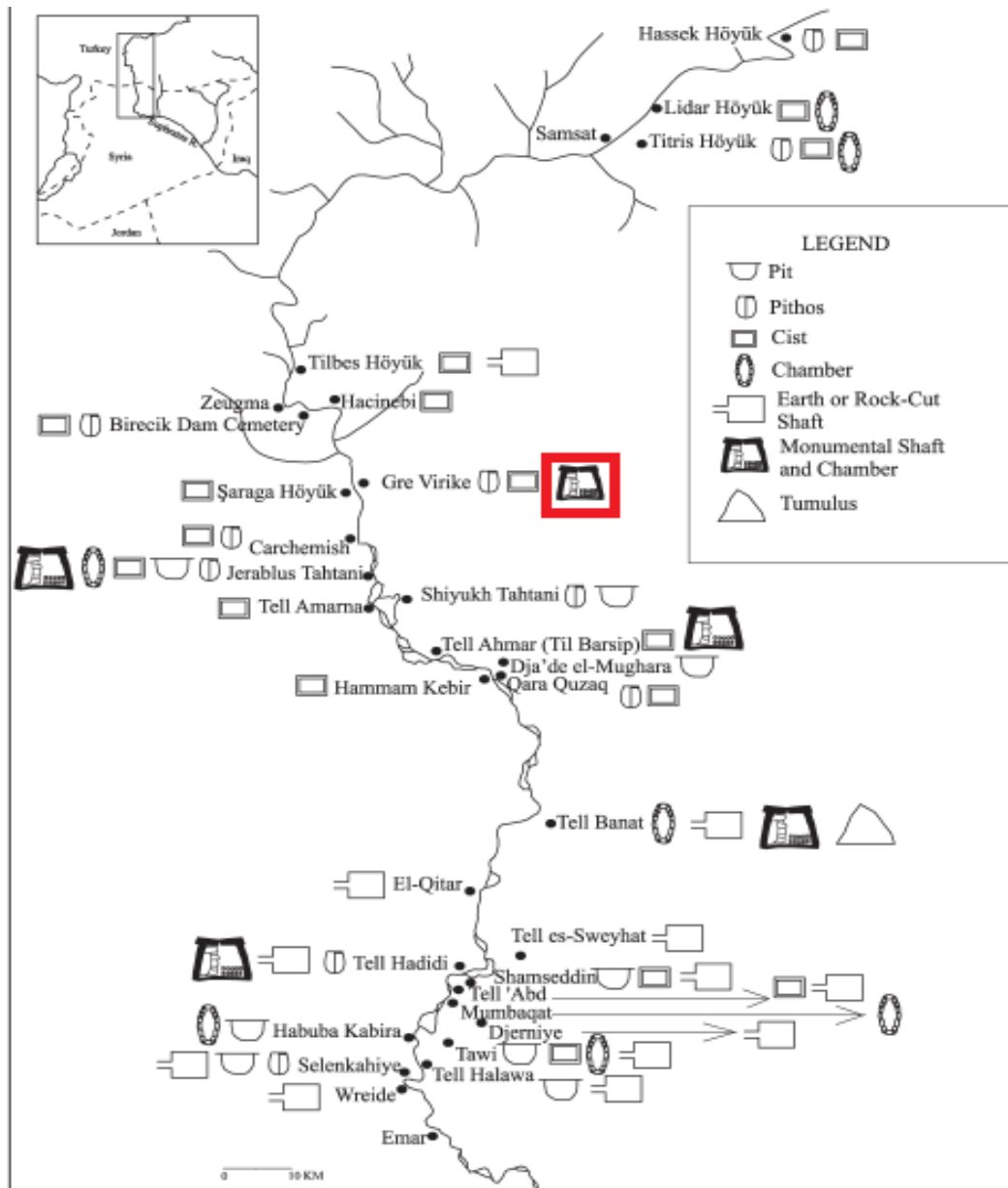


Fig. 6.3: Map of the Upper Euphrates Valley that shows the distribution of burial forms at various sites. The addition of a monumental burial chamber at Gre Virike is indicated in red. Modified from Cooper, 2007, Figure 4.3, 11.

From the presented evidence, I argue that the Gre Virike chambers from Phase IIA should be added to the growing body of ceremonial burial centers on the Euphrates. In the following chapters, I will discuss these burials in more detail within the context of the emergence of an elite group in Upper Mesopotamia that embodies the Southern Mesopotamian symbolism of power and kingship.

#### 6.2.1.2 Vessels

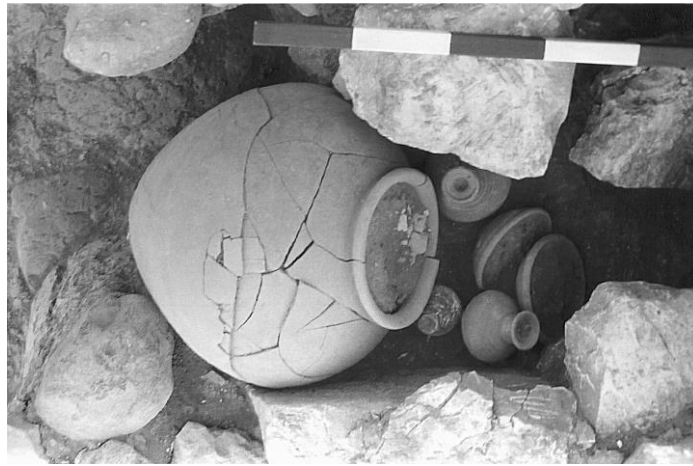


Fig. 6.4: Horizontal vessel burial from Gre Virike, Phase IIB.  
Reproduced from Ökse, 2006: Figure 34, 23.

The most popular burial style here was the jar, pot, or sometimes cooking vessel, which I grouped into the general category of "vessels" (Figure 6.4). This was done based on the fact that there is no substantial difference or any notable pattern with respect to what vessel is used. Additionally, many of the words used—such as pot, jar, urn, etc.—vary from site to site because of the recorder rather than the appearance of

characteristically different forms. Cooper, for example, uses jar and pithos interchangeably when describing the burial custom, which Figure 6.4 illustrates (Cooper, 2006: 212). One exception that must be noted here is the sample from Oylum Hoyuk, which will be discussed below. The burials varied by site and within site in terms of shape, size, and design like handles, holes, lids, etc. Generally, these are rough ware vessels, commonly used in household contexts for food processing and storing. Overall, the vessel represents 52% or 86 out of 165 burials. They were recorded from levels at Carchemish, Oylum Hoyuk, Kenan Tepe, Gedikli, Asagi Salat, and Gre Virike.

Vessel burials are common in the Turkish Euphrates, but they are not dominant. They appear at the very beginning and the very end of the EBA. They are usually associated with cist graves, and this is consistent with my findings here; however, more than half of these burials come from Gedikli, where 43 of them are found in an extramural cemetery right at the edge of the mound's slope. Alkim (1966: 42) notes that the cremation urns were in the 100's, but it is only possible to count the 43 that he lists. At this site, the cremation aspect is more significant than the amount because cremations were not a known practice in this region during the EBA. According to Alkim's (1966: 43) description of the internment procedure, the deceased were burned in a pyre to the east of the site. The fire was extinguished by a libation ritual with some liquid, and the bones were bundled up in a cloth fastened with a toggle pin. On top of the bundle, a small vessel of various forms was placed as the intended "gift." The ashy remains from the pyre were used to fill up the vessel, which was then covered with a fragment from the container of the liquid used to extinguish the pyre. This recreation of the events is probably inspired by some later Hittite texts, and it is similar to the Patroklos and Hektor

cremations described in the *Iliad* (XIII: 112-257; XXIV: 777-803; Otten, 1940).

Whatever the case, both the contents and the sequence of layers within the cremation vessels strongly supports this type of ritual.

The Gedikli cremations are extremely important because they occur in the last phases of the EBA from about 2300 to 2100BC. The following early Middle Bronze Age period is known for extensive use of cremation burials, a tradition which continues into the Iron Age in the Aegean and Near East. This instance of such a ritual in the EBA hints at a lasting social change that influenced mortuary practices and, in later periods, was characterized by a highly-stratified society. A further discussion of these changes will follow in later chapters.

Vessel burials are usually assumed to be associated with children or infants, but this is not the standard. Unfortunately, the sex and age of any of the Gedikli burials could not be found, so I could not provide this information for over 50% of this sample for this burial type. Regardless, my data shows an essentially even distribution between the known individuals in vessels, as can be seen in Table 6.5. This is consistent with other observations at sites such as Jerabulus Tahtani, where vessel burials contained all age groups (Peltenburg et. al, 1995: 25). All of the sites used here follow this pattern with respect to the individuals that could be categorized.

As mentioned above, burials at Oylum Hoyuk EBA III do discriminate between the designations "pot" and "cooking vessel," with the latter only containing the remains of children and infants and the former holding mostly adults, except for two children (Table 6.5). This implies that the people at this site placed infants almost exclusively in the cooking vessels based on some association with children and food processing or the

form of the vessel itself. Such a tradition is, of course, not foreign to the region when we think back to the Ubaid infant and child burials at Tell Abada, for example (see Chapter 5). This is not observed at other EBA sites either because the distinction is not made or because it did not exist. Alternatively, the vessels have seven uncategorized individuals that may have included infants amongst them and change the interpretation of this data.

TABLE 6.5:  
DISTRIBUTION OF INDIVIDUALS IN DIFFERENT BURIAL TYPES AT OYLUM  
HOYUK.

Burial Types	Adult	Child	Infant	Unknown	Total
<b>Pit</b>	2	3	2	2	9
<b>Chamber</b>		1		0	1
<b>Pot Vessel</b>	9	2		7	18
<b>Cooking Vessel</b>		7	10	0	17

Vessel burials seem to have included a very standard repertoire of artifacts. Almost all EBA pot burials have at least one toggle pin in or around the vessel—this is seen, especially, at Gre Virike and Gedikli (See Alkim, 1966 and Okse, 2006). At Oylum Hoyuk and Asagi Salat, eyeleted pins and needles are used as a variation of this tradition. More common than an accompanying artifact that was placed with/for the dead, these fasteners were probably used as part of a garment worn by the deceased at the time of internment and/or as fasteners of the cloth/shroud that some deceased were bundled with.



Vessel burials had the most artifacts out of any other group, but they are the most numerous burial type. Table 6.6 here shows the number of burials in which different artifacts are found in vessel burials. We can see that ceramics and metal ornaments are the most numerous, which is consistent with the burials' characteristics described above. The high number of grave contexts with metal ornaments present and the number of metal ornaments can be explained by the presence of toggle pins or some type of fastener in almost every grave. Ceramics are deposited in bulk during this time period, where a single individual could receive more than one vessel. These aside, vessel burials do not generally contain a large number or variety of artifacts, as can be seen in Appendix A.

TABLE. 6.6:

PRESENCE OF ARTIFACT TYPES IN VESSEL BURIALS

Non-Metal Ornaments	Non-Metal Tools	Ceramic Vessels	Non-Metal Stamps/ Seals	Non-Metal Weapons	Unspecified Non Metallic Artifacts	Metal Ornaments	Metal Tools	Metal Stamp/ Seals	Metal Weapons	Unspecified Metallic Artifacts
5	1	74	3	0	3	61	11	1	1	1

Note, the vessel used as the burial container is not counted as an artifact, nor is the ceramic fragment/whole vessel used as a lid, if present.

### 6.2.1.3 Cist Graves

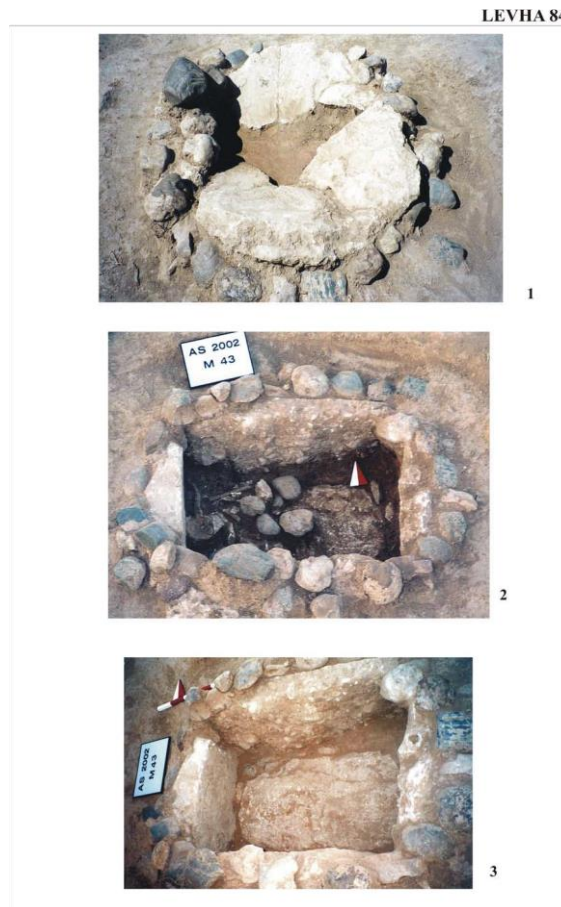


Fig. 6.5: Cist grave at Asagi Salat. 1) Before excavation 2) Opened, 3) Post excavation. Reproduced from Akcay, 2005: Lahva 84.

The second most numerous category of graves was cist burials (Figure 6.5). They could be either lined fully or partially with stone or mud-brick or not at all. I have divided the simple and regular cists into these two designations mainly because of reporting and because of a difference in building technique: simple cists are usually not paved and

sometimes not lined, and cists are. Their shape varied from perfectly rectangular to trapezoidal to oval. All of the cist burials had a stone slab covering the top. In some of the burials at sites, like Asagi Salat, it was common to line the floor with pebbles rather than larger stones.

The two sites with the most cists were Carchemish and Asagi Salat, and a few instances at Saraga Hoyuk, Tilmen Hoyuk, and Gre Virike. All the variations of the burials co-existed, and they were more or less evenly distributed. Together they make up 36% of the burials, with 34 cists and 24 simple cists. Cist graves are the most common grave types in the Turkish sector of the Euphrates, with over 300 such burials coming from the Biricek Dam Cemetery alone (Sertok and Kulaloglu, 2002: 375). Pot burials are usually found intermingled or somehow associated with the cist burials.

These graves were usually communal, as can be seen above, and account for 11 internments in four multi-burial cists. Even though there are more unknowns than knowns in the age categories here, it is well accepted that these burials include all age groups, except for infants, who are more likely to be buried in pits or vessels. This distribution pattern seems to be similar for both cists and simple cists (Table 6.7). This is an interesting comparison with the cist graves that are not in this sector of the Euphrates, where it is clear that they are used for single internments. Gre Virike and Carchemish are closely-related sites, and with the discovery of multiple internments at Jerablus Tahtani, it may be considered a regional pattern (Bounni, 1979: 55).

In cist graves, the high number of individuals with an unknown age is the result of two main factors: 1) bones were heaped and pushed aside after burial to make space for additional internments, and 2) cist graves are almost always disturbed by modern

villagers, who push the bones to the side and even scoop them out of the graves (Algaze et. al., 1995: 20). The two cist tombs at Saraga Hoyuk present an interesting case of non-disturbed tombs completely void of human remains, a case which we also find at Carchemish. This is not because the tombs were never used since heaps of vessels like fruit stands/champagne cups were found in and in front of the main burial space. Thus, these libations and/or burial gift rituals did occur. These tombs were also sealed with large stone slabs. Grave M42 at Asagi Salat is another example of a sealed cist with an inventory but no evidence of skeletal remains. This phenomenon has been reported at Tell Banat in Syria and the Birecek Dam Cemetery (Porter, 2002: 165; Sertok and Kulaloglu, 1999: 90). I will revisit this discussion below.

TABLE 6.7:  
DISTRIBUTION OF INDIVIDUALS BY AGE CATEGORY IN CIST GRAVES

Age Distribution	Simple Cist	Cist	Total
Adult	4	2	6
Infant	1	0	1
Child	2	5	7
?	17	31	48
<b>Total:</b>	24	38	62

Artifacts are also evenly distributed between cists and simple cists. There is no difference noted between the instances of artifacts deposited in these two graves types. This distribution presented in Figure 6.6 is, again, based not on the count of artifacts in each category found within the graves, but on the count of graves in which they are present. As was the case with vessel burials, the most numerous are the graves that contain ornaments and ceramics. In this case, the metal inventory includes several cist graves with weapons. I would venture to argue that the four and two (together six) cist graves with weapons from Carchemish are not representative of the burial record. Cist graves almost always contained such inventories in the event that they were not robbed. Almost all of the graves at Asagi Salat were robbed, so it is more than possible that these artifacts were removed. Toggle pins and other needle forms and non-metallic beads continued to be the main form of ornamentation.

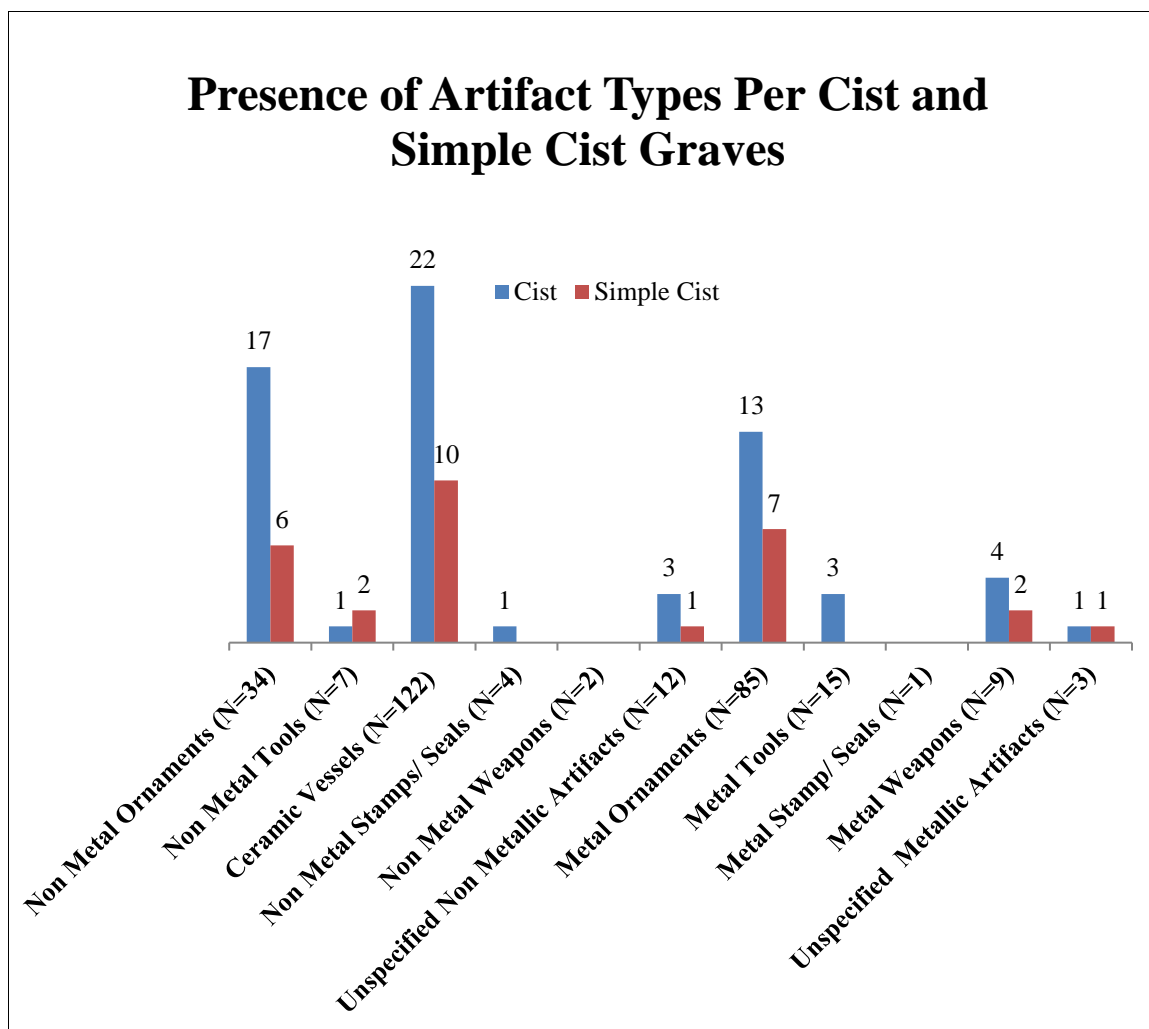


Fig. 6.6: Presence of different artifact types recovered from cist and simple cist graves.

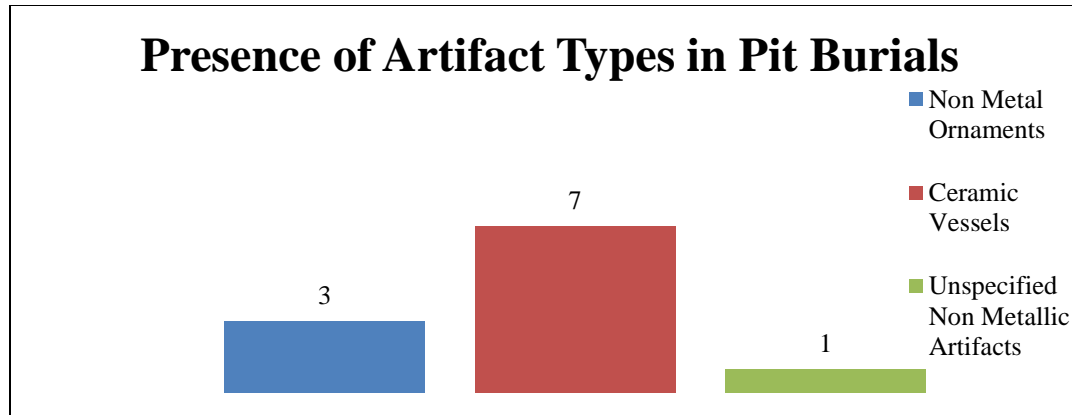
#### 6.2.1.4 Pit Burials

Pit burials are not attested to very frequently in the Turkish sector of the Euphrates, but they are at sites further West like Oylum Hoyuk, which represents 10 out of the 13 (8% of burials) pits from this study. The rest come from Gre Virike. In northern

Mesopotamia, they are often found in the lower sector of the Euphrates in northern Syria (Cooper, 2006: 209). These burials were small, narrow, and relatively deep in comparison to the cist graves. As the simplest form of burial, they might have had some mudbrick lining and/or stone and were either sealed up with dirt or stone slabs. All of the burials at Oylum were sealed with stone slabs and smaller stones. One of the burials at Gre Virike imitated a chamber tomb through its square-cut and the placement of a stone slab on one of the walls.

Out of the 13 pits, 8 of the graves could be categorized by age (Table 6.3). Small sample aside, everyone is represented. The two adults are female and male in different pits from Oylum Hoyuk. A larger sample size may represent more infants and children being buried in these types of graves, but other sites in the region do not show such a distribution.

The distribution and occurrence of artifacts seem to be similar to those described for the vessel burials (Figure 6.7). There are almost always ceramic vessels included as well as ornaments in the form of beads from different stones like frit and crystal. None of the pit graves contained metal artifacts at either Gre Virike or Oylum Hoyuk. This absence stands out from the vessel burials, where at least a toggle pin was the standard, implying that those individuals might have been dressed or had a shroud that used such fasteners.



Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/ Seals	Non-Metal Weapons	Ceramic Vessel	Non-Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
Oylum Hoyuk	OYMez37					X						
Oylum Hoyuk	OYMez38					X						
Oylum Hoyuk	OYMez39					X						
Oylum Hoyuk	OYMez40											
Oylum Hoyuk	OYMez41					X						
Oylum Hoyuk	OYMez42	X										
Oylum Hoyuk	OYMez43	X				X						
Oylum Hoyuk	OYMez44	X				X						
Oylum Hoyuk	OYMez45											
Oylum Hoyuk	OYMez46											
Gre Virike	1											
Gre Virike	2											
Gre Virike	3					X						

Fig. 6.7: Presence of artifact types recovered in pit burials, marked by "X", per site, per grave.



#### 6.2.1.5 Chamber Tombs



Fig. 6.8: Oval Stone Chamber at Gre Virike. Reproduced from Ökse, 2006: Figure 30, 20.

Rare occurrences in this data set include the five stone/earth chamber tombs. They differ from the former monumental chamber tombs in their smaller size, their subterranean component, and their lack of attached chambers (Figure 6.8). These burials sometimes have floors paved with large pebbles or just trampled earth. The entrance is built up from stone so that one has to descend inside. Stone Chamber tombs are cut into the earth and then lined with rough stones that sometimes cobble inwards at the top. Like the other burials, they are covered with monolithic stone slabs and sometimes have

similar slabs placed at the entrance (Algaze et. al. 1995: 27). They are recorded at Oylum (one), Gre Virike (one), and three mud-mortar and rough-stone technique tombs from Gedikli. At Oylum, reports mention five, but details are only provided for OYMez1, so that is the only one included in this analysis. With no exception, all of the graves here have been robbed or partially disturbed.

Out of the excavated tombs, two were intact enough to allow for an age estimate of the skeletons (Table 6.3). Generally, we know from other similar graves on the Syrian border, like tomb 1518 at Jerablus Tahtani, that they could accompany up to five individuals (Peltenburgh et. al. 1997: 7), but this is not necessarily a standard. As is the case with the other burials, demographically, everyone is more or less represented, though of course, my data does not reflect this, if only for the low number of this burial type.

In terms of artifacts, this tomb type suffered from looters. Because of its visibility, it lends itself to both ancient and modern interests. Those tombs that are somewhat intact, however, like at Oylum Hoyuk, featured a large number of metal artifacts and other stone and bone tools (Table 6.8). The villagers at Oylum Hoyuk made an offer to the excavation director to return and give context to some of the artifacts that they had looted from the chamber tomb, but whether or not this is the extent of the whole inventory is unclear, of course. Looters tend to ignore ceramic vessels, so they are found in large numbers in all of the chamber burials, as is expected. The tradition of depositing heaps of vessels is observed in this burial type as well.

Chamber tombs contain many metal artifacts, especially weapons. The single chamber tomb at Oylum Hoyuk that was described had 13 bronze items in the form of

ornaments, weapons, and tools. This should be considered the standard if not a minimum for these burials. Thus, the five chamber tombs in this study are not representative of artifact types or distribution.

TABLE 6.8:  
PRESENCE OF ARTIFACT TYPES RECOVERED IN CHAMBER TOMBS,  
MARKED BY "X", PER SITE, PER TOMB.

Sites	Grave Identification	Non-Metal Ornaments	Non-Metal Tools	Non-Metal Stamp/Seals	Non-Metal Weapons	Ceramic Vessel	Non-Metal Unspecified Artifacts	Metal Ornaments	Metal Tools	Metal Weapons	Metal Stamp/Seal	Metal Unspecified Artifacts
<b>Gedikli</b>	M1					X		X				
<b>Gedikli</b>	M2					X						
<b>Gedikli</b>	M3					X						
<b>Oylum Hoyuk</b>	OYMez 1					X	X	X	X	X		
<b>Gre Virike</b>	11					X	X	X				

#### 6.2.1.6 Shaft Grave



Fig. 6.9: Oval Shaft Grave at Gre Virike Phase IIB. Reproduced from Ökse, 2006: Figure 26, pg.18.

The shaft tomb is represented by a single occurrence at Gre Virike. It is an exceptional example of this rather variable category of burials. Ökse (2006: 14-15, 17-18) describes the shaft chamber as a small pit measuring 1.20mx0.95m that is 0.70m deep. The walls are constructed of 4 rows of rough stone, and a large stone was placed upright on the west side of the grave. The tomb was sealed with limestone slabs (Figure 6.9).

Inside the chamber were the bones of 2 subadults: an infant between 6-12 months of age and a child between 3 and a half to 4 years of age. Their bodies were covered with a layer of soil, in which grains and beans were spread out. The burial inventory consisted

of a zoomorphic ceramic bell, two wheels from a model ox cart, three toggle bronze pins, and four agate beads. Their ceramic heap contained 32 vessels of bottles, trefoil-mouth jugs, goblets, bowls, miniature bowls, and miniature vases (Figure 6.10). On top of some of the artifacts in the northern wall of the chamber was placed a ceramic basin containing the bones of another 1- to 1-and-a-half-year-old child. This basin, which essentially serves the role of a larnax, reminds us of the few found at the Royal Cemetery of Ur from period IIIA. (Wolley, 1934: Pl.11a, 17a/b, 61a) (Figure 6.11). On top of the grave's stone cover, a few more vessels were placed intermingled with bone fragments. This is probably the result of post-internment activity that included some feasting or food offering given the animal bones found here.

Tombs like this are usually very well furnished, include a bounty of metal artifacts, and contain more than one person, as is the case here, with internments of two at sites like Wreide or Selenkahiye or over 10 at Halawa (Orthmann and Rova 1991: 10; Orthmann, 1981: 73). As mentioned in the previous section, the shaft tombs display the full range of EBA material culture, from ornamentation to weapons (Table. 6.9). In this example of a shaft tomb, we may be missing some common artifacts like the stamp seals because 1) all of the internments were of subadults who perhaps did not get such artifacts as often, and 2) the tomb might not have been used for a long period of time or had frequent openings and reopening that would have resulted in more material accumulation.



Fig. 6.10: Inventory of the Oval Shaft Grave. Reproduced from  
Ökse, 2006: Figure 27, pg. 18.



Fig. 6.11: Larnax at Ur Royal Cemetery (Woolley, 1934: Pl.17b.).

TABLE 6.9:  
OVAL SHAFT TOMB AT GRE VIRIKE AND THE PRESENCE OF ARTIFACT  
TYPES THAT IT CONTAINED.

Non-Metal Ornaments	Non-Metal Tools	Ceramic Vessels	Non-Metal Stamps/ Seals	Non-Metal Weapons	Unspecified Non- Metallic Artifacts	Metal Ornaments	Metal Tools	Metal Stamp/ Seals	Metal Weapons	Unspecified Metallic Artifacts
1	1	1	0	0	1	1	0	0	0	0

Contrary to the material that I present here, shaft tombs are the most common grave types in the Euphrates region North of Carchemish. I have established the presence of shaft tombs at Tilbes Hoyuk, which I could have included here in theory. After looking at the reports, however, I could not find data on any of the tombs except for the mention of their existence in Cooper (2006: 244). On the reporting of the Tilbes Project on the Birecek Dam, Fuensanta's only mention of these burials explains that "The tombs were dug from a later phase into this building.... The poorly preserved burials contained corroded metal pieces, possibly ornaments. To date, these tombs have produced the largest amount of metal from Tilbes Hoyuk EB tombs" (2007: 147). The associated photograph however shows cist graves, so either these "tombs" are different or not



reported. Because I could not verify the existence of these shafts, I chose to not engage with them here.

### 6.2.2 *Demographics*

In the following section, I examine the individuals who are buried in the EBA portion of the burial data. I aim to answer the following questions:

- 1) What is/is there a pattern of distribution of age/sex based on burial style?

(Table 6.3)

- 2) What is/is there a pattern of distribution of age group/sex based on artifacts?

Table 6.10 below shows the association between individuals and the artifacts that they are found with from this sample. As always, here too, the number shows the number of individuals associated with a presence of artifacts in each category and not how many artifacts were found with the individuals.

TABLE 6.10:  
PRESENCE OF ARTIFACT TYPES RECOVERED IN ASSOCIATION WITH  
DIFFERENT AGE GROUPS.

Age Distribution	Non-Metal Ornaments	Non-Metal Tools	Ceramic Vessels	Non-Metal Weapons	Non-Metal Stamps/ Seals	Unspecified Non-Metallic Artifacts	Metal Ornaments	Metal Tools	Metal Stamp/ Seals	Metal Weapons	Unspecified Metallic Artifacts
<b>Adult</b>	2	1	15	0	0	2	7	7	0	0	1
<b>Infant</b>	4	0	6	0	0	4	5	1	0	0	0
<b>Child</b>	6	2	19	1	3	5	11	4	0	2	1
<b>?</b>	16	3	89	0	2	5	68	11	1	7	1
<b>TOTAL:</b>	28	6	129	1	5	16	91	23	1	9	3

I abandoned my initial intent to deal with the sex of any of the EBA groups because most burials are not sexed. Those that were sometimes were reported as children, and given the large error of sexing sub-adults, I did not include these individuals. Thus, I focused on the age groups that included adult, child, infant, and unknown. Interestingly, not one of the sites reported a single individual as being an adolescent. This could be due to errors in categorization (for example, if the person is a young adult and gets categorized as a child). Based on my data and what is known from Near Eastern archaeology, it is unlikely that adolescents had a different burial manner unknown to archaeologists, for the full range of customs is probably established at this point.

For this period, all ages and sexes are more or less represented in the mortuary record. A Chi Square was performed to test for the significance of variance in the distribution of each age category from the data presented in Figure 6.13. The test showed no significance at  $p < 0.05$ , with a  $t$ -value of -0.31324 and  $p$ -value 0.380619. We know from other sites in northern and southern Mesopotamia that females and males receive the same treatment, and children and infants often do too. The burial data collected here does show that pattern. A Fisher Exact Test was used to test the level of variance between the group children and adults in pits and vessels and again in cists and simple cists from the same group. The results of the test showed that the former had a Fisher statistic value of 0.673 and the latter a value of 0.5581, both insignificant at  $< 0.05$ . The adults and infants between vessel and pits were compared with the same test and were also not significant with a value of 1 at  $p < 0.05$ . The rest of the burials were not compared between these groups because of their insignificant numbers and a large portion of unknown individuals. Thus, children, infants, and adults seem fairly evenly or insignificantly distributed amongst these four burial categories. It is interesting to note that the vessel burial data set does not show a favoring towards infants or children. This stands in contrast to other Euphrates sites along with other sites in Greater Mesopotamia, where these burials tend to favor infant internments. Perhaps this is the result of reporting infants and children as the same entity.

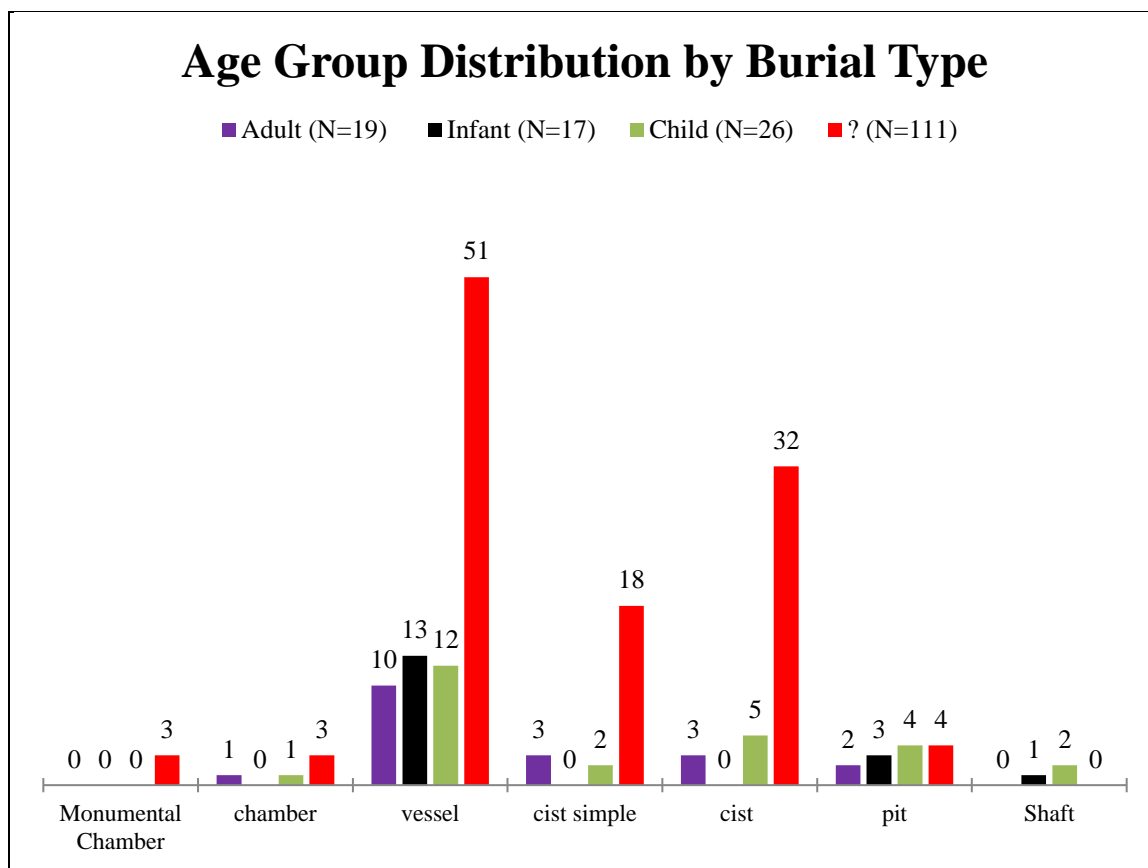


Fig. 6.12: The distribution of individuals in different burial types.

The situation with artifacts is complex to consider in this study given that many trends and impressions so far have been made from graves, such as cists and shafts, which are usually used for multiple individuals. It is difficult to understand which item belongs to who, especially when they are found in heaps, as is the case with ceramics and often the rest of the artifacts. In such shaft and cist graves, we often find all the bones stacked on one side, a pile of metal artifacts, and a pile of ceramics. Tell Ahmar's Hypogeum is a good example of this internal organization of burial space (Theureau-Dangin and Dunand, 1936: Pl. XX).

Figure 6.14 below shows the number of individuals in each of the age categories by the presence of artifact categories. It seems that children do have a larger number of artifacts, but they are also the most well-represented group out of the four categories, though not significantly so. They are also frequently featured in communal burials. Thus, I do not interpret their association with more artifact groups as being more prestigious or necessarily possessing a higher rank. As one can see in the actual burial inventory and descriptions, children's burials have about as many objects as adults. Consistent with what we observe at other sites, infants tend to not have as many artifacts as the other age categories. Overall, the range of grave furnishing in any age category varies from poor to well furnished (Schwartz and Curvers, 1993).

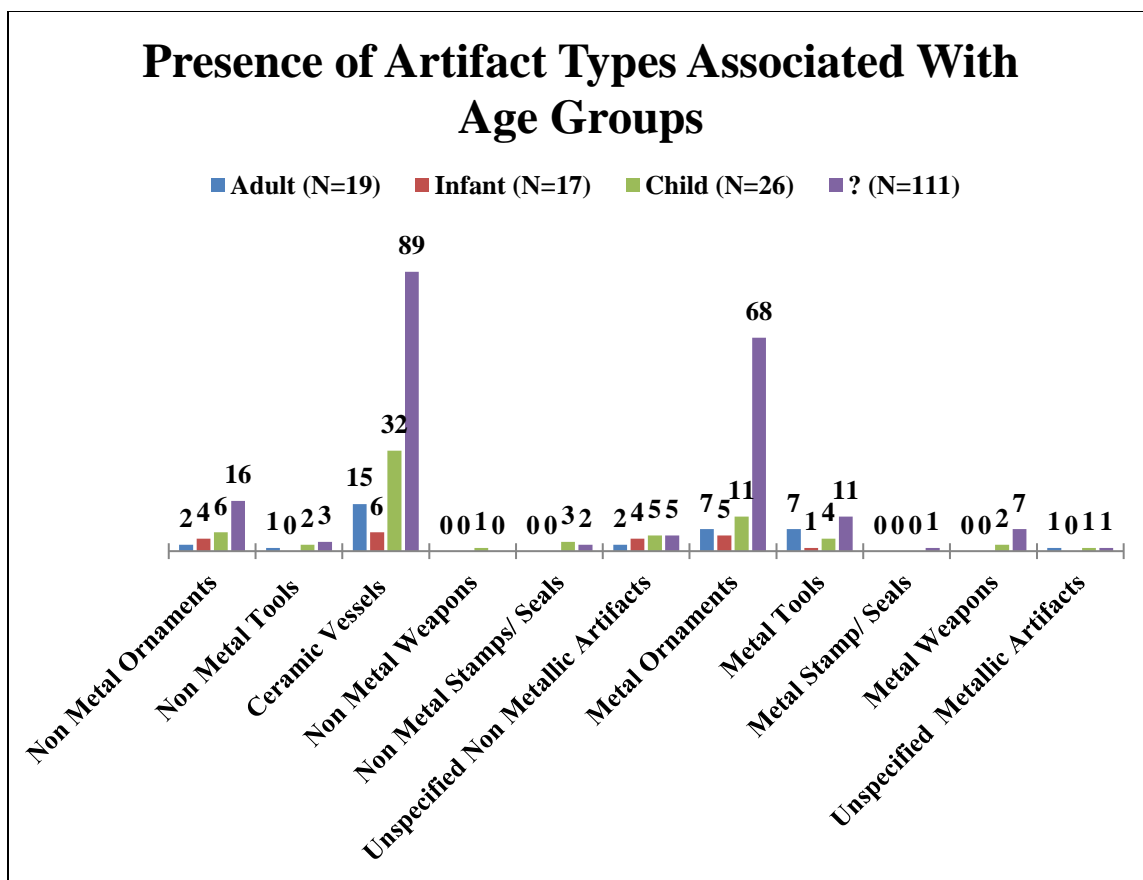


Fig. 6.13: Presence of artifact types as distributed across the different age groups.

Metal artifacts seem to be evenly distributed amongst each category as well (Figure 6.15). When we consider other sites that are similar, we know that infants are not likely to receive weapons in situations where they are buried alone. This is consistent with the data that I have presented here; however, the problem of association in burials is an issue here because of the frequent occurrence of metal items in communal burials. Infants and children have high instances of ornaments overall, which is expected based on the fact that these ornaments are probably toggle pins.

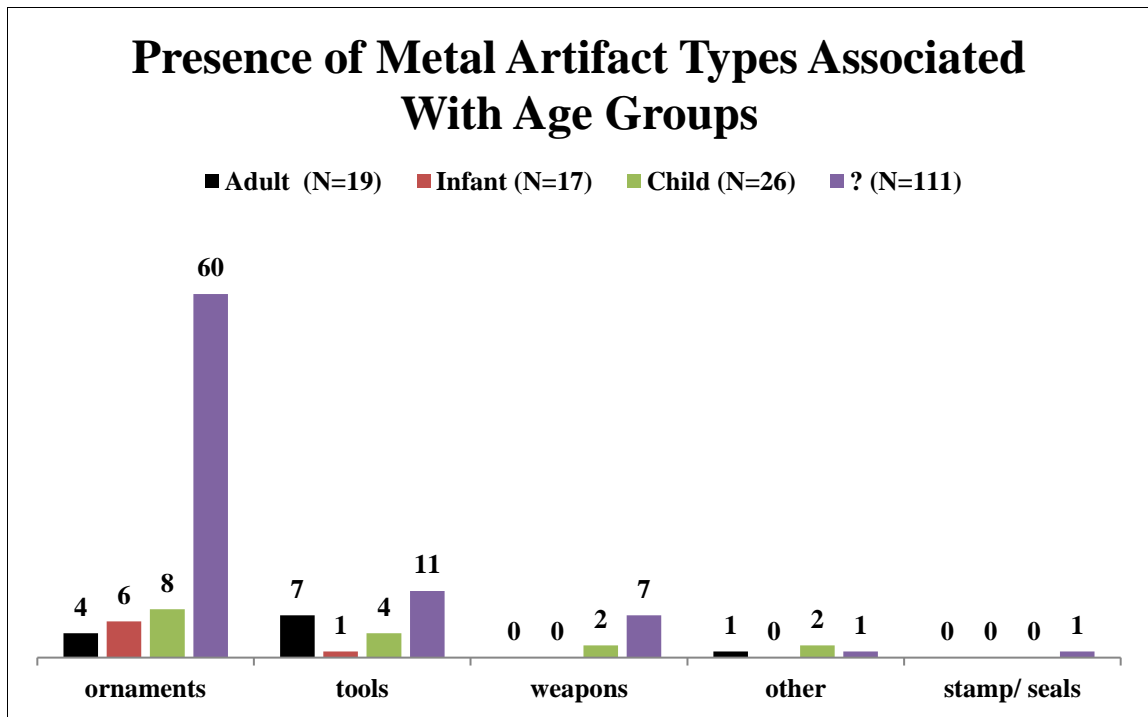


Fig. 6.14: Presence of metal-artifact types as distributed across the different age groups.

### 6.2.3 Analysis of Artifact

In the following section, I examine the type and distribution of artifacts amongst the burial data represented in this sample.

- 1) What is/is there a pattern of distribution of artifacts based on burial style (Table 6.4)?
- 2) What is/is there a pattern of distribution of artifacts based on age group categories (Table 6.10)?

The problem of communal burials was discussed above, and it is relevant for how artifact occurrence was counted. The figure shows artifact distribution in each category, as counted in burials, not accounting for the number of internments (Figure 6.16).



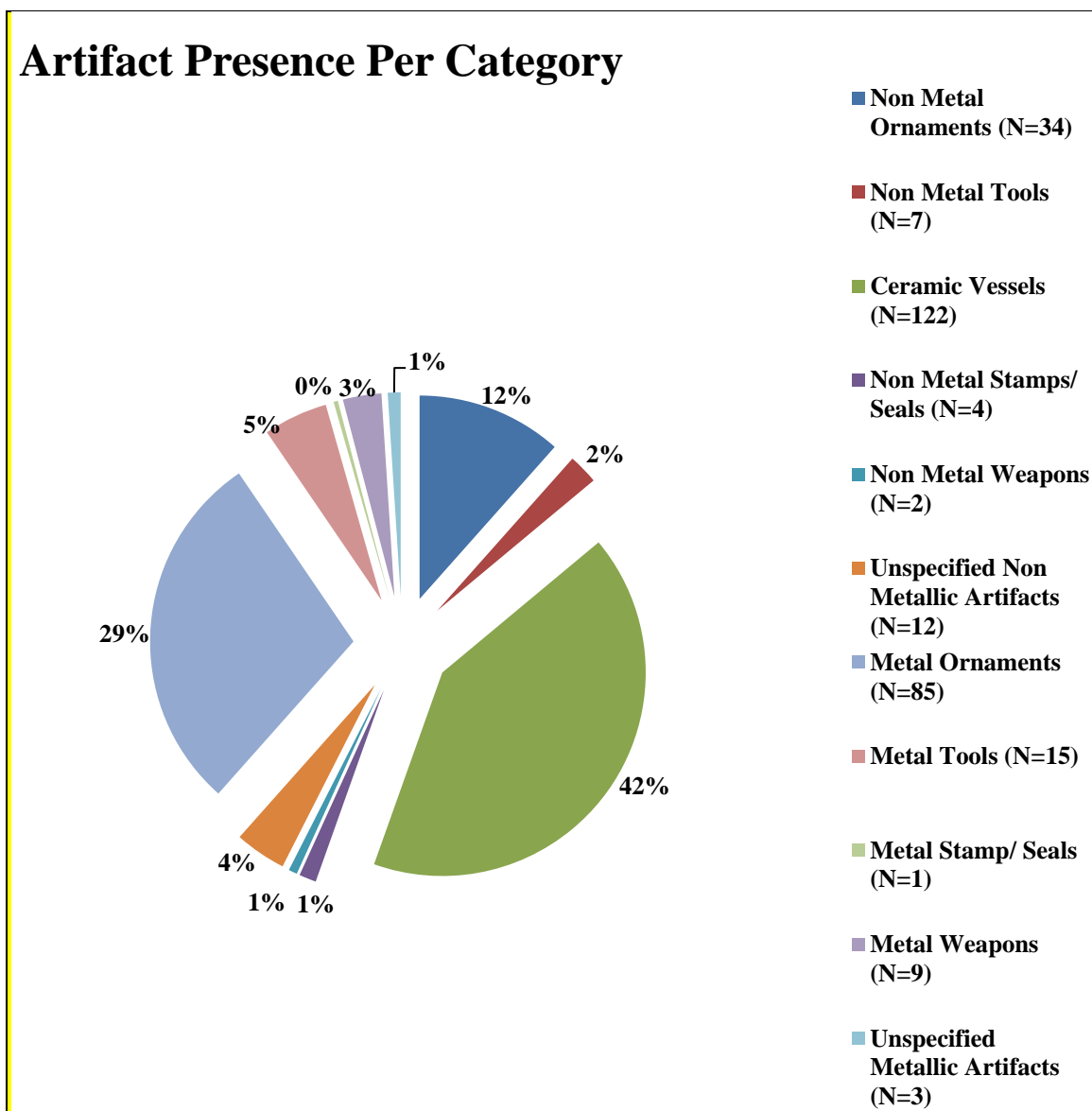


Fig. 6.15: Presence of all artifact types recovered from all burials.

The artifact presence in burials strongly favors the consumption of ceramic vessels and metal artifacts. Ceramics are the largest category, as already discussed, where tens of different ceramic vessels could be found in a single burial. An extreme example of

this is the aforementioned Hypogeum at Tell Ahmar, where over 1000 vessels were recovered from the main chamber (Theureau-Dangin and Dunand, 1936: Pl. XX). At the early periods of EBA I-II, one of the most characteristic vessels is the so-called fruit stand/high base vessel/Champagne Cup (Figure 6.17). These are associated with Syrio-Mesopotamian influences and were first registered and given the term from the excavations at Carchemish. Such vessels are later recognized along the Carchemish area, namely the Birecik Cemetery, where these vessel forms are associated with a particular form of metal working, burial types, and the use of weapons in burials (Philip, 2007). Aside from these peculiar vessels, all forms of the EBA repertoire are represented in the burials.



Fig. 6.16: Champagne-cup vessels recovered from the Carchemish tombs. Reproduced from Falsone and Sconzo, 2007: Figure 5.4, 76.

The EBA is marked by a period in which bronze artifacts began to be used and consumed in burial context more so than any other period discussed here. Stork (2014: 58) compared the deposition of metal items in graves during the Chalcolithic and the EBA: while 88% of hundreds of metal objects found in period I-II EBA were from burials, the previous period has only a consumption rate of 24% from about 71 artifacts. In addition to the actual number of artifacts in the burials increasing, the number of metal tools deposited decreases, and weapons and ornaments are the most frequently observed.

My findings with this data set are consistent with Stork's 2014 study (refer to Figure 6.14 above). The number of burials associated with tools exceeds the number with weapons by 4, but this comes from the designated "threading needles" from the Oylum Hoyuk burials, which are probably normal ornamental pins, but since the recording made a distinction, I treated them as a tool.

The EBA burials, as mentioned above, had the highest number of ornaments out of any other item across all age groups, be it by counting artifacts as illustrated in the appendix or by presence/absence, as I do in this analysis. There were far fewer individuals buried with ornaments made from a material other than metal (Figure 6.18). This is probably due to the trend described above where metal items become the main source of mortuary consumption and seem to replace other materials. I do not see the use of metals for ornamentation replacing the use of non-metal items. As can be seen in the appendix, both of these styles co-occur in both the EBA I period and EBA III/IV period.

## Presence of Artifact Types Associated With Each Age Group

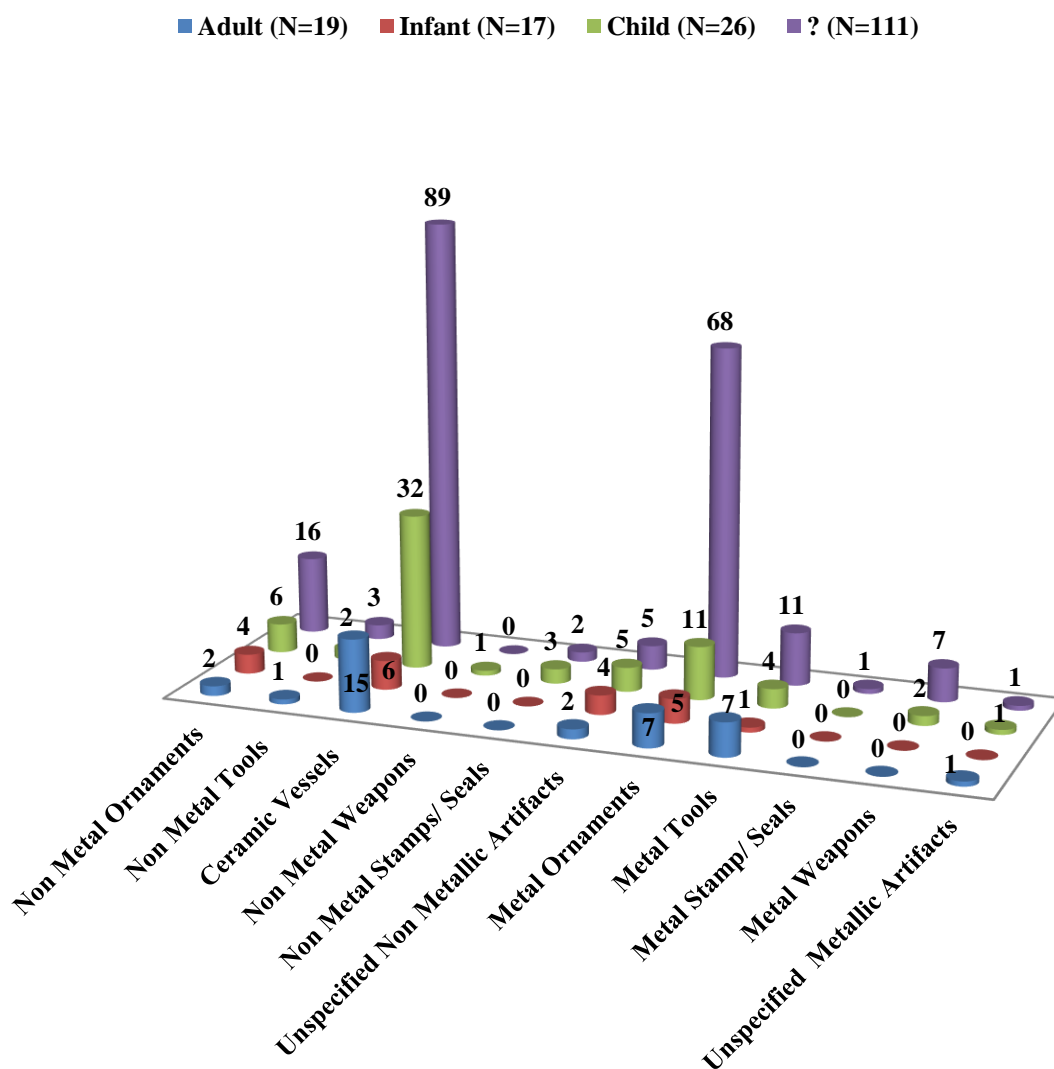


Fig. 6.17: Presence of artifact types as distributed across the different age groups.

The Carchemish burials stand out here as being very rich in metal artifacts, especially ornaments and weapons. Weapons consisted of spears, pokers, daggers, and one mace head and were found in 6 out of the 15 graves. Other than metal and ceramics, the grave repertoire was very concise with a few random figurines and other small artifacts.

Artifacts are more or less distributed equally amongst the identified individuals' age group. Overall, there seem to be more instances of artifacts associated in children and adult age groups in comparison to infants in the categories of metals and ceramics. Children have significantly more instances of ceramics than adults do, but again, they are better represented overall. Based on what we know from other sites, this distribution is consistent with the observations that burials are very varied and that everyone can receive most burial gifts except for infants, who seem to have a higher instance of simple burials (Cooper, 2006).

When it comes to metals, nothing should be said about the distribution in age groups. Weapon inventory is greatly unrepresented here because of the high rate of tomb robbery across all the sites except Carchemish. From my conversations with locals at such sites, I understand that they do choose the big metals that could be sold to smiths for money. This is why ceramics are usually undisturbed. It is interesting to note an almost complete lack of gold used for ornamentation except for a single diadem at Oylum Hoyuk. However, in non-disturbed graves, gold and silver are fairly common in moderate amounts amongst the burial inventory of the EBA. Thus, this difference might be due to the high number of graves that have been robbed in this sample.

The distribution of artifacts in relation to burial types is loose at best (Figure 6.19). As it can be seen from the chart below and the appendix, regardless of the burial style, the idea is the same: abundance of ceramics and some type of ornamental and/or functional fastener, followed by everything else. These charts are very consistent with the expected burial repertoire, and they can be used to illustrate what would be found in the average tomb. Thus, my data corresponds to the expected distribution of artifacts in different burial contexts. The type of metal artifacts in the burials is also not surprising. Here, we see that more often than not, a burial will have at least an ornament, no matter the burial method. The most numerous are the vessel burials, and they tally the most ornaments in this sample, as was shown in previous sections.

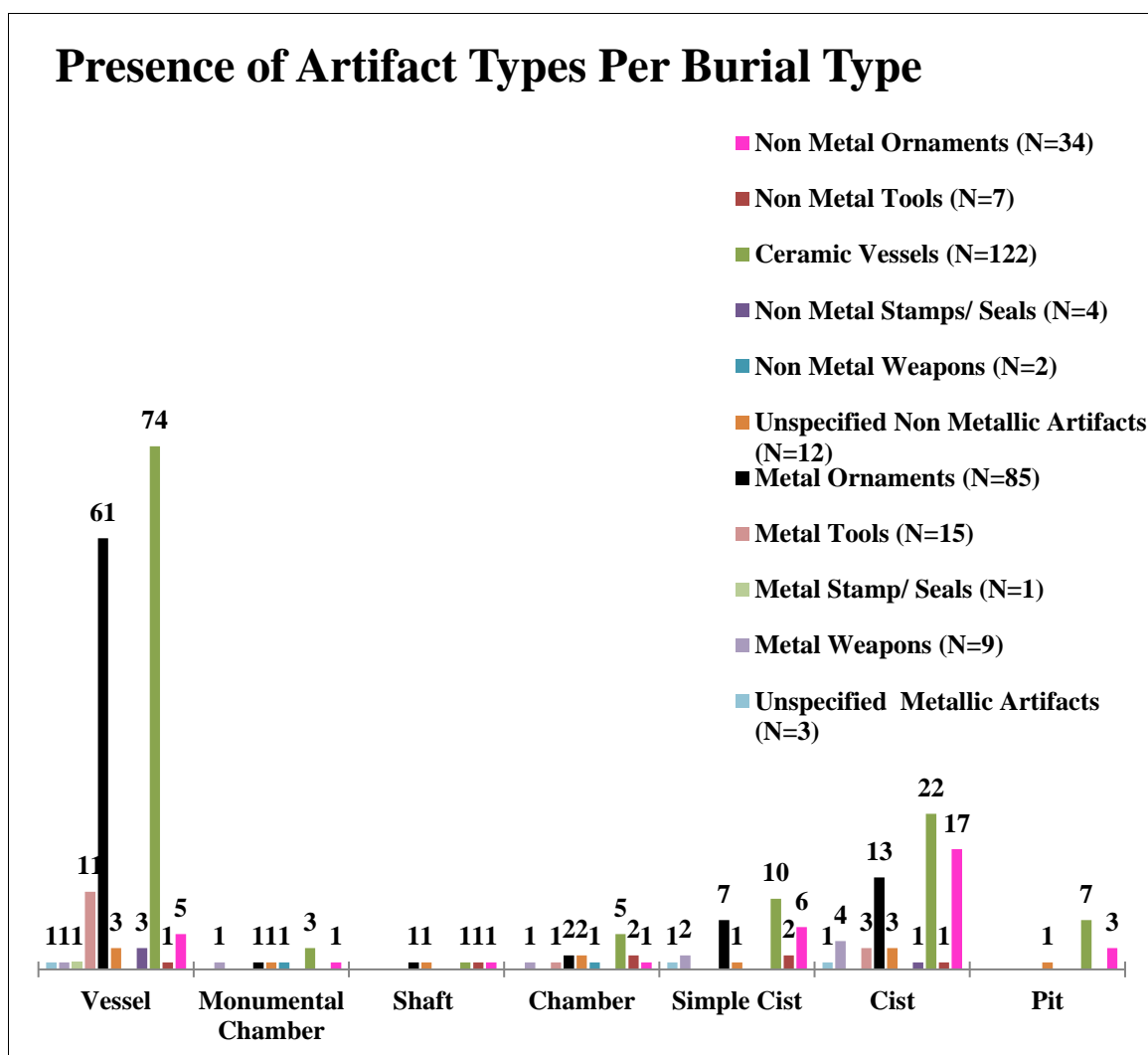


Fig. 6.18: Presence of artifact types recovered from each burial type.

Based on all of the data presented here in terms of the number of graves with artifacts from each category, I would argue that out of all the burials, the 13 pit burials stand out as lacking in furnishings, both in terms of artifact variety and instances of association. These graves were not robbed but failed to produce an inventory aside from ceramics and non-metallic beads. At other northern Mesopotamian sites where pit burials



are well attested to, such as Selenkahiye and Jerablus Tahtani, this is also the case (Van Loon, 1977; Peltenburg, 2007). These burials seem to stand out in their simple architecture, small size, and similar shortcoming of artifacts. The presence of pit burials in southeastern Anatolia that I have discussed can be relevant to the discussion of pits that are similarly barren, furthering the possibility that they served as a discriminative grave type when compared to the rest of the burials (Orthmann, 1981).

### **6.3 Discussion of Early Bronze Age Burial Practices**

The EBA is a very complex period because it is a time of both the shambles of the previous urban system from the 4th millennium BC and the rise of another. Subject to many archaeological investigations by American, Italian, and Turkish teams, excavations have exposed many similarities and differences between North and South Mesopotamia. As we shall see, southern influences are not the only channels of cultural transmission during this period. Ideas about the funerary display and particularly complex metallurgical styles can be attributed to Trans-Caucasus from Eastern Anatolia in the Malatya region (Palumbi, 2003).

During the beginning stages of the EBA (IA, IB, and II), much of northern Mesopotamia had returned to a state of nomadism, characterized here as a constant movement. Communities were sparse and increasingly came into contact with different cultural traditions, mainly the Transcaucasian Kura-Aurax, attested to by the presence of Mijkop and the black and red burnished ware with its characteristic knobs, lugs, and handles, as was discussed in the previous section (Palumbi, 2003: 103-105). It is at this

time that stone cist graves began to appear and dominate in Anatolian Mesopotamia. In the ruins of the violent Uruk city of Arslantepe, which was turned into a tumulus by the heap of its destructions, between phases of occupation VIB1- VIB2 (3000-2750 BC), the EBA people erected a mass stone cist grave (Palumbi, 2007: 26). This grave contained a rich inventory that showcased fine metalwork in the form of spears and pokers reminiscent of the Uruk metalwork repertoire, hair pins and spirals, and a diadem almost identical to the metalwork from the grave repertoire of the Kvatskhelebi burials as well as red and black burnished vessels that can be linked to Kura-Araks influences (Palumbi, 2004; Hauptmann et. al., 2002: 43-53; for a detailed description of this tomb and its contents, see Frangipane et. al., 2001). Most interestingly, the tools from the burial, such as the gouges, chisels, and axes, are reminiscent of those from the Mijkop Kurgans' (Chernyk, 1992: 67-83). In this context, we can view the dissemination of the Uruk colonies and the state of social instability that is observed in the North as a venue in which newly-emerging elite negotiated power, expressed identity, and formed new ties through their use of the mortuary platform (Hansen, 2017; Palumbi, 2003; 2004).

In the shambles of what was the Uruk world and these new Caucasian influences from the East, the old and the new synergies of the Mesopotamian world resulted in varied ways of power legitimization. Yet, the roots of what became the EBA were already in place as a result of socio-political developments that took place during the Chalcolithic. The previous chapter introduced and argued for the idea that the budding religious practices of the Uruk were inseparable from the economic and sociopolitical aspects of those societies. It would not be a stretch to say that they were at the top, for in the South, this relationship is clearly expressed. It is also clear that in the North, the

constant instability of hierarchical relationships, the inability of elites to capture power in a manner that would monopolize production and distribution of goods made the region more susceptible to the ebbs and flows of outside influences.

In this manner, northern Mesopotamian burial practices should not be enslaved to religious dynamics as we understand them in southern Mesopotamia. I will emphasize again that religion in whatever form it took in the North, should not be seen as functioning in precisely the same manner as it did in the South, if only for the reason that we do not know exactly how kings or religious priests functioned in the North. What we do know is that they existed, as evident by the religious architecture that clearly served administrative roles. What is also clear is that southern Mesopotamian elite ideology and thus religious ideology seeped into the system of status display for the northern elite. This suggests that even though elite roles might not have been the same in the North as in the South, the North certainly reproduced notions of high social standing, especially at death. As written records emerge in the northern cities at this time, one way that we can follow this development is through the reproduction of myths and mythic elements in burials. To begin, one of the practices that draw our attention to religious propaganda and illustrate how it infiltrates the realm of burials are the staged death scenes, often classified as sacrifices in the whole of Mesopotamia. Here, I present the known examples as an attempt to set the scene for how Mesopotamian mythology found its way into the mortuary realm and why, as archeologists, we should actively seek those elements out. I will then discuss how my data relates to these texts and how their use can shine light on observed patterns.

Returning to the Arslantepe Royal Tomb, this site is significant not only for its earliest use of cist burial, but also for the human sacrifice made to a central figure—who is clearly a distinguished elite—and his retainers (three females and one male). This is part of the image that we start to see emerge in the EBA, where instances of purposeful death become known across Mesopotamia. South of Arslantepe at a slightly later date, Shiyukh Tahtani, a tomb comprised of a round pit, uses the bodies of at least two adults and one child that are placed with their backs to the pit to frame the burials of an infant and an adult. The adults were dressed in a way that was not observed in any of the burials in the Shiyukh cemetery. The excavator, Dr. Paola Sconzo, points out that on the dead's torsos, there were up to seven pairs of crisscrossed pins that held together some garments not afforded to other burials (Porter, 2012: 199). It is of significance, too, that while everyone here is provided a pile of ceramic vessels, the central adult is denied any. Another interesting example is the Umm el-Marra burial, where two women with rich garments and two infants were placed on top of two males with no adornment—all laid upon an earlier burial (Schwartz, 2007). The southern female-male pair wore diadems of gold and silver, respectively. Sacrifice is attested to around the whole structure of the burial, as discussed earlier in the chapter, by the infant and equid internments (Schwartz et. al., 2003). The paramount example of human sacrificial elaboration that Mesopotamia achieved in the 3rd Millennium BC is, of course, Woolley's famous Royal Cemetery of Ur, with its 16 Death Pits of 16 royals (Pollock, 2008). Be it the sheer number of dead animals and people or the unprecedented richness of the monument, this is an extraordinary example of ritual (Woolley, 1934; Pollock, 1983). Here, hundreds of people were dressed, sometimes prepared by being smoked and cooked before being

placed in the pits and provided with the remains of rich feasts. Their bodies were adorned with various objects ranging from chariots and musical instruments to weapons and lavish ornamentation crafted from the most exotic materials known at the time (Gansell, 2007). On their heads, blows by a pickaxe show how they found their demise, shattering previous notions that this was a scene of a peaceful and voluntary death (Vidale, 2011; Baadsgaard et. al., 2012: 125-158). To add to the growing body of evidence for the performance of human sacrifice, Basur Hoyuk in Siirt, Turkey is contemporary to Arslantepe's cist tomb. At the site, 16 cist graves are dug into the backfilled Uruk structures. A large capstone marked the largest of the cist graves, called Grave 15 and 17, which had a stone pavement in the main chamber, 15, and an additional antechamber with no pavement, 17. As it was in the previous contexts, these burials were of male-female pairs of teenagers (see Hassett and Saglamtimur, 2018: 644-647 for a detailed discussion of the biological markers used to date and sex the remains). The three individuals in G15 were marked by their association with 100+ bronze spearheads bundled with textile or scattered within the chamber as well as the hundreds of pins in criss-cross groups identical to the Shiyukh Tahtani that adorned the deceased (Figure 6.20). The outer burials in G17 were buried with heaps of ceramic vessels and large crossed pins identical to those of the so-called "Mari woman" (Zettler et. al., 1996: 20, Figure 9). Skeleton 36 was found clutching those pins near the throat. On top of the buried tiles, black and white beads were laid on the chest (Figure 6.21). At least three of the individuals have blunt-force trauma to the head as the cause of death.

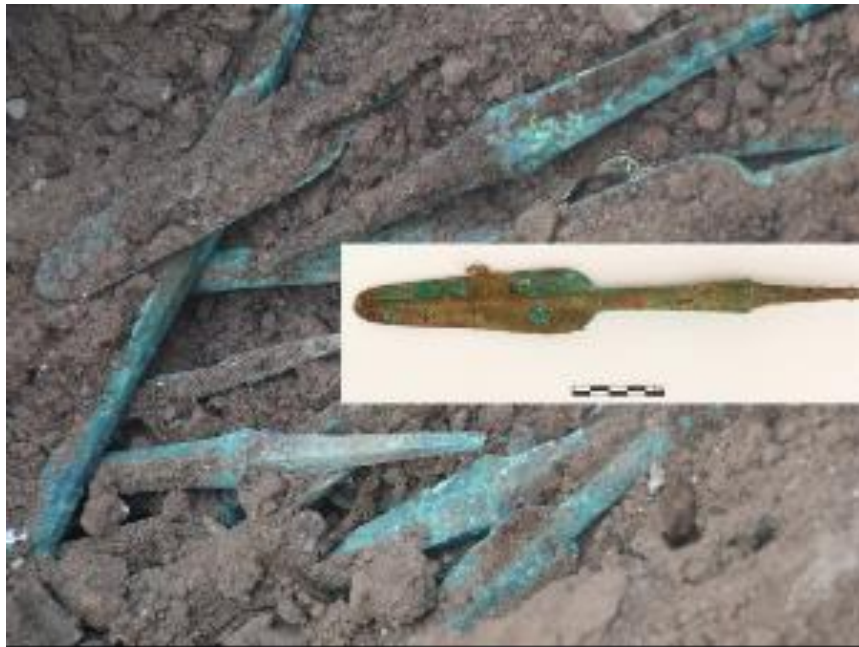


Fig. 6.19: Grave 15, Basur Hoyuk—spear bundle that still has fabric attached to it. Reproduced from Hassett and Saglamtimur, 2018: Figure 3, 644.



Fig. 6.20: Grave 17, Basur Hoyuk—bead placket. Reproduced from Hassett and Saglamtimur, 2018: Figure 8, 650.

The examples of human sacrifice discussed here have common themes, such as body staging, male-female pairs, bodily adornment, and the use of weapons caches. It is interesting to consider the appearance of human sacrifice in this stage of social development in the Near East because it places these acts during a time that is considered to be socially vulnerable. Turchin (2016) and Watts et. al. (2016) have argued that sacrificed members of society can serve to position authority, especially during times of instability. Morris (2007) has also pointed out such a dynamic in the staged deaths that took place during Den's reign of the First Dynasty in Egypt. In this mass sacrifice,

hundreds of individuals met their death with the purpose of displaying and enhancing various social standings, both those of themselves and in their relationship to the central figure—the king. The disposal of wealth and human life is not just a physical act, but also a symbol of control and power. To achieve an act of peaceful sacrifice, one must imagine that the governing body that stages this act has enough control to talk hundreds of people in going to their death, as is the case with the Ur Great Death Pit. Using human sacrifice in societies that embark on the instability of social hierarchy and used as means of consolidation has been found archaeologically in the chiefdoms of Papua New Guinea (Watts et. al., 2016) and Cahokia (Redmond and Spencer, 2012). Though disposal of human life and material culture might have certainly helped for these purposes, I do not believe that human sacrifice was employed to do this in the Mesopotamian example. First, a highly centralized and urbanized system was already in existence in the South, so the instability that is of importance here would not have been an issue. Similarly, while the EBA was unstable in its beginning stages, by the mid 3rd millennium BC, this certainly was not the case for the whole EBA, and we do find these mortuary practices throughout the period. In the sections to follow, I will explain why human sacrifice might have been performed within the EBA context.

Along with the appearance of sacrifice, the EBA continues the Uruk trend of showcasing the dead and creating a public spectacle. Laneri has extensively discussed how the EBA mortuary practices turn attention to feasting, libation, and continuation of ceremonies past the immediate burial of the deceased (Laneri, 2013; 2007; 1999). In the graves presented here, we can see how their construction aids in the enactment of these types of rituals, such as the corridors and chambers at GreVirike that presented heaps of



ceramics from past libations. Laneri (2006) also points out how pipes and drains that lead from the dromos entrance of tombs to the burial chamber are connected to these practices. The production of wine became ceremonially integrated into burial customs that connected the consumption of wine with the underworld deities, which according to Ebla texts, required the provision of this liquid (Postgate, 1992: 99). In this context, we need to view the burial practices of EBA communities as very vivid and continuous methods of creating social memory and perpetuating newly-emerged kinship ideology. Evidence for this can be seen in the city planning of Titriş Höyük, where the medium/large houses were built with the idea that they would house a tomb that was to be used and reused for generations, always containing multiple internments (Matney, 2005). The rooms, which Woolley referred to as "domestic chapels," contained other elements connected to mortuary rituals, such as basins, anthropomorphic paintings, and benches (Woolley and Mallowan 1976: 29–30). This is, of course, in concert with the extramural burials that had a different song to sing and perpetuated different elite ideologies.

Extramural burials coexisted in proximity to the settlements and incorporated different burial methods, such as the cist graves with pithos burials found at Titriş Höyük, especially during the middle of the EBA (Matney and Algaze, 1995: 46). Their contents were consistent with other Syrio-Anatolian repertoires, which included large amounts of ceramic vessels, bronzes, and, to a lesser extent, other object types. Extramural tombs completely disappeared from the town outskirts during the late EBA, when at Titriş Höyük, a massive fortification system was erected on top of the Outer Town. City planning contracted considerably and was now based on private dwellings connected by

carefully calculated roads and alleys (Matney, 2002: 24-27). It was during this phase that the practice of extramural burials was abandoned and the communal tombs moved into the houses.

Pollock (1999) interprets the coexistence of the EBA intramural and extramural burials as the result of different means of expressing hierarchical standing, or more precisely, showing where alliances lay. According to her, large public institutions, such as the temple government or palaces (called the *oikoi*), emphasized ties through their socioeconomic status or perhaps corporate identity and were buried outside of the settlement. Those who were buried inside large houses were connected through kinship ties that emphasized status based on internal relationships. Cooper (2006) points out that the trouble with this line of analysis is that the *oikoi* system probably does not properly describe the northern Mesopotamian reality, and it is not entirely possible to divorce the kinship ties from any system or institution. She proposes that instead of kinship versus government ties, the choice of where people were buried was based on their tribal identity, which was still strong in the region. Those who were buried within the settlement did not choose to emphasize the tribal kinship ties (Cooper, 2006: 240-242). In this case, Cooper's use of 'tribal' should be understood as nomadic, for these populations were indeed highly mobile. Furthermore, Cooper argues that it is possible to assign the distribution of cist burials to Anatolian/Hurrian populations, which is a suggestion that Carter and Parker made first in their 1995 (113) examination of the movement of pots in comparison to burial types. She makes this assertion based on Bonechi's examination of contemporary place names, which shows that pockets of Hurrians probably coexisted

with Semitic populations and that these places correlated with the presence of cist and rock-cut shaft tombs, respectively (1998: 236-237).

Though ethnicity/cultural affiliation can be a factor in the choice of burial types and styles, I believe it is a stretch to argue that it played a role in the location of burials, especially in this region, where as time went on, it becomes notoriously difficult to distinguish who is who archaeologically and textually. In addition, differences in alliances, whether with kin or the state are most likely not clear cut, but neither are the nomadic affiliations. While I acknowledge the mobile nature of the northern Mesopotamian populations, I find the explanation that the intramural burials chose not to emphasize that aspect of their identity unfulfilling. What were they showing instead? I believe that to understand what these practices are based on, we should look at the monumental extramural cemeteries that can now be identified at Tell Banat in Syria and Gre Virike in Anatolia (McClellan and Porter, 1999; Ökse, 2006). As discussed earlier, these are monumental sanctuaries, dedicated to generations of funerary activity involving not just burials, but the libations, feasting, and other such ceremonies. They are usually understood to be unique, but I want to bring to light the possibility that they might not be all that different from the intramural mausoleums that the larger tombs essentially became. Intramural burials like Tomb 302 at Jarablus Tahtani certainly played the role of a monumental structure that held the remains of members of society that were to be tended to for generations, a practice attested to by the movement of older remains to make room for newer ones, often leaving only the skull to account for the individual (Peltenburg et. al., 1999). These types of tombs were placed in prominent places of the city in an abandoned sector or at the entrance to be seen. Thus, perhaps the free-standing

monuments, such as Banat and Gre Virike, are akin to monumental and elaborate intramural burials (McClellan and Porter, 1999; Ökse, 2006). The other extramural tombs simply did not hold the same veneration status that the former did. We have evidence for the continuation of libations and rituals for the extramural examples too, but perhaps it is the monumental mausoleums and the selected intramural tombs that represent those members of society that had a long-lived memory amongst their people.

So far, I have discussed the role of religion in the fiber of Uruk and Bronze Age society, specifically as it pertained to burial practices. In the preceding discussion of human sacrifice, I have shown how northern and southern elites employed this method to possibly showcase power and legitimize their changing social position. I have also positioned ancestor veneration and the associated funerary rituals as central in understanding EBA mortuary traditions. In this next section, I will offer an alternative explanation of what human sacrifice might have achieved in urbanized Bronze Age societies. I will argue that burials, both those that are the result of natural death and of sacrifice, should be examined in the context of that which structures EBA society the most: religion. To inform my data, I turn to the written records of the 3rd and 2nd millennium BC. Myths, which speak of the complicated relationships between gods, people, and cities, namely, will allow me to derive a better understanding of what is buried and why. First, I will discuss aspects of *The Descent of Ishtar Into the Underworld* to position its text and concerns within the Mesopotamian cosmology and its role in everyday life and death. Then, I will turn to the data that I presented above and discuss my findings in concert with what religious mythology might offer to unveil some mortuary customs.

### 6.3.1 Why Are Artifacts Interred?

*Let the palace of the land of no return rejoice at thy presence!  
He bade her enter the first gate, which he opened wide, and took the large crown off her head:*

*"Why, O gatekeeper, dost thou remove the large crown off my head?"*

*"Enter, O lady, such are the decrees of Ereshkigal."*

*The second gate he bade her enter, opening it wide, and removed her earrings:*

*"Why, O gatekeeper, dost thou remove my earrings?"*

*"Enter, O lady, for such are the decrees of Ereshkigal."*

*The third gate he bade her enter, opened it wide, and removed her necklace:*

*"Why, O gatekeeper, dost thou remove my necklace? "*

*"Enter, O lady, for such are the decrees of Ereshkigal."*

*The fourth gate he bade her enter, opened it wide, and removed the ornaments of her breast:*

*"Why, O gatekeeper, dost thou remove the ornaments of my breast? "*

*"Enter, O lady, for such are the decrees of Ereshkigal."*

*The fifth gate he bade her enter, opened it wide, and removed the girdle of her body studded with birthstones.*

*"Why, O gatekeeper, dost thou remove the girdle of my body, studded with birth-stones?"*

*"Enter, O lady, for such are the decrees of Ereshkigal."*

*The sixth gate, he bade her enter, opened it wide, and removed the spangles off her hands and feet.*

*"Why, O gatekeeper, dost thou remove the spangles off my hands and feet?"*

*"Enter, O lady, for thus are the decrees of Ereshkigal."*

*The seventh gate he bade her enter, opened it wide, and removed her loin-cloth.*

*"Why, O gatekeeper, dost thou remove my loin-cloth? "*

*"Enter, O lady, for such are the decrees of Ereshkigal."*

*Now when Ishtar had gone down into the land of no return,*

(Wolkstein and Kramer, 1983)

I believe that based on this text from the *Descent of Ishtar into the Netherworld*, the answer to why artifacts are buried with the dead is very clear: because they will be taken away at death as the dead descend into the netherworld. These texts date from the 2nd millennium BC and were written on tablets from Nippur and Ur—the 3rd and 2nd

millennium BC religious centers where worship centered on the goddess Inanna and her husband Dumuzi (Zettler, 1992). In the myth, Inanna, for some unclear reason, decides to go from the world of the living, where she is sovereign, to the world of death, where her sister Ereshkigal resides. Once there, Ereshkigal turns her into a corpse and strips her of all her powers and her garments, as can be seen from the passage above. When a few days pass, Inanna's most trusted servant asks for help to go and retrieve her body from the Netherworld, which she finds in Enkil, the God of Water and Wisdom (Wolkstein and Kramer, 1983: 61-62). He forges two creatures from dirt to bring libation gifts to the Netherworld goddess Ereshkigal, but she refuses them. They manage to snatch Inanna's corpse, but upon her descent, Ananna, the Underworld Judge, blocks them and insists that a replacement for Inanna needs to be provided if she is to leave (Wolkstein and Kramer, 1983: 64). She decides to send Dumuzi, her mortal husband, in her place, but he flees and tries to escape with the help of his sister, the goddess of wine, Geshtinanna. But seven demons from the realm of the dead are sent to hunt him. They jump into his sheepfold and break his libation cup, and Dumuzi is "no more" (Wolkstein and Kramer, 1983: 84). After much mourning and negotiation, Inanna decides that Dumuzi will forever be with the dead for six months of the year and then his sister Geshtinanna can replace him for the other six (Wolkstein and Kramer, 1983: 87).

In this story, we can see that living is in constant opposition with what happens after life and the struggle against the aftermath of a death. There are oppositions in all aspects of life, and it seems that EBA people, though mythologically expressed, are always trying to make sense of these forces. For instance, Dumuzi is wild—he needs to be tamed. He is perceived as the bull that herds the sheep. Inanna is the goddess of

fertility and love—she marries him and tames him through various sexual encounters, a process that is greatly elaborated on in another text, *The Courtship of Inanna and Dumuzi* (Wolkstein and Kramer, 1983). No one, however, can avoid the one inevitable reality and objectivity, which is death. As Inanna dies, and later Geshtinanna, both goddesses are made naked as they pass through the seven gates of the underworld. In this case, being naked is symbolic of how death dismantles a person of all that they are. Inanna might be the queen of the world of the living, but at death, she is made into a "rotting corpse" that is hung on a hook. She is dismantled of all of her power once she is dead, and she is nothing. Make no mistake, the afterlife or the underworld is not a place where the living wanted to be. Unlike their Egyptian contemporaries, Mesopotamian civilizations did not see the Netherworld as a place to experience happiness on earth that could be recreated and enhanced at death. This was true of the Early Bronze Age and through the future periods as well, up until the rise of monotheism in the region. The underworld was a dark place, with seven demons called the *gulla* that tortured people and occasionally engaged in sexual acts with the poor, naked dead.

In this light, I argue that attire, personal ornamentation, and other objects that I discussed above at sites like Carchemish and Oylum Hoyuk are the living's ultimate protest against the darkness that was death to EBA communities. The symbolic reference to the stripping that occurs at death should not be ignored, for it is the backdrop in which we find the bronze pins which held garments, items of personal ornamentation, and vessels. Laneri (2002) has argued that such myths show aspects of the archaeological record that archaeologists must take into account during analysis. The hooks that are found at sites like Titriş Höyük, though I do not have an example in my dataset, are

informed by the myths as not burial gifts or objects for the dead, but as hooks on which the dead rotting body is hung, the hook from which libation vessels are placed, and where clothes probably were hung. I agree with Laneri's (2002) assertion that the prolific amount of items we see in burials should be understood, at least in part, as a result of the belief in an afterlife, which signals the removal of all that is human and all that is alive. The reduction of a human to their naked state is then the return to nothingness. Being buried with worldly things despite knowing that they will be taken away is a demonstration of the never-ending tension between life and death and the desire and inability to control forces that are out of human control. What is certain is the total devastation and total power of death.

So what is there to say about the burials that had considerably fewer artifacts and less artifact diversity than some others? For example, Oylum Hoyuk and Carchemish compared to Gedikli from my sampling of burials show stark differences in numbers and presence (see Appendix A). Was it that some people chose to engage with the myths less than others, or that they did not relate to them? Was it a matter of affordability? I argue that based on the archaeological record as presented here and what we know from texts, what is in the graves is based on esoteric concepts. Simply put, the myths and lessons from the relationship between the gods and kings concern the elite. We know that Dumuzi was a real king of Uruk before Gilgamesh and after Lugalbanda, but as Laneri explains, his political identity is completely overshadowed by his mythical one (2002: 29). Keeping this in mind, we should not treat the myths that he is involved as hints about real events because these are ideologies that elites primarily used to legitimize their sovereignty and create a belief system based on practices. Such practices can be seen in



the mortuary archaeological evidence. I argue here based on the sites presented and the rest of what we know from the burial record of northern Mesopotamia, that while the objects in graves might not exactly be a show of social status to the living, they do reflect the ability of certain individuals to play into the ideology of elites and gods. I am certain that I cannot yet speak of kings from *my* dataset, simply because I do not think they are represented. While the king as a role is not clearly defined in the North, and I would argue in the South also, beyond a textual recognition, who the leaders of respective polities were is impossible to know. We know that they existed in the North, however, because of texts such as the Mari Archives, which illustrated how kings/leaders mobilized resources that showcased their sovereignty in various ways (Flemnig, 2004). We also see that certain centers, such as Titriş Höyük, acted as a core to nearby smaller centers and thus provide evidence for a between-site hierarchical organization (Algaze et. al., 2001: 56-57). Thus, I am not making the argument here that high social status was marked in some graves from this sample and that those graves were for elite rulers; instead, I suggest that elitist ideology was widespread with a southern origin, mixed with localized indigenous traditions of the North, and became integrated into burial customs. Religious texts serve to recognize some of these elitist elements in the archaeological record, which most definitely do not translate into the social standing of those who were buried.

Elite style and practice usually set the trends in society. The belief system that kings and religious leaders play into what resonates with the socially lower-standing tiers of society. So, when thinking about what the elites do and what the non-elites do when they bury their dead, we should imagine members of society trying to replicate what is

the epitome of the desired social state. We can see this practice here, for example, at Gedikli, where it is clear that all the burials are not of wealthy individuals. Nevertheless, the recorded cremation of individuals in the way a king would be treated (see above for discussion) and their garments of at least one bronze pin attest to the imitation of trends seen in much more elaborate graves. A more relatable example is that today many people choose to buy or even rent expensive accessories because this is what people of higher social status do, not because they are of that status themselves necessarily. In other words, most of the mortuary records of the EBA Mesopotamian societies should not necessarily be seen as indicative of status at life, but as a replication of ideology perpetuated by the elite of southern Mesopotamia. This ideology's vector was religion, the roots of which developed during the Chalcolithic.

The practice of burying bronze weapons in this dataset deserves special attention. These items were already experiencing a rise in their use in the mortuary context if we recall the preceding Uruk period. I had discussed how this can be attributed to the infiltration of religious practices emerging in southern Mesopotamia that venerated deities and a king or temple leader that was often portrayed as a warrior who directly interacted with those deities. These ideas continue into the EBA, and we can see support for the notion that I push here that the masses adopts elite practices because, at this point, the average grave has a weapon or two. I argue that this correlates with further integration of elite power and divine interactions that become more and more emphasized. The use of weapons in burials perpetuates the concept of heroes and their qualities. At the beginning of the EBA, it is much more common to see the individualized elaboration of burials, while towards the end of the period, intramural communal tombs are the most

extravagant. Carchemish, for example, presents mostly individualized cist tombs with rich metal assemblage, and in some cases, an emphasis on weapons. In contrast, Oylum Hoyuk, as seen here, or the relevant Birecik Dam cemetery show communal burials used over time that also stack a large number of vessels and most certainly metal artifacts. Later, in this group, we can add the Gedikli complex, Tell Banat, Tell Ahmar, which show the continuation of burial of multiple individuals spanning generations from all age groups (Thureau-Dangin and Dunand, 1936; Porter, 2002). It is possible to interpret this change as the idealization of individual merit of a person who can be remembered as a hero to the passage of these qualities to a kin group that inherits and perpetuates the heroic qualities of the family. This can be observed through the Near East up to the Iron Age with the graves often referred to as "warrior burials" (Philip, 1995). In this vein, much of the communal burials in my study group could be understood as the result of group practices that turn from individual elite to kin-based elite groups. The values embedded in the heroic individuals continued to be reproduced utilizing social memory supported by lavish and repetitive mortuary rituals that did not cease once the deceased was buried. Thus, while I might not be able to recognize who the heroes of my northern dead are, I can recognize the heroic play that their burials enact.

### 6.3.2 *What Structures Early Bronze Age Burials?*

Myths did not just reflect what was put into the burial. Religious understanding also structured the whole way in which death was performed, not only for the dead but also for the living. For example, it most certainly defined the parameters of what a hero does. What it means to be a hero can be many things. Here, the hero is a mythical

concept, defined by the actions of kings in light of actions deemed worthy of a god. To illustrate this point, in the "Courtship of Inanna and Dumuzi," Dumuzi is deemed worthy of rule, and weapons were what defined him as "worthy":

“In battle I am you leader,  
In combat I am you armor-bearer  
In the assembly I am your advocate,  
On the campaign I am your inspiration.  
You, the chosen shepherd of the holy shrine,  
You, the king, the faithful provider of Uruk,  
You, the light of An’s great shrine,  
In all ways you are fit:

To hold you head high on the loft dais,  
To sit on the lapis lazuli throne,  
To cover you head with the holy crown,  
To wear long clothes on your body,  
To bind yourself with the garments of kingship,  
To carry the mace and sword,  
To guide straight the long bow and arrow,  
To fasten the throw-stick and sling at your side,  
To race on the road with the holy scepter in your hand,  
And the holy sandals on your feet,  
To prance on the holy breast like a lapis lazuli calf.

You, the sprinter, the chosen shepherd,  
In all ways you are fit.

(Wolkstein and Kramer, 1983: 40)

Here, we can see the symbolic connection between a ruler and weapons. The heroic qualities that Inanna defines here do not come from Dumuzi's feats in battle, but rather his successful sexual encounter with her. Similarly in Gilgamesh, Enkidu is praised only after his encounter with a prostitute (Wokestein and Kramer, 1983). In Near Eastern religion, sexuality and sexual behavior are viewed as that which tames the wild and the dangerous. The act of sex is highly symbolic here, however, so we must not think of it as

a heroic feature per se. It does seem that courtship between male and female characters of mythology is how one becomes civilized, so in a sense, this is another opposition between the wild and the tame, nature and the city. The sanctuary of the city or its perceived protection from the bad can also be found in the "Descent of Inanna" when Dumuzi runs from the demons by hiding behind his reed fence in his sheepfold. The sheepfold and the reed fence here symbolize what was probably the farmstead and what was the scene of the landscape at the time (Fronzaroli, 1993). Dumuzi desires to become a farmer instead of just being a simple shepherd. Again, it is his role of a bull that is emphasized in the archaeological record through the bull-shaped cups that we recognize from many of the burials in this sample (see Oylum Hoyuk, Carchemish, and Gre Virike for example). Through that role, he ultimately becomes a farmer and the worthy ruler of Uruk that wears the *me* garments (Wolkstein and Kramer, 1983: 75). Being a hero is not this profane, however, and the idea of sexual fervor most certainly represents taming in the form of conquering. The king is a conqueror above all else, as we can see from the text above, kingship is illustrated by the kingly symbols, most of which are his weapons. Thus, we must not look at heroism in a limited view but understand that a hero is many things that a king must be worthy of. If we recall the vase from Uruk discussed in the previous sections, the emerging idea of a king included the belief that he had many roles to fulfill for his community. In the EBA, the relationships between kings and the gods that they served became much more intimate and often intertwined because, though Near Eastern kings were not divine in the way that their Egyptian rivals were, the king was certainly a king through divine intervention.

The fertility and sexuality of Inanna in concert with Dumuzi's portrayal of a bull and shepherd should not be seen as a new element that plays into Near Eastern burial practices in Mesopotamia. If we recall the earlier discussion of the Late Neolithic, these elements were in place millennia before. Of course, populations change and belief systems evolve, but in this region, traditions are very rooted and tend to show continuation. The image of Inanna and her role and the bull figure and his role might not have been written in Anatolia, but archaeologically, we recognize them from figurines, anthropomorphic vessels, and illustrative imagery. Ultimately, agriculture and its sibling, urbanism, played inseparable roles in shaping beliefs that in turn structured the burial practices of EBA communities. The strength of religious influence can be securely traced into the Iron Age through archaeological and textual evidence. By the end of the EBA, the whole of Anatolia venerates Inanna, known at this point as Ishtar. I must emphasize again that just because we find Inanna or Dumuzi during the Uruk, does not mean that these deities did not exist before. It is almost certain that they did, for religious beliefs do not just spring up from the passage of one period to the other, especially where we do not have the infiltration of a foreign population. As always, the South led cultural trends, but these trends were already shared in the region.

It is not overkill to emphasize that regional variation did exist and that southern Mesopotamia cannot fully explain northern Mesopotamia, as I have discussed here numerous times. For much of the EBA, what we know about the beliefs and political doings of the North is from southern texts from Ebla and Uruk (Pollock, 1999). I am secure in reconstructing the ideology of at least the religion, but what I cannot gauge is the regional variation that, without a doubt, contributed to *how* mortuary rites were

performed or even experienced. As shown in the sites presented here, Gedikli and Oylum Hoyuk (unpublished data), these are the only two cases of cremations that exist, and they surely reflect both a local culture and the clear connection of the passage of a king in the afterlife for the forming Hittite Empire that developed in the region. As already implied, the high occurrence of the stone cist graves in Anatolia should also be considered as a regional preference. Most importantly here, the biggest difference between the elite burials of the North and those of the South is how direct the reference to divine kingship is, which is a point that I will return to shortly. Therefore, in the South, a king or queen might be obvious to recognize and declare as such. In the North, one has to ponder how much of the status display and conspicuous consumption is a true testament to what the person(s) were in life, and how much of it is simply the ability to afford to participate in elite ideology through mortuary activities. Again, I must point out the Early Dynastic texts that show definitive evidence that this was actually occasionally a commissioned favor.

One clear connection between the North and the South is the rise of violence by EBaII/III. At Titriş Höyük, as the familial burials moved intramurally and the settlement shrunk and reconfigured, a large fortification wall was erected on top of the former Outer Town (Algaze et. al., 2001). Arslantepe sees a very similar pattern where the town shrinks and becomes more centralized. Other settlements, such as Kurban Hoyuk, Kazane, Jerablus-Tahtani, Tell es-Sweyhat, Selenkahiye, also experienced comparable changes during this time (Lenari, 2007, 261). Bioarchaeological evidence also shows a very sharp increase of trauma—in particular, blunt force trauma to the skull—at this time. For instance, at Titriş Höyük, over 81% of the individuals from the plaster basin have

evidence of death-inflicting wounds to the skull (Erdal, 2012). Many sites from this time period show similar evidence. For a recent discussion of specific evidence of warfare, see Selover (2015). She argues that different pressures of the EBA, such as urban lifeways as well as more pressing climatic conditions, caused an increase in instances of clashing between different groups that were coming into contact more and more frequently. In this light, the movement of some of the venerated burials inside the large houses during the later period of the EBA must also be viewed as a reaction to the growing threat that people experienced as a force coming into their settlements. Perhaps the movement of important burials closer to the residence implied that people were wary of hostile behavior towards their ancestors and their important monuments. Such violence can be seen in the robbed tombs of Umm el-Marra, where Schwartz et. al., (2012:71-72) notes that all of the disturbed tombs show a deliberate blockage to the entrance to the tombs, including the case of Tomb 9, where huge boulders were tossed inside to smash the dead and their offerings. The mausoleum at Gre Virike that I have presented here may also be viewed as falling victim to such hostilities, for every large structure is deliberately destroyed and/or robbed during the same period.

In the shadow of violence that we see, we can also begin to understand the emphasis that is placed on the king's role as a heroic warrior and a conqueror. It is not difficult to conceptualize how during a time of heightened hostility between populations, the quality in the elite to protect and conquer is desired and thus perpetuates heroic ideology. Archaeologically, we know that this ideology was venerated more than the actual *act* of heroism or that of a warrior, for the occurrence of empty graves prepared with the expected vessels might suggest that those that were to be buried never returned



or did not die. These cenotaphs or object burials could be seen as a practice that stood in place for the human (Hassett and Saglamtimur, 2018: 652). This is in agreement with the social status presentation in these burials—it is not necessarily what happened in life that was illustrated at death; rather, it was the idea of who one should be.

### *6.3.3 Are Burial Practices a Good Proxy for Understanding the Social Complexity of EBA Societies in Mesopotamia?*

It is clear that there are distinguishing features between burials that are based on more than just age, both in the North and in the South. It is also very safe to say that the burial record in terms of form, style, demographic distribution, and artifact forms are essentially the same in the North and the South (Pollock, 1999: 214-215). From this ample burial record, it is clear that in some cases, such as instances of communal burials, age is not considered, and the burial and its contents concern all of the buried. In other cases, such as the jar burials of infants that we see here with all EBA infants, these are the most simple interments and usually void of a variety of goods. Thus, it is certainly appropriate to speak of social differentiation that is expressed in burial practices, but how and with whom this is done is not at all clear. Age is not the defining feature, arguably implying that status is now inherited.

However, burial practices here are multifaceted and complex and cannot be used to identify status directly. As was already mentioned, we know that the practice of commissioning objects for burial was well employed. In addition, I have argued how directly religious beliefs and the recreation of myths translate materially into grave repertoires. Of course, the ability to do this is indicative of ability correlated with wealth,

but we must be reluctant to translate this into a show of true power. In comparison, the mausoleums Tell Ahmar, Tell Banat, and Gre Virike (Baccarin, 2014; Porter, 2002; Porter and McClellan, 2003; Ökse, 2007) must be viewed differently, for they were treated as sanctuaries. The people that were buried there were in one way or another a focal point for the inhabitants of the area, and that is a form of social power.

To demonstrate how difficult it is to comprehend social status based on EBA burials, I want to bring the following point forward: the aforementioned monumental burials do not necessarily contain the richest grave inventories, but they do show the most tending. Tell Ahmar contained 1000s of ceramic vessels in a single chamber, showing that people returned, again and again, to libate and feed the dead, an act that I have already discussed as a necessity in Mesopotamian religion (Thureau-Dangin and Dunand, 1936: pl. XX). The most extraordinary burials in terms of both weapons and exotic materials are always the sacrificial graves from the earlier parts of the EBA, a period that we know was not subjected to any significant centralization of power, especially not in the North, as is evidenced by the inactivity of palatial buildings at sites like Norsuntepe, Arslantepe, and Korucutepe (Hauptmann, 2000; Frangipane, 2001; Van Loon, 1978). If we were to judge by these extraordinary graves, it is easy to argue for the presence of elite leaders who wielded sociopolitical power and requested the sacrifice of prime members of society so that they can serve them in the underworld (children and teenagers) (see Watts et. al, 2016; Turchin, 2016; Woolley, 1934; Schwartz, 2012; Hassett and Saglamtimur, 2018).

There is a major problem with this idea of sacrifice for the elite, and it is that this is obviously not how the underworld works for Mesopotamian societies. If we go back

and forth in time and even account for the regional variations between the North and the South, it does not change the fact that there has never been any indication that the dead elite continue on a life of pleasure in the Netherworld like their Egyptian neighbors. Simply put, the retainers here will not be accompanying those they serve anywhere. Then, I must return to my first question: what is the point of all this lavishness in death in the most extraordinary burials? In line with Vidale's (2011: 448) and Douglas' (1986) ideas, these monuments were probably not created to show established status, for cured social power should not require such extreme display, as this would already be socially understood and invisible. Porter (2008) has also argued against the interpretation of this group of burials as monuments that were created with the intention of showcasing elite status, or even the possibility that the people buried are elite at all. To her, the killing, the display, or the element of power is not the most important detail—these were staged scenes of mythological acts that were not meant to be enjoyed by the general public but instead by the deities that they concern. Evidence shows that most of these death scenarios had a long-termed deposition sequence and stayed exposed. At Ur, this staging is the clearest, as it seems that many things were done to the bodies after they were dead, such as artificial preservation, dressing, and headwear decorations, possibly to hide their wounds (Fletcher et. al., 2008). This was not a scenario in which people were killed for a greater social good and then placed in their graves. Their bodies were used like pieces in a chess game—staged. In this light, the people who were sacrificed did not matter—it did not matter if we have three women and one man, or two men and three women. These bodies served a role, and their role was whatever they were made out/dressed/cooked/positioned to be.

Porter implies that the key to these scenes of death was to mirror cosmological realities, but it was also to perpetuate kin ties through the act of feasting that occurred at these sites (2008: 206-208). In a sense, the ritualized acts created a scenario in which people have to libate and feast with the dead. These rituals, such as the *ki-a-nag* or the *kispu* (Lynch, 2010) that we know from Old Babylonian texts, make it clear that these rituals are not only for the living but also the dead. They are an invitation for both realms to merge (Charpin and Durand, 1986). This is the ultimate perpetuation of kinship. Porter implies that these death shows are for humans to create a new moment for the future that would invoke ancestor veneration through kinship. It is not clear here how the sacrificed are kin and to whom if this whole setup is a staged performance for the gods. Perhaps the dead are for the gods and the living at the same time. I would like to attempt to interpret what these death scenes might mean in light of the feasting and libation activities that we know occurred.

In the backdrop of Laneri's (2002) discussion of the importance of a few key figures that were illustrated in the archaeological context of burials at Türiş Höyük, these sacrificial theatrical acts probably reenacted different scenes from Ishtar and Dumuzi's adventures (Porter, 2008). In particular, when we look at the pairs of females-males at least garment-wise, I believe these mirror the sister-brother or sister-sister pairs that always act in opposition or concert in these myths (Dumuzi and Geshtinanna or Inanna and Ereshkigal). The relationships between the siblings are what structure the events and the relationships in many of the stories. The central figure in the burials that we see is not always clear, and they are probably the main character of the act; and, again, the sex is probably not always significant, so it would be difficult to deduct who they meant to

enact based on skeletal evidence. It is also interesting to note that the diadem of the ruler and the diadem of the gods is found on two figures or one figure in these burials, such as the individuals interpreted as retainers and the central burial at Arslantepe, as well as the Basur Hoyuk discovery. These diadems are identical to what has been described in many texts as Inanna's holy diadem and the king's regal diadem (see Wolkstein and Kramer, 1983). Within the burial context and especially these sacrificial ones, I believe that we should see these objects less as personal testaments of wealth and more as having a role to play in the great death acts.

If even sacrifices cannot necessarily be attributed to testaments of prestige, power, and the ability to showcase a ruler's dominance, then what can we say of the EBA social structure based on evidence from their burial practices? First, even in the case that these sacrifices do not serve to display control and dominance, we must interpret that unequal relationships are present. In a world where mythology served the ideologies and social positioning of the elites, these staged deaths mostly served them too. Thus, underlying the archaeological situation that we are presented with, these sacrifices were probably made by the elite for the elite. The ability to either force or convince a handful or a large group of people to meet their death is to exercise not just social and political power but also ideological power. If these deaths were not showcased or even if they were displayed to the public, the fact remains that a sector of the community can justify mass death in a way that is legitimized. This is elite control and power. While much of this elite is invisible in the burial record all over Mesopotamia, with the exceptions that I have discussed, the mythology and use of sacrifice underline that it is elite symbolism and performativity that structures EBA burials.

An interesting point to end on is the high occurrence of bronze weapons and other metal items in the average grave. As I have shown here, in the burial data and the discussion of other burial contexts, grave robbing aside, it is clear that these items were a standard. Thus, can they be indicative of social inequality? I have already spent time discussing that these items circulate in graves most likely because of religious ideology connected to the priest king's heroic qualities of conqueror, hunter, and protector of his state. Thus, the spread of bronze weapons to lower-tier graves can be understood as the result of the adoption of these practices that infiltrate from the top down. A perfect comparison to this situation in Mesopotamia and especially in the North is from the Late Bronze Age Mycenaean states, where at least 50% of burials had bronze weapons in their graves. As in the Mesopotamian context, very few burials stood out as extraordinary from the rest of the population, like the Treasury of Atreus (Hood, 1960). Here, the Myceneans had what we would call a large middle-class, judging by their burial practices.

As was the case with Mycenaean burials, for the Mesopotamian social system, this means that a wide portion of the population had access to these items of prestige, implying that they were not tightly controlled by the state. In the Mycenaean palatial system, we know that this is because palatial officials concerned themselves with the upmost tiers of society, and this was the extent to which trade was controlled (Galaty and Parkinson, 2007). Bronze, however, filtered into all sectors of society through sub-palatial trade systems, and this is what we usually find in the regular graves (Sherratt and Sherratt, 1991). If the average person could commission and afford a bronze spear or sword, then its production and/or trade could not have been under palatial control. To focus on the North, this is most certainly what we can establish archaeologically from

other data. While the South had a clear and defined relationship with the temple palaces, to what extent these institutions functioned and how they exercised control is largely unknown (Cooper, 2006). A simple testament to this is the nature of administrative texts found in the South in comparison with the North. In northern states like Tiritş Höyük and Arslantepe, palatial texts largely serve accounting purposes—they keep track of what is going in and out. In the South, texts are much more elaborate, deal with laws, tell more stories, and, most importantly, provide information about the give and take of the political territory of the lands. Those in control in the North never extended power to all sectors of society, and they did not monopolize the trade systems in the way that the South did starting in the Uruk period (Algaze, 2007). Essentially, this is the foundation of a less stringent system of inequality that could shift according to need, and one that did not fully control or support all economic sectors of society. The resulting heterarchical structure of northern Mesopotamia will be the subject of discussion in the concluding chapter, after an examination of the human physiological markers of inequality in the following chapter.

## CHAPTER 7:

### LONG BONE GEOMETRY AND PREHISTORIC LIFEWAYS: WHAT DO THE DEAD TELL US ABOUT EVERYDAY LIFE FROM THE LATE NEOLITHIC TO THE EARLY BRONZE AGE IN NORTHERN MESOPOTAMIA (6400- 2000 BC)

In the following chapter, I intend to enrich my previous findings and analysis of the Late Pottery Neolithic-Early Bronze Age mortuary practices. In order to better understand the variation in life style between and within communities of these periods, I will examine human remains from a biological aspect: cortical morphology. I will compare and contrast the lifeways of LPN-EBA populations by analyzing differences and similarities in cortical bone shape, thickness, and density. This will allow me to quantify biological markers that can potentially inform the questions about inequality that I address below. In this chapter, I aim to answer:

- 1) What is the relationship between sex and bone morphology at each site?
- 2) How, and in what way, does bone morphology change from the Late Pottery Neolithic to the Early Bronze Age?



3) What can the observed changes in long bones tell us about differentiated life styles? While answering these questions, I will examine various relationships within and between groups based on sex and chronology.

## **7.1 Biological Behavior of Bone**

The study of cortical thickness and shape in long bones come from the field of biomechanics, where principles used in engineering drive the understanding of biological factors. The simple beam model suggests that when different forces are applied to a hollow beam, it exhibits proportional and predictable bending strength properties. The mechanical stress of bending a flexible and dynamic object, like a bone, is proportional in magnitude to the distance from the neutral axis (Ruff, 1989; Haider et. al, 2020; Keerthan et. at., 2014).

Human bone experiences these kinds of mechanical loads from activities such as running, jumping, climbing, and other strenuous tasks. Muscles that attach to the bone will pull at the attachment sites, exhibiting different forces, such as bending, shear, tension, and compressions. As the simple beam model demonstrates, the shaft will experience the greatest stresses along the outside of the beam. Because bone is a living tissue with muscle attachments, these muscle and substrate reaction forces will cause bone deposition throughout a structure. This ultimately causes changes in cortical bone thickness and density (e.g.,Ruff, 1992; Currey, 1984). The more a bone is loaded as the result of different activities, the more cortical bone is deposited. The less loading a bone experiences, the less cortical bone is deposited. In this sense, cortical thickness should be

positively correlated with activity level resulting in long bone loading (Pereira et. al., 2015; De Souza et. al., 2005; Feng et. al., 2000). Studies in mammals such as rabbits have repeatedly shown that diet-induced mechanical loading of the mandible and associated jaw joints results in thicker cortical bone at the site of the muscle attachments and along the bone's surface. The animals that experienced greater mandibular stresses due to a more mechanically strenuous diet developed larger jaw muscles (Ravosa et. al., 2007, 2010, 2016). Similar results have been demonstrated in Mstn-deficient mice (Ravosa et. al., 2007, 2008; Nicholson et. al., 2006).

Another parameter of bone function or quality is cortical bone biomineralization or tissue mineral density. Biomineralization is the process in which the osteocytes and osteoblasts deposit hydroxyapatite crystals between the collagen fibrils of the bone matrix (Gorski, 2015). The denser and more mineralized a bone is, the stronger it is in compression. Cortical bone density is affected by many of the factors affecting cortical bone thickness since the modeling and remodeling processes of bone are connected.

Of interest here is how biomineralization is influenced by mechanical loading on the bone. This functional relationship is well demonstrated in vertebrates such as rats, mice and fish, showing that the loading of various bones results in higher bone mineral density when compared to groups that do not experience similar stresses (Noble et. al., 2003; Sugiyama et. al., 2008; Suniaga et. al., 2018). In rabbits (Terhune et. al., 2020), it has been shown that cortical biomineralization was greater at the bone sites that experienced greater mechanical loading due to differences in diet in comparison with a more easily processed diet that did not load the condyle as much during chewing. It is possible that bone could experience changes in biomineralization without having changes

in cortical thickness and shape, or vice versa (Ravosa et al., 2016). Several studies have demonstrated that cortical bone quantity and quality can change independently from one another when experiencing stresses such as exercise (Franks et al., 2017; Ravosa et al., 2016; Wallace et. al., 2010; Kohn et. al., 2009). This is an important factor to consider in this study, where I am examining both cortical bone thickness and biomineralization in order to track activity-induced morphological changes at multiple hierarchical levels of bone organization.

Nutrition is a fundamental factor in how cortical bone is modeled (the process by which mineralized bone is reabsorbed and then creates new bone by forming a bone remodeling compartment) (Seeman, 2009; Allen and Burr, 2014). Bone models and remodels through a process of coordination of 3 bone cell types: osteoclasts, osteoblasts, and osteocytes. In the case of maLP Nutrition, this cycle of bone modeling and remodeling is interrupted, and the mechanism that keeps a balance between the destruction and remodeling of bone becomes unable to remain balanced because the bone cannot remodel properly and can become porous and brittle (Woo et. al., 2010). For instance, in the case of vitamin D and calcium deficiency, osteoids (the main units of cortical bone) will not mineralize properly, thus hindering the remodeling process (Holich 2004). In an opposite reaction, the production of the PTH hormone due to the deficiency will cause additional bone loss. Thus, evaluating the state of nutrition is an important assessment when studying the effects of mechanical load on bone strength.

Another factor that influences cortical thickness and biomineralization is sex. Sexual dimorphism may play a role in the variation of cortical thickness and density between individuals (Parfitt, 2003). Males tend to have a higher amount of cortical bone

deposited as adults (Bergot et. al., 2009), and females are more likely to experience bone loss earlier in life than males due to factors such as menopause or reproductive patterns that can cause bone loss due to estrogen cycling (Lauretani et. al., 2008). In males, higher levels of testosterone may result in larger muscles that strain the bones more than those of females, who have a lower muscle mass (Abe et. al., 2003; Pitukcheewanont and Safani, 2006). Thus, a positive relationship between muscle mass and both cortical thickness and cortical biomineralization might exist (Zamberlan et. al., 1996; Hamrick, 2003; Nicholson et. al., 2006; Elkasrawy and Hamrick, 2010).

While I have provided this brief overview that lays out some factors that could drive variation in cortical bone in humans, this study does not quantify and thus does not control for them. In comparing the three populations that I will deal with in sections 7.2.1-7.2.3 below, I aim to test if the changes observed in the shifting social structures between the Late Pottery Neolithic and the Early Bronze Age, as described in the previous chapters, affected cortical thickness and density in femora and humeri. I quantify these comparisons between the sexes within the three sites as well as across the sites. Understanding how male and female cortical bone structure was influenced by lifestyle within each site is fundamental in interpreting patterns observed when comparing populations as a whole.

Because I am dealing with two different bones for this study, humeri and femora, each are treated as a proxy in potentially understanding different human behaviors. For the purpose of this study, the femora are taken to represent cortical bone morphology as the result of mobility patterns. For example, this might indicate that one group traveled longer distances than another or engaged in tasks on a more uneven terrain. In contrast,

differences in cortical density and thickness between groups in the humeri will be taken to suggest that people were doing strenuous activities with their arms. This or may or may have been related to being more or less mobile. For instance, it cannot be ruled out that if I find that one group has significantly more robust humeri than the other from tasks related to agricultural activities in fields that were further from the settlement, then this same group was also not more mobile because they had to get to the place where they were working. Thus, activity patterns cannot be treated as excluding, or the lack of mobility.

In comparing these parameters, this study seeks to understand cortical bone change and differences in the context of changes in social complexity and the rise of more centralized societies. I rely on the idea that as settled lifestyle progressed into the Early Bronze Age, urban settlements came with a considerable amount of social stratification. We can find evidence for this differentiation from the EBA urban plans themselves, where at least three-tier settlement hierarchies existed. Such examples are Titriş Höyük here and Arslantepe (Menze and Ur, 2012; Nishimura, 2014).

In the urban setting, it is inferable that people no longer did the same things as they did 3000 years ago because they no longer had equal access to resources, nor did they hold the same range of positions in society. For example, the intensification of agriculture meant that new methods of farming, irrigation, and land exploitation were employed (Algaze, 2008). Monumental architecture attests to a particular sect of building efforts of a particular group of people with certain skills. Metallurgical exploitation and smelting with molds show that this was done on a considerable scale by a dedicated set of people (Yener, 2000).

In addition to the different tasks or activity patterns that people had when comparing the LPN and the EBA, mobility is certainly an aspect of life that can be contrasted starkly in early Mesopotamian cities and villages. Mobility is understood to have declined for people who lived in urban settlements. A few factors contributed to this. First, the non-seasonal occupation at EBA Mesopotamian urban centers meant that people relied on the exploitation and creation of resources year-round in contrast with moving around and looking for those resources (Paulette, 2013; Akkermans and Schwartz, 2003). Continual stratigraphic layers with vertical build up at EBA sites attest that people were staying in the same place for longer and not coming and going with the seasons, as was characteristic of the Neolithic as a whole (Akkermans, 2010). Second, in the 4<sup>th</sup> millennium BC, the donkey and *kunga* were domesticated (Greenfield et. al., 2012; Oates et. al., 2008). These animals surely reduced the distances that people had to walk as well as the load that they had to carry—factors that potentially influenced cortical bone thickness or density. The third factor that affected mobility was agriculture. Mesopotamian cities had their farming lands away from the main mound, often kilometers away from where they lived. The pulling of animals as well as the tools, food, and water that they carried factored into how the femora (and potentially humeri) were repeatedly loaded. Above, I have already argued that with the rise of urbanized societies, more specialized tasks divided a population. Thus, while for the later parts of the Neolithic, it was feasible that most of the population went out to the fields and worked, in the EBA, specialized farmers were tasked with these activities, which resulted in fewer members of the city that farmed for a living when compared with earlier periods (Ur et.

al., 2011). These variations in the reconfiguration of work-loads and tasks that I cannot distinguish in my samples are a limitation of this study.

At Hakemi Use and the Late Pottery Neolithic in general, it is widely accepted that social stratification or differentiation on any level of society did not exist in a way that is visible archaeologically. For the purposes of this study, if it is not visible archaeologically, I am speculating that males and females were moving and doing similar things to one another. The Early Bronze Age sites here are more complex because we know that people had differentiated social roles expressed as various tasks and jobs that did not exist before. Furthermore, there were dedicated people who took on these roles. For example, specialized farmers mostly farmed, metallurgy was at least a three-tier production line, and long-distance trade simply could not be done by just anyone (Yener, 2000). What I do not know is if any division of labor was based on sex. Did males and females perform separate roles that were dictated by the social rules within a EBA city? This is a major limitation of this study because it means that I cannot make valid predictions about behavior between males and females within each sites or predict how those relationships changed with time (across the sites).

There is a considerable element of speculation on which this work relies. The first issue is that we cannot treat all Late Pottery Neolithic or Early Bronze Age sites the same since we know regional and local variation existed. For example, in the LPN, Domuztepe was a site with a very unusual size and non-seasonal occupation that did not match most of the other Halaf settlements. Hakemi Use excavations have not provided vertical or horizontal exposure that would allow us to understand the length of occupation seasonally. Similarly, Titriş Höyük cannot be taken to represent lifestyle at all Early

Bronze Age sites. Thus, this study seeks to understand lifestyle as inducing cortical bone thickness and density changes and not just chronological progression.

Traditionally, bioarchaeologists have conducted comparative studies of the morphology of bones, which rely on the idea that the chosen long bones for this study will correlate with the activity and mobility patterns of populations past without much consideration of behavior and its effect on bone morphology in clinical studies. Such studies on past populations have been examined by many scholars, who have interpreted a positive relationship between activity and cortical bone size. (Holt, 2003; Trinkaus and Ruff, 2011; Sparacello et. al., 2011). On the other hand, biomineralization of cortical bone has not been considered in archaeological populations. Experimental clinical studies, however, have shown that bones do not always react predictably to the same stressors, nor does the bone always experience stress in the predicted location along the shaft (Demes et. al., 2001; Lieberman et. al., 2004; Pearson and Lieberman, 2004). We also do not know all of the factors that drive bone variation and changes in modern populations, but this is especially problematic with prehistoric populations where we do not know the same factors or understand what people were doing. Considering these factors, I want to make it clear that skeletal form is driven by many factors, some of which we do not understand. One of these factors could be behavior. This study focuses on understanding cortical variation as behavior-induced but acknowledges the problem of the inability to support claims with clinical studies due to the nature of the populations in question.



## 7.2 Site Overview

The site was a multi-period small mound in southeastern Anatolia, excavated by Halil Tekin as part of the rescue excavations before the flooding of the Ilisu Dam along the Tigris (Fig. 7.2). On the main mound, which contains the Late Pottery Neolithic settlement, three absolute radio carbon dates put the entire level of LPN occupation to 6100-5950 cal. BC (Tekin, 2013: 493-494). The site is considered Proto-Halaf or of a Samarra/Hassuna character (Nieuwenhuys, 2006).

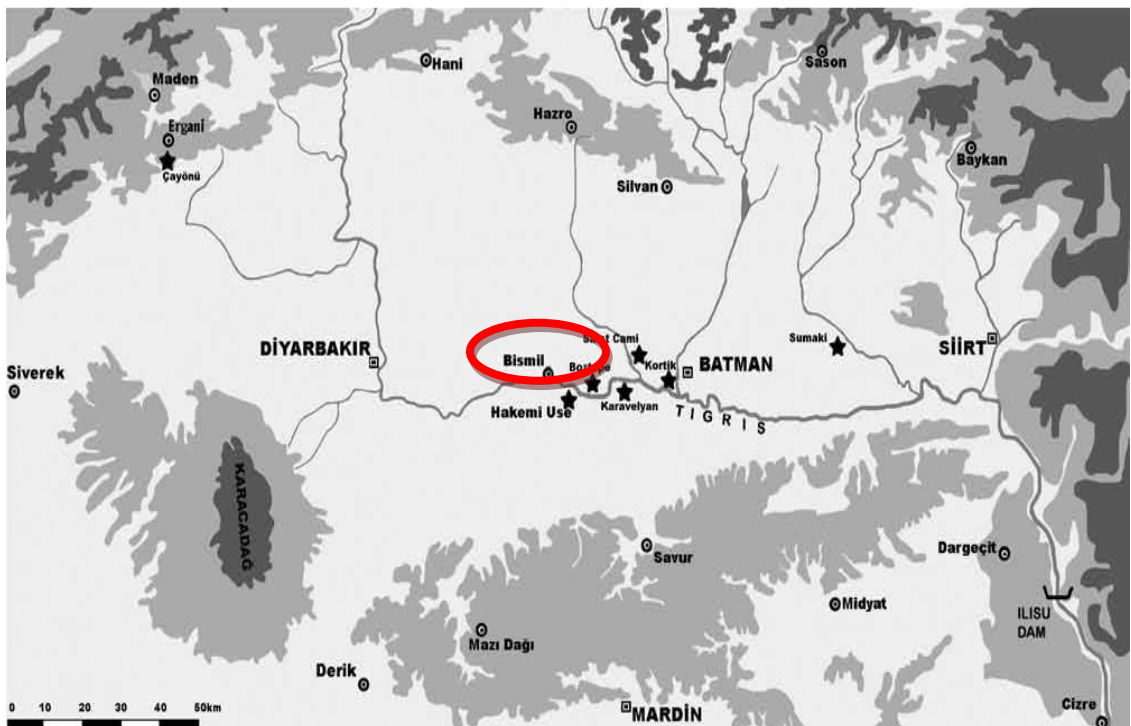


Fig. 7.1. Map of the Ilisu Dam along Tigris, showing the position of Hakemi Use in red outline. Modified from Tekin, 2013: 492, Fig. 44.1.

Architecturally, the excavations revealed 29 dwelling units, which all had residential purposes. Characteristically, these structures were rectangular with one main room in the front and two smaller divisions in the back, with the hearth usually external to the house (Fig. 7.3). The method of construction was usually wattle and daub with no stone foundations, but in a few cases, low-quality mud brick was used (Tekin, 2013: 494). The houses showed no signs of forceful abandonment, which would have resulted from a fire or other kinds of destruction; instead, the houses were slowly outlived. No differentiation in terms of style and/or size existed between the structures (Tekin, 2013: 494).



Fig. 7.2: Hakemi Use. Building 12, Level 4. Reproduced from Tekin 2013: 494, Fig. 44.2.

Hakemi Use is important due its large collection of burials from the period in Anatolia, though the skeletal material, inventory, and catalog of graves has not yet been published. All individuals were found either under or next to the dwelling features, as was customary for this period. Many individuals were wrapped in reeds or mats.

In Chapter 3, I presented demographic information about Hakemi Use in respect to the overrepresentation of females in the intramural burials. A recent study by Erdal (2013: 214), who examined 95 individuals of total excavated skeletons, found that about 75% of the total adult sample was made up of females. As expected for the LPN, sub-adults were overrepresented compared to adults. The demographic breakdown is almost identical to that of Tell Sabi Abyad and Tell el- Kerkh (Smits and Akkermans 2009; Hudson et. al., 2003).

Activity patterns from the skeletal data have been previously examined, and the following findings are based on Erdal's (2013) findings. Dental chipping and flaking was observed on 33% of 400 total teeth examined, primarily on the molars. This indicates that even though domesticated plants such as grains and legumes were consumed, the food did not go through heavy processing that would remove heavy particles from the foodstuff. Archaeologically, the use of microblades for sickles and extensive use of mortars and pestles in combination with the low consumption of animals at the site support these findings (Tekin, 2007; 2004). The anterior teeth of nine individuals, including two sub-adults, showed small circular notches, mesiodistally and labiolingually oriented grooves, and lingual surface attrition. Further microscopic analysis of the teeth indicate labiolingually-oriented microscratches on the occlusal surfaces. These patterns of dental wear are consistent with the use of the front teeth as a tool for the processing of

fibers and leather (Erdal, 2013: 215). At other Anatolian sites such as Ilıpınar (Alpaslan-Roodenberg, 2008), Menteşe, and Aktopraklık Höyük (Alpaslan-Roodenberg, 2008), this pattern is well observed, but only for females. This suggests that at Hakemi Use, activities surrounding the use of anterior teeth for the processing of some materials was shared between the sexes and may have also included sub-adult individuals.

There is evidence of extensive kneeling in four females, similar to the individuals from Abu Hureyra (Molleson, 1994) and Çatalhöyük (Molleson et. al., 2005). In all of these cases, the first and second metatarsal shows excessive degenerative joint disease potentially resulting from repetitive and extensive periods of time spent exerting pressure on these bones in the process of kneeling while working (Erdal, 2013: 216). Finally, in four individuals for whom the sex is not reported, enthesopathies was noted on the medial epicondyles of distal humeri (Erdal, 2013: 215). This occurs because of flexion-extension activities that load the elbow joint and is possibly the result of activities that are familiar in modern populations like gold/copper hammering, climbing steep surfaces, or weight throwing (Priest et al., 1977; Tschantz and Meine, 1993; Walker-Bone et. al., 2004).

Hakemi Use excavations have not provided any evidence that would indicate a difference in lifestyle that was based on sex. Even more importantly, we do not know of any factor that that would result in significant patterns of social differentiation that would have effects on bone development (Grasgruber et. al., 2016). Given a lack of activity or mobility factors that would create differences between males and females at Hakemi Use, normal variation in bone cortical thickness and density should be understood as sex-based dimorphism where the males have greater density and thickness values. This is important to consider because activity patterns could mask sexual dimorphism, or sexual

dimorphism could be mistaken for activity-based patterns. The following predictions about bone quality and thickness in the Hakemi Use adult sample will be tested in this chapter.

*Prediction 1:* During this period at Hakemi Use, there is no archeological evidence that males and females embodied different social roles or performed vastly different tasks that would have an effect on bone morphology. Similarly, I have no reason to believe that the two sexes had different mobility patterns (Robb et. al., 2018; Kousta, 2017; Kuijt and Chesson, 2005). Thus, I predict that cortical thickness in males and females in both femora and humeri will be higher in males due to expected sexual dimorphism between the two sexes.

*Prediction 2:* During this period at Hakemi Use, there is no archeological evidence that males and females embodied different social roles or performed vastly different tasks that would have an effect on bone morphology. Similarly, I have no reason to believe that the two sexes had different mobility patterns that would result in differentiated biomineralization (Robb et. al., 2018; Kousta, 2017; Kuijt and Chesson, 2005). Thus, I predict that the cortical density in males and females in both femora and humeri will be higher in males due to expected sexual dimorphism between the two sexes.

### 7.2.2 *Titriş Höyük*

This northern Mesopotamian site has been discussed in the previous chapters in terms of social developments, archaeology, and the burial record. Titriş Höyük is used as the type-site for an urbanized, sedentary, and agriculturally oriented settlement in this

study. Titriş Höyük is the type-site of North Mesopotamian for an urbanized settlement that occurred some 3000 years after the Hakemi Use settlers came to the area. Life, social roles, and sex-based relationships are thought to have experienced transformative changes. For example, Titriş Höyük was an urban center that even in its layout showed that people lived based on ranked differentiation that may or may not have resulted in differences between the social roles, tasks, and mobility of the sexes (Fisher and Creekmore, 2014; Erdal, 2012).

As this represents a settled population, I expect a diversification in activities between individuals. Though tablets that inform us of these tasks do not exist, texts from the South do imply this differentiation and the existence of different social roles starting in the Uruk (see Chapter 5). I am unable to make predictions on sex-based differences at Titriş Höyük because I do not have information about how labor was divided or if it was divided based on sex at all. In order to make predictions, I would need to know what activities were performed with a known effect on cortical bone thickness and density and who performed those activities in terms of sex. While testing male-female differences is necessary from a methodological standpoint, the results from these finds are helpful in understanding labor division in this EBA society.

In chapter 6, we have seen that mortuary practices did not discriminate based on sex. Females experienced the same treatment at death as males and subadults. However, as explained above, the rest of the archaeological record suggests that, based on mortuary burial practices and settlement organization, at Titriş Höyük, an obvious social structuring based on rank existed but was not expressed between the sexes. Thus, the

following scenarios of the results of male and female cortical bone thickness and density in the humeri and femora will guide my interpretations in the discussion of this chapter:

If the cortical bone thickness or the cortical bone density comparisons of males and females for humeri or femora are not shown to be significantly different from one another, then I will interpret the archaeologically-observed social stratification to be in agreement with the burial practices observed in the EBA of Mesopotamia; while social differentiation existed, it did not result in differentiated activity patterns between the sexes. Alternatively, this pattern could be understood as sexual dimorphism in favor of males being masked by an underlying socially-induced behavior that resulted in cortical thickness and/or density values being similar between the sexes, either because of reduced activity in males and/or increased activity in females.

If the cortical bone thickness or the cortical bone density comparisons of males and females for humeri or femora are shown to be significantly different from one another, a few possibilities exist. If males are found to have higher cortical thickness/density in one or both of the bones examined here, this might signal higher activity levels in males, sexual dimorphism, or both. If females are found to have higher cortical thickness/density in one or both of the bones examined here, this might suggest that females were doing more, males were doing less, or both.

### 7.2.3 *Bakla Tepe*

Located in the Izmir region of Western Anatolia in the early Bronze Age, Bakla Tepe startled the cultural spheres of interaction of the emerging Aegean cities and the Central Anatolian regions that were experiencing a boom in experimentation with

metallurgical techniques and materials. A testament to this is the rich metal finds in the cemeteries of Alaca Hoyuk, Troy, Mahmatlar, and Eskiypar, to name a few (Kosay and Akok, 1950; Zimmermann, 2007; 2006; Palmeri and di Nocera, 1999). The presence of important mines near the site that supplied lead, silver, copper, and gold, surely contributed to its engagement with the Aegean coine (Erkanal, 2008; Gundogan et. at., 2019).

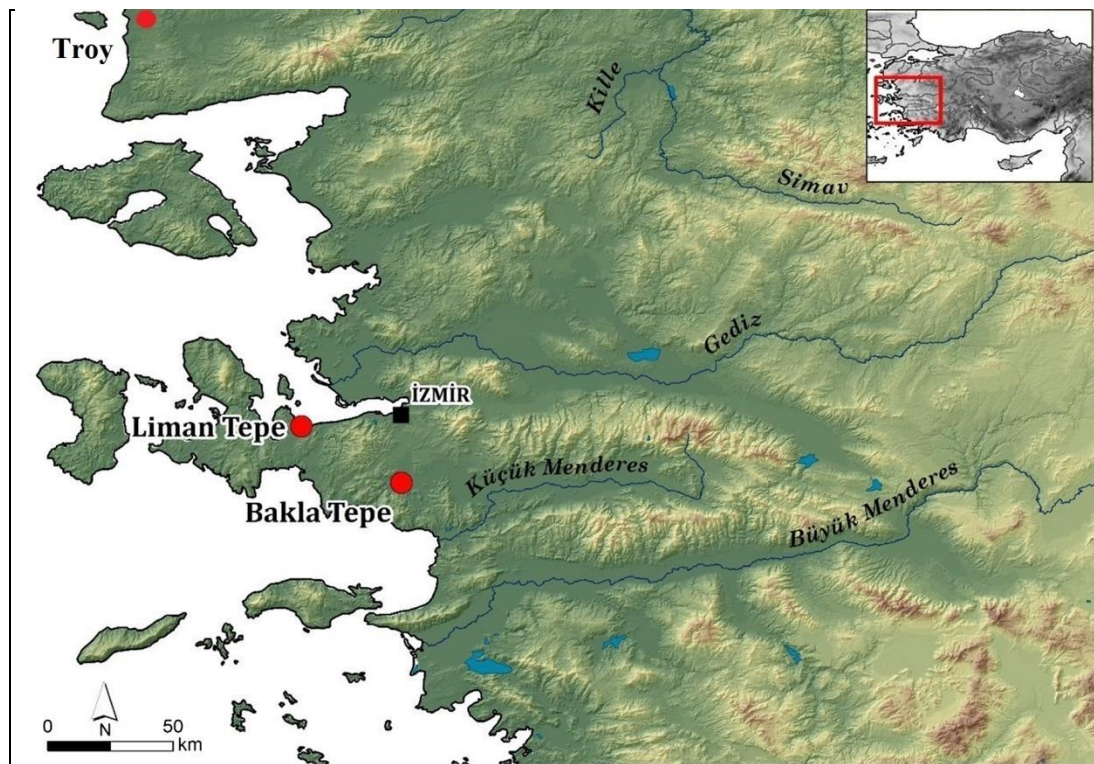


Fig. 7.3. Map showing Bakla Tepe and other important regional centers on the Aegean coast.

The cemetery of the EBAI period consists of burials in pits, cists, and vessels, mostly in the form of pithos graves. Graves are considered rich, often containing pearls,



necklaces of various stones, bronze needles and daggers, and idols made from silver and gold (Erkanal, 2008). Black-polished ceramic jugs were produced and buried for the sole purpose of mortuary rites (Erkanal and Sahoglu, 2012). During the late EBAlI period, a change in burial ritual shows a trend towards more homogeneity. All of the burials during this time were interred in a standard Western Anatolian fashion, where the individuals were placed in a pithoi facing east (Erkanal, 2008; Wheeler, 1974). Grave goods continued to be lavish with various bronze weapons and tools, including spears, axes, and daggers. In addition, ceramic forms such as tripods, depas, and tankards and various anthropomorphic/zoomorphic vessels link this site with important centers such as Troy, Alaca Hoyuk, Bogazkoy, Kultepe, and Titriş Höyük in Mesopotamia.

Multi-isotopic analysis of EBAlI and EBAlI population has been recently done by Irvine and Erdal (2020) and Irvine et. al., (2019). Sulphur, nitrogen, and carbon isotopes as well as collagen were utilized to reconstruct dietary patterns. The results of these studies on over 200 samples of bone from humans and animals showed that inhabitants of Bakla Tepe, despite being next to a marine source of food, relied on a diet predominantly high in terrestrial carbon, consistent with animal husbandry and the consumption of legumes and grains (Irvine et. al., 2019: 111). Results found that the population had dietary habits that were very homogeneous, with the possible exception of two females who might have moved inland in the last five to seven years of their life. Tests also failed to expose any sex-based subsistence patterns or a difference between the EBAlI and EBAlI/III individuals (Irvine and Erdal, 2020: 7). In the EBAlI population, while there was no statistically significant result for carbon, nitrogen was significantly higher in males than females (Irvine and Erdal, 2020).

The Bakla Tepe individuals come from differentiated graves that are marked by extraordinary grave goods, but like Titriş Höyük, those graves did not mark sex. It is important to establish here that while Bakla Tepe was an EBA site, the western Anatolian settlements of the time were not nearly as ranked and structured as their Mesopotamian counterparts, nor did they show the same patterns of urbanization. Thus, cortical bone values could resemble Hakemi Use or Titriş Höyük. Again, because I have no insight into the way social roles were divided between the sexes in the EBA, I cannot make a prediction about which sex will have greater cortical bone thickness and biomineralization density values. Thus, the following scenarios and interpretations of the results will guide my discussion:

If the cortical bone thickness or the cortical bone density comparisons of males and females for humeri or femora are not shown to be significantly different from one another, then I will interpret the archaeologically observed social stratification as not based on sex. Alternatively, this pattern could be understood as sexual dimorphism in favor of males being masked by an underlying socially-induced behavior that resulted in cortical thickness and/or density values being similar between the sexes, either because of reduced activity in males and/or increased activity in females. This finding would be in agreement with the burial practices observed in the Bakla Tepe graves.

If the cortical bone thickness or the cortical bone density comparisons of males and females for humeri or femora are shown to be significantly different from one another, a few possibilities exist. If males are found to have higher cortical thickness/density in one or both of the bones examined here, this might signal higher activity levels in males, sexual dimorphism, or both. If females are found to have higher

cortical thickness/density in one or both of the bones examined here, this might suggest that females were doing more, males were doing less, or both. The possibility that males and females had differentiated activity patterns suggests that, in contrast to what is observed archaeologically, males and females experienced different social stressors in the early phases of this EBA settlement.

#### *7.2.4 A Chronological Comparison*

As discussed in the previous chapters, the transition from the Late Pottery Neolithic to the Early Bronze Age in Mesopotamia marks a transformative period. This is when people are understood to have experienced a re-configuration in the ways that they interacted with their community, figured into the placement of the internal structures of their society, and quite literally, how their day-to-day activities passed. With this work, I seek to discover if these social changes also resulted in physiological differences in bone morphology.

Bakla Tepe is very interestingly positioned in the chronology of this study. Straddling the Late Pottery Neolithic early settlement and the urbanized city of Titriş Höyük, this site falls somewhere in between in terms of social stratification, urban planning, and substance. In this view, Bakla Tepe may or may not have experienced the same social stratification that was seen at Titriş Höyük. Because Bakla Tepe stood at a position that straddled a more-centralized and urban (EBA) and a less-centralized and-non-urban (LPN) period and this study assumes that social stratification resulted in the diversification of social roles, I would imagine that Bakla Tepe cortical bone values in the long bones for the individuals from this site would fall in between those from Hakemi

Use and Titriş Höyük. It is also possible that cortical measurements may resemble Hakemi Use or Titriş Höyük. This would imply that either Bakla Tepe is more similar to the LPN site of Hakemi Use in lifestyle or closer to the EBA lifestyle characterized here by Titriş Höyük. As discussed above, archaeologically, we see evidence of social stratification past the level at Hakemi Use, but settlement patterns do not compare to Mesopotamian EBA centers. This would depend on what is driving variation in cortical thickness and density. This is a limitation to the nature of this data that should not be overlooked—morphological bone drivers are not only behaviors, so understanding social differentiation at Bakla Tepe and how it compares to a LPN or a EBA urban center in terms of critical bone patterns can only be one variable.

Between-site comparisons in this study are not based on sex but on overall population patterns. I compare the sexes between the populations as a necessary methodological step in order to understand the differences between the three sites/groups as a whole. These comparisons may potentially expose any chronological differences in cortical patterns between males and females, which would aid in understanding the way that sex-based variation within sites changed with time. However, I have no predictions about the chronological differences between males and females. Since I could not make predictions for the Early Bronze Age sites in terms of what the expected patterns would be between males and females, it is impossible to make predictions about sex-based chronological patterns.

When comparing the total LPN population at Hakemi Use to the EBA urban lifestyles of Titriş Höyük and Bakla Tepe, I expect that the early farming settlement's population will be more robust overall due to higher levels of mobility and labor-based

activities. This may or may not vary between the sexes. In the urban setting, it is expected that people were less mobile for reasons outlined in section 7.1. Thus:

*Prediction 1:* Cortical thickness of Hakemi Use individuals is expected to be greater than it is in the Titriş Höyük and Bakla Tepe samples as a result of greater mobility and/or other activities. Bakla Tepe will fall in between Hakemi Use and Titriş Höyük cortical thickness patterns. This may show three possible patterns: Bakla Tepe values are similar to Hakemi Use but significantly different from Titriş Höyük, Bakla Tepe values are similar to Titriş Höyük but significantly different from Hakemi Use, and Bakla Tepe is similar to both Titriş Höyük and Bakla Tepe.

*Prediction 2:* Because cortical density is also a marker for bone stress and loading, I expect that the Hakemi Use total population will have the greatest mean biomineralization values in the humeri and femora when compared to the other two sites as a result of greater mobility and/or other activities. Bakla Tepe will fall in between Hakemi Use and Titriş Höyük cortical biomineralization patterns. This may show three possible patterns: 1) Bakla Tepe values are similar to Hakemi Use but significantly different from Titriş Höyük, 2) Bakla Tepe values are similar to Titriş Höyük but significantly different from Hakemi Use, 3) and Bakla Tepe is similar to both Titriş Höyük and Bakla Tepe.

### **7.3 Materials and Methods**

In order to conduct this study, I collected CT scans of individual long bones from the three sites from two time periods: Hakemi Use (a Late Pottery Neolithic site), Titriş

Höyük (an Early Bronze age (EBA) site in southeastern Anatolia), and Bakla Tepe (an EBA site from western Anatolia).

### *7.3.1 Samples*

In Table 7.1 below, the samples and bones collected from each site for the CT scans are presented. All of the material was collected at the Anthropology Department at Hacettepe University in collaboration with Prof. Selim Erdal in Ankara. Beginning with the worst preserved sample, Titriş Höyük, I was able to collect 15 femora and 15 humeri to scan. For Hakemi Use, as the collection was much better preserved, the same number was retrieved with more choice and control for left- and right-sided bones, as evidenced in Table 7.1. Because Bakla Tepe is outside of northern Mesopotamia and used as a comparison to the main study group, for expediency sake, only 12 samples of each bone were collected. As it was not always possible to collect a complete bone shaft even after piecing broken fragments together, I selected those with at least 25-50% or 50-75% of the shaft length. Due to this shortcoming, I do not include the length of all limb bones in this study.

TABLE 7.1

## ORGANIZATION OF SAMPLES USED FOR THIS STUDY FROM EACH SITE

Site	Time Period	Right Femora	Left Femora	Female Femora	Male Femora	Unknown Femora	Right Humeri	Left Humeri	Female Humeri	Male Humeri	Unknown Humeri
<b>Hakemi Use</b>	Late Neolithic	15	0	7	8	0	11	4	7	8	0
<b>Titriş Höyük</b>	Early Bronze Age	10	5	4	5	6	10	5	2	3	10
<b>Bakla Tepe</b>	Early Bronze Age	12	0	6	6	0	12	0	6	6	0

Table shows the distribution of bones and their attributes that were collected for CT scanning.

Because of ontogenetic changes that occur with cortical bone, both in terms of volume and biomineralization, only adults were considered for this study (Woo et al., 1981; Biewener et. al., 1986; McCulloch et al., 1992; Conroy et al., 1993; Grimston et. al., 1993; Kanuus et. al., 1995; Söderman et. al., 2000; Bass et al., 2002; Kontulainen et. al., 2003; Cowgill, 2008). Older adults were also excluded because of compromised bone composition that would affect density and thickness. For similar reasons related to bone loss, I did not include adult females from any population who were pregnant or possibly breastfeeding, per indications in the archaeological reports or the identification of a fetus within the bag of bones. The age of the individuals was determined using osteological

aging criteria per availability, such as dentition and epiphyseal fusion (Ubelaker, 1987).

There are no specimens for which age is not accounted for in this sample.

### 7.3.2 CT Scanning Procedure

In order to prepare the bones for the CT scans, a method that would ensure the proper recording of the bone, and later, the quantitative properties of that same bone had to be devised. For this purpose, a spread sheet was created, as exemplified here in Table 7.2.

TABLE 7.2  
EXAMPLE OF CT SCAN ORGANIZATIONAL SYSTEM

Bone #	Grave #	Bone	Sex	Age	Period	Scan 4 TH
1h	65166	L humerus	M	older adult	EBA III	
2h	96001	R humerus	M	35-40	EBA II	
3h	5271	R humerus	F	38-42	EBA II	
4h	5520	R humerus	M	41-50	EBA I	
5h	65x	R humerus	X	adult	EBA III	

Sample of data entry for scanning the bones, which was used to track the order and the organization of the bones as they were placed on the CT scanner.



The scans were performed at the Radiology Center in Bayandir Hospital in Ankara. In order to overcome the possibility that an error would occur during the time of scanning when the bones were moved around and the wrong values could be associated with the incorrect bone, I placed each bone in a bag with a number that was then associated with a scan number, as can be seen in table 7.2. During the imaging process, I did not remove each bone from its own bag. Ear plug foam was used to hold each bone in anatomic position while scanning. All of the scans were transferred to nine CDs, from which the relevant slices were retrieved (Fig. 7.1).



Fig. 7.4: Hakemi Use, scan # 6 of the humeri in the CT scanner.

### 7.3.3 Measurements

Because long bones may experience and react to loads differently along the shaft, I decided to track changes on 25%, 50%, and 75% of the shaft lengths of humeral and femoral bones (Lieberman et. al., 2013; O'Neill and Ruff, 2004). Loading stresses will

also vary according to slice and sample location, so cortical thickness and biomineralization was measured from the anterior, posterior, medial, and lateral sides of each slice (A, P, M and L) (Yu et. al., 2005; Ruff and Hayes, 1983).

An issue that had to be resolved during the data collection process was how to demarcate the 25%, 50%, and 75% locations on the shafts prior to scanning. This was important because of the fact that I did not have complete bones from which to measure the length. Thus, I used anatomical points on each shaft or shaft fragment to mark where the CT scans would be read. Table 7.3 and Fig. 7.2 below show the locations of where lead wire was placed for each bone type.

**TABLE 7.3**  
**ANATOMICAL MARKERS AT 25%, 50%, AND 75% OF BONE SHAFTS**

Shaft Position	Femur Marker Placement	Humerus Marker Placement
<b>25%</b>	across the gluteal tuberosity	at the end of the surgical neck
<b>50%</b>	midline of linea aspera	at the distal end of the deltoid tuberosity
75%	at the end of linea aspera	at the tip of the triangle that the medial and lateral supra condoler crests form

Table shows anatomical positioning where lead wire was placed to demarcate each slice to be measured.



Fig. 7.5: Left side humerus and right side femur show where on the shaft lead markers were placed to measure slices 25%, 50% and 75%.

After the scans, the data had to be processed from the CDs to the spreadsheet. First, the designated locations marked with lead were captured as a screen shot with an embedded scale. Using the resulting jpgs, the images were imported into SolidWorks software. The slice was then embedded into a confining quadrilateral, whose sides were

divided into midsections, as shown in the figure below (Fig. 7.3). At that point, cortical bone thickness was measured. In a separate process, those locations were used to measure cortical bonedensity on the CT software, Dicon, by using a circle 1.1 mm in diameter for the humeri and 2.2 mm for the femora (Fig. 7.4). The diameters of the circles for the humeral and femoral measurements were determined by the lowest cortical bone thickness value measured across the three samples for each of the bones. In order to take a density reading, the circle was positioned approximately in the middle of the line used to measure cortical thickness in order to not encounter endosteal bone, which would alter the cortical density values. The value inside the circles gives a mean pixel reading by which cortical density is measured. For the bones that had the whole shaft preserved, the CT software was also used to measure the bone length from the 25% to the 75% lead marker, as well as 25-50% and 50-75% (Fig. 7.5 and Appendix B).

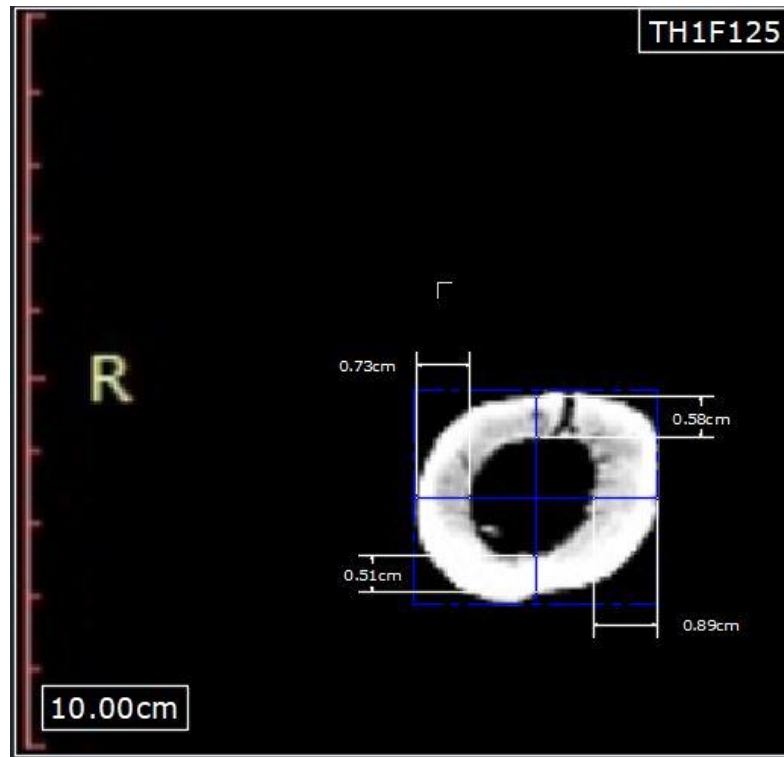


Fig. 7.6: Scan 1, femur 1, slice 25% from Titriş Höyük: measuring cortical thickness in an embedded into a confining quadrilateral.

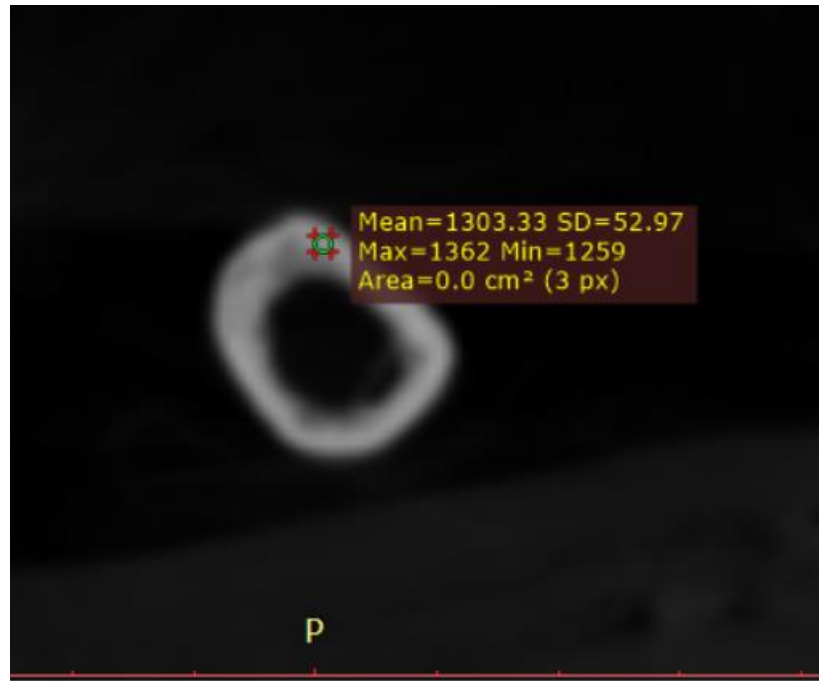


Fig. 7.7: CT scan of a slice shows a circle with a 1.1mm diameter (3px) placed where cortical thickness proximal reading was taken. Cortical density is read from the “mean” value above.

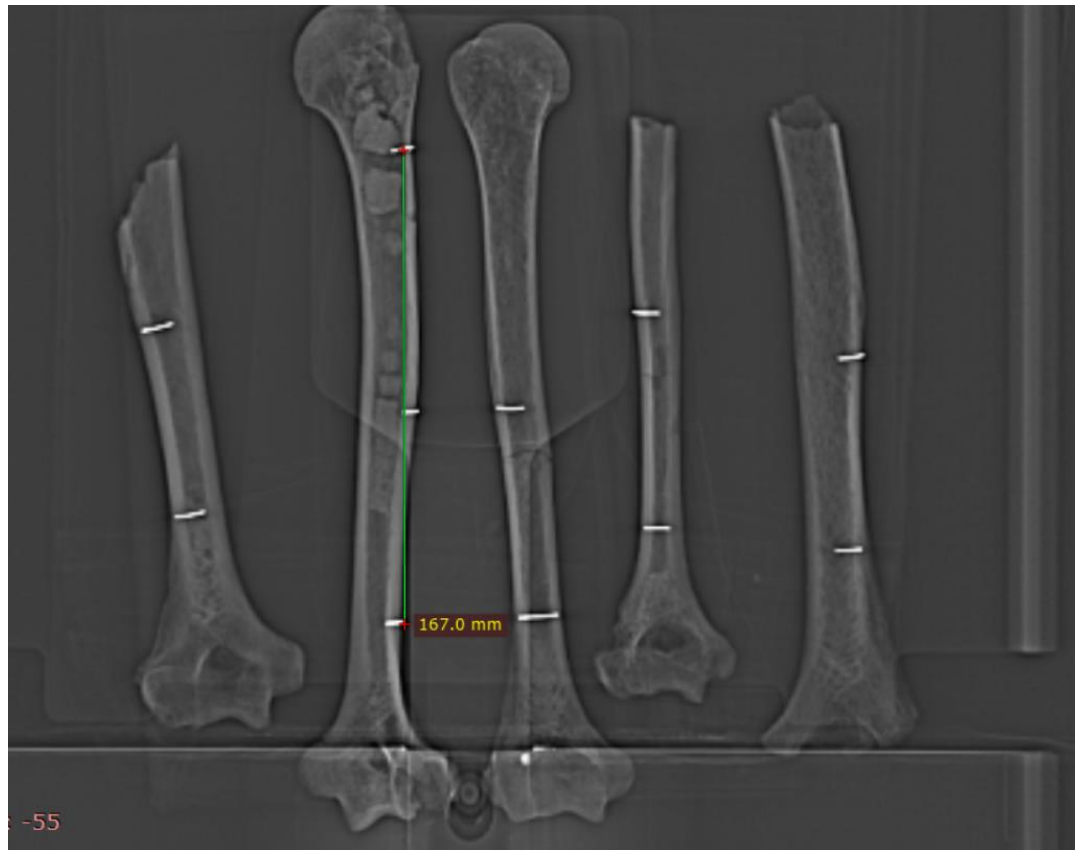


Fig. 7.8: Hakemi Use humeri- measuring bone length from slice 25% to 75%.

#### 7.3.4 Statistics

In this study, all statistical tests were compared at a  $p \leq 0.05$  significance level. At  $0.05 < p \leq 0.1$ , the result was considered biologically interesting. This indicates that while not statistically significant, it might be important to consider as it is almost significant.



#### 7.3.4.1 Within-Site Comparisons at Hakemi Use, Bakla Tepe, and Titriş Höyük

Mann Whitney U Tests ( $p < 0.05$ ) were performed between males and females within the three groups (Hakemi Use, Bakla Tepe and Titriş Höyük) in order to determine if femoral length between males and females and humeral length between males and females differed. It is an important step to establish if bone length varied significantly for each bone and between each sex at every site because cortical thickness may correlate positively with bone length. If this is the case, then consequent tests need to control for this difference in the length of bones between males and females. Only the long bones that had the 25%, 50%, and 75% lead markers were included for this comparison.

In order to test differences between male and female cortical bone thickness in femora and humeri, cortical thickness mean measurements were compared with a Mann Whitney U Test with a significance level of  $p < 0.05$  in slices of 25-75% at A, P, L, and M locations per each slice, for a total of 12 measurements per bone. In order to test differences between male and female cortical bone density in femora and humeri, mean bone density measurements were compared at slices of 25-75% at A, P, L, and M locations per each slice, for a total of 12 measurements per bone. This test was repeated six times for each sex at the three sites.

#### 7.3.4.2 Between-Site Comparisons at Hakemi Use, Bakla Tepe, and Titriş Höyük

As was outlined above with the within-site and between-sex comparisons of bone length in femora and humeri, establishing if a positive relationship exists between cortical bone thickness and cortical bone length is critical. A significant result of the comparisons

would indicate that further tests are needed in order to control for bone length when comparing cortical thickness in order to enable total population comparisons between the three sites. A Kruskal Wallis Test ( $p<0.05$ ) was performed between the total population of all three sites in order to determine if bone length needs to be controlled for in further between-group tests. It is important to understand if sex needs to be controlled for in order to understand if the cortical variation that we see is driven by sex-based differences, which would then need to be accounted for in between group comparisons. If there are no significant differences between the sexes in the between-site comparisons, then the total populations could be compared. The test was performed for the humeri and femora separately.

In order to test for variation between the sexes of between mean cortical thickness and density values in humeri and femora so that sex-based differences could be accounted for in further tests before comparing the groups as a whole, A Kruskal Wallis Test ( $p<0.05$ ) was performed with control for sex at slices 25-75% at A, P, M and L locations on each slice, for a total of 12 measurements per bone.

Any bone sites with a significant p-value comparison that emerged as a result of the Kruskal Wallis Test was tested with the Whitney U Test ( $p<0.05$ ) with control for sex. The test compared all three sites to each other in pairs of two. It was performed in order to determine which two groups are significantly different from one another, if any.

All of the cortical thickness and cortical density comparisons for each bone from each site from the sex-controlled Kruskal Wallis Tests that did not show a significant or biologically interesting result were compared again without control for sex with a Kruskal Wallis Test ( $p<0.05$ ).

Any bone sites with a significant p-value that emerged as a result of the Kruskal Wallis Test that did not control for sex were tested again with the Whitney U Test ( $p < 0.05$ ) without control for sex. The test compared all three sites to each other in pairs of two in order to determine which two groups are significantly different from one another, if any.

## **7.4 Results**

In the following section, I present the questions that I investigate with the data, the tests used, and the results obtained.

### *7.4.1 Hakemi Use*

A Mann Whitney U Test was performed to compare the femoral and humeral length means of the individuals from Hakemi Use who could be sexed (Table 7.4). None of the p values for the Mann Whitney U Test were significant. Based on the results of this comparison, there is no statistically significant difference between adult male and female femoral and humeral lengths for the population at Hakemi Use.

TABLE 7.4:  
MANN WHITNEY TEST: COMPARISON BETWEEN BONE LENGTHS OF MALE  
AND FEMALE POPULATIONS OF THE LATE POTTERY NEOLITHIC BURIALS  
AT HAKEMI USE.

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Bone Length (mm)	Range- Male Bone Length (mm)	Mean- Female Bone Length (mm)	Range- Female Bone Length (mm)	z Value	p Value
Male-Female Femoral Length	7	6	211.800	196.300-223.500	211.817	196.300-228.300	-0.072	0.943
Female-Male Humeral Length	5	3	165.440	142.500-175.500	156.168	130.900-180.100	0.566	0.786

Significant value *p* is bolded.

The mean values of cortical bone thickness between males and females at Hakemi Use are tested first in order to see if there are significant differences between males and females (Table 7.5 and 7.6).

*Prediction 1:* I predict that there will be significant differences between the mean value of cortical thickness between males and females for femora and humeri at Hakemi Use, with males having greater cortical thickness than females.

Table 7.5 shows three out of 12 significant values for the sex-based comparisons between male and female cortical bone thickness in the femora, with males having higher cortical bone thickness at those three bone locations. The significant  $p$  values are at the proximal end of the femur at the anterior and posterior of the bone. Only the anterior of the 50% slice shows a significant  $p$  value.

Table 7.6 shows one out of 12 significant and three out of 12 biologically interesting values for the sex-based comparisons between male and female cortical bone thickness in the humeri, with males having higher cortical thickness in all four such cases. The only significant value  $p$  in this sample was the lateral measurement at the 75% slice. The anterior and posterior sides of the slice have the potential to be biologically differentiated. Such values are found at 25% slice- posterior, 50% slice- anterior, and 75% slice- anterior.

TABLE 7.5

MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE FEMUR BETWEEN MALE AND FEMALE POPULATIONS FROM THE LATE  
POTTERY NEOLITHIC BURIALS AT HAKEMI USE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean- Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
<b>A25T</b>	8	7	0.538	0.410-0.830	0.391	0.260-0.460	-2.734	0.006
<b>P25T</b>	8	7	0.594	0.460-0.750	0.400	0.280-0.520	-3.075	0.002
<b>M25T</b>	8	7	0.730	0.380-1.110	0.627	0.320-0.760	-0.927	0.354
<b>L25T</b>	8	7	0.755	0.390-1.110	0.627	0.390-0.740	-1.100	0.271
<b>A50T</b>	8	7	0.575	0.440-0.890	0.426	0.260-0.550	-1.969	0.049
<b>P50T</b>	8	7	0.746	0.440-0.121	0.657	0.280-0.910	-0.463	0.643
<b>M50T</b>	8	7	0.710	0.450-0.890	0.637	0.340-0.760	-0.581	0.561
<b>L50T</b>	8	7	0.638	0.390-0.830	0.593	0.350-0.740	-0.812	0.417
<b>A75T</b>	7	6	0.371	0.290-0.520	0.388	0.290-0.490	-0.718	0.473
<b>P75T</b>	7	6	0.4529	0.170-0.590	0.410	0.310-0.490	-1.286	0.199
<b>M75T</b>	7	6	0.406	0.300-0.630	0.452	0.270-0.830	-0.501	0.617
<b>L75T</b>	7	6	0.370	0.250-0.450	0.388	0.270-0.650	-0.435	0.663

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.6:  
MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE HUMERUS BETWEEN MALE AND FEMALE POPULATIONS FROM THE  
LATE POTTERY NEOLITHIC BURIALS AT HAKEMI USE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean-Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
A25T	5	3	0.288	0.190-0.440	0.307	0.120-0.500	-0.149	0.881
P25T	5	3	0.304	0.210-0.360	0.210	0.120-0.260	-1.64	0.101*
M25T	5	3	0.276	0.230-0.390	0.260	0.230-0.320	-0.764	0.445
L25T	5	3	0.288	0.220-0.320	0.250	0.180-0.290	-1.207	0.227
A50T	8	7	0.483	0.390-0.600	0.380	0.280-0.460	-1.858	0.063*
P50T	8	7	0.405	0.190-0.620	0.353	0.200-0.480	-0.580	0.562
M50T	8	7	0.461	0.340-0.630	0.436	0.300-0.520	-0.406	0.685
L50T	8	7	0.438	0.320-0.570	0.376	0.210-0.590	-1.334	0.182
A75T	8	7	0.537	0.180-0.550	0.427	0.180-0.550	-1.799	0.072*
P75T	8	7	0.414	0.340-0.560	0.349	0.200-0.440	-1.453	0.146
M75T	8	7	0.484	0.360-0.590	0.417	0.260-0.560	-1.220	0.223
L75T	8	7	0.506	0.440-0.570	0.370	0.180-0.490	-2.379	0.017

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

In order to understand sex-based differences in cortical density, I compared the average measurement of bone density in slices 25-75% (A, P, L and M) in the humeri and the femora (Table 7.7 and 7.8).

*Prediction 2:* Cortical density in males will be significantly higher than females in both femora and humeri.

Table 7.7 shows one out of 12 significant values for the sex-based comparisons between male and female cortical bone density in femora, with males having higher cortical density at the medial 25% bone location. Table 7.8 shows three out of 12 significant and two out of 12 biologically interesting values. However, in the humeri, values show that males had higher cortical density, which appears in the mid and distal shaft of the humeri in the medial and lateral portions of the 50% slice. My prediction 2 is not supported by these findings.



TABLE 7.7

## MANN WHITNEY TEST: COMPARISON BETWEEN MALE AND FEMALE

## FEMORAL CORTICAL DENSITY FROM HAKEMI USE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (pixel)	Range- Male Density (pixel)	Mean- Female Density (pixel)	Range- Female Density (pixel)	z Value	p Value
A25D	8	7	1253.058	1032.450-1443.560	1210.856	832.000-1391.200	-0.116	0.908
P25D	8	7	1273.380	1055.100-1521.700	1135.553	918.000-1286.780	-1.389	0.165
M25D	8	7	1350.636	1126.000-1555.500	1224.929	1057.170-1448.830	-1.736	0.083*
L25D	8	7	1344.136	1105.800-1604.500	1313.559	1129.900-1658.920	0	1.000
A50D	8	7	1298.591	1051.670-1463.670	1319.517	1055.360-1614.500	-0.231	0.817
P50D	8	7	1339.665	1166.500-1591.000	1257.989	915.360-1497.780	-0.694	0.487
M50D	8	7	1360.229	1056.330-1566.250	1343.687	1217.500-1466.830	-0.463	0.643
L50D	8	7	1346.898	1057.890-1504.000	1378.223	1199.220-1707.640	-0.116	0.908
A75D	7	6	1219.871	1063.500-1365.830	1178.805	856.330-1376.250	-0.143	0.886
P75D	7	6	1273.109	1110.780-1373.670	1334.852	1104.600-1811.000	0	1.000
M75D	7	6	1291.227	1119.000-1379.330	1344.267	1143.000-1654.250	0	1.000
L75D	7	6	1305.434	1059.930-1594.560	1322.535	1089.900-1686.750	0	1.000

Significant value  $p$  is marked by bolding. Biologically interesting  $p$  value is indicated by asterisk.

TABLE 7.8:

MANN WHITNEY TEST: COMPARISON BETWEEN MALE AND FEMALE

HUMERAL CORTICAL DENSITY FROM HAKEMI USE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (pixel)	Range- Male Density (pixel)	Mean- Female Density (pixel)	Range- Female Density (pixel)	z Value	p Value
<b>A25D</b>	5	3	1217.884	1041.750-1392.500	948.723	438.000-1293.670	-0.149	0.881
<b>P25D</b>	5	3	1342.766	1174.500-1495.000	1035.973	684.500-1213.670	-1.640	0.101*
<b>M25D</b>	5	3	1323.806	1247.860-1496.170	1228.640	701.750-1977.170	-0.764	0.445
<b>L25D</b>	5	3	1293.450	1113.000-1478.500	1070.777	871.000-1190.000	-1.207	0.227
<b>A50D</b>	8	7	1241.596	1064.400-1520.250	1205.089	1022.000-1378.670	-0.347	0.728
<b>P50D</b>	8	7	1402.484	1144.290-1573.500	1256.510	952.250-1675.250	-1.389	0.165
<b>M50D</b>	8	7	1443.240	1279.500-1635.750	1262.316	1099.800-1385.250	-2.199	0.028
<b>L50D</b>	8	7	1410.954	1194.500-1644.330	1186.339	1012.000-1332.250	-2.199	0.028
<b>A75D</b>	8	7	1295.729	1113.500-1472.500	1366.833	1229.500-1596.750	-0.694	0.487
<b>P75D</b>	8	7	1452.954	1304.500-1732.290	1274.009	1087.250-1514.000	-2.083	0.037
<b>M75D</b>	8	7	1387.604	1207.000-1773.000	1317.220	1124.500-1577.250	-0.694	0.487
<b>L75D</b>	8	7	1422.528	1136.000-1604.000	1265.859	1039.670-1539.500	-1.852	0.064*

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.

#### 7.4.2. *Titriş Höyük*

As with Hakemi Use, it was first necessary to understand the relationship between sex and bone length for this sample from *Titriş Höyük* (Table 7.9). Based on the results from the Mann Whitney U Test in Table 7.9, there is not a significant difference between the bone lengths of humeri and femora of females and males from EBA burials at *Titriş Höyük*.

TABLE 7.9:  
MANN WHITNEY TEST: COMPARISON BETWEEN BONE LENGTHS FF  
MALEAND FEMALE POPULATIONS OF THE EARLY BRONZEAGE BURIALS  
AT TITRIŞ HÖYÜK

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Bone Length (mm)	Range- Male Bone Length (mm)	Mean- Female Bone Length (mm)	Range- Female Bone Length (mm)	z Value	p Value
<b>Female-Male Femoral Length</b>	4	2	207.525	186.100-231.200	204.350	195.900-212.800	-0.253	0.800
<b>Female-Male Humeral Length</b>	2	1	179.900	174.200-185.600	145.400	145.500	82.264	0.667

Significant p value marked by bolding. Biologically interesting p value is indicated by asterisk.

Next, I compared the cortical thickness values in between males and females in humeri and femora using a Mann Witney U-Test (Tables 7.10 and 7.11). Table 7.10 shows two out of 12 significant and three out of 12 near-significant values for the sex-based comparisons between male and female cortical bone thickness in femora, with males having higher cortical thickness in all of these cases. Aside from the two significant *p* values that indicate a difference between male and female measures in femoral cortical thickness, there are three more locations along the femora that may pose biologically noteworthy disparities: 50% slice- posterior, 50% slice- lateral, and 75%

slice- anterior. Table 7.11 shows that none of the 12 comparisons have significant or near-significant p values between male and female cortical thickness in the humeri.

TABLE 7.10

MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE FEMUR BETWEEN MALE AND FEMALE POPULATIONS FROM THE  
EARLY BRONZE AGE BURIALS AT TITRIŞ HÖYÜK

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean- Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
A25T	4	3	0.500	0.360-0.580	0.383	0.360-0.420	-1.249	0.212
P25T	4	3	0.598	0.510-0.800	0.323	0.160-0.440	-2.121	0.034
M25T	4	3	0.735	0.420-0.960	0.540	0.440-0.610	-1.061	0.289
L25T	4	3	0.670	0.460-0.770	0.487	0.460-0.510	-1.249	0.212
A50T	5	4	0.662	0.530-0.890	0.378	0.260-0.490	-2.449	0.014
P50T	5	4	0.882	0.700-1.070	0.603	0.450-0.770	-1.599	0.110*
M50T	5	4	0.756	0.590-0.990	0.620	0.540-0.690	-1.470	0.142
L50T	5	4	0.752	0.540-0.880	0.543	0.500-0.570	-1.853	0.064*
A75T	4	3	0.420	0.360-0.460	0.313	0.220-0.370	-1.768	0.077*
P75T	4	3	0.448	0.360-0.500	0.420	0.400-0.450	-0.707	0.480
M75T	4	3	0.425	0.350-0.550	0.430	0.300-0.560	-0.354	0.724
L75T	4	3	0.433	0.380-0.480	0.360	0.310-0.450-	-1.414	0.157

Significant value *p* is indicated by boding.

TABLE 7.11

MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE HUMERUS BETWEEN MALE AND FEMALE POPULATIONS FROM THE  
EARLY BRONZE AGE BURIALS AT TITRIŞ HÖYÜK

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean- Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
<b>A25T</b>	2	1	0.220	0.190-0.250	0.110	N/A	-1.225	0.221
<b>P25T</b>	2	1	0.230	0.160-0.300	0.160	N/A	-0.707	0.480
<b>M25T</b>	2	1	0.230	0.230-0.230	0.210	N/A	-1.414	0.157
<b>L25T</b>	2	1	0.240	0.210-0.270	0.150	N/A	-1.225	0.221
<b>A50T</b>	3	1	0.507	0.410-0.570	0.170	N/A	-1.342	0.180
<b>P50T</b>	3	1	0.543	0.380-0.630	0.130	N/A	-1.342	0.180
<b>M50T</b>	3	1	0.557	0.330-0.690	0.280	N/A	-1.342	0.180
<b>L50T</b>	3	1	0.493	0.460-0.550	0.210	N/A	-1.342	0.180
<b>A75T</b>	3	2	0.560	0.460-0.660	0.470	0.210-0.730	0.000	1.000
<b>P75T</b>	3	2	0.470	0.450-0.490	0.340	0.130-0.550	0.000	1.000
<b>M75T</b>	3	2	0.583	0.510-0.640	0.400	0.250-0.550	-1.155	0.248
<b>L75T</b>	3	2	0.503	0.450-0.560	0.380	0.190-0.380	0.000	1.000

Significant value p is indicated by bolding. Biologically interesting p value is indicated by asterisk.

Comparison of bone density between males and females in humeri and femora is presented in Tables 7.12 and 7.13. Table 7.12 shows 12 out of 12 significant  $p$  values for the sex-based comparisons between male and female cortical bone density in femora, with males having higher cortical density. This is not the case for the humeri from this population, for only one value in the distal end is possibly biologically interesting when compared across the sexes (Table 7.13) with females in this location having greater values

TABLE 7.12:

MANN WHITNEY TEST: COMPARISON BETWEEN MALE AND FEMALE  
FEMORAL CORTICAL DENSITY FROM EARLY BRONZE AGE TITRIŞ HÖYÜK

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (mm)	Range- Male Density (mm)	Mean- Female Density (mm)	Range- Female Density (mm)	z Value	p Value
<b>A25D</b>	4	3	1605.550	1401.500-1794.880	627.320	234.750-1090.880	-2.121	0.034
<b>P25D</b>	4	3	1678.393	1321.140-1838.000	753.043	317.630-1012.500	-2.121	0.034
<b>M25D</b>	4	3	1783.350	1516.630-2068.780	790.493	439.380-1113.880	-2.121	0.034
<b>L25D</b>	4	3	1835.928	1671.860-2120.220	922.000	726.330-1096.780	-2.121	0.034
<b>A50D</b>	5	4	1629.692	905.330-1999.380	722.918	595.090-862.800	-2.449	0.014
<b>P50D</b>	5	4	1511.808	857.000-2004.130	707.715	362.560-996.780	-1.960	0.050
<b>M50D</b>	5	4	1561.048	884.890-1999.710	836.888	424.500-1184.110	-1.960	0.050
<b>L50D</b>	5	4	1581.454	994.110-1987.780	735.855	464.330-1057.670	-2.205	0.027
<b>A75D</b>	4	3	1605.568	1453.000-1886.500	1062.777	930.130-1240.090	-2.121	0.034
<b>P75D</b>	4	3	1552.883	1247.250-1877.570	861.133	621.880-1092.890	-2.121	0.034
<b>M75D</b>	4	3	1839.565	1545.130-2093.000	914.110	782.560-1056.670	-2.121	0.034
<b>L75D</b>	4	3	1765.968	1447.880-1975.000	776.2867	561.890-1009.890	-2.121	0.034

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.



TABLE 7.13:

## MANN WHITNEY TEST: COMPARISON BETWEEN FEMALE AND MALE

## HUMERAL CORTICAL DENSITY FROM TITRIŞ HÖYÜK

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (mm)	Range- Male Density (mm)	Mean- Female Density (mm)	Range- Female Density (mm)	z Value	p Value
<b>A25D</b>	2	1	701.040	368.330-1033.750	173.250	N/A	-1.225	0.221
<b>P25D</b>	2	1	630.875	627.500-634.250	217.000	N/A	-1.225	0.221
<b>M25D</b>	2	1	735.125	640.000-830.250	760.250	N/A	0	1.000
<b>L25D</b>	2	1	559.665	402.330-717.000	512.000	N/A	0	1.000
<b>A50D</b>	3	1	771.933	473.000-929.800	341.500	N/A	-1.342	0.180
<b>P50D</b>	3	1	816.307	750.250-945.670	365.500	N/A	-1.342	0.180
<b>M50D</b>	3	1	744.000	698.500-799.750	912.000	N/A	-1.342	0.180
<b>L50D</b>	3	1	786.417	704.500-866.000	430.000	N/A	-1.342	0.180
<b>A75D</b>	3	2	739.277	483.000-1069.330	742.430	508.000-976.860	0	1.000
<b>P75D</b>	3	2	664.890	354.250-1021.670	524.665	485.330-564.000	-0.577	0.564
<b>M75D</b>	3	2	588.803	316.330-787.750	814.840	802.250-827.430	-1.732	0.083*
<b>L75D</b>	3	2	683.500	536.000-929.500	542.375	436.250-648.500	-0.577	0.564

Significant value p is marked by bolding. Biologically interesting p value is indicated by asterisk.

#### 7.4.3 *Bakla Tepe*

As with the other two sites, it is necessary to establish size differences between the male and female subjects of the sample (Table 7.14). Based on the results illustrated in Table 7.14, the differences between male and female long bone lengths are not significant.

TABLE 7.14

MANN WHITNEY TEST: COMPARISON BETWEEN BONE LENGTHS OF MALE  
AND FEMALE POPULATIONS OF THE EARLY BRONZE AGE BURIALS AT  
BAKLA TEPE.

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Bone Length (mm)	Range- Male Bone Length (mm)	Mean- Female Bone Length (mm)	Range- Female Bone Length (mm)	z Value	<i>p</i> Value
<b>Female-Male Femoral Length</b>	5	6	204.540	185.600-221.900	183.200	153.000-231.100	1.738	0.126
<b>Female-Male Humeral Length</b>	3	3	150.667	131.300-166.600	161.333	138.300-184.500	-0.385	0.700

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

Cortical thickness between males and females in humeri and femora was compared in order to establish if there are significant differences between the sexes (Tables 7.15 and 7.16). Table 7.15 shows 1 out of 12 significant and 1 out of 12 near-significant *p* ( $p < 0.05$ ) values for the sex-based comparisons between male and female cortical bone thickness in femora, with males having higher cortical thickness in both of these cases. Table 7.16 shows 3 out of 12 significant and 2 out of 12 near-significant *p* ( $p < 0.05$ ) values for the sex-based comparisons between male and female cortical bone

thickness in the humeri, with males having higher cortical thickness in all of these cases.

The humeral measurements of cortical thicknesses show that differences between the sexes occur at the mid and distal shaft (Table 7.16). Aside from the three significant *p* values, there might also be biological differences between the sexes in the following locations: 50% slice at the medial and lateral bone sites. These *p* values do not occur consistently enough to form a pattern.

TABLE 7.15:

MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE FEMOMRA BETWEEN FEMALE AND MALE POPULATIONS FROM THE  
EARLY BRONZE AGE BURIALS AT BAKLA TEPE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean- Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
<b>A25T</b>	5	6	0.448	0.300-0.570	0.378	0.260-0.510	-1.189	0.234
<b>P25T</b>	5	6	0.582	0.450-0.680	0.500	0.380-0.600	-1.651	0.099*
<b>M25T</b>	5	6	0.682	0.560-0.870	0.568	0.370-0.770	-1.006	0.314
<b>L25T</b>	5	6	0.660	0.450-0.920	0.585	0.440-0.760	-0.550	0.582
<b>A50T</b>	6	6	0.512	0.400-0.660	0.465	0.400-0.530	-1.043	0.297
<b>P50T</b>	6	6	0.708	0.450-0.990	0.660	0.500-0.790	-0.160	0.873
<b>M50T</b>	6	6	0.762	0.630-0.930	0.585	0.500-0.750	-2.402	0.016
<b>L50T</b>	6	6	0.727	0.640-0.820	0.698	0.460-0.910	-0.320	0.749
<b>A75T</b>	6	6	0.388	0.320-0.570	0.360	0.280-0.450	-0.482	0.630
<b>P75T</b>	6	6	0.513	0.380-0.650	0.438	0.350-0.540	-1.203	0.229
<b>M75T</b>	6	6	0.508	0.290-0.800	0.477	0.300-0.720	-0.321	0.748
<b>L75T</b>	6	6	0.447	0.310-0.610	0.490	0.330-0.740	-0.320	0.749

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.16:

MANN WHITNEY TEST: COMPARISON OF CORTICAL BONE THICKNESS OF  
THE HUMERUS BETWEEN MALE AND FEMALE POPULATIONS FROM THE  
EARLY BRONZE AGE BURIALS AT BAKLA TEPE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Cortex (mm)	Range- Male Cortex (mm)	Mean- Female Cortex (mm)	Range- Female Cortex (mm)	z Value	p Value
<b>A25T</b>	3	4	0.283	0.240-0.370	0.283	0.160-0.450	-0.357	0.721
<b>P25T</b>	3	4	0.377	0.310-0.480	0.303	0.250-0.350	-1.249	0.212
<b>M25T</b>	3	4	0.330	0.250-0.440	0.280	0.210-0.370	-0.707	0.480
<b>L25T</b>	3	4	0.340	0.310-0.370	0.358	0.210-0.570	-0.360	0.719
<b>A50T</b>	6	6	0.523	0.440-0.700	0.437	0.330-0.530	-1.527	0.127
<b>P50T</b>	6	6	0.492	0.330-0.750	0.340	0.290-0.450	-2.258	0.024
<b>M50T</b>	6	6	0.522	0.440-0.630	0.408	0.300-0.580	-1.761	0.078*
<b>L50T</b>	6	6	0.490	0.420-0.660	0.395	0.310-0.500	-1.604	0.109*
<b>A75T</b>	6	5	0.570	0.520-0.620	0.446	0.370-0.560	-2.196	0.028
<b>P75T</b>	6	5	0.465	0.360-0.660	0.354	0.290-0.410	-1.372	0.170
<b>M75T</b>	6	5	0.528	0.400-0.680	0.494	0.330-0.660	-0.548	0.584
<b>L75T</b>	6	5	0.527	0.490-0.560	0.420	0.320-0.510	-2.384	0.017

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.

Cortical bone density was measured in order to compare bone mineralization in humeral and femoral differences between males and females at Bakla Tepe (Tables 7.17 and 7.18). Tables 7.17 and 7.18 show that there is not a single significant or near-significant value  $p$  for both the humeral and femoral mean value measurements.

TABLE 7.17

MANN WHITNEY TEST: COMPARISON BETWEEN MALE AND FEMALE

FEMORAL CORTICAL DENSITY FROM BAKLA TEPE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (pixel)	Range- Male Density (pixel)	Mean- Female Density (pixel)	Range- Female Density (pixel)	z Value	p Value
<b>A25D</b>	5	6	973.136	684.220-1297.000	1009.167	777.000-1216.180	-0.365	0.715
<b>P25D</b>	5	6	890.628	778.860-1226.430	904.517	727.250-1099.910	-0.548	0.584
<b>M25D</b>	5	6	1014.854	887.670-1130.500	1027.898	778.570-1348.830	-0.183	0.855
<b>L25D</b>	5	6	849.818	580.580-1134.500	757.948	610.570-1037.150	-0.730	0.460
<b>A50D</b>	6	6	1089.247	702.560-1502.710	1047.900	929.880-1296.150	-0.641	0.522
<b>P50D</b>	6	6	931.260	720.250-1182.710	951.153	847.570-1105.920	-0.480	0.631
<b>M50D</b>	6	6	1061.221	880.450-1237.820	1031.107	694.140-1334.270	-0.320	0.749
<b>L50D</b>	6	6	909.507	656.250-1209.710	906.940	680.500-1140.330	0	1.000
<b>A75D</b>	6	6	1173.612	964.220-1582.710	1099.602	721.140-1397.570	-0.183	0.855
<b>P75D</b>	6	6	922.960	746.500-1202.110	890.280	695.820-1067.430	-0.801	0.423
<b>M75D</b>	6	6	995.954	782.330-1427.860	1055.232	829.570-1344.850	-0.160	0.873
<b>L75D</b>	6	6	782.780	618.730-879.250	835.733	622.750-1084.000	-0.160	0.873

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.



TABLE 7.18

MANN WHITNEY TEST: COMPARISON BETWEEN MALE AND  
FEMALE HUMERAL CORTICAL DENSITY FROM BAKLA TEPE

Variables	Sample Size (Male)	Sample Size (Female)	Mean- Male Density (pixel)	Range- Male Density (pixel)	Mean- Female Density (pixel)	Range- Female Density (mm)	z Value	p Value
<b>A25D</b>	3	4	860.303	558.330-1032.250	879.250	600.500-1237.750	0	1.000
<b>P25D</b>	3	4	796.000	615.250-1071.000	764.020	459.500-1018.250	-0.707	0.480
<b>M25D</b>	3	4	749.667	623.000-915.500	762.875	414.500-1191.250	0	1.000
<b>L25D</b>	3	4	717.723	460.670-1093.000	596.938	253.000-1004.250	-0.354	0.724
<b>A50D</b>	6	6	994.458	715.000-1217.000	862.055	561.000-1042.250	-1.441	0.150
<b>P50D</b>	6	6	799.667	477.750-1115.750	806.890	379.000-1234.000	-0.160	0.873
<b>M50D</b>	6	6	843.208	668.750-926.750	799.487	405.670-1113.330	0	1.000
<b>L50D</b>	6	6	638.000	312.250-1444.000	576.125	170.500-875.750	-0.160	0.873
<b>A75D</b>	6	5	1075.362	775.750-1315.000	1011.300	771.670-1354.000	-1.095	0.273
<b>P75D</b>	6	5	752.958	490.000-1120.250	779.954	434.670-1008.600	-0.183	0.855
<b>M75D</b>	6	5	878.037	339.000-1225.000	814.266	464.000-1245.500	-0.365	0.715
<b>L75D</b>	6	5	834.555	493.000-1306.670	659.934	218.000-1022.500	-0.730	0.465

Significant value *p* is marked by bolding. Biologically interesting *p* value is indicated by asterisk.

#### 7.4.4 Between-Site Comparisons

In order to enable between-site comparisons of the total population of cortical bone thickness, a Kruskal Wallis Test was conducted on humeri and femora in order to establish if bone length varied significantly between the three groups (Table 7.19). The results are not significant for femora or humeral comparisons of cortical bone thickness.

TABLE 7.19

KRUSKAL WALLIS TEST: FEMORAL AND HUMERAL LENGTH COMPARISONS  
BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use	Range- Hakemi Use	Mean-Titriş Höyük	Range-Titriş Höyük	Mean-Bakla Tepe	Range- Bakla Tepe	H Value	p Value
Femoral Length (mm)	13	10	11	211.808	223.500-202.700	204.620	184.500-231.200	192.9	153.000-231.100	4.752	0.093
Humeral Length (mm)	8	4	6	162.713	130.900-180.100	167.025	145.400-185.600	156	131.300-184.500	1.208	0.547

Based on the Kruskal Wallis Tests, size does not need to be accounted for when establishing relationships between cortical thickness and bone length in both humeri and femora between the three sites. Thus, the following between-site comparisons do not take size into account but do control for sex. Sex was controlled for only at the values that had significant or near significant  $p$  values in Tables 7.5-7.6; 7.10-7.11; 7.15-7.16. Tables 7.20- 7.23 present Kruskal Wallis Tests in order to compare cortical thickness between male and female femora and humeri at all three sites.

When controlling for sex in cortical thickness variations between the sites, tables 7.20- 7.23 show that not a single  $p$  value was significant for neither the humeri nor the femora. There is only one  $p$  value that was possibly biologically interesting in the femora, at L50T.

TABLE 7.20

KRUSKAL WALLIS TEST: MALE COMPARISONS BETWEEN

CORTICAL THICKNESS OF FEMORA BETWEEN HAKEMI USE, TITRIŞ HÖYÜK,

AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titriş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titriş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	p Value
<b>A25T</b>	8	4	5	0.538	0.220	0.448	0.410-0.830	0.360-0.580	0.300-0.570	0.571
<b>P25T</b>	8	4	5	0.594	0.230	0.582	0.460-0.750	0.510-0.800	0.450-0.680	0.860
<b>A50T</b>	8	5	6	0.575	0.507	0.512	0.440-0.890	0.530-0.890	0.400-0.660	0.138
<b>P50T</b>	8	5	6	0.746	0.543	0.708	0.440-0.1.21	0.700-1.070	0.450-0.990	0.309
<b>M50T</b>	8	5	6	0.710	0.557	0.762	0.450-0.890	0.590-0.990	0.630-0.930	0.891
<b>L50T</b>	8	5	6	0.638	0.493	0.727	0.390-0.830	0.540-0.880	0.640-0.820	0.202
<b>A75T</b>	7	4	6	0.371	0.560	0.388	0.290-0.520	0.360-0.460	0.320-0.570	0.354

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.21

KRUSKAL WALLIS TEST: FEMALE COMPARISONS BETWEEN CORTICAL THICKNESS OF FEMORA BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titriş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titriş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	p Value
<b>A25T</b>	7	3	6	0.391	0.383	0.378	0.260-0.460	0.360-0.420	0.260-0.510	0.793
<b>P25T</b>	7	3	6	0.400	0.323	0.500	0.280-0.520	0.160-0.440	0.380-0.600	0.284
<b>A50T</b>	7	4	6	0.426	0.378	0.465	0.260-0.550	0.260-0.490	0.400-0.530	0.362
<b>P50T</b>	7	4	6	0.657	0.603	0.660	0.280-0.910	0.450-0.770	0.500-0.790	0.779
<b>M50T</b>	7	4	6	0.637	0.620	0.585	0.340-0.760	0.540-0.690	0.500-0.750	0.552
<b>L50T</b>	7	4	6	0.593	0.543	0.698	0.350-0.740	0.500-0.570	0.460-0.910	0.062*
<b>A75T</b>	6	3	6	0.388	0.313	0.360	0.290-0.490	0.220-0.370	0.280-0.450	0.414

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.22:  
KRUSKAL WALLIS TEST: MALE COMPARISONS BETWEEN CORTICAL  
THICKNESS OF HUMERI BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND  
BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titriş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titriş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	p Value
<b>P25T</b>	5	2	3	0.304	0.230	0.377	0.210-0.360	0.160-0.300	0.310-0.480	0.141
<b>A50T</b>	8	3	6	0.483	0.507	0.523	0.390-0.600	0.410-0.570	0.440-0.700	0.686
<b>P50T</b>	8	3	6	0.405	0.543	0.492	0.190-0.620	0.380-0.630	0.330-0.750	0.335
<b>M50T</b>	8	3	6	0.461	0.557	0.522	0.340-0.630	0.330-0.690	0.440-0.630	0.404
<b>L50T</b>	8	3	6	0.438	0.493	0.490	0.320-0.570	0.460-0.550	0.420-0.660	0.403
<b>A75T</b>	8	3	6	0.537	0.560	0.570	0.180-0.550	0.460-0.660	0.520-0.620	0.492
<b>L75T</b>	8	3	6	0.506	0.503	0.527	0.440-0.570	0.450-0.560	0.490-0.560	0.840

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.23

KRUSKAL WALLIS TEST: FEMALE COMPARISONS BETWEEN CORTICAL THICKNESS OF HUMERI BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titirş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titirş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titirş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	p Value
<b>P25T</b>	3	1	4	0.210	0.160	0.303	0.120-0.260	N/A	0.250-0.350	0.154
<b>A50T</b>	7	1	6	0.380	0.170	0.437	0.280-0.460	N/A	0.330-0.530	0.185
<b>P50T</b>	7	1	6	0.353	0.130	0.340	0.200-0.480	N/A	0.290-0.450	0.237
<b>M50T</b>	7	1	6	0.436	0.280	0.408	0.300-0.520	N/A	0.300-0.580	0.242
<b>L50T</b>	7	1	6	0.376	0.210	0.395	0.210-0.590	N/A	0.310-0.500	0.308
<b>A75T</b>	7	2	5	0.427	0.470	0.446	0.180-0.550	0.210-0.730	0.370-0.560	0.980
<b>L75T</b>	7	2	5	0.370	0.380	0.420	0.180-0.490	0.190-0.380	0.320-0.510	0.697

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

The Kruskal Wallis Tests in Table 7.21 showed a biologically interesting *p* value at L50T in the female comparisons of cortical thickness of femora. A Mann Whitney U Test was performed at L50T in group-pairs, comparing female cortical thickness of femora in order to determine which two groups vary significantly from each other, if any (Table 7.24). The Mann Whitney U Tests show that Bakla Tepe and Titriş Höyük have a significant difference in cortical thickness at the 50% lateral bone site, with Bakla Tepe having the greatest cortical thickness in females at the L50T site of the femora. The differences between Bakla Tepe and Hakemi Use are possibly biologically interesting. There is no significant difference between Titriş Höyük and Hakemi Use at this bone location.

TABLE 7.24:  
MANN WHITNEY U TEST: COMPARISONS BETWEEN FEMORAL CORTICAL  
THICKNESS IN FEMALES BETWEEN THE THREE SITES AT BONE LOCATION  
L50T

Variables	z Value	p Value
Hakemi Use & Titriş Höyük	-1.136	0.256
Hakemi Use & Bakla Tepe	-1.715	0.086*
Titriş Höyük & Bakla Tepe	-2.121	0.034

Significant *p* value is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.



Cortical bone densities that had significant or near-significant  $p$  values in Tables 7.7-7.8, 7.12-7.13, 7.17-7.18 were compared with the control for sex between the three sites. Tables 7.25-7.28 present Kruskal Wallis Tests in order to compare cortical biomineralization densities between male and female femora and humeri at all three sites.

Table 7.25 shows that femoral density in males between all three settlements varies significantly at 11 out of 12 bone sites and is biologically interesting at 1 of 12 bone sites. Table 7.26 shows that femoral density in females between all three sites varies significantly at 10 out of 12 and is biologically interesting at 1 out of 12 bone sites. Table 7.27 shows that humeral density in females between all three sites varies significantly at 5 out of 6 bone sites. Table 7.28 shows that humeral density in males between all three sites varies significantly at 6 out of 6 bone sites. For both male and female comparisons in humeral and femoral cortical bone density across the three sites,  $p$  values in the four tables show that there is a significant or near-significant difference at all locations on the bone.

TABLE 7.25

## KRUSKAL WALLIS TEST: COMPARISON OF FEMORAL MALE BONE DENSITY

MEANS BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (TitrişHoyuk)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	p Value
<b>A25D</b>	8	4	5	1253.058	1605.550	973.136	1032.450-1443.560	1401.500-1794.880	684.220-1297.000	0.005
<b>P25D</b>	8	4	5	1273.380	1678.393	890.628	1055.100-1521.700	1321.140-1838.000	778.860-1226.430	0.006
<b>M25D</b>	8	4	5	1350.636	1783.350	1014.854	1126.000-1555.500	1516.630-2068.780	887.670-1130.500	0.002
<b>L25D</b>	8	4	5	1344.136	1835.928	849.818	1105.800-1604.500	1671.860-2120.220	580.580-1134.500	0.002
<b>A50D</b>	8	5	6	1298.591	1629.692	1089.247	1051.670-1463.670	905.330-1999.380	702.560-1502.710	0.054*
<b>P50D</b>	8	5	6	1339.665	1511.808	931.260	1166.500-1591.000	857.000-2004.130	720.250-1182.710	0.008
<b>M50D</b>	8	5	6	1360.229	1561.048	1061.221	1056.330-1566.250	884.890-1999.710	880.450-1237.820	0.029
<b>L50D</b>	8	5	6	1346.898	1581.454	909.507	1057.890-1504.000	994.110-1987.780	656.250-1209.710	0.004
<b>A75D</b>	7	4	6	1219.871	1605.568	1173.612	1063.500-1365.830	1453.000-1886.500	964.220-1582.710	0.025
<b>P75D</b>	7	4	6	1273.109	1552.883	922.960	1110.780-1373.670	1247.250-1877.570	746.500-1202.110	0.010
<b>M75D</b>	7	4	6	1291.227	1839.565	995.954	1119.000-1379.330	1545.130-2093.000	782.330-1427.860	0.010
<b>L75D</b>	7	4	6	1305.434	1765.968	782.780	1059.930-1594.560	1447.880-1975.000	618.730-879.250	0.004

TABLE 7.26

KRUSKAL WALLIS TEST: COMPARISON OF FEMORAL FEMALE BONE DENSITY MEANS BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (TitirşHoyuk)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	p Value
<b>A25D</b>	7	3	6	1210.856	627.320	1009.167	832.000-1391.200	234.750-1090.880	777.000-1216.180	0.039
<b>P25D</b>	7	3	6	1135.553	753.043	904.517	918.000-1286.780	317.630-1012.500	727.250-1099.910	0.034
<b>M25D</b>	7	3	6	1224.929	790.493	1027.898	1057.170-1448.830	439.380-1113.880	778.570-1348.830	0.080*
<b>L25D</b>	7	3	6	1313.559	922.000	757.948	1129.900-1658.920	726.330-1096.780	610.570-1037.150	0.003
<b>A50D</b>	7	4	6	1319.517	722.918	1047.900	1055.360-1614.500	595.090-862.800	929.880-1296.150	0.003
<b>P50D</b>	7	4	6	1257.989	707.715	951.153	915.360-1497.780	362.560-996.780	847.570-1105.920	0.012
<b>M50D</b>	7	4	6	1343.687	836.888	1031.107	1217.500-1466.830	424.500-1184.110	694.140-1334.270	0.011
<b>L50D</b>	7	4	6	1378.223	735.855	906.940	1199.220-1707.640	464.330-1057.670	680.500-1140.330	0.002
<b>A75D</b>	6	3	6	1178.805	1062.77 7	1099.602	856.330-1376.250	930.130-1240.090	721.140-1397.570	0.741
<b>P75D</b>	6	3	6	1334.852	861.133	890.280	1104.600-1811.000	621.880-1092.890	695.820-1067.430	0.006

TABLE 7.26 (CONTINUED)

Variables	Sample Size (Hakemi Use)	Sample Size (TitirsHoyuk)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	p Value
<b>M75D</b>	6	3	6	1344.267	914.110	1055.232	1143.000-1654.250	782.560-1056.670	829.570-1344.850	0.030
<b>L75D</b>	6	3	6	1322.535	776.287	835.733	1089.900-1686.750	561.890-1009.890	622.750-1084.000	0.038

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.27

KRUSKAL WALLIS TEST: COMPARISON OF HUMERAL FEMALE BONE DENSITY MEANS BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	p Value
<b>P25D</b>	3	1	4	1035.973	217.000	764.020	684.500-1213.670	N/A	459.500-1018.250	0.143
<b>M50D</b>	7	1	6	1262.316	912.000	799.487	1099.800-1385.250	N/A	405.670-1113.330	0.011
<b>L50D</b>	7	1	6	1186.339	430.000	576.125	1012-1332.250	N/A	170.500-875.750	0.007
<b>P75D</b>	7	2	5	1274.009	524.665	779.954	1087.250-1514	485.330-564.000	434.670-1008.600	0.006
<b>M75D</b>	7	2	5	1317.220	814.840	814.266	1124.500-1577.250	802.250-827.430	464.000-1245.500	0.023
<b>L75D</b>	7	2	5	1265.859	542.375	659.934	1039.670-1539.500	436.250-648.500	218.000-1022.500	0.007

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.28

## KRUSKAL WALLIS TEST: COMPARISON OF HUMERAL MALE BONE DENSITY

MEANS BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	p Value
P25D	5	2	3	1342.766	630.875	796.000	1174.500-1495.000	627.500-634.250	615.250-1071.000	0.032
M50D	8	3	6	1443.240	744.000	843.208	1279.500-1635.750	698.500-799.750	405.670-1113.330	0.002
L50D	8	3	6	1410.954	786.417	638.000	1194.500-1644.330	704.500-866.000	170.500-875.750	0.008
P75D	8	3	6	1452.954	664.890	752.958	1304.500-1732.290	354.250-1021.670	434.670-1008.600	0.002
M75D	8	3	6	1387.604	588.803	878.037	1207.000-1773.000	316.330-787.750	339.000-1225.000	0.002
L75D	8	3	6	1422.528	683.500	834.555	1136.000-1604.000	536.000-929.500	493.000-1306.670	0.003

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

To understand what site varied the most from the other two, every site was compared against one another at all significant or near-significant  $p$  values at all bone locations (Tables 7.29-7.40). Tables 7.29-7.31 show that most  $p$  values were significant or near-significant when comparing male femoral cortical density for male femoral density comparisons. Table 7.29 presents 7 out of 12 significant and 2 out of 12 biologically interesting values when comparing femoral density in males from Titriş Höyük and Hakemi Use. Table 7.30 presents 10 out of 12 significant and 2 out of 12 biologically values when comparing femoral density in males from Titriş Höyük and Bakla Tepe. Table 7.31 presents 9 out of 12 significant and 1 out of 12 biologically significant values when comparing femoral density in males from Bakla Tepe and Hakemi Use. Compared to the other two sites, Bakla Tepe and Titriş Höyük differ the most from one another.

Tables 7.32-7.34 show that when  $p$  values are compared, Titriş Höyük and Bakla Tepe vary less than when compared with Hakemi Use. Table 7.32 presents 11 out of 11 significant values when comparing femoral density in females from Titriş Höyük and Hakemi Use. Table 7.33 presents 1 out of 11 significant values at the anterior 25% slice when comparing femoral density in females from Titriş Höyük and Bakla Tepe. Table 7.34 presents 10 out of 11 significant values when comparing femoral density in females from Bakla Tepe and Hakemi Use. Hakemi Use has the greatest density in femora in females between the three settlements.

Tables 7.35-7.37 show significant  $p$  values of bone density variation in humeri of only males between Hakemi Use and the Bakla Tepe and Titriş Höyük. Table 7.35 presents 5 out of 6 significant and 1 out of 6 biologically interesting values when

comparing humeral density in males from Titriş Höyük and Hakemi Use. Table 7.36 presents no significant or biologically interesting values out of 6 when comparing humeral density in males from Titriş Höyük and Bakla Tepe. Thus, the differences between the EBA sites are not significant. Table 7.37 presents 6 out of 6 significant values when comparing humeral density in males from Bakla Tepe and Hakemi Use.

Tables 7.38-7.40 report similar results to the male humeral comparisons, with Hakemi Use having the most varied cortical bone density when compared to the other two sites. Table 7.38 presents three out of five significant values when comparing humeral density in females from Titriş Höyük and Hakemi Use. Table 7.39 presents no significant or biologically interesting values out of 5 when comparing humeral density in females from Titriş Höyük and Bakla Tepe. Table 7.40 presents 5 out of 5 significant values when comparing humeral density in females from Bakla Tepe and Hakemi Use.



TABLE 7.29

MANN WHITNEY U TEST: COMPARISON OF FEMORAL MALE BONE DENSITY  
MEANS BETWEEN HAKEMI USE AND TITRİŞ HÖYÜK

Variables	Sample Size (Hakemi Use)	Sample Size (Titrış Höyük)	Mean- Hakemi Use Cortex (pixel)	Mean- Titrış Höyük Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titrış Höyük Cortex (pixel)	z Value	p Value
A25D	8	4	1253.058	1605.550	1032.450-1443.560	1401.500-1794.880	-2.548	0.011
P25D	8	4	1273.380	1678.393	1055.100-1521.700	1321.140-1838.000	-2.038	0.042
M25D	8	4	1350.636	1783.350	1126.000-1555.500	1516.630-2068.780	-2.548	0.011
L25D	8	4	1344.136	1835.928	1105.800-1604.500	1671.860-2120.220	-2.717	0.007
A50D	8	5	1298.591	1629.692	1051.670-1463.670	905.330-1999.380	-1.757	0.079*
P50D	8	5	1339.665	1511.808	1166.500-1591.000	857.000-2004.130	-0.878	0.380
M50D	8	5	1360.229	1561.048	1056.330-1566.250	884.890-1999.710	-1.317	0.188
L50D	8	5	1346.898	1581.454	1057.890-1504.000	994.110-1987.780	-1.757	0.079*
A75D	7	4	1219.871	1605.568	1063.500-1365.830	1453.000-1886.500	-2.646	0.008
P75D	7	4	1273.109	1552.883	1110.780-1373.670	1247.250-1877.570	-0.945	0.345
M75D	7	4	1291.227	1839.565	1119.000-1379.330	1545.130-2093.000	-2.646	0.008
L75D	7	4	1305.434	1765.968	1059.930-1594.560	1447.880-1975.000	-2.268	0.023

Significant *p* values indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.30

MANN WHITNEY U TEST: COMPARISON OF FEMORAL MALE BONE DENSITY  
MEANS BETWEEN BAKLA TEPE AND TITRIŞ HÖYÜK

Variables	Sample Size (TitrişHoyuk)	Sample Size (Bakla Tepe)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>A25D</b>	4	5	1605.550	973.136	1401.500-1794.880	684.220-1297.000	-2.449	0.014
<b>P25D</b>	4	5	1678.393	890.628	1321.140-1838.000	778.860-1226.430	-2.449	0.014
<b>M25D</b>	4	5	1783.350	1014.854	1516.630-2068.780	887.670-1130.500	-2.449	0.014
<b>L25D</b>	4	5	1835.928	849.818	1671.860-2120.220	580.580-1134.500	-2.449	0.014
<b>A50D</b>	5	6	1629.692	1089.247	905.330-1999.380	702.560-1502.710	-1.826	0.068 *
<b>P50D</b>	5	6	1511.808	931.260	857.000-2004.130	720.250-1182.710	-2.191	0.028
<b>M50D</b>	5	6	1561.048	1061.221	884.890-1999.710	880.450-1237.820	-1.826	0.068 *
<b>L50D</b>	5	6	1581.454	909.507	994.110-1987.780	656.250-1209.710	-2.373	0.018
<b>A75D</b>	4	5	1605.568	1173.612	1453.000-1886.500	964.220-1582.710	-1.960	0.050
<b>P75D</b>	4	6	1552.883	922.960	1247.250-1877.570	746.500-1202.110	-2.558	0.011
<b>M75D</b>	4	6	1839.565	995.954	1545.130-2093.000	782.330-1427.860	-2.558	0.011
<b>L75D</b>	4	6	1765.968	782.780	1447.880-1975.000	618.730-879.250	-2.558	0.011

Significant *p* values indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.31

MANN WHITNEY U TEST: COMPARISON OF FEMORAL MALE BONE DENSITY  
MEANS BETWEEN BAKLA TEPE AND HAKEMI USE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>A25D</b>	8	5	1253.058	973.136	1032.450-1443.560	684.220-1297.000	-2.049	0.04
<b>P25D</b>	8	5	1273.380	890.628	1055.100-1521.700	778.860-1226.430	-2.342	0.019
<b>M25D</b>	8	5	1350.636	1014.854	1126.000-1555.500	887.670-1130.500	-2.635	0.008
<b>L25D</b>	8	5	1344.136	849.818	1105.800-1604.500	580.580-1134.500	-2.489	0.013
<b>A50D</b>	8	6	1298.591	1089.247	1051.670-1463.670	702.560-1502.710	-1.678	0.093*
<b>P50D</b>	8	6	1339.665	931.260	1166.500-1591.000	720.250-1182.710	-2.969	0.003
<b>M50D</b>	8	6	1360.229	1061.221	1056.330-1566.250	880.450-1237.820	-2.453	0.014
<b>L50D</b>	8	6	1346.898	909.507	1057.89-1504.000	656.250-1209.710	-2.969	0.003
<b>A75D</b>	7	6	1219.8714	1173.612	1063.500-1365.830	964.220-1582.710	-0.893	0.372
<b>P75D</b>	7	6	1273.109	922.960	1110.780-1373.670	746.500-1202.110	-2.429	0.015
<b>M75D</b>	7	6	1291.227	995.954	1119.000-1379.330	782.330-1427.860	-1	0.317
<b>L75D</b>	7	6	1305.434	782.780	1059.930-1594.560	618.730-879.250	-2.429	0.015

Significant *p* values indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.32

MANN WHITNEY U TEST: COMPARISON OF FEMORAL FEMALE BONE  
DENSITY MEANS BETWEEN HAKEMI USE AND TITRİŞ HÖYÜK

Variables	Sample Size (Hakemi Use)	Sample Size (Titrış Höyük)	Mean- Hakemi Use Cortex (pixel)	Mean- Titrış Höyük Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titrış Höyük Cortex (pixel)	z Value	p Value
<b>A25D</b>	7	3	1210.856	627.320	832.000-1391.200	234.750-1090.880	-1.937	0.053
<b>P25D</b>	7	3	1135.553	753.043	918.000-1286.780	317.630-1012.500	-1.937	0.053
<b>M25D</b>	7	3	1224.929	790.493	1057.170-1448.830	439.380-1113.880	-2.165	0.030
<b>L25D</b>	7	3	1313.559	922.000	1129.900-1658.920	726.330-1096.780	-2.393	0.017
<b>A50D</b>	7	4	1319.517	722.918	1055.360-1614.500	595.090-862.800	-2.646	0.008
<b>P50D</b>	7	4	1257.989	707.715	915.360-1497.780	362.560-996.780	-2.268	0.023
<b>M50D</b>	7	4	1343.687	836.888	1217.500-1466.830	424.500-1184.110	-2.646	0.008
<b>L50D</b>	7	4	1378.223	735.855	1199.220-1707.640	464.330-1057.670	-2.646	0.008
<b>P75D</b>	6	3	1334.852	861.133	1104.600-1811.000	621.880-1092.890	-2.260	0.024
<b>M75D</b>	6	3	1344.267	914.110	1143.000-1654.250	782.560-1056.670	-2.260	0.024
<b>L75D</b>	6	3	1322.535	776.287	1089.900-1686.750	561.890-1009.890	-2.260	0.024

Significant *p* values indicated by bolding

TABLE 7.33:

MANN WHITNEY U TEST: COMPARISON OF FEMORAL FEMALE BONE  
DENSITY MEANS BETWEEN BAKLA TEPE AND TITRIŞ HÖYÜK

Variables	Sample Size (Titirshoyuk)	Sample Size (Bakla Tepe)	Mean- Titirş Höyük Cortex (Pixel)	Mean- Bakla Tepe Cortex (Pixel)	Range- Titirş Höyük Cortex (Pixel)	Range-Bakla Tepe Cortex (Pixel)	Z Value	P Value
<b>A25D</b>	3	6	627.320	1009.167	234.750-1090.880	777.000-1216.180	-1.291	0.197
<b>P25D</b>	3	6	753.043	904.517	317.630-1012.500	727.250-1099.910	-0.258	0.796
<b>M25D</b>	3	6	790.493	1027.898	439.380-1113.880	778.570-1348.830	-0.775	0.439
<b>L25D</b>	3	6	922.000	757.948	726.330-1096.780	610.570-1037.150	-1.291	0.197
<b>A50D</b>	4	6	722.918	1047.900	595.090-862.800	929.880-1296.150	-2.558	0.011
<b>P50D</b>	4	6	707.715	951.153	362.560-996.780	847.570-1105.920	-0.853	0.394
<b>M50D</b>	4	6	836.888	1031.107	424.500-1184.110	694.140-1334.270	-0.64	0.522
<b>L50D</b>	4	6	735.855	906.940	464.330-1057.670	680.500-1140.330	-1.066	0.286
<b>P75D</b>	3	6	861.133	890.280	621.880-1092.890	695.820-1067.430	-0.120	<b>0.905</b>
<b>M75D</b>	3	6	914.110	1055.232	782.560-1056.670	829.570-1344.850	-0.876	0.381
<b>L75D</b>	3	6	776.287	835.733	561.890-1009.890	622.750-1084.000	-0.120	0.905

Significant *p* values indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.34

MANN WHITNEY U TEST: COMPARISON OF FEMORAL FEMALE BONE  
DENSITY MEANS BETWEEN HAKEMI USE AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>A25D</b>	7	6	1210.856	1009.167	832.000-1391.200	777.000-1216.180	-2.000	0.046
<b>P25D</b>	7	6	1135.553	904.517	918.000-1286.780	727.250-1099.910	-2.286	0.022
<b>M25D</b>	7	6	1224.929	1027.898	1057.170-1448.830	778.570-1348.830	-1.429	0.153
<b>L25D</b>	7	6	1313.559	757.948	1129.900-1658.920	610.570-1037.150	-3.000	0.003
<b>A50D</b>	7	6	1319.517	1047.900	1055.360-1614.500	929.880-1296.150	-2.286	0.022
<b>P50D</b>	7	6	1257.989	951.153	915.360-1497.780	847.570-1105.920	-2.571	0.010
<b>M50D</b>	7	6	1343.687	1031.107	1217.500-1466.830	694.140-1334.270	-2.286	0.022
<b>L50D</b>	7	6	1378.223	906.940	1199.220-1707.640	680.500-1140.330	-3.000	0.003
<b>P75D</b>	6	6	1334.852	890.280	1104.600-1811.000	695.820-1067.430	-3.067	0.002
<b>M75D</b>	6	6	1344.267	1055.232	1143.000-1654.250	829.570-1344.850	-1.846	0.065
<b>L75D</b>	6	6	1322.535	835.733	1089.900-1686.750	622.750-1084.000	-3.067	0.002

Significant *p* values indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.35

MANN WHITNEY U TEST: COMPARISON OF HUMERAL MALE BONE DENSITY  
MEANS BETWEEN HAKEMI USE AND TITRIŞ HÖYÜK

Variables	Sample Size (Hakemi Use)	Sample Size (Titirş Höyük)	Mean- Hakemi Use Cortex (pixel)	Mean- Titirş Höyük Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titirş Höyük Cortex (pixel)	z Value	p Value
P25D	5	2	1342.766	630.875	1174.500-1495.000	627.500-634.250	-1.936	0.053*
M50D	8	3	1443.240	744.000	1279.500-1635.750	698.500-799.750	-2.449	0.014
L50D	8	3	1410.954	786.417	1194.500-1644.330	704.500-866.000	-2.449	0.014
P75D	8	3	1452.954	664.890	1304.500-1732.290	354.250-1021.670	-2.449	0.014
M75D	8	3	1387.604	588.803	1207.000-1773.000	316.330-787.750	-2.449	0.014
L75D	8	3	1422.528	683.500	1136.000-1604.000	536.000-929.500	-2.449	0.014

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.36:

MANN WHITNEY U TEST: COMPARISON OF HUMERAL MALE BONE DENSITY  
MEANS BETWEEN BAKLA TEPE AND TITRIŞ HÖYÜK

Variables	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>P25D</b>	2	3	630.875	796.000	627.500-634.250	615.250-1071.000	-0.577	0.564
<b>M50D</b>	3	6	744.000	843.208	698.500-799.750	405.670-1113.330	-1.291	0.197
<b>L50D</b>	3	6	786.417	638.000	704.500-866.000	170.500-875.750	-0.775	0.439
<b>P75D</b>	3	6	664.89	752.958	354.250-1021.670	434.670-1008.600	-0.516	0.606
<b>M75D</b>	3	6	588.803	878.037	316.330-787.750	339.000-1225.000	-1.549	0.121
<b>L75D</b>	3	6	683.500	834.555	536.000-929.500	493.000-1306.670	-0.516	0.606

Significant value p is indicated by bolding. Biologically interesting p value is indicated by asterisk.



TABLE 7.37:

MANN WHITNEY U TEST: COMPARISON OF HUMERAL MALE BONE DENSITY  
MEANS BETWEEN HAKEMI USE AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>P25D</b>	5	3	1342.766	796.000	1174.500-1495.000	615.250-1071.000	-2.236	0.025
<b>M50D</b>	8	6	1443.240	843.208	1279.500-1635.750	405.670-1113.330	-3.098	0.002
<b>L50D</b>	8	6	1410.954	638.000	1194.500-1644.330	170.500-875.750	-2.582	0.010
<b>P75D</b>	8	6	1452.954	752.958	1304.500-1732.290	434.670-1008.600	-3.098	0.002
<b>M75D</b>	8	6	1387.604	878.037	1207.000-1773.000	339.000-1225.000	-2.969	0.003
<b>L75D</b>	8	6	1422.528	834.555	1136.000-1604.000	493000.-1306.670	-2.969	0.003

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.38:  
MANN WHITNEY U TEST: COMPARISON OF HUMERAL FEMALE BONE  
DENSITY MEANS BETWEEN HAKEMI USE AND TITRIŞ HÖYÜK

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	z Value	p Value
<b>M50D</b>	7	1	1262.316	912.000	1099.800-1385.250	N/A	-1.528	0.127
<b>L50D</b>	7	1	1186.339	430.000	1012.000-1332.250	N/A	-1.528	0.127
<b>P75D</b>	7	2	1274.009	524.665	1087.250-1514.000	485.330-564.000	-2.049	0.040
<b>M75D</b>	7	2	1317.220	814.840	1124.500-1577.250	802.250-827.430	-2.049	0.040
<b>L75D</b>	7	2	1265.859	542.375	1039.670-1539.500	436.250-648.500	-2.049	0.040

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.39:

MANN WHITNEY U TEST: COMPARISON OF HUMERAL FEMALE BONE  
DENSITY MEANS BETWEEN TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (TitirşHoyuk)	Sample Size (Bakla Tepe)	Mean- Titirş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Titirş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>-M50D</b>	1	6	912.000	799.487	N/A	405.670-1113.330	0	1.000
<b>L50D</b>	1	6	430.000	576.125	N/A	170.500-875.750	1.000	0.617
<b>P75D</b>	2	5	524.665	779.954	485.330-564.000	434.670-1008.600	-1.162	0.245
<b>M75D</b>	2	5	814.840	814.266	802.250-827.430	464.000-1245.500	0	1.000
<b>L75D</b>	2	5	542.375	659.934	436.250-648.500	218.000-1022.500	0.775	0.439

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.40:

MANN WHITNEY U TEST: COMPARISON OF HUMERAL FEMALE BONE  
DENSITY MEANS BETWEEN HAKEMI USE AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>M50D</b>	7	6	1262.316	799.487	1099.800-1385.250	405.670-1113.330	-2.857	0.004
<b>L50D</b>	7	6	1186.339	576.125	1012.000-1332.250	170.500-875.750	-3.000	0.003
<b>P75D</b>	7	5	1274.009	779.954	1087.250-1514.000	434.670-1008.600	-2.842	0.004
<b>M75D</b>	7	5	1317.220	814.266	1124.500-1577.250	464.00-1245.500	-2.355	0.019
<b>L75D</b>	7	5	1265.859	659.934	1039.670-1539.500	218.000-1022.500	-2.842	0.004

Significant value  $p$  is indicated by bolding. Biologically interesting  $p$  value is indicated by asterisk.

The  $p$  values that were not significant or near-significant in Tables 7.5-7.6, 7.10-7.11, and 7.15-7.16 were compared across the three sites without controlling for sex (Tables 7.41-7.42).

*Prediction 1:* Cortical thickness mean values of the Hakemi Use samples will be significantly greater than those of the Titriş Höyük population, and less so from the Bakla Tepe samples in humeri and femora.

Table 7.41 shows that 0 out of 5 comparisons of femoral cortical thickness values were significant between Hakemi Use, Titriş Höyük, and Bakla Tepe. Table 7.42 shows that 1 out of 5 comparisons of humeral cortical thickness values was significant between Hakemi Use, Titriş Höyük, and Bakla Tepe. Based on these results, prediction 1 is not supported. There are no significant differences in cortical thickness in both femora and humeri at Hakemi Use, Titriş Höyük, and Bakla Tepe when not controlling for sex.

TABLE 7.41:  
KRUSKAL WALLIS TEST: COMPARISONS BETWEEN CORTICAL  
THICKNESSES OF FEMORA BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND  
BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titriş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titriş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	p Value
M25T	15	12	11	0.682	0.727	0.620	0.320-1.110	0.420-0.960	0.370-0.870	0.258
L25T	15	12	11	0.695	0.727	0.619	0.390-1.110	0.460-1.020	0.440-0.920	0.354
P75T	13	12	12	0.433	0.454	0.476	0.170-0.590	0.360-0.600	0.350-0.650	0.810
M75T	13	12	12	0.427	0.413	0.493	0.270-0.830	0.300-0.560	0.290-0.800	0.355
L75T	13	12	12	0.379	0.389	0.468	0.250-0.650	0.270-0.480	0.310-0.740	0.161

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.42:  
KRUSKAL WALLIS TEST: COMPARISONS BETWEEN CORTICAL  
THICKNESSES OF HUMERI BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND  
BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Titirş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Titirş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titirş Höyük Cortex (mm)	Range- Bakla Tepe Cortex (mm)	p Value
<b>A25T</b>	8	6	7	0.295	0.252	0.283	0.120-0.500	0.110-0.350	0.160-0.450	0.867
<b>M25T</b>	8	6	7	0.270	0.278	0.301	0.230-0.390	0.160-0.450	0.210-0.440	0.674
<b>L25T</b>	8	6	7	0.274	0.265	0.350	0.180-0.320	0.150-0.440	0.210-0.570	0.093*
<b>P75T</b>	15	14	11	0.383	0.446	0.415	0.200-0.560	0.130-0.640	0.290-0.660	0.166
<b>M75T</b>	15	14	11	0.453	0.512	0.513	0.260-0.590	0.250-0.690	0.330-0.680	0.225

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

The lateral 25% bone site (L25T) of the humeri showed a biologically interesting comparison between the three sites. Thus, the three sites were compared again in pairs in order to understand which two sites result in the near-significant value (7.43-7.45).

Tables 7.45, 7.46, and 7.47 show that humeral cortical thickness differences are not significant between Hakemi Use and Titriş Höyük, are significant between Hakemi Use and Bakla Tepe, and are biologically interesting between Titriş Höyük and Bakla Tepe.

TABLE 7.43:

MANN WHITNEY U TEST: COMPARISONS BETWEEN CORTICAL THICKNESS OF HUMERI BETWEEN TITRIŞ HÖYÜK, AND HAKEMI USE

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Mean- Hakemi Use Cortex (mm)	Mean- Titriş Höyük Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range- Titriş Höyük Cortex (mm)	z Value	p Value
<b>L25T</b>	8	6	0.274	0.265	0.180-0.320	0.150-0.440	-0.778	0.437

Significant value *p* is indicated by bolding.

TABLE 7.44:  
MANN WHITNEY U TEST: COMPARISONS BETWEEN CORTICAL THICKNESS  
OF HUMERI BETWEEN BAKLA TEPE AND HAKEMI USE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Hakemi Use Cortex (mm)	Range-Bakla Tepe Cortex (mm)	z Value	p Value
<b>L25T</b>	8	7	0.274	0.350	0.180-0.320	0.210-0.570	-1.974	0.048

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.



TABLE 7.45:

MANN WHITNEY U TEST: COMPARISONS BETWEEN CORTICAL THICKNESS  
OF HUMERI BETWEEN BAKLA TEPE AND TITRIŞ HÖYÜK

Variables	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Titriş Höyük Cortex (mm)	Mean- Bakla Tepe Cortex (mm)	Range- Titriş Höyük Cortex (mm)	Range-Bakla Tepe Cortex (mm)	z Value	p Value
L25T	6	7	0.265	0.350	0.150-0.440	0.210-0.570	-1.650	0.099*

Significant value  $p$  is indicated by bolding. Biologically interesting  $p$  value is indicated by asterisk.

In Tables 7.7-7.8, 7.12-7.13, 7.17-7.18,  $p$  values that did not indicate sex differences in cortical density, the three sites' density values were compared with each other with a Kruskal Wallis test without controlling for sex (Table 7.46).

*Prediction 2:* Cortical biomineralization density mean values of the Hakemi Use samples will be significantly greater than those of the Titriş Höyük and Bakla Tepe samples in humeri and femora.

Table 7.46 shows that when not controlling for sex, humeral density comparisons are significant at 5 out of 6 bone sites and biologically interesting at 1 out of 6 bone sites when comparing the whole samples from Titriş Höyük, Bakla Tepe, and Hakemi Use.

TABLE 7.46:  
KRUSKAL WALLIS TEST: COMPARISON OF HUMERAL BONE DENSITY  
MEANS BETWEEN HAKEMI USE, TITRIŞ HÖYÜK, AND BAKLA TEPE

Variable	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range- Bakla Tepe Cortex (pixel)	p Value
<b>A25D</b>	8	6	7	1116.949	797.125	871.130	438.000-1392.500	173.250-1668.750	558.330-1237.750	0.093 *
<b>M25D</b>	8	6	7	1288.119	719.528	757.214	701.750 - 1977.170	514.500-1037.170	414.500-1191.250	0.008
<b>L25D</b>	8	6	7	1209.948	646.708	648.703	871.000 - 1478.500	374.000-1260.250	253.000-1093.000	0.005
<b>A50D</b>	15	12	12	1224.559	1202.050	928.257	1022.000 - 1520.250	341.500-2354.250	561.000-1217.000	0.013
<b>P50D</b>	15	12	12	1334.363	1011.785	803.278	925.250 - 1675.250	309.670-1715.330	379.000-1234.000	0.003
<b>A75D</b>	15	14	11	1328.911	1193.894	1046.243	1113.500-1596.750	483.000-2159.670	771.670-1354.000	0.018

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

In order to understand which site is the most varied from the others, the three were compared in pairs with a Mann Whitney U-Test (Tables 7.47-7.49). Tables 7.47, 7.48, and 7.49 show that comparisons of cortical density between Hakemi Use and Titriş Höyük are significant at 2 out of 6 and biologically interesting at 1 out of 6. Bakla Tepe and Titriş Höyük have no significant or biologically interesting differences, and Bakla Tepe and Hakemi Use have 6 out of 6 significant differences at all bone sites compared. Thus, Hakemi Use and Bakla Tepe are the most different from one another in humeral density comparisons. Prediction 2 is supported here, with Hakemi Use having the highest cortical density from all the sites.

TABLE 7.47:

MANN WHITNEY U TEST: COMPARISON OF HUMERAN BONE DENSITY  
MEANS BETWEEN HAKEMI USE AND TITRIŞ HÖYÜK

Variables	Sample Size (Hakemi Use)	Sample Size (Titriş Höyük)	Mean- Hakemi Use Cortex (pixel)	Mean- Titriş Höyük Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	z Value	p Value
<b>A25D</b>	8	6	1116.949	797.125	438.000-1392.500	173.250-1668.750	-1.678	0.093*
<b>M25D</b>	8	6	1288.119	719.528	701.750-1977.170	514.500-1037.170	-2.582	0.010
<b>L25D</b>	8	6	1209.948	646.708	871.000-1478.500	374.000- 1260.250	-2.453	0.014
<b>A50D</b>	15	12	1224.559	1202.050	1022.000-1520.250	341.500-2354.250	-0.732	0.464
<b>P50D</b>	15	12	1334.363	1011.785	925.250-1675.250	309.670-1715.330	-1.317	0.188
<b>A75D</b>	15	14	1328.911	1193.894	1113.500-1596.750	483.000-2159.670	-1.440	0.150

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.48:

MANN WHITNEY U TEST: COMPARISON OF HUMERAL BONE DENSITY  
MEANS BETWEEN TITRIŞ HÖYÜK, AND BAKLA TEPE

Variables	Sample Size (TitrişHoyuk)	Sample Size (Bakla Tepe)	Mean- Titriş Höyük Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Titriş Höyük Cortex (pixel)	Range-Bakla Tepe Cortex (pixel)	z Value	p Value
<b>A25D</b>	6	7	797.125	871.130	173.250-1668.750	558.330-1237.750	-0.429	0.668
<b>M25D</b>	6	7	719.528	757.214	514.500-1037.170	414.500-1191.250	0	1.000
<b>L25D</b>	6	7	646.708	648.703	374.000- 1260.250	253.000-1093.000	0	1.000
<b>A50D</b>	12	12	1202.050	928.257	341.500-2354.250	561.000-1217.000	-0.289	0.773
<b>P50D</b>	12	12	1011.785	803.278	309.670-1715.330	379.000-1234.000	-0.808	0.419
<b>A75D</b>	14	11	1193.894	1046.243	483.000-2159.670	771.670-1354.000	-0.109	0.913

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

TABLE 7.49:  
MANN WHITNEY U TEST: COMPARISON OF HUMERAL BONE DENSITY  
MEANS BETWEEN HAKEMI USE AND BAKLA TEPE

Variables	Sample Size (Hakemi Use)	Sample Size (Bakla Tepe)	Mean- Hakemi Use Cortex (pixel)	Mean- Bakla Tepe Cortex (pixel)	Range- Hakemi Use Cortex (pixel)	Range- Bakla Tepe Cortex (pixel)	z Value	p Value
<b>A25D</b>	8	7	1116.949	871.130	438.000-1392.500	558.330-1237.750	-1.967	0.049
<b>M25D</b>	8	7	1288.119	757.214	701.750-1977.170	414.500-1191.250	-2.662	0.008
<b>L25D</b>	8	7	1209.948	648.703	871.000-1478.500	253.000-1093.000	-3.009	0.003
<b>A50D</b>	15	12	1224.559	928.257	1022.000-1520.250	561.000-1217.000	-3.757	0
<b>P50D</b>	15	12	1334.363	803.278	925.250-1675.250	379.000-1234.000	-3.952	0
<b>A75D</b>	15	11	1328.911	1046.243	1113.500-1596.750	771.670-1354.000	-3.348	0.001

Significant value *p* is indicated by bolding. Biologically interesting *p* value is indicated by asterisk.

## 7.5 Discussion

### 7.5.1 Hakemi Use

There is no statistically significant difference between the male and females femoral and humeral lengths (Table 7.4). In Chapter 4, I presented the mortuary evidence

from Hakemi Use as featuring mostly females and subadults buried intramurally. The males from this intramural sample were buried differently from the majority of the Hakemi Use males. In future studies, it would be beneficial to see if the femoral and humeral lengths of extramurally buried males differ from the individuals found intramurally.

Some serious limitations in this inquiry include the small sample sizes of intact bones, especially for lengths of humeri bones between females and males. Humeri at Hakemi Use were often broken, so I could not collect all of the measurements from the 25%-75% for all of the bones included in this study. Any interpretation of the correspondence between the archeological evidence and stature beyond preliminary findings should be reserved for future detailed examinations of the Hakemi Use population when all of the adult individuals are sexed and a more detailed test can be repeated.

Based on the comparisons of Hakemi Use male and females, cortical bone thickness in femora (Table 7.5) also shows that it does not differ by sex. As indicated earlier, this result could be interpreted in several ways. It is possible to view these results as an indication that males and females at Hakemi Use followed similar activity-based patterns that resulted in femoral thickness similarities between both sexes. Alternatively, it is also feasible that the expected sex-based dimorphism in favor of males that should be present given all else is equal is masked here because 1) females are doing something more that compensates for the cortical thickness differences between the sexes, 2) males are doing something less with their femora that brings down robustness in the cortical bone, or 3) a combination of one and two is occurring. Of course, the limitation that exists

here is that without a better understanding of daily life tasks that would affect the shape of the bone in such a manner, the question remains. It might be of interest to note that the 2 out of 3 significant comparisons that existed between the male and female femora centered at the 25% slice. Archeological evidence does not currently shed light on what males and females were doing at this settlement that would affect the femoral thickness mostly at the proximal shaft or if this is even a morphological feature influenced by activity.

The humerus shows a different pattern between the sexes at Hakemi Use. While a single significant difference between males and females was observed at the lateral site of the 75% slice along the shaft, the anterior or posterior dimensions of all three slices showed a potentially biologically interesting difference (three out of 12 bone locations-see Table 7.6). As was the case with the femora, archaeological evidence that could explain the observed patterns is not available. However, the three interpretations should still guide how this result could be interpreted.

At Hakemi Use, comparisons of cortical bone biomineralization between the sexes in the femora are not statistically significant (Table 7.7). The humeral bone mineralization values show two points of significant differences between the sexes and three which might be biologically interesting all along the bone shaft in no particular pattern, with males having greater bone density values than females. Lower bone biomineralization at those five bone locations in females could be due to normal biological factors, such as sexual dimorphism, or related to the endocrine system of individuals that interact with bone absorption and renewal, such as estrogen cycling, breastfeeding, weaning, and aging (Labbok, 2001; Bolzetta et. al., 2014; Pennypacker et.



al., 2011; Douma et. al., 2005). It is possible to suggest that activity patterns were similar for this population, which is suggested by the lack of any difference in cortical thickness or biomineralization in the femora. Alternatively, sexual dimorphism here could be masked by an activity that males are doing less or females are doing more. Similarly, activity patterns involving the arms, such as working with sickle and pulling animals, seem to be similar between the sexes. The five significant or near-significant  $p$  values for biomineralization in the humeri between the sexes might be investigated in future studies.

The femoral differences from this sample for both cortical thickness and density are minimal. This leads me to suggest that on a larger scale, females and males did not experience great differences in mobility and/or activity. If I am examining cortical thickness and density in the femora related to mobility, for this is one activity that I know people were doing, this sample suggests that both of the sexes had similar levels of mobility-related cortical bone loading (Ruff and Larsen, 2014; Wescott, 2006).

Catalhoyuk metacarpal cortical thickness studies have been used to expose interesting patterns pertaining to the sociocultural aspects of society (gender, in particular) (Glencross and Agarwal, 2011) and have shown results similar to my findings here at Hakemi Use. At Çatalhöyük bone robustness showed that, as expected, individuals over 50 years of age had a higher rate of cortical bone loss, particularly in females. However, when dealing with the oldest age groups at Çatalhöyük, males and females did not have statistically significant differences in bone loss and robustness. Thus, we must turn to differences in the social context, such as lifestyle patterns, in order to understand why this is. Here, we can emphasize the role that gender played within the community to shape the skeleton beyond biological factors (Agarwal, 2016). While this

study discriminates against different age groups and I do not, my results also show that the similarities between males and females show that activity patterns between males and females were not significantly different. These findings are consistent with the expectation that mobility or activity will be relatively similar between males and females in Late Pottery Neolithic Mesopotamia, though I want to emphasize that we cannot know if the patterns observed in cortical bone are directly related to mechanical stress and loading, or if they are, how much.

#### 7.5.2 *Titriş Höyük*

When comparing femoral size between males and females at Titriş Höyük, no significant difference is observed. The female sample for humeri only contained one individual, so sex-based analysis was not possible. The single value of humeral length for a female was lower than the range of male humeral length. Table 7.9 summarizes these findings.

Comparisons of femoral cortical thickness show that the differences between the sexes can be observed along the shaft, but there is no particular pattern of where on the shaft or on the slices these differences occur. Two of the comparisons are significant and three are near significant (Table 7.10). The humeral data is also hard to interpret since only two individuals represent each slice at 50% and 25%. Table 7.11 shows that there are no significant or biologically interesting comparisons between female and male humeral cortical thickness bone locations.

Cortical density in the femora is strongly significant between males and females, with males having more than twice the cortical density in the humeral shaft when

compared with females and significant comparisons at all of the bone sites (Table 7.12). Cortical density is similar and not statistically different between males and females in the humeri (Table 7.13).

A possible explanation that can reconcile the huge differences between sex-based bone mineralization in the femora could be sought out in activity patterns differences between males and females. Were males doing more, or were females doing less? Or was it both? It is impossible to understand from this sample. Sexual dimorphism could also be a reason behind this pattern, where the femora represents the normal male/female variation and the difference in activity is in the humeri, where males are doing less, females are doing more, or both. The sample of female humeri is not optimal, so perhaps with a better sample, the pattern in the humeri cortical density comparisons will change.

It is possible that the archaeological record could give some insight into how to interpret these results. In a study of dietary plasticity in rabbits, Ravosa et. al. (2007) demonstrated that individuals experiencing greater stress along the mandible during chewing and biting had greater bone mineralization values than those who did not. It is possible that the male individuals at Titriş Höyük experienced greater loading stress in the femora that induced higher bone mineralization when compared with female femora. This is further supported by the fact that we do not see this pattern in the humeri. While the archaeological record does not provide insight into what these activities might have been, I can speculate that males were involved in more intense agricultural activities that required them to exhibit considerable stress to their femora. Alternatively, it was females who did less than males, and this resulted in the same bone signal. Without knowing what the baseline for that population was, and not knowing exactly what caused higher cortical

density in males, it is impossible to know whether male or female behavior drove this result.

Previous studies that have explored such sex-based differences show a similar trend. For example, Neolithic Ligurian samples showed a higher-than-expected femoral robustness, supposedly due to pastoral activities on an uneven terrain. Comparisons with a later Neolithic group show that the Ligurian population was more similar to the Upper Paleolithic, which had more pastoral groups—hence its high post-cranial robustness (Marchi, 2008). High sexual dimorphism of femora is suggestive of males being more mobile than females. Thus, in addition to agricultural activities, males could have also been responsible for commuting long distances for trade or warfare, which we know was widespread during this period. Overall, this study provides evidence to support the notion that the males at Titriş Höyük were more active in a way that would stress the femora in males more than the femora in females.

Studies by Marchi et. al., (2006) compare samples from later Neolithic periods with the Upper Palaeolithic and some medieval samples. They argue that as mobility decreased, cortical bone thickness of femora did too. Studies of populations during the transition between the Early Paleolithic and the Mesolithic show significant sexual dimorphism in femora attributed to males being more mobile than females on average. This pattern is supported by a very similar study by Holt (2003). Holt showed that growing sedentism during the Last Glacial Maximum correlated with a decrease in femoral strength measured by cortical thickness and shape. An important factor that emerged from this research was that terrain has a profound effect, not just on the bone deposition due to mechanical loading, but also on the cortical shape, as suggested by Ruff

(1999). I have not accounted for shape in this study, but as available samples grow in the Near East, more cortical density studies will be vital in order to discriminate against activity-based patterns that archaeology could not detect. What is interesting to note here is that I did not find differences in cortical bone thickness but rather in cortical bone density. This is an intriguing perspective that suggests that cortical thickness may not always expose such mobility and activity patterns and emphasizes that both of these cortical measurements in concert might improve the depth of analysis. Is especially true for prehistoric populations such as the ones in this study, where morphological plasticity cannot easily be linked with activity-induced changes.

As I outlined in section 7.1.2, if differences in the cortical bone density are to be interpreted as related to social patterns that influenced activity or mobility patterns depending on where sex-based cortical thicknesses are found, the differences observed here must be sought in mobility patterns between males and females. I would also be hesitant to link these socio-structural differences influencing mobility that we see in the bone to social stratification that would result in unequal access to resources. We know from other studies that, at the very least, both sexes had equal access to resources. For example, studies by Irvine et. al. (2019) show no disparity between the diets of males and females at Titriş Höyük, who consumed mainly key crops such as bitter vetch, lentils, barley, emmer wheat, and sheep, goat, and cattle as livestock. This study did find that a possible difference in the  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  isotope ratios between young adults, middle adults, and older adults (which were excluded from this study). Laneri (2007: 262-263) has argued that social organization in Titriş Höyük was based on kin-family relationships, with ascribed social status passed on from elders. In the Irvine et. al. (2019)

case study, it is suggested that dietary differentiation is not based on sex, but possibly age.

### 7.5.3 *Bakla Tepe*

Like at Hakemi Use and Titriş Höyük, no significant difference is observed between male and female in humeral and femoral length. Femoral cortical bone thickness is not significantly different between the sexes. This trend is not replicated when comparing cortical density between the sexes in the femora (Table 7.17). The humeri show a few statistically significant or biologically interesting values mid-shaft and at the distal end of the bone, with males having higher values than females (Table 7.16).

For this population, it seems that males and females had similar mobility and activity patterns, as shown by cortical bone thickness and bone mineralization density in the femora and the humeri, respectively. In section 7.1.3, I had proposed that the EBA population of Bakla Tepe should be seen socially as falling somewhere between Hakemi Use and Titriş Höyük. While burials attest to the existence of a complex network of interaction between the Aegean, Mesopotamia, and central Anatolia, settlement patterns resembled Chalcolithic plans in the area. Thus, during the early phases of the EBA at Bakla Tepe, most of the characteristic traits of the period were in development, and it is entirely possible that social structure had not yet outlined various social roles for males and females that would result in the differences that we observe in bones. The cortical bone values that we see here support this interpretation, falling between the Late Neolithic at Hakemi Use and the Early Bronze Age of Titriş Höyük.

Regardless of the social implications from settlement and burial contexts, the patterns that we see in cortical bone should not only be understood in the context of behavior, for there are a plethora of factors influencing bone morphology. In this case, the lack of differences between the sexes could also mean that standard sexual dimorphism is overcompensated by more activity loading in females than in males or that males had reduced activity or mobility compared to females, or both of these patterns occurred at the same time. In any case, we do not know what the baseline for working was, what the work was, or how it differed between the sexes.

#### *7.5.4 Sex Based Between-Site Comparisons*

When comparing Bakla Tepe, Titriş Höyük, and Hakemi Use, no significant differences in bone length of the femora or the humeri was observed. Understanding how bone length differs between the populations allows comparisons of cortical thickness across the whole population. The fact that the length of the bones compared does not differ between the three groups suggests that the cause of variation between bone cortical thicknesses in the group should be sought in external factors to size.

When controlling for sex in the between site comparisons, cortical thickness in male femora does not vary significantly (Table 7.22). On average, the lowest cortical thickness values were measured in individuals from Titriş Höyük and the highest interchangeably between Hakemi Use and Bakla Tepe. In the female femora, Hakemi Use had the highest values. Female femora at Titriş Höyük did not stand out as having drastically lower cortical thickness values when compared with the other sites, as is the case with males from the same settlement. Male and female humeral measurements of

cortical thickness show no significant differences between the LPN and the EBA samples.

We expect that changes would have occurred because from the Late Pottery Neolithic to the Early Bronze Age, archaeologically, we know that people experienced a shift in lifestyle that would have led to more sedentism and diversified social roles (Jasim, 1989; Akkerman and Schwartz, 2003: 42-154). It is always assumed that the biggest change that occurred in people's lives was that with the onset of bigger and more permanent settlements, differences in what males and females did in their everyday lives became more explicit. If this is the case, then findings between differences in cortical thickness in males and females should agree with this perspective.

With more recent bioanthropological studies of the people in Mesopotamia, scholars have begun to question what aspects of life had really changed for 3000 years. For example, one of the fundamental changes that were expected to have occurred from the Neolithic to the EBA is that more intense farming efforts changed diets by limiting the diversity of what people consumed. Yet, studies that look into the diets of populations in western Anatolia (Hakemi Use and Titriş Höyük) have shown that the Late Pottery Neolithic and Early Bronze Age were remarkably similar at these two sites. These differences spanned not only sex-based comparisons but populations as a whole. One of the fronts that have been explored recently is that of subsistence patterns of these populations. It is not yet defined how meat consumption figured into Hakemi Use diets since the only study done on collagen and amino acid isotopic ratios is based on limited samples from both animals and humans at the site (Itahashi, et. al., 2017: 680). However, we know that it was not diverse and that it was similar to the EBA diets of Bakla Tepe



and Titriş Höyük, all of which did not exploit marine resources. Hakemi Use individuals had N/C ratios between 2.9-3.6 range with delta N15 mean  $7.2 \pm 1.4\%$  and delta C13 mean  $-19.6 \pm 0.4\%$ . This is very similar to the results from Titriş Höyük, where delta N15 had a mean value of  $-19.8\%$  and delta C13 mean of  $7.1\%$ , as well as Bakla Tepe with delta N15 mean  $-19.6\%$  and delta C13 mean  $8.3\%$  (data taken from Irvine, 2017: ii).

This study of cortical thickness shows that the LPN settlement does not demonstrate that individuals led a more mobile or a more active lifestyle than their EBA counterparts if we are comparing the populations by sex. Thus, cortical thickness and quality similarities between the LPN-EBA populations examined here could be understood in the context of a similar lifestyle between the three sites. Hakemi Use, Bakla Tepe, and Titriş Höyük did not engage in hunting wild animals or fishing as other populations (such as Ikiztepe) did during the same period (Itahashi, et. al., 2017: 682). Building off of dietary findings, I argue that based on cortical thickness of male and female femora and humeri from the three sites here that span the LPN to the EBA, there is no evidence of a shift in lifestyle and mobility from the 7th to the 3rd millennium BC since there is no significant difference in cortical thickness between the three settlements (Wescott, 2014).

While the cortical bone thickness study from this sample has agreed with previous studies of diet that have suggested a similar lifestyle between the LPN and the EBA, as discussed above, it is interesting that cortical bone mineralization values on these same bones show completely different results where sex-controlled comparisons between the three sites is always significant and biologically interesting (see Tables 7.27 to 7.30). For femora in males at Titriş Höyük, even though they had the lowest cortical thickness, this

sample significantly has the highest bone density, with values more than double those from Bakla Tepe male femora (Table 7.30). For female femora, the most mineralized bones are from Hakemi Use, and the least mineralized are from Titriş Höyük (Table 7.26). For this bone in females, Hakemi Use varies significantly from both of the EBA sites, but the EBA sites do not vary from each other (Tables 7.36 to 7.38). This is what one would expect from the available archeological evidence—people in settlements from the 3rd millennium BC had more in common than those from the 7th millennium BC. This study suggests that male individuals at Titriş Höyük experienced greater femoral loading in comparison with the Late Pottery Neolithic and western Anatolian Early Bronze Age groups; the other groups experienced less or a combination of all. Significant differences between male and female femoral density values at Titriş Höyük as well as the femoral comparisons between the three sites provide a possible interpretation that males at the EBA site of Titriş Höyük were possibly the most active/mobile group.

Male humeri also vary significantly in terms of bone mineralization density when compared between all three settlements (7.28). The Hakemi Use sample has the highest density—over two times that of the bones from Titriş Höyük, which show the lowest values in this sample. As expected, Bakla Tepe falls in between Hakemi Use and Titriş Höyük. Female humeri have a pattern that is identical to males, with Hakemi Use cortical density values varying significantly from both of the EBA sites (Table 7.38 to 7.40). Exceptions are the lateral and medial sites on the 50% slice in female humeri, which are only significant when Hakemi Use and Bakla Tepe are compared (Table 7.40). This pattern might imply that, in the case of females and males at Hakemi Use, the population sampled experienced more loading in the humeri in comparison with the Early Bronze

Age groups; they experienced less or a combination of both. In addition, the fact that the Hakemi Use male and female humeral densities are significantly different with different EBA sites may suggest that if the difference was activity based, the EBA sites had differentiated activity patterns. This is further supported by the fact that the femora do not show the same cortical patterns. This is consistent with my expectation that Hakemi Use individuals experienced a more active lifestyle as a general population than their EBA counterparts. This is only one possible interpretation, again, because of the fact that we do not have evidence that whatever activity they were doing influenced cortical thickness.

#### *7.5.5 Total Population Between-Site Comparisons*

When not controlling for sex in femora, there are no statistically significant differences between the three sites in terms of cortical thickness measurements (Table 7.4). Cortical density in femora was not compared with other sites without control for sex since all of the values were significant in the sex-based comparisons. Cortical density comparisons in bone density of the humeri across the sites without controlling for sex differ significantly from one another as they did with sex-based comparisons.

Previous studies that have applied cortical biomineralization in archeological populations in order to understand activity and mobility patterns have focused on trabecular bone patterns. Chirchir et. al. (2017) have compared lower and upper limb articulations of various Holocene populations. The results of these studies have shown that a reduced level of stress to the bones resulted in reduced levels of bone strength at the distal ends of the limbs and that results were more variable for the upper limb

articulations, which were measured by cortical thickness and biomineralization values. Numerous studies of biomineralization in the trabecular bones have been done more recently on past populations in order to understand bone loss patterns as influenced by sociocultural pathways as well as biological differences between the sexes (Brickley and Ives, 2008; Agarwal and Gryn timer, 2009). A plethora of populations and studies have been collected in order to investigate the relationship between bone biomineralization, cortical bone thickness and stress on bones (Cho and Stout, 2011). This study contributes to this body of literature by finding an association between cortical bone biomineralization and mobility patterns while showing that cortical bone thickness may not imitate these patterns.

Interpretations of changes that occurred across the populations as a whole when compared chronologically need to be considered in terms of activity diversity. It is important to address the aforementioned fact that EBA populations probably had a bigger diversification of activities due to labor specialization. For example, in this sample, the male femora showed higher cortical density levels than any other group. This is in conflict with the idea that EBA groups were less active or less mobile in comparison to the LPN sample. While the male femoral density shows this pattern, other comparisons do not. In the case that this pattern results from activity-based differences, it implies that perhaps my sample represents a specific group of people that were especially active/mobile, like specialized traders or warriors. In comparison, the LPN period had more people doing many of the same activities without much specialization. That the EBA groups were probably more diversified in terms of activity is important to consider

since the inability to understand who is represented in my burial samples may contribute to a lack of significant comparisons between the groups, especially chronologically.

## **7.6 Conclusion**

The literature on cortical thickness and its application in anthropology is still very limited and is largely thematically represented in this survey. It is generally accepted that populations during the Neolithic were more mobile and led a more strenuous lifestyle than EBA urban settlers (Özdoğan, 2014; Abbo et. al., 2003; Akkermans and Schwartz, 2003). Connected to this is the plethora of human health problems that arose as a result of a more crowded, sedentary lifestyle (Paulette, 2013; Webber and Price, 2016).

With this preliminary study of cortical bone thickness, I could not support these arguments. Cortical thickness in the femoral and humeral bones did not show variation between the LPN and the EBA. The data used here to study these populations of Anatolia has shown that cortical thickness is not as sensitive to lifestyle changes across this time period as previous works have expressed (Cowgill and Hager, 2007; Cowgill, 2014). Alternatively, this could be due to other factors, such as previous over-interpretation of results or a lack of understanding of time factors that might affect morphological changes in bone. Furthermore, this study has demonstrated that both of the Early Bronze Age sites had considerably less dense humeri and femora than their Late Neolithic counterpart.

While this study did not show variation between populations chronologically or expose sex differences based on cortical bone thickness as the result of bone loading, it did show these patterns when cortical biomineralization was explored. In particular, this

study showed that 1) cortical bone biomineralization was significantly greater in males at Titriş Höyük in comparison with females, and 2) with the exception of Titriş Höyük, male femora, the Late Neolithic site of Hakemi Use had denser humeri for both male and female femora than the Early Bronze Age populations. This is very significant not only because it exposes chronological and sex-based activity difference as expected archaeologically, but it brings attention the fact that cortical bone thickness studies may not show the same pattern. Cortical bone density seems to be a more sensitive marker in this study in distinguishing differences based on lifestyle changes. Subsequent studies that repeat examinations of cortical thickness in northern Mesopotamian populations should be paired with cortical bone density studies in order to verify the patterns observed in cortical thickness.

These findings are significant in the study of social complexity in Mesopotamia in that they methodologically contribute to the investigation of questions related to social change. Cortical bone examinations in the humeri and the femora show that the Late Neolithic population was overall more robust than the Early Bronze Age groups, which is something that is understood to be the result of earlier settlers leading a more mobile and non-settled life style. This study also demonstrates that in the Early Bronze Age urban center Titriş Höyük, males experienced a different loading stress in the femora than females. How that translated in activity patterns is not clear.

Future studies of similar populations in Mesopotamia would be essential in understanding if these trends were site specific or if these patterns were more widespread throughout the region. These studies would ideally test for group mean dispersion of

cortical bone thickness and density, which would enable analysis that accounts for the possibility of higher variability in the EBA samples.

This work seeks to compare the social structures in the North and the South, and it is necessary to be able to do this with the cortical bone values from populations from South Mesopotamia. In the following chapter, I explore how mortuary data and cortical bone data relate and translate into the rhetoric of heterarchical structuring in North Mesopotamian societies, while for the South more hierarchical societies existed. In order to contextualize my findings in this chapter, it would be essential for future studies to investigate how cortical bone data in a heterarchical society compares with a more hierarchical one.

CHAPTER 8:

CONCLUSION: HETERARCHY'S CONTRIBUTION TO UNDERSTANDING  
MORTUARY PRACTICES AS A WINDOW INTO SOCIAL STRUCTURES

This final chapter discusses how the Neolithic, Chalcolithic, and Early Bronze Age mortuary and cortical bone data resonate with anthropological discussions of social complexity. Specifically, I will examine the material discussed through time and space, often comparing northern and southern Mesopotamia in order to understand how social organization changed through the millennia in Mesopotamia. Finally, I argue that a heterarchical model offers a helpful perspective while attempting to frame these changes in power relations and social complexity in a variety of contexts and as they are expressed in the mortuary record of Mesopotamia.

**8.1 What Does the Data Show?**

In the section that follows, I present my findings in Table 8.1 as a quick summary of mortuary trends per period. Then, I will provide a short overview of these findings and their interpretation per each chapter. Details from this table are discussed by time period in the sections below that outline the contents of each chapter. I do not intend to give a



detailed discussion of all the data and its implications, but rather plan to point out the highlights.

TABLE 8.1:

## TRENDS IN MORTUARY PRACTICES AND CORTICAL BONE PER PERIOD

<b>Cultural Period</b>	<b>Late Pottery Neolithic (Hassuna, Samarra, Halaf, and Local SE Anatolian cultures)</b>	<b>Early/Middle Chalcolithic-Ubaid</b>	<b>Middle/Late Chalcolithic- Uruk</b>	<b>Early Bronze Age</b>
<b>Location</b>	Intramural (anywhere in or around the house) add extramural (cemetery)	Intramural (in walls, foundations, anywhere in the house or public buildings) and extramural (outside of settlement)	Intramural (in house floors and around public buildings) and extramural (abandoned parts of settlement or outside of settlement)	Intramural (in burial grounds inside of the settlement or in between-house spaces) and extramural (burial grounds outside of the settlement)
<b>Burial Types</b>	Inhumation; cremation; pit; cist; fragmentations; skulls; secondary burials; vessel; mix of few types	Vessel; basket; inhumation; wall/foundation; pit variations; mud brick	Vessel; inhumation; pit variations; mud brick	Cist variations, shafts, monumental chambers, pits, inhumations
<b>Demography</b>	Adults; infants; children; unidentified individuals	Adults; infants; children; adolescent	Adults; infants; children; unidentified individuals	Adults; infants; unidentified individuals
<b>Objects Interred</b>	Vessels and beads primarily	Beads; tools- artifacts are rare in general	Ceramics, beads and various ornaments including metal; weapon	All artifactual categories included, and always vessels and metal fibulae
<b>What Structured Burials?</b>	Cosmological notions of fertility and gender relationships	Ideologies connected with production (infants/small children) and products (adults); LPN traditions of keeping subadults near or in the houses	Emergent Southern ideologies connected to kingship as defined in Southern Mesopotamian religion; LPN/Ubaid traditions of keeping subadults near or in the houses	Elitist ideology based on religion as understood from myths and imagery
<b>Cortical Bone</b>	No differences between males and females in any cortical measure in both femora and humeri	Not analyzed	Not analyzed	Males have much denser femoral bones than females and no differences in humeri; significantly less denser bones in this period when compared to the LPN with the exception of male femora

## 8.2 Review of Neolithic Mortuary Practices

The mortuary evidence from the Late Pottery Neolithic Halaf and Hassuna/Samara graves compares well with previously excavated and published material. I, too, found that infants/small children are mostly found within the house, under the house floor, or somewhere in the vicinity of the house. The most common burial types in my sample were simple inhumations and pits, which held adult and adolescent remains and most of the infants. The sample here also included a burial style not previously noted for the period that was discovered at Trbe Hyk cist graves. These three cist graves contained 17 individuals, all of which were adults except two. Overall, Neolithic artifacts in adult graves were usually ceramic vessels, and infant burials could contain beads.

Based on these findings and previous publications, I argue that Neolithic mortuary contexts are hard to distinguish from other rituals in which all human and non-human materials were merged into a context that resembled a trash deposit. I have argued that this phenomenon was due to the fact that the body of the deceased was often subject to the physical integration into other rituals and secondary burials. Artifacts, humans, and animals had the potential to be treated similarly after death. Thus, based on this analogous treatment of humans as other "things" and the fact that graves of individuals were not differentiated in terms of burial type or contents, I do not believe that the mortuary rituals of Late Pottery Neolithic communities reflect structural ranking in society.

Instead, I have suggested that burial rites were structured by differences based on ideologies surrounding gender, fertility, and female-male dichotomies. For example, the

reason it is possible that we find females with infants buried intramurally or within the vicinity of the house is that the house was a place of reproduction and fertility.

I have suggested the possibility that males were often buried extramurally away from the settlement while deceased females and infants/young children were usually kept close to the house. Conversely, how do we explain the number of females who were buried without a close association to a house or the male burials in the house? I do not have any data to support this in this body of work, but I speculate that the females who were buried with the adolescents and males were probably older and carried a different gender role. The same could be said for the males who, in one way or the other, were viewed by their community as gendered in a way that linked them with young females and children. This gives importance to the fact that sex alone cannot be translated to mean with what gender prehistoric individuals carried, simply because so many factors go into its creation that we cannot see them archaeologically (Arnold, 2007; Arnold and Wicker, 2001; Brumfiel and Robin, 2008; Nelson and Rosen-Ayalon, 2001). In future studies of the sex and age of Mesopotamian burials, more a thorough examination of Late Pottery Neolithic skeletal remains might begin to provide a deeper understanding of gender-based burial patterns. Such studies would aid in enlightening our understanding of how gender set the stage for the way people were or were not buried.

Going forward, it is important to reconcile some problematic concepts. While I quantified fragmented human remains in mixed contexts as burial types, how correct is this designation? If the human body was used in secondary rituals, then is what we find still a "mortuary" practice and thus a grave? This lack of clarity makes it necessary in the future to identify if what we mean by a grave is the result of the archaeologist designating

it as such, the intention of those that created the feature and buried the individual, or both. Perhaps it would be necessary to redefine how we consider Late Pottery Neolithic burials. With more excavations in Mesopotamian sites and the publication of legacy materials, I predict that this issue will draw more interest.

Late Pottery Neolithic mortuary practices were indicative of the organization of society. Graves showed that objects more or less did not mark buried individuals differently. The LPN was the last phase in Mesopotamian prehistory when this was the case. While the 7<sup>th</sup> millennium BC set the stage for a settled lifestyle in Mesopotamia, the long Chalcolithic period cemented the newfound lifeways of a sedentary lifestyle and a growing connection to other communities.

### **8.3 Chalcolithic Mortuary Practices: Ubaid and Uruk**

During the Ubaid, burial practices did not differ drastically from those of the Late Pottery Neolithic. By the 5th millennium BC, however, the diversity with which human remains were buried in the Neolithic was significantly reduced. One of the most important departures from previous millennia was the abandonment of multiple and fragmentary burial practices. Infant burials continued to be confined to the house, and adult burials began to disappear from all burial contexts, which is consistent with findings from previous studies (Akkermans and Schwartz, 2006).

Foundation burials became common during this time. They were usually vessel burials under the floors or walls of houses. Sometimes, the foundation burials were just inhumations. For the Ubaid sample, the most common burial type involved an urn vessel, which typically contained the remains of infants or young children. The Ubaid burials

generally lack much material culture. If artifacts were present, the adult graves contained one to two ceramic vessels, and infant burials had at most a string of beads and never ceramic vessels. In terms of the Ubaid infant burials, I have argued that their preferential burial in ceramic vessels stemmed from their association with the production of goods, such as foods and metals, around the settlements. In comparison, the adults were buried in separate areas usually connected to the production areas of the community. At Tepe Gawra, there seemed to have been some division between the distribution of infant burials within structures; however, it is unclear what factors determined these choices. I would venture to suggest that the gender of the infants was considered. Nevertheless, in the Ubaid, we still do not see the structuring of burials as representative of social structuring. More specifically, if a chief or a temple leader did exist, we cannot distinguish those burials archeologically.

As with the Ubaid, in the Uruk phase, vessel burials were the most common, followed by pit burials which were usually reserved for adults. These pits were lined with mud or mud bricks. A new form of grave type appears—mud-brick *libn* tombs, most famously seen at Tepe Gawra. These burials held adult remains and tended to have a more elaborate grave repertoire when compared with the other burial forms that have been discussed, such as pits or vessel.

In the Uruk, some change is observed in the treatment of the dead. It marked a point in which the grave repertoire could have been more elaborate (but it almost never was) and included metal ornamentation and weapons in addition to ceramic vessels and other objects. Some of the burials show evidence of being dressed up and ornamented and were buried in a communal area, indicating the members of the community who

engaged in mortuary rituals and aspects of public display. I have argued here that the reason behind this new trend may be related to the infiltration of southern influences that contributed to the institutionalization of organized religion. In this light, what structured Uruk graves was not the inequality of social structure, but rather elitist ideology that was reflected religion, which emphasized a king as many things, including the servant of various deities. Thus, it can be argued that inequality between the leaders and deities structured burial practices.

#### **8.4 Early Bronze Age Mortuary Practices**

During the Early Bronze Age, burial styles diversified. The burial forms established during the Uruk period developed into more complex constructed forms, such as chamber and monumental tombs. Shafts and cist graves became common forms of burial in line with previously established styles such as pit and vessel burials. Multiple depositions of individuals became common again during this period. All age groups are represented in this sample, though they are mostly unidentified here due to the condition of the bones. Artifacts buried with the dead were common at this point and diverse. Graves always included ceramic vessels and almost always a bronze fibulae or pin. Additionally, during this time, we see more graves with bronze weapons.

I have argued that the religious trends that settled into the northern fringes of Mesopotamia during the previous millennia continued to be the main influence on the treatment and presentation of the dead. The rich sacrificial contexts that we see throughout the Early Bronze Age are a testament to the lengths that people went to in order to index mythological scenes in the name of their deities. These human scenes

could be seen as forms of temples since evidence shows that they were long-standing monuments in communal landscapes as well as places of worship. In this context of associating myths with life, I see the objects in EBA burials as present due to the fact that they would have been removed by deities once the deceased entered the underworld—a place that was not seen as desirable by Mesopotamians. For example, we know that the dead were dressed or shrouded upon burial (Zetter et. al., 1996: 20; see 6.1 in Chapter 6). From texts of the period, we understand that once they reached the gates of the underworld, all their garments and possessions were removed. Thus, people were buried with so many things because they were expected to lose them into the underworld, and so they had to bring them there first (Laneri, 2002; Wolkstein and Kramer, 1983). While I do not see Early Bronze Age grave repertoire as a display of wealth and power *per-se*, I do acknowledge that differences in grave contents attest to the fact that some people were able to engage in elite display more than others. In this way, what structured EBA burials was not only status, but also the desire to play into a system of ideology that linked the region.

Having examined the burial practices in Mesopotamia spanning the 7<sup>th</sup> to the 3<sup>rd</sup> millennium BC, I turn to biological data from some of the same burials in the previous chapters. This data compares what we know archeologically in order to understand how changes in social complexity influenced human lifestyle.

## **8.5 Cortical Bone Study**

The materials presented in Chapter 7 complement the archaeological examination of burials and focuses on the biological remains from one Late Pottery Neolithic and two



Early Bronze Age burials from North Mesopotamia (Hakemi Use and Titriş Höyük) and western Bakla Tepe in western Anatolia. This analysis aimed to see if differences in lifestyle between the LPN and the EBA resulted in sex-based and population differences in cortical bone density and size in the humeri and femora.

Cortical bone thickness comparisons in humeri and femora showed that when males and females were compared from the LPN to the EBA, or when not controlling for sex in between site comparisons, there were no significant differences in cortical thickness in both bone types between all three sites. When performing the same comparisons between the three sites for cortical bone density in humeri without controlling for sex, there was a significant difference, but not within the LPN and the EBA in northern Mesopotamia. Results showed that the EBA populations in both regions were similar, but both populations from North Mesopotamia were more like one another than the western EBA population. The femoral comparisons of cortical density could not be compared without control for sex. In male femoral, they showed that differences in density were always significantly different between all three sites. In female femora, comparisons showed that differences in density were not significant between the two EBA sites but were significant for all the comparisons of the LPN and both of the EBA sites.

Sex-based comparisons of the femora from Titriş Höyük showed that adult males had denser bones than the females (12 out of 12 comparisons), but cortical thickness did not show this same pattern (5 out of 12 comparisons were significant or biologically interesting). In the humeri, this was not the case, and none of the comparisons for density or thickness showed significant differences between males and females. At Hakemi Use,

cortical thickness showed no significant differences in the femora (3 out of 12) or the humeri (4 out of 12). Density measurements agreed with thickness comparisons and showed non-significant differences between males and females in the femora (1 out of 12). The cortical density comparisons for the humeri show 5 out of 12 biologically interesting or significant comparisons between males and females. At Bakla Tepe, cortical thickness comparisons between males and females were significant or biologically interesting only 2 out of 12 times in the femora and 5 out of 12 in the humeri. Density measurements at this site for both humeri and femora showed no significant differences in the femora and the humeri (0 out of 24).

This study relies on the speculation that cortical bone will respond directly from stimulation from loading and stress, which in this case, are interpreted to be activity-based patterns that result from the differences in lifestyles between the Late Pottery Neolithic and the Early Bronze Age (Noble et. al., 2003; Sugiyama et. al., 2008; Suniaga et. al., 2018; Terhune et. al., 2020). In this analysis, mobility is understood as a subset of activity that involved the femora and the understanding that activity and mobility are mutually exclusive. In addition, activity patterns involving the femora may result in the same bone signals as mobility but might not be the result of a more mobile individual. The results of this study show that cortical bone thickness did not reflect changes in lifestyle that may have possibly affected the humeri and the femora from the LPN to the EBA. For example, archaeologically, we expect that mobility decreased for the EBA populations when compared with the LPN populations, which could be signaled in the femora as a result of less population movement and/or other activities that may have loaded the bone. However, the cortical bone density results for the sex-based

comparisons of femora at Titriş Höyük hint towards the possibility that once people began to live in more urbanized settings, some activity patterns of daily life were sex-based. This is a very interesting find, for we do not see this difference in the archeological record.

What can all of these findings in both the archaeological record of graves and the biological record of bones tell us about social differentiation and complexity? In the next part of this chapter, I analyze how social complexity was structured and, in turn, reflected in the mortuary practices of the various periods. This discussion focuses on the mortuary practices within the context of additional archaeological data. I now turn to answer the ultimate questions about what can be said about North Mesopotamian social complexity and structure through the millennia. I seek to situate my analysis of mortuary practices here in conversation with previous arguments about complexity in Mesopotamian society.

## **8.6 What Have We Learned About Mesopotamian Complexity?**

In 2001, D'Altroy wrote that "Uruk Mesopotamia has stood as the model for the study of the rise of state for several decades" (445). I, too, have examined the hierarchy and social complexity in this formative period and agree with others that what predisposes some societies to organize more hierarchically than others is a combination of environmental factors and the ability of communities to exploit them (Adams, 1981, 1978; Algaze, 2001; McCorriston, 1997; Kouchoukos, 1998; Wright, 1998, 2001). While the natural and built environments were a prerequisite to the formation of a highly-centrally structured society, I do echo Rothman (1994) in saying that the environmental

approach does not define processes of interaction between social units or explain change. Indeed, it might not be as important to understand *why* there was social complexity given that every human society is complex as it is to understand *how* complexity functioned in a given group.

One of the biggest motivators of social development and change in terms of complexity in Mesopotamia must have been the networks that arose from the acquisition and trade of resources. Algaze (1986; 1993; 2001) has explored the concept of long-distance trade in the Near East during the Uruk as the main method by which differences in social complexity developed: one region, the South in this case, became the core of a world-system. The northern periphery's sole purpose in his model was to provide raw materials for the South. The power of this model lies in the self-serving or network-exclusionary system, which offers an explanation for how elites acquired and kept power in the Mesopotamian core. Within the discussions in Chapters 5 and 6, I have shown that indeed, northern elites (in the periphery) were tied to the trade networks, which made it possible for core elites (those in the South) to legitimize their unequal access to a specific raw material—copper, silver, gold, tin, lead, and arsenic. I have discussed that the focus of core and periphery elite's interest lay in the consumption of metal objects, namely to express status with the symbolic use of weapons. The focus on weapons as a symbol of elite power came from the growing integration of religion into other branches of society, a religion that portrayed gods as all powerful, burdened with various tasks, and having a special relationship with the elite/king/leader, who above all, served these entities (Suter, 2013; McMahon, 2009). In doing so, elites used religious symbols to demonstrate their many social roles—a thresher (someone who threshes wheat), a warrior, or a lover.

Mortuary customs show that this elitist ideology was not only employed by those who held some type of power, but it also seeped into other community tiers. This emphasis and reenactment of religious scenes from mythology should be attributed to southern influences, which surely amplified as the result of intensified trade-networks.

While I acknowledge the nature of the relationship between northern and southern Mesopotamia, I am one amongst many who disagree with Algaze's view of the South as the driver of northern complexity, even if only for the uncontested fact that during the Late Chalcolithic, both the North and the South showed the same level of development. For example, Algaze's theory simply cannot explain why there was an increase in indigenous settlement complexity in the North and the South well before the Uruk expansion starting in LC3 or about 3700 BC (Wright and Rupley, 2001). Other research has contested the level that the South did or could exercise control over the North (Frangipane, 2001; Wright, 2001; Schwartz, 2001). The interpretation of Uruk presence in the North itself was precarious. It is clear that some sites from South to North experienced different levels of Uruk influence, as discussed in Chapter 2. However, designating northern sites as Uruk colonies sits uncomfortably with the fact that this line of analysis equates ceramic cultures with groups of people. Based on only the presence of Southern ceramic forms, it is difficult to accept that groups of Uruk settlers were colonizing northern enclaves. Support for this can be found at sites like Hassek Hoyuk, which controlled the trade routes to the South from the Ergani copper mines. The presence of southern pottery styles and the defense structure surrounding the LC 4/5 settlement have contributed to the designation of this site as an Uruk outpost (Behm-Blanke, 1992). However, southern-looking ceramics have all been created with northern

ceramic technologies. The same situation is observed at Arslantepe and Kurban Hoyuk, where southern ceramic styles were created with local materials or methods. Taking this information into account, Uruk ceramics need not represent southern settlers who brought their own vessels, but rather indicate that the southern style was emulated in the North (Evins, 1989; Helwing, 1999).

What I observe is that while the relationship between the North and South could be described as asymmetrical or hierarchical, it was not so in every aspect. The hierarchical nature of the core-periphery relationship in this region was not well defined because we do not know how it functioned. It is also unclear exactly what the presence of Uruk material culture in the North should mean archaeologically in terms of the dynamics between the two regions. In another light, we must ask why some sites had no southern styles in their ceramic repertoires. Why didn't they adopt southern styles? Whether it was due to less control from the South or some sites simply having a stronger indigenous presence is unknown. In this view, I question not only the centralization of northern settlements, but also the relationship between Upper and Lower Mesopotamia. These interactions have long been characterized as one of cultural sphere of influence from the Late Pottery Neolithic through the Ubaid, and then as a colonial interaction in the Uruk (Stein and Özbal, 2007). Interestingly, no attempt has been made to define the second attempt at urbanization and centralization during the Early Bronze Age. I believe factors such as distance, as proposed by Stein (1999: 228-231) in the "distance parity" model, surely played a major part in how much influence the South could have had over the North. Hacinebi is a great example of this situation. Located in the Upper Euphrates, indigenous and Uruk settlers coexisted for over 400 years in settlements with no evidence

of dominance over each another. Intercultural households (an assessment based on material culture as well as faunal analysis) even suggest the possibility that Uruk settlers married local women of the community (Stein, 2012: 143-144).

How a state rises, what defines its systems of centralization, and the resulting differentiation based on rank results from the interaction between different institutions in a society—the nature and degree of system integration. Kowalewski et. al., (1983: 35), Rothman (2004: 82), Johnson (1980: 255), and Lupton (1996: 9) have examined different models that measured both system integration and gravity, defined by interdependence of an exchangeable unit (information, materials, or energy). In their view, the unit could be an element or a sub-system of a larger system. Building from this approach, here I treat complexity as the result of interactions between two or more social systems and/or institutions in a given community. The degree of complexity and, more specifically, the hierarchical configuration of these systems depend on how interdependent they were, such that the more centralized a community was, the more likely it was to experience a top-down structural and cultural reform.

Recently, archeological researchers in the Near East have used the heterarchical model of social organization and complexity in order to characterize the dynamics of differentiation in Early Bronze Age Near Eastern societies in North Mesopotamia (Erarslan, 2009; Ur, 2006). Excavations at Tell Brak, especially, have changed the tone used to discuss urban settlements. Additionally, recent excavations and inquiries at highland sites have shown that size of settlement does not correlate with their urban character or the lack thereof. For example, at 30 ha during its peak and located around 3km inland from the Euphrates, Tell Banat was clearly the largest site in the region.

Much smaller settlements such as Tell Kabir and Tell es-Saghir were situated near Tell Banat (Cooper, 2006: 60; Oates and Oates, 1990; Porter, 1995). While it is logical to assume that the smaller sites were subordinate to sites like Tell Banat, archeologically, we see that no matter the size, northern Mesopotamian sites were autonomous and not subject to a centralized control (Cooper, 2006; Ur, 2014). At the same time, these sites possessed a level of specialization that allowed flexibility in how they interacted with other sites, both spatially and temporally (McClellan and Porter, 1999: 416).

The Mesopotamian Neolithic period in its entirety is usually not included in the evolutionary modeling of heterarchical or hierarchical societies. It is accepted that those societies were not hierarchical, nor did they have institutions that monopolized power. However, in her discussion of northern Mesopotamian communities during the Neolithic, Frangipane (2007: 153) makes a distinction between *vertical egalitarian systems* and *horizontal egalitarian systems* that touches on heterarchical concepts. The former focuses on kin-based social organization that gave certain members of society privileges or prestige in a system that had an economy that was not based on competition, and people had relatively equal access of resources. In horizontal egalitarian systems, the same level of equality existed along with many of its members having the same decision-making tasks and abilities. This model has been designated as a "diffuse government" by Lucy Mair (1962). Frangipane (2000: 164) argues that equality and inequality were flexible and variable states of social organization, and she proposes that Halaf cultures were an example of horizontal egalitarian systems and that the early Ubaid (0-2 phase) was a vertical one. She makes this argument primarily based on settlement organization data, such as the utilization of space external and internal to the household, and evidence of



economic competition. Frangipane sees the Ubaid settlement features as increasingly standardized with architectural plans that were not communally-centered but rather family-oriented, had no evidence of communal storage, show the appearance of some temple-like structures, and reflect a sort of a forward momentum that resulted in the culmination of the following Uruk period. While I agree with her approach in contextualizing and teasing out structural differences between the two periods, my analysis of mortuary practices does not support this view. I would not characterize the Ubaid period's development or growth as support for Frangipane's egalitarian distinctions. The cultural phenomenon of the Ubaid was stable and homogeneous in all aspects, from the house to agricultural production, in both the South and the North for over 1500 years (Stein, 1994).

Building on the interest in creating meaningful comparisons of complexity, in the following section, I examine how the characterization of Mesopotamia as a system of heterarchy fits with the data that I have presented on mortuary practices and cortical bone biomineralization and thickness. In addition, I will incorporate what is known archaeologically from other sectors of society in order to holistically dissect the social systems of the region. This discussion is mainly concerned with the later parts of the Chalcolithic (namely the Uruk) and the Early Bronze Age. However, in order to understand how inequality manifested itself temporally and spatially, I will incorporate Late Pottery Neolithic mortuary and archaeological data.

## 8.7 Is Heterarchy Useful?

I agree with Frangipane's (2007: 151) dissatisfaction with the terms equality and inequality when discussing the structure of social relations systems and when used to measure the level of organization. In the same vein, I believe that quantifying social complexity as an analytical unit to be fully self-defeating. By default, all human social groups are complex. The ease with which this term rolls off the tongue in anthropological writings has contributed to its use in describing *how* societies organize themselves, often discussing their centralized ranking, but not the level of their complexity. I argue here that how complex societies are depends on the point of view—heterarchical modeling can be one such view.

Crumley (1987) has argued for the deconstruction of models grounded in a lineally-organized or hierarchical society, instead suggesting that we create more nuanced models with the consideration of three dialectical relations. The first is *spatial*, which refers to the patterns of social relations that change over time or in accordance with a certain context. *Temporal* relationships address what aspects of a group are compared. For example, the role of a religious institution can shift in accordance to other cultural situations and needs. Thus, institutions and their interactions are often flexible and contingent on many variables. Finally, Crumley considers the importance of perception that she sees as a *cognitive* relationship. Where someone or some unit of society stands, or ranks, can depend on how they are perceived and by whom. Utilizing Crumley's model, these structural nuances can be seen as creating hierarchical elements in a heterarchically-organized structure. Heterarchy's main aim is to show that complexity exists even when there is no centralization or hierarchy. I argue that heterarchy offers a

more nuanced and appropriate model for understanding the emergence of rising social differentiation, inequality, and urban systems from the standpoint of my analysis of mortuary practices and cortical bone structure.

Brumfiel (1995: 125) has outlined a number of heterarchical structural forms that different scholars have used to describe various social structures from case studies—called heterarchical Traits here. Here, I take the original five Traits and modify them into three heterarchical Traits that better fit the results of this analysis. Elements that illustrate the heterarchical structural forms could be units such as an object, say ceramic vessels that functioned within a system. A sub-system (a trade network, for example) could also be an element in the larger social system. Below, I will discuss each of the three Traits of heterarchical complexity in the context of mortuary and other archaeological data in Mesopotamia, as expressed through agents and institutions:

**Trait I:** An assortment of independent but homogenous elements—these elements could be social institutions or their agents, for example; they are not standardized by a central system (hierarchical), nor do they depend on one another to function.

For the Late Pottery Neolithic, I will discuss 1) the basic social organization of communities based on autonomous institutions that did not compete, 2) mortuary practices that support this observations, and 3) cortical bone data that also shows similar patterns.

Trait I and its presentation are characteristic of the way that LPN sites were organized. Archeological evidence demonstrates that all social functions within a community were self-sufficient. Thus, they were not dependent on one another to

function. The configuration of and individuals within a social group during this time for both the North and South Mesopotamia is characterized by this homogeneity. This is not to say that the relationships between agents and institutions were not complex or equal. On the contrary, the roots of social inequality that existed in the later periods are to be sought in the settlements of the early farmers of the Near East. Thus, LPN societies had form and structure that were based on inequalities; however, these societies were not based on the reinforcement of social status of people or systems by a centralized force, be it an elite faction, temple, palace, or king.

The burial data that I have presented here for the LPN does agree with the social system that we see in the rest of the archaeological record, supporting Trait I. There was no difference between the quantity or quality of burial goods in graves. Graves were not differentiated from each other in terms of body and grave treatment or style. In fact, differences occurred in the location of graves, where extramural graves are associated with mostly adults, and probably males, whereas females and infants stayed near the household. Furthermore, there was reasonable variation between how each burial was executed, implying that standardization of burials did not exist.

Cortical bone thickness and biomineralization data from the Hakemi Use was collected from the intramural burials that contained mostly females. Consistent with the Late Pottery Neolithic narrative of mortuary practices that do not differentiate between people and a social structure that more or less distributes social roles equally, the biological data may reflect these findings, though we do not necessarily know what drives variation in the bones of this population. The cortical bone study that I conducted here shows that males and females lived a similar lifestyle, again, assuming that cortical

bone will respond to behavior in a predictable fashion. Activity and mobility patterns in the arm and leg long bones did not show significant differences, as expressed by bone quality and quantity. It is also possible that behavioral differences are masked by sexual dimorphism where males have relatively larger muscles contributing to higher cortical density and thickness (Abe et. al., 2013; Pitukcheewanont and Safani, 2006). Thus, it is possible that females in the LPN were engaging in strenuous behavior related to femoral or humeral loading more than males, but it is not recognized here because of biological factors. This finding supports the LPN mortuary impressions that when it came to internal social structures, members were more or less equal. If we are to consider male and female members of society as social units, then they interacted in the system of heterarchical Trait I.

In the following Ubaid period, we begin to see more permanent settlements, a set of material culture usually related to agricultural activities, and some structural differentiation of houses versus other buildings. In every sense, we still cannot see the elites or their institutions archaeologically, nor what they did. Overall, it was a period that continued the LPN cultural practices. Trait I is exemplified in the mortuary practices of the Ubaid and their expression of non-ranked status.

The burial practices of the Ubaid confirm my observation that socio-structurally, the Ubaid was similar to the Late Pottery Neolithic. It is important to note that the Ubaid burials were much more standardized than the LPN, implying that a growing concern for how different people were buried was developing. Thus, mortuary evidence shows that seventh to fifth millennium BC households that co-existed and favored the communal good over the good of a certain family or individuals tended to bury their dead in a

manner that reflected not qualities of prestige and wealth, but gender (based on sex and age). This communally-oriented interaction is an example of a heterarchical characteristic of Trait I, where independent non-centralized elements co-exist.

The Uruk settlements of northern Mesopotamia can be seen as possessing a heterarchical quality of organization in which, as Trait I stipulates, elements (or in this case sites) acted autonomously. For the Uruk period, I use two instances to demonstrate Trait I: 1) the non-ranked southern outposts that cohabited with northern locals, and 2) smaller centers in the North and South that interacted with one another on an equal level.

While the Uruk presence certainly had a core, as I had discussed above, there is no understanding of how, how much, or *if* southern elites controlled the northern outposts. In addition, they were all quite variable, ranging from Hacinebi-type co-habitation sites where indigenous and foreign groups lived side-by-side to Yarim Tepe, where a Uruk city was erected on virgin soil (Kozbe and Rothman, 2005). It is also important to note that other than Uruk/Warka, we do not have another Uruk-like settlement to speak of in the South, a problem emphasized by the fact that the site is only informative for the later Uruk periods. Hence, we know very little about how the process of urbanization unfolded in the Mesopotamian alluvial zone (Algaze, 2008; Nissen, 2002). The same problem occurs with textual evidence that is very esoteric in its discussion of specific economic activities (Van De Mieroop, 2000: 42). The possibility that Warka was a religious center serving surrounding regions (as we see from texts that often mention bringing women-slaves, food, and wine to the Innana precinct) also complicates the scale of political paramountcy of the site (Steinkeller, 1999). Thus, Uruk presence in the North should not be seen as a monolith that represented the expansion of

a centralized hierarchical system (the South), but one that was dependent on factors such as location, presence of northern indigenous inhabitants, and the intentions of the foreigners. These nuances are the temporal and spatial aspects of a heterarchically-organized system. I have shown here that while some asymmetrical dynamics might have occurred between Uruk and indigenous populations, archeologically, in the North we see local and southern cultures co-existing autonomously, as expected in Trait I. This can be both in terms of southern presence alongside northern sites or the interaction between southern settlers and northern locals at the same site.

We can find more evidence of Trait I within and between northern settlements dating to post-Uruk contact. Evidence of warfare or forceful control/replacement of indigenous sites is rare (Algaze, 2008: 69-70). Stratigraphic levels of cultural shifts at Brak have been used to support this idea, but they are not contextualized in transformational mechanisms of violence (Emberling and McDonald, 2002). Hamoukar in northeastern Syria might have been an example of a forceful displacement where the level of occupation preceding Uruk presence contained thousands of slingshots and projectiles as well as burnt destructions (Lawler, 2006). Nevertheless, we know that the majority of settlements with Uruk influence or otherwise had horizontal relationships based on trade of raw, finished, and by-products. If we examine smaller sites that had no evidence of elite authority, like those in the Upper Euphrates of Turkey and Syria, then these sites co-existed and displayed Trait I within a heterarchical system.

Post-Uruk collapse, many northern sites experienced their second attempt at urbanization only after several centuries of ruralization (Algaze, 1999; Schwartz, 1994). After 2500 BC, the North saw rapid urban growth and regionally-widespread

development, and settlements became nucleated with at least a three-tier settlement hierarchy that was not seen in the LC. The pattern of Tell al-Hawa settlement structure showed that the main settlement used smaller sites as tributaries (Wilkinson and Tucker, 1995: 81). In southeastern Anatolia, Titriş Höyük engulfed a number of sites that provided surplus (Algaze et. al., 2001: 56-57). However, even though this hierarchy of settlement characterized the later parts of the EBA, even the smallest sites in northern Mesopotamia were autonomous and economically self-sufficient. For example, Tell Ahmar was only a 2ha site, but it had a monumental elite tomb that clearly spoke of a local powerful entity (Baccarin, 2014). Thus, small BA sites had urban planning, systems of administration connected to distribution and collection, and religious institutions with elites in place. Evidence for Trait I within EBA society is best exemplified here with my findings from mortuary practices in non-monumental graves in terms of style, distribution, and contents.

At this point, my burial evidence for the numerous EBA sites agrees with the observed social structure in the North. In southeastern Turkey, there is a single published and documented site with a monumental shaft and chamber elite burials—GreVirike. In Syria, there are examples such as Tell Ahmar (Thureau-Dangin and Dunand, 1936), Banat (Porter, 2002), and Jerablus Tahtani (Peltenburg et. al., 2000). These tombs attest to the fact that there was an elite presence in the cities. These monumental burial forms, the rich cists and shafts such as the ones at Carchemish, and all other insignificant graves, mirror the three-leveled hierarchy of settlement organization that we see from the rest of the archaeological record in the EBA. Nevertheless, non-ranked systems of burials existed alongside the elite tombs.



There are notable homogeneous elements that act independently and equally in EBA burial practices in non-monumental graves. The most obvious is the co-existence of the pit, vessel, cist, chamber, and shaft tombs of the North Euphrates sector. They were also geographically, or in Crumley terms, spatially, distributed. Studies by Carter and Parker (1995) have failed to associate these burials with either an ethnic or political boundary distribution. My research has demonstrated that within a site, different genders were buried in all grave types, with the exception of pit burials, which tended to favor infants. However, infants were often also included in other grave types. Each burial form was used for either communal or singular inhumation, and this also did not correspond to any differentiation based on artifacts, gender, and age of the individuals or the location of the burial. Finally, I want to emphasize that within burials, these common grave forms co-exist with no set distribution around the settlement. Examples of this arrangement are the cist tombs at Carchemish, around which the vessel burials were located. This evidence emphasized the heterarchical organization that structured co-existing burial practices that shared elements but also allowed for a considerable nuance in execution of a ritual, not only from site to site in the North but also from burial to burial within each community. In this way, this study shows that burial practices could express more than just one aspect of a society—they expressed preference of style, wealth, gender, and social standing. Consistent with the heterarchical Trait I examined here, all of these styles co-existed without hierarchical structuring.

**Trait II:** The membership of one element in one system that may occupy a different rank in a different system (for example, the different roles attributed to a substance, like perfumed oil, in a burial ceremony or in an elite trade system). This may

also be the presence of an element in an interaction-based system, such as a trade network, whose participation is decided based on the element's or system's motives and not on centralized control.

Elements that occupy varying rank in different systems are difficult to recognize in the Late Pottery Neolithic period because of the homogenized nature of all systems and institutions, as already discussed. However, burial evidence here does show that the very act of a mortuary ritual occupied different systems at once. In Chapter 4, I argued that bodies, graves, and the artifacts that they were associated with were subsumed into a larger sphere of fragmentation rituals. Trait II for the LPN is best characterized by the example of fragmentary burials.

In the case of these types of burials, the human grave and its dead played into one system that concerned the communal separation of the living from the dead. The process further engaged with social memory-making and ancestor veneration, judging from our Early Neolithic understanding of mortuary and other rituals (Kuijt, 2001; Guarrero et. al., 2009). At the same time, the bodies of those dead were integrated into a separate system of fragmentation, burning, moving, and an overall destruction of their physicality. I cannot discern the rank that the dead human occupied during a ritual that was dedicated to them. Based on what we know about Neolithic social structure and their community-oriented societies, during the burial or memory making process, I can speculate that the dead were of central importance. In the case of fragmentation rituals, I have discussed in detail that not only do we have trouble understanding which part or parts of the burial contents are the center of importance, but that on the contrary, there was no visible difference between the treatment of a human's body and everything else. Based on this, I

would argue that mortuary evidence from the LPN shows heterarchical Trait II because the body and its grave occupied different ranks in different social systems: those of mortuary ritual and fragmentation ritual. Surely, this evidence does not suggest that these systems were not connected to one another in a way that escapes us archaeologically, but it does imply that they could act as separate entities.

The Ubaid period poses its own challenges in discerning ranks because we are not familiar with how Ubaid institutions functioned from either an archeological or a textual perspective. One of the best examples of heterarchy at play here emerges 1) when we consider the nature of elite status and the presence of the elite themselves and 2) the varied roles of burials.

It is logical to assume that elites were now a social tier based on the presence of temples, the intensification of secondary production and distribution, and the clear growth in long-distance trade of raw and finished products. The simplification and standardization of ceramic forms is a testament to a more complexly-organized system that is motivated by an economical standard. Unlike the handmade, lavishly painted Late Pottery Neolithic forms, the simple and crude wheel made Ubaid pottery show that people were concerned with production rather than display. However, we cannot see these institutions through archaeologically-expressed evidence of conspicuous consumption, even if we consider the tri-partite external-buttress architecture that became restricted to official buildings within Ubaid settlements (Wengrow, 2001: 170).

Alternatively, it has been proposed that the elites did exist but that they chose not to demonstrate wealth and power as means of communal ideology and instead focused on alliance and control of local resources (Flannery, 1999: 46-47; Stein, 1994). In this view,

it was of benefit to the community to mask the elite's status. Based on the evidence that I have discussed in Chapter 4, I believe that the power of individuals in the 6th to 5th millennium BC was rather situational and unsustainable. Thus, certain individuals made decisions and took control when needed, but the extent and duration that this was done was limited (Carter and Philip, 2006: 13). These phases of symmetrical and asymmetrical elite social status and their varied expressions of power are characteristic of Trait II in a heterarchically-organized system.

My mortuary sample does support the rest of the archaeological pattern. The role of the dead is surely more defined in the Ubaid, for we barely see any secondary or even communal burials. The repertoire of grave types and burial goods is also rather predictable, though significantly less abundant (see Chapter 5). On one side, there is standardization of practices much like the production of ceramics. On the other, there is virtually no distinction between any of the graves. Heterarchical behavior of mortuary practices can also be noted in the fact that some individuals were buried within certain administrative buildings while others were not. For example, my Ubaid sample contained intramural and extramural graves. Yet, there was no distinctive difference between the contents of the grave whether the graves were extramural or intramural. Thus, the dead human body served to portray different messages within varied contexts, meaning that the dead had different roles to play. In this way, human subjects at death could occupy different roles depending on the context of burial location, demonstrating heterarchical Trait II.

For the Uruk period, Trait II best describes 1) the unity of Uruk burial customs between the South and the North and 2) the emergent use of metals.

Uruk burials included adult and infant graves in the intramural context. Burials of both infants and adults showed initial tendencies to display wealth in graves. This change could only be observed at Tepe Gawra, as that is the only site in the North with continual occupational levels. Also, the included sites represent the Early to Middle Uruk phases (until about 3600 BC). I do not see a reliable pattern of burial behavior at any site, for Uruk burials are mostly missing from the archeological record, and this is especially true for the South and after 3600 BC (see sections 5.2 and 5.5.3 in Chapter 5 for a detailed review and Algaze, 2008; Brereton, 2013; Charvat, 2002; McMahon and Stone, 2013). However, what we see in the South is identical to the North based on my burial data. Thus, during the Late Chalcolithic phases, the use of similar mortuary rites signals Trait II in a heterarchical system because these practices occupied different ranks in southern and northern systems.

Going further, this similarity begs the question, “if the same mortuary rites were performed in a centralized and a non-centralized (the South and the North) system, then how were their roles different?” Clearly, the ranks that I examine here must have been different in each context. I cannot answer this question using evidence at hand. Nevertheless, the appearance of metals in graves may offer some clues.

The amount of metal (as ore or crafted objects) that circulated in Mesopotamia during the Uruk phase did not correspond with what was found in graves, where metal objects were still rare. However, at this time, metals made an appearance in some graves in the form of weapons (like at Korucutepe) and predominantly ornaments. This practice is significant because the circulation of metals played the role of a standard that connected the world system of Mesopotamia. Metals were used to reference elitist

ideology, and weapons, specifically, were status markers. Sites in the North probably did not have the palatial leaders, kings, or elites that focused power in temples the same way that southern leaders are understood to have done, even though they shared religious believers and their practices. These beliefs played into ideas about kingship, elite representation, and rank, which were often symbolized through the wielding of a metal weapon in imagery from the time period. Evidence of metal use in burials is sparse, but it is the first time that we see it with subadults and adults and in higher numbers. I have argued in Chapter 5 that in the later phases of the Chalcolithic, we begin to see elite ideology used in burials of the non-elite through the usage of power symbols, such as metal weapons. Thus, metal at this time begin to be an economic standard and a representation of status. By integrating metal items into more than just elite burials, the same metal items were used by various rank-holders in society and signaled different ideas in Chalcolithic burials. Metal is the element in Trait II that can be ranked differently depending on the system that it is found in. It is very common for metal items to be used in such way by society, as demonstrated in various studies by diverse socio-economic systems (Mozhaysky, 2018; Blackwell, 2018). The social role of metals in the Early Bronze Age in Mesopotamia was not different.

The role of metal, especially bronze, as a status marker continued and intensified in the EBA periods, a period during which the South and the North were integrated into the same cosmology of gods and goddesses. Trait II is discussed here in terms of 1) bronze use in graves, 2) the relationship of southern presence at northern sites, and 3) cortical bone density.

Starting in the late Uruk phases and continuing into the Bronze Age, elites of Mesopotamia are understood to have served deities and embody some of their qualities. A king could be tamed or could be a tamer, or he could be peaceful and also a violent conqueror. In all the authoritative and hierarchical things that a king did, the metal spear or sword was a symbol of his power. The burial record, however, does not show that this ideology was only used by kings. As it was in the Late Bronze Age in Mycenaean Greece, a huge sample of graves contained at least some metal objects—around 50% according to Dickinson (1994: 39). Exceptional elite burials were rare, and it is likely that through one venue or another, a large section of the population was able to afford the recreation of some elite imagery. This is because, as I have shown with my data here, metal artifacts and ceramics were included in a wide range of burials across all demographic groups. With the exception of pits, all burials contained at least one bronze pin, implying that in various graves contexts, a ritual of shrouding or dressing the dead was performed. The role of metals and their presence in various grave contexts here is interpreted to be suggestive of heterarchical behavior by the definition of Trait II since it cut across different social groups.

The second testament to the varied control of Late Uruk/EBA elites is the relationship of southern and indigenous elements at northern enclaves. Nowhere is this more evident than at Arslantepe due to its extensive excavations with horizontal and vertical exposures. Public buildings and residential units clearly show that Mesopotamian-style food redistribution bowls and "flower" pots were produced to imitate the southern repertoire while keeping their indigenous character and production methods. In level IVA (Period VIA/ ~3500 BC), four intertwined public buildings on a

terraced platform served various administrative and religious duties. Though they retained their northern style, they exhibited unmistakable southern references. First, these temples were not tripartite but bipartite, composed of a central hall flanked by smaller rooms (Frangipane, 1997:51). Inside Temple B, tens of southern clay sealing impressions along with an offering of food in northern and southern ware forms were found. Other examples include the offering basin between two niches in Building A that is typical of Mesopotamian temples. Building IV called the 'Palace Complex' featured a long corridor that led to a storage area with three rooms. The northern room stored various sealings and vessels of a mixed style, while the southern room housed 130 impressed sealings and hundreds of vessels of only southern conical bowls (Frangipane, 1997: 66; Frangipane and Palmieri, 1988: 541-542). The wall paintings served as an ideological and symbolic connection to the religious and elite themes of 'ceremonial threshing' that were undeniably of southern origin. In Building III, we are confronted with a character that turns Arslantepe's connections to the North and the East. The 'hall of weapons' contained a large amount of arsenic bronzes, including the world's earliest swords that we know of: a group of nine smelted swords with a handle and inlaid with geometric triangles in silver. In addition to the swords were a buckle and 12 spearheads, all of which were suspended and bound on the western wall of the room (Frangipane and Palmieri, 1983: 307-315).

All of the characteristics of elite institutions that I just described demonstrate that while leaders used southern ideology to emulate power, they did not forego their indigenous character, nor were they subordinate to any southern polity. Thus, while northern leaders could centralize power and structure some aspects of society, their



power was not total, nor were they concerned with all social levels. They often held different ranks within diverse systems and institutions in northern Mesopotamia. The fact that elites could control one aspect of society but not another in the same fashion meant that the same elite did not hold the same rank in all of the social systems of their center. The Arslantepe palatial layout example here has shown that in using southern ideology elites appealed to a certain social level, but by keeping their indigenous cultural elements they were able to tap into a different, probably more northern system. Thus, elites were ranked differently in respect to the various tiers of society by means of heterarchical trait II.

In a more indirect fashion, cortical bone data also demonstrates Trait II expressed in male-female differences. While at death this data does not detect differentiation between females and males in the EBA group, as evidenced by mortuary practices, the skeletal data gives us a different clue. Cortical bone density data shows that at Titriş Höyük, in life males and females had different mobility or activity patterns where males had bones over three times thicker than the bones of women. What exactly this particular activity was is beyond the data available, but it is clear that male and female femora experienced different levels of stress. This implies that males and females occupied different ranks in at least certain aspects of life. What this activity was I cannot know; however, I am inclined to speculate that it was mobility related to the fact that the humeri of males and females did not show this pattern. Finally, it is important to mention that we do not know whether males or females were driving this pattern. It is possible that males were doing something more than females or females were doing something less than males, or it was a biological factor that I could not account for.

**Trait III:** Two or more ranked systems may co-exist as equals. For example, in a society that has a system of ranking for religious practice and another agriculture, these two aspects are not ranked (or do not have a hierarchical relationship) against each other but interact on the same level.

During the Late Pottery Neolithic in Mesopotamia, mortuary material remains do not show evidence of ranked systems or systems that acted as hierarchical on occasion. Thus, I do not think that this particular trait of heterarchy could be discussed here. This does not mean that such systems did not exist in the 7th millennium BC but that I cannot recognize them archaeologically from the mortuary practices or the skeletal data that are included in this work.

Similar to the Neolithic, the Ubaid mortuary evidence does not apply to this trait. Recognizing ranked systems but equal relationships in the rest of the archaeological record for the Ubaid is tricky, but it is even trickier in the North, where we look for parallels with the South. As a formative period that configures the transition between settled farming society and a period of urban planning of the world's first cities, it is important to understand how elite institutions structured societies. It is clear that while southern Ubaid elites probably began to harness power in public buildings that certainly served a cult-like purpose focused on religious ideology, what exactly the people in the North were doing with similar architecture is unclear. For example, sites like Choga Mami, Uruk, Ouli and Eridu feature monumental buildings that probably used buttress-recess as a status symbol and expression of power at those buildings (Sievertsen, 2010: 206-212). Degirmentepe, Arslantepe, and Hasssek Hoyuk in Upper Mesopotamia featured end-wall niches and tripartite arrangements but not on the scale of the labor-intensive

buildings like the Empfangspalast at the Eannana precinct at Uruk (Heinrich, 1982: 77-78, fig. 118a). However, these sites offer no other indication of an elite entity that could be singled out in the rest of the archaeological contexts, making these features similar in character to any other domestic structure on site. Thus, during the Ubaid period, I still cannot make an argument about the existence of hierarchical elements that act as equals in the North. As explained in the previous point about Brumfield's heterarchical characteristics, the Ubaid is best characterized by heterarchical Trait II where one element/system can be ranked differently depending on the system that it occupies.

In the Uruk period, Trait III can be seen in the nature of interactions between the southern and northern elite. The end of the 4th millennium BC sees the spread of Uruk influence into Greater Mesopotamia and the co-existence of Uruk and indigenous northern. While the nature of elites and their institutions are not always defined, it is clear at sites like Hacinebi that local elite and the presence of Uruk settlers, motivated by an asymmetrical relationship from the South, did not dominate and make the northern site subordinate. Thus, while some relationships were based on assimilation, southern Uruk sites did not overtake northern polities economically or politically. The southern presence there was not hybridized but instead co-existed amongst the native styles and cultural habits. For instance, it was evident that the indigenous inhabitants of Hacinebi were involved with pig domestication and rearing, while the Uruk neighbors relied on protein from the typical southern diet of sheep/goats (Stein, 2001). In both of these cases, elite elements acted as diverse but ranked entities that exercised power autonomously from one another in the same system (that of Hacinebi). Both systems of elites were able to

balance power and function without interference from one another. This type of elite presence in the same system is Trait III in a heterarchical model.

Starting in the late Uruk, and especially during the Early Bronze Age, hierarchical systems of power that co-existed as equals are best illustrated by 1) the political administration of temples at various Mesopotamian urban centers, 2) shared labor in urban construction, and 3) mortuary practices using various styles to display power.

At the end of 4th/3rd millennium BC, a temple was an elite residence, a place of worship, a judicial institution, a surplus storage facility, and a redistribution center. While we know of these institutions from texts such as the Mari Archives, they are not expressed archaeologically (Flemmin, 2004; Cooper, 1983). This is also the case with southern Mesopotamia, where texts express social roles, but how literally defined and applied they were is also uncertain. The kings in the North communicated with kings in the South and exchanged letters, attesting to their existence, using the universal word for king (lordship?), 'en'. This epithet suggests that southern rulers viewed those counterparts as equals (Astour, 1992: 34). In both cases, the temple was a hierarchical system of administration but also had a religious role.

The EBA centers of northern Mesopotamia exhibited Trait III in the co-existence of vertical relationships in areas outside of the temples. Most of the cites during this time featured full or partial fortification systems that clearly required an impressive mobilization of labor, demonstrated the fact that settlements faced a threat, and also stood as a symbolic representation of wealth and power. However, the fact that none of the northern acropoli were fortified within the settlement demonstrates that these were citadel cities where elite power was distributed and varied across the settlement. Furthermore,

these fortification projects seem to have been built by different authority figures, as was the case with the city plan at Selenkahiye. Van Loon (2001: 110) argues that while the central authority might have instructed where a wall would be built, the execution of the project was distributed amongst a few decision-making entities.

In addition to the joint elite building projects that demonstrate Trait III here, mortuary evidence sings the same song. The burial data discussed here from southeastern Anatolia clearly shows that a few mortuary types could contain very wealthy burials. Cist tombs, chamber tombs, and monumental tombs all have comparable remains, and the difference is found in the burial structure itself. Thus, while I have made the argument that I do not believe that burials in the EBA directly reflect social status of individuals as much as reflect elitist ideology connected to religious views, I do think that the show of wealth and power they do portray permeated through various social sectors. If power was extremely centralized, then the association between the elite and the rest of the population would have been more regulated: a smaller sector of society would be allowed to ideologically associate with the elite in burial rites. The fact that many grave forms were used to express a comparable wealth and status also shows that different type of Mesopotamian elites had access to various social niches at a single settlement. This situation is perfectly expressed through a heterarchical model in which ranked or hierarchical social elements (the elite in this case) function on the same level in a single social system (that of burial practices), or Trait III.

Not fitting into any one mode of heterarchy in particular, I note that the power of the elites during the Uruk and EBA phases in South or North Mesopotamia could be characterized as heterarchical Trait II (variable show of power and rank) or as Trait III

(where a few ranked systems coexisted). Northern elites at sites like Tell Banat, Arslantepe, Titriş Höyük were clearly present. They erected monumental architecture like the temple in the main palatial phase VII and VIA (~ 3800 - 3400BC) at Arslantepe. Frangipane has shown that the temple was a hub of complex administrative transactions involved in the accumulation and distribution of various goods to all social tiers and people of various ranks. The palace was also the residence and the office of elite (Frangipane, 2015: 5). At the same time, she has noted that the palace was only one socioeconomic unit at Arslantepe since there were other elite dwellings that were not associated with the temple (Frangipane, 2001: 312). Stamps, seals, sealings, bulla and numerical tablets, and mass-produced Uruk ware recovered from public and private contexts attest to the fact that private households managed large sections of labor and resource movement that completely bypassed the palace's oversight and control. Thus, elites had central control over some aspects of the economy, but not always or over all of it. The role of various goods and their circulation within Mesopotamian interaction systems (palatial vs. households) shows that North Mesopotamian institution of leaders (those I refer to as elite) occupied a different rank within each of those systems—the core idea behind this heterarchical Trait II. At the same time, they are different type of elites who could be described as a few ranked systems acting as equals—Trait III.

## **8.8 What Can Heterarchy Tell Us About Complex Societies?**

In this discussion, I have argued that the complex and varied northern Mesopotamia and its interactions with the South did not have a relationship based on linear interactions. For 6000 years, the two regions went through cycles of homogeneity,

contact, trade, retreat, assimilation and ideological influence until the end of the Early Bronze Age when the region was subsumed into the Assyrian Empire. To understand how the different types of interactions influenced Mesopotamia, it is beneficial to view the organization and relationship of settlements, especially in the North, as heterarchical. As I have attempted to show, this model allows researchers to make sense of the complex sets of mortuary data that do not always or in every way agree with what we know archaeologically or textually from the Late Pottery Neolithic through the Early Bronze Age settlements. By applying a heterarchical lens, I have been able to reconcile these gaps and confusions.

Heterarchy explains the lack of strong patterns, demonstrating differentiated access to resources in prehistoric mortuary practices. If I intended to reconstruct social structures by using a macro-analysis of a robust timeframe, I cannot say that I have done that with data from Mesopotamian graves. Instead, I have brought attention to an important way in which we can talk about the transition from the LPN to the EBA. In the Late Pottery Neolithic, mortuary practices reflect what we have interpreted from settlement patterns, household excavations, and material analysis of artifacts. In the Chalcolithic, mortuary rituals are essentially useless in the reconstruction of the social structure because they do not reflect the social intricacies and the developing differentiation of their communities. The burial practices of the Early Bronze Age show agreement between our understanding of social structures and how the dead were buried.

Where does this leave us with? For one, this study shows that scholars should be wary of how directly they see a parallel between those who buried and those who were buried in the context of prehistoric societies. Second, based on the way that mortuary

practices in the LPN, Chalcolithic, and EBA reflected their social structures, I would argue that the more un-centralized a community is, the more likely it is that the burials will reflect that social reality. A more heterarchical society, such as the late Uruk and Early Bronze Age, can reflect some structures of society but not all or not directly. For example, the monumental elite tombs at Gre Virike are clear in their lavishness and ideological association with elite status. However, the vast majority of graves in the Early Bronze Age in North Mesopotamia are quite similar to each in their contents of copious amounts of vessels and bronzes. In contrast, the South is better characterized as a hierarchical society during this period. At the end of the Early Bronze Age, complex economic archives and king lists show a level of social segregation that was never a part of North Mesopotamian cities. The grave repertoire of the South during this period, which I did not discuss in this work save for the Royal Cemetery of Ur, reflects the hierarchical nature of its interconnected cities with large cemeteries. Thus, I demonstrate that in the case of more heterarchical societies, the interpretation of mortuary practices as a mirror into past societies might not be a straightforward process because some aspects of the social complexity could be masked. Thus, social complexity does not structure burials in a predictable fashion in more heterarchical societies. The consideration of the rest of the archaeological record and reconstruction of historical processes are essential in reconstructing social organization.

Heterarchy also puts the findings in chapter 7 into perspective. Due to the nature of this data, I cannot speak of elite versus non-elite status here or how each burial and my cortical bone findings are reflected within systems of rank. What we do see in the greater scheme of the cortical thickness data is that between the Late Pottery Neolithic and the



Early Bronze Age, males and females did not express the sex-based differences that we expect archaeologically during the transitioned from early farming societies to urban settlements that would indicate differentiated activity patterns. If cortical thickness and quality is taken to imply changes in social structure that resulted in the differentiation of social and economic roles based on sex, it was expected that with the rise of cities, mobility would have diminished and there would have been cortical changes associated with different occupations in the EBA. Despite the lack of differences that would link cortical bone thickness and activity or mobility changes during the time period examine, one comparison did show very interesting results: cortical density measurements in femora indicated that at Titriş Höyük males had significantly denser femora than females, but this same pattern was not replicated in the humeri data from the same site nor from the western Anatolian EBA site. This finding suggests a behavioral origin that influenced male bone mineralization favorably. Thus, in the EBA in northern Mesopotamia, males at Titriş Höyük experienced greater bone loading than females that resulted in the observed biomineralization pattern in the femora. How directly this could be translated into a differentiated activity patterns where males were doing more or females were doing less would be subject to further archaeological investigations that could shed light on the daily life of the people at Titriş Höyük and result in a larger sample size by which to repeat this study.

When sex-controlled cortical bone thickness was compared between LPN and EBA populations, not a single comparison proved to be significant; however, when the same bones were compared for bone density, almost all of the between-population sex-controlled comparisons were significant. All of these measures for difference between the

sexes within and between sites show us that change occurred between the Neolithic and the Early Bronze Age. The Titriş Höyük male femora's biomineralization values were significant not only when comparing them with the females in that population but also with the males across all three populations. This implies that Titriş Höyük males experienced greater femoral loading stresses than Hakemi Use (in 6 out of 6 comparisons). Based on these findings in Chapter 7, I have suggested the possibility that as Mesopotamia entered the EBA, social roles based on sex emerged based on these findings.

In respect to the model of heterarchy, what does the skeletal data imply? It supports the archeological mortuary data in that it shows that social differences based on sex were not consistent. This finding supports the notion that burial practices in the EBA are not necessarily a reflection of the social structure. While we see that males and females were doing something different than one another during their lifetime, we do not see males or females treated differently at death based on this activity.

More generally, I argue that the cortical data presented here is a reflection of the heterarchical model outlined here from a chronological point of view. The Early Bronze Age data varied from the Late Pottery Neolithic sometimes, but not always. Isotopic studies that I had mentioned in Chapter 7 also support this notion—while life changed for northern Mesopotamian settlers from the 7th millennium to the 3rd millennium BC, many aspects of life remained the same.

In order to see if and how biological markers in long bone cortical quality and quantity respond to social structure in the region as a whole in order to compare between site and within site male-female differences, it will be necessary to conduct a similar

study from southern Mesopotamian sites where the social structure was more hierarchically organized, and texts may provide a more explicit view into the type of activities that different sectors of society were engaging in starting in the Late Chalcolithic. Such a study in combination with my data would provide a method of examining social differentiation that is based on the physiological changes that occurred in the human body as a result of social structure.

#### *8.8.1 Heterarchy and the Fall and Rise of Societies*

Finally, modeling social systems as being more flexible by using heterarchical framework can help us understand shifting social relationships and organization. Using this model, we see that Late Pottery Neolithic societies did not just stop and continue with a different character called the Ubaid and then the Uruk and the second wave of cities in the Early Bronze Age. Phases of symmetrical and asymmetrical relationships of power shaped every settlement differently; however, one unifying character that is important to bring out in Mesopotamia is how agreeable the mortuary record was between the South and the North for the Late Pottery Neolithic, Ubaid, and Uruk. While the rest of the archaeological record showed many diverse patterns and phases, the mortuary record stood out with its consistency. I venture to suggest that this is evidence of a temporally and spatially powerful—perhaps even a hierarchical—ideology that unified the region in a manner that political leaders could not.

Looking to the end of the Early Bronze Age, even more change infiltrated the region. Whether brought upon by climate change, a systems-collapse due to the demise of economic relations at the hands of Akkadian and Egyptian military feats, or a

combination of these factors, the reasons behind the end of the EBA are beyond this chapter. While collapse might be useful in understanding the fall of Ur around 2000BC in the South, in the North, heterarchical rhetoric can give a sense of connectedness to the history of the region. After every period of social development and an intensified cycle of growth, southern settlements retracted and then continued to grow after some time. This happened at the end of Halaf and at the end of Uruk and developed exponentially until the end of the Early Bronze Age.

At the end of the Early Bronze Age, there was a collapse of old centers. Then, the Akkadian language or Old Babylonian developed in the South, but it was also used and called Old Assyrian in the North after the Assyrian dialect (Charpin, 1986). This textually-rich documented period shows how city states dedicated efforts in conquering and subsuming smaller cities, securing alliances, and competing with each other in order to establish control and emerge as political centers. This effort resulted in the creation of new powerful states such as Mari, Eshnunna, and Babylon in 1595 BC (Kuhrt, 1995: 75).

The northern story diverges at the end of the EBA. While the abandonment of many cities was experienced all over Mesopotamia, violent destructions occurred at almost all EBA centers, and a monumental movement of people took place, North Mesopotamian populations were more flexible. While public temples, large scale architecture, and elite temples disappeared in the region, cultural continuity from ceramic repertoire and smaller scale buildings was evident. In northern Syria especially, centers like Tell Ahmar, Halawa, and Emar persevered into the Middle Bronze Age (Roobaert and Bunnens, 1999: 164-166; Orthmann, 1981; Finkbeiner, 1999). A similar story could

be told of some southeastern and eastern Anatolian sites like Tilmen and Carchemish, which emerged as important centers.

Unlike southern Mesopotamian cities, the more autonomous cities of Upper Mesopotamia did not experience a region-wide systems-collapse when the events towards the end of the EBA started to interfere with ways of life. Unlike the more rigidly organized hierarchical institutions and social structures of the South, people in northern Syria and southeast Anatolia, in a sense, re-emphasized their more rural and kin-based pastoral character (Cooper, 2006). Thus, when their urban lifestyle became threatened, they were able to adapt to the disintegration of hierarchical elements experienced in the centers of the Early Bronze Age. When taking into account the heterarchical social structure of northern Mesopotamia in conjunction with environmental factors such as fertile lands and access to resources and a reliable rainfall, the more flexible nature of these communities made them more adaptable to change. By accommodating to the dynamic world around them, people of the Upper Euphrates and Tigris were able to perpetuate some Early Bronze Age traditions while integrating into the changing world of Mesopotamia.

APPENDIX A:  
CATALOGUE OF GRAVES AND CONTENTS

Appendix A lists all the graves from the Late Pottery Neolithic to the Early Bronze Age and provides a full description of the location, contents and style of burial. Not all locations provide the same level of detail for every category of description included here. Thus, blank spaces should be interpreted as lack of description instead of as lack of content.

TABLE A. 1

## LATE NEOLITHIC MISCELLANEOUS GRAVES BY SITE

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Girikihaciyan</b>	5400B C L. Halaf	1	intramural- associated with a plaster basin	inhumation	1	M	25-40	on the left side in flexed position	No					
<b>Girikihaciyan</b>	5400B C L. Halaf	2	intramural- in or on house floor	inhumation	1		44354	Flexed	No					
<b>Girikihaciyan</b>	5400B C L. Halaf	3	intramural- associated with a dump area above a house	inhumation	1		3	complete	No					large fragment of a jar to cover the skeleton
<b>Girikihaciyan</b>	5400B C L. Halaf	4	intramural- under a floor	Frag. burial	1		adult	only 5 rib fragments and a humerus	No					

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1	extramura l or extramura l in an unsettled area	cist lined with stone slabs	7 or 8				Yes	vase with rounded body and closed neck	no			multiple burial, with skulls stacked on the east/ north-east wall. Acephalic bone scatter of adult (s)
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(1 )					45-50	skull with red paint traces						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(2 )				F	adult	Skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(3 )					2.5	Skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(4 )					adult	Skull						



TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(5 )					adult	Skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(6 )					adult	Skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(7 )				M	30-40	Skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M1(8 )						Skull						8th skull mentione d on the north-east wall but not described
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	M2	extramura l or extramura l in an unsettled area	cist lined with stone slabs	8				yes	a pot and bowl with geometric patterns in black. Bowl is very fine- Typical Hassuna	no			skull stack on eastern wall and 2 on the south. Acephalic bone scatter not associated with

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
														Skull 1
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?					adult	skull with a few long bones that show that this individual was laid on its right, in a flexed position. Very poor condition						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?					adult	skull						

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				M	adult	skull with red paint traces						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				M	adult	skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				F	adult	skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				M	20-30	skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				F	adult	skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun a	?				M	adult	skull						
<b>Turbe Hoyuk</b>	6400- 6000 BC Hassun	M3	extramura l or extramura l in an	cist line with stone slabs	1	M	adult	only upper and lower bones,	no					

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
	a		unsettled area					very damaged						
<b>Tell Hazna</b>	6200B C Proto- Hassun a	?	intramura l	vessel burial	1		infant		yes	clay vessel	no		marble vessel, stone beads	
<b>Karavelyan</b>	1st half of 6th Mil. BC Early Halaf	M-52	intramura l- between houses	pit burial	1		adult	hocker position: 1 head, 2 femurs, and a few ribs	yes	long necked vase, open mouth pot, tub style bowl	no			2 large stones that probably marked the grave
<b>Boztepe</b>	1st half of 6th Mil. BC Early/ Middle Halaf	1	extramura l or intramura l but unoccupie d	pit inhumatio n/ multiple burial with Burial 2?	1	F	20-40	badly preserved skeleton in fetal position	yes	squat jar	no			no clear pit distinctio n between burial 1/2. May have been the same internmen t
<b>Boztepe</b>	2nd half of 6th Mil. BC Early/ Middle Halaf	2	extramura l or intramura l but unoccupie d	pit inhumatio n/ multiple burial with Burial 1?	1		18+	very fragmente d and not well preserved	yes	straight- sided collared jar	no		a soapston e stamp seal	
<b>Boztepe</b>	3rd half of 6th	3	extramura l or intramura	pit inhumatio n	1		15+	badly preserved and	yes	globular hole- mouthed	no			

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
	Mil. BC Early/ Middle Halaf		l but unoccupie d					damaged during storage		jar, straight- sided collared jar, miniature jar, bulbous jar				
<b>Boztepe</b>	4th half of 6th Mil. BC Early/ Middle Halaf	4	extramura l or intramura l but unoccupie d	pit inhumatio n	1			few fragments	yes	miniature undecorat ed long necked jar	no			
<b>Domuztepe</b>	5600B C Halaf	?	intramura l	simple inhumatio n	1		infant		no					
<b>Domuztepe</b>	5590B C Halaf	F146 5	in the Red Terrace	simple inhumatio n	1		adult	complete and articulate d	no					
<b>Domuztepe</b>	5500B C Halaf II	?	S. of Feature 148/ "Death Pit"	burial pit	1		6	complete	no					
<b>Domuztepe</b>	5500B C Halaf II	?	S. of Feature 148/ "Death Pit"	secondary burial	1			fragment of skull	no					

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Domuztepe</b>	5500B C Halaf II	?	SW. of Feature 148/ "Death Pit"	a deposit	2		child	skull only	see comment s		no			in the deposit are contained the child's skull, a pig's skull, and a pot with a fragment from another skull,
<b>Domuztepe</b>	5500B C Halaf II	?	S. of Feature 148/ "Death Pit"	secondary burial	?				no					a complex secondary burial
<b>Domuztepe</b>	5500B C Halaf II	?	S. of Feature 148/ "Death Pit"	skull burial	1			skull only	no					
<b>Domuztepe</b>	5500B C Halaf II	F942	in Pit F942, NW of "Death Pit", whose contents resemble it	pit burial	?			fragments only	no					

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
<b>Domuztepe</b>	5500B C Halaf II	F868	in Pit F868 that cuts into Pit F942	pit burial	1			mandible	no					
<b>Tulintepe</b>	5400B C L. Halaf	1	intramura l	simple inhumatio n	1		infant		no					
<b>Mersin</b>	6th mil. BC Halaf	XVII -1	intramura l	pit inhumatio n	1		infant	flexed on the right side	no					
<b>Mersin</b>	7th mil. BC Halaf	XVII -2	intramura l	pit inhumatio n	1			contracte d, only leg bones	no					
<b>Mersin</b>	8th mil. BC Halaf	XVII I	intramura l	not clear /deposit	1		adult?	laying on left, randomly	no					accidental feature? Stones and mubricks separated the head from the rest of the body
<b>Mersin</b>	9th mil. BC Halaf	XIX- 1	intramura l	inhumatio n	1		adult?	laying on left, contracte d	no					
Mersin	10th mil. BC Halaf	XIX- 2	intramura l	pit cremation	1		child	blackenin g on bones and red under	no					

TABLE A.1 (CONTINUED)

Site Name	Date/ Time Period	Grav e	Location	Style	# of Indi v.	Se x	Age(yr s)	Osteo findings	Artifacts ?	Ceramics	Metals ?	Meta l Type s	Other	Commen ts
								the skeleton						
Mersin	11th mil. BC Halaf	XIX- 3	intramura l	pit cremation	1+		adults	many bones intermixe d with pottery, blackened	yes	ceramic shards and 2 vessels	no			



TABLE A. 2  
CHALCOLITHIC MISCELLANEOUS GRAVES BY SITE

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
Salat Tepe	4800-3900BC Middle/ Late Chalcolithic	64/G	intramural- on top of soil	made of mud	1		infant		Yes		no	/	2500 white, blue and black stone beads	
Salat Tepe	4800-3900BC Middle/ Late Chalcolithic	9G/G	intramural- on top of soil	made of mud	1		infant		No	/	/	/	/	
Salat Tepe	4800-3900BC Middle/ Late Chalcolithic	?	in a place with lots of vessels and obsidian flakes	vessel burial	1		infant		No	/	/	/	/	the vessel used for burial was used for a few hundred years before becoming a burial
Salat Tepe	4800-3900BC Middle/ Late Chalcolithic	107/G	intramural	inhumation	1		adolescent/ adult		No	/	/	/	/	probably died as a result of a stone collapsing on the back of the head

TABLE A.2 (CONTINUED)

[illegible]

TABLE A.2 (CONTINUED)

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
Korucutepe	4000BC	K12-4				M	24-35	skeleton on its right, flexed	Yes		yes	metal mace head from raw iron, silver band with spirals around wrists,	belt decorated with small limestone disc shaped beads	
Korucutepe	4000BC	K12-5					adult	skeleton in its left, flexed. No skull, due to pit cut	yes	gray round bottomed burnished jar , cream slipped orange pot stand	yes	silver stamp seal with a horned animal iconography, round metal beads,	round button with convex sides and central hole, blue chalk bead, small white disk shaped beads found on the skeletons	
Korucutepe	4000BC	K12-1		pot burial	1		<1yr	only skull at the bottom of the jar	yes		yes?	maybe some copper ore with uncertain association		
Arslantepes	3700-3600BC LC 3-4	?	intramural-under house floor	inhumation	1		6-7	may have cranial trauma	yes		no		beads on arms and neck	
Arslantepes	3500BC LC 3-4	?	intramural-under house floor	inhumation	1				yes		no		necklace and armlet made of stone beads	
Arslantepes	3500BC LC 3-5	?	intramural-under house floor	inhumation	1				no					
Arslantepes	3100BC LC5	?	intramural? Disturbed area	pot burial	1		infant		no					
Turbe Hoyuk	5th Millennium BC	?	intramural	vessel burial	1		infant		yes		no		an obsidian mirror	

TABLE A.2 (CONTINUED)

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
Yenice Yani	4400-3600BC Middle/Late Chalcolithic	?	inside the wall	inhumation wall	1		1 to 3yrs	extended on the right, running along the wall	no					
Yenice Yani	4400-3600BC Middle/Late Chalcolithic	?	intramural	pit	1		infant		no					
Yenice Yani	4400-3600BC Middle/Late Chalcolithic	?	intramural	pit	1		infant		no					
Muslumantepe	3400BC Late Chalcolithic 3-4	?	intramural	pithos with lid	1		1-3mos		no					
Muslumantepe	3400BC Late Chalcolithic 3-5	?	intramural	pithos with lid	1		infant		no					
Muslumantepe	3400BC Late Chalcolithic 3-6	?	intramural	pithos with lid	1		infant		no					
Muslumantepe	3400BC Late Chalcolithic 3-7	?	intramural	pithos with lid	1		infant		no					
Muslumantepe	3400BC Late Chalcolithic 3-8	?	intramural	pithos with lid	1		infant		no					

TABLE A.2 (CONTINUED)

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
<b>Muslumantepe</b>	3400BC Late Chalcolithic 3-9	?	intramural	pithos with lid	1		infant		no					
<b>Muslumantepe</b>	3400BC Late Chalcolithic 3-10	?	intramural	pithos with lid	1		infant		No					
<b>Muslumantepe</b>	3400BC Late Chalcolithic 3-11	?	intramural	pithos with lid	1		infant		No					
<b>Muslumantepe</b>	3400BC Late Chalcolithic 3-12	?	intramural	pithos with lid	1		infant		No					
<b>Pirot Hoyuk</b>	4th Millennium BC Middle/Late Chalcolithic	1	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					
<b>Pirot Hoyuk</b>	5th Millennium BC Middle/Late Chalcolithic	2	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					

TABLE A.2 (CONTINUED)

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
<b>Pirot Hoyuk</b>	6th Millennium BC Middle/Late Chalcolithic	3	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					
<b>Pirot Hoyuk</b>	7th Millennium BC Middle/Late Chalcolithic	4	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					
<b>Pirot Hoyuk</b>	8th Millennium BC Middle/Late Chalcolithic	5	intramural under the floor of food storage/ processing area	vessel burial	1		6 mons-1yr	arm rests under the head	Yes	carinated bowl with fairing rim	no			
<b>Pirot Hoyuk</b>	9th Millennium BC Middle/Late Chalcolithic	6	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					
<b>Pirot Hoyuk</b>	10th Millennium BC Middle/Late Chalcolithic	7	intramural under the floor of food storage/ processing area	vessel burial	1		infant		No					urn burial intermixed with grain, animal bone fragments and teeth

TABLE A.2 (CONTINUED)

Site Name	Date/ Time Period	Grave	Location	Style	# of indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	M.types	Other	Comments
<b>Pirot Hoyuk</b>	11th Millennium BC Middle/Late Chalcolithic	Burial 2	intramural under the floor of food storage/ processing area	vessel burial	1		infant	infant put feet first and pressed, arms stretched on the sides	Yes		no		flour poured in the vessel	
<b>Pirot Hoyuk</b>	12th Millennium BC Middle/Late Chalcolithic	8	in a hearth	inhumation	1		adult	skull only	No					
<b>Cattepe Hoyuk</b>	4th Millennium BC Late Chalcolithic	?	unknown	urn burial	1		infant		No					
<b>Tepecik</b>	3400 BC Late Chalcolithic 3-4	?	mud brick grave inside a narrow room	brick lined pit	1		infant		yes		no		necklace around the neck from limestone beads	

TABLE A. 3  
EARLY BRONZE AGE MISCELLANEOUS GRAVES BY SITE

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	3rd Mil. BC EBA II	M1	extramural	irregular rectangular mud mortar build chamber, with stone cover and floor lined with pebbles	1			arm and leg bone fragments	yes	18 vessels: campaniform types, bowls, and cups	no		bone pin	tomb robbed
Gedikli	4th Mil. BC EBA II	M2	extramural	irregular rectangular mud mortar build chamber, with stone cover and floor of trampled earth	1	F?	adult		yes	very fine and thin ware: cup fragments and 2 full bodied pot with flaring rims, a pod with a trefoil sprout	no			tomb robbed



TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	5th Mil. BC EBA II	M3	extramural	irregular rectangular mud mortar build chamber, with stone cover and floor lined with pebbles	1			a few fragments	yes	3 cups, fragments from bowls- one painted red over buff	no			tomb robbed
Gedikli	2300-2100BC EBA III	1	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	2	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	3	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	4	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	5	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	6	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	7	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	8	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	9	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	10	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	11	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	12	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	13	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
<b>Giddily</b>	2300-2100BC EBA III	14	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
<b>Gedikli</b>	2300-2100BC EBA III	15	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.



TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	16	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	17	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	18	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	19	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	20	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	21	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	22	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	23	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	24	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	25	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	26	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	27	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	28	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	29	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	30	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	31	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.



TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	32	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	33	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	34	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	35	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
<b>Gedikli</b>	2300-2100BC EBA III	36	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
<b>Giddily</b>	2300-2100BC EBA III	37	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Giddily	2300-2100BC EBA III	38	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Giddily	2300-2100BC EBA III	39	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	40	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	41	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
Gedikli	2300-2100BC EBA III	42	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Gedikli	2300-2100BC EBA III	43	extramural	cremation in vessel	1			cremated bones on bottom of the vessel	yes	small cup/jar	yes	bronze toggle pin		First the bones bundled in a wrap fasten with the pin are deposited on the bottom of the spherical vessel (30-40cm in diameter). Then, the cup or jar are placed on the bundle, after which the ash and bones from the pyre are placed on top. The burial vessel is sealed with a fragment from the liquid containing vessel used to put out the pyre.
Tilmen	3rd Mil. BC	M1	intramural	cist grave lined with stones and pit floor paved with ceramic fragments	1		child	fragmented bones	yes		no		necklace from white painted ceramic beads	

TABLE A.3 (CONTINUED)

Site Name	Date/Time Period	Grave	Location	Style	# of Indiv	Sex	Age(yrs)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
<b>Tilmen</b>	4th Mil. BC	M2	intramural	cist grave lined with stones and pit floor paved with ceramic fragments	1		child	finely fragmented bones	no					
<b>Saraga Hoyuk</b>	3rd Mil. BC	1	extramural	cist grave lined and covered with stone slabs	0			no skeleton or remains	yes	heaps of fruit stand pottery in front of the entrance and inside the tomb.	no			
<b>Saraga Hoyuk</b>	4th Mil. BC	2	extramural	cist grave lined and covered with stone slabs	0			no skeleton or remains	yes	4 small fruit stands	no			

TABLE A.4  
LIST OF GRAVES AT KENAN TEPE

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age (yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
4700BC Ubaid 2	D.5.5221	intramural	vessel burial in a prepared pit, placed in a temporary external area	1		0-2mos	excellent condition but skull frag	no	burial vessel				
4700BC Ubaid 3	D.8.162	intramural	pit and basket burial in kiln work area	1		0-6mos		no					lots of grinding stones in kiln pits
4650BC Ubaid 3-4	D.8.54	intramural	burial under house floor in a plaster pit covered with a vessel	1		3-9mos	frags	yes	burial vessel			large grinding stone and beads	
4650BC Ubaid 3-5	D.8.90	intramural	inhumation and secondary burial of individual that was used partly in the foundations of Ubaid 2 wall	1		12-18mos	only skull and small arm bones from inhumation intact- secondary burial frags.	no					



TABLE A.4 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age (yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
4650BC Ubaid 3-6	E.5	intramural	urn burial placed within the walls of a cellar room	1	F	30-40	frags but complete	no	burial urn				
4300- 4200BC Terminal Ubaid/ LC1	D.4.4128	intramural	pit- in a basket/cloth	1		2	long bones/vertebrae in good condition- all else frags.	no					
4300- 4200BC Terminal Ubaid/ LC2	D.6.145	intramural	pit and basket	1		1-6mos	frags	yes		no		calcareous bead	
4300- 4200BC Terminal Ubaid/ LC3	D.6.155	intramural	burial pot/bowl	1		6-12mos	complete skeleton	no	a bowl covering burial vessel	no		covered by reed mat	
4300- 4200BC Terminal Ubaid/ LC4	E.2.174	intramural	wall/ foundations burial	1		4 to 5	frags	No					between the 3rd and 4th phase of Ubaid Structure 3, within a mud- brick wall
3100BC LC5	F.X	intramural	Pit	1		child	frags	Yes	frags	no		cylinder seal	
3100BC LC6	F.19	intramural		1		adult	frags	No					
3100BC LC7	F.21	intramural	Pot	1		2 to 4	frags	No	burial vessel				
3100BC LC8	F.7.7148	intramural	pit-inhumation	1	M	25-40	lower torso and L arm missing	No					

TABLE A.4 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age (yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3100BC LC9	F.7.7150	intramural	pit-inhumation	1		15-20	fragmented + flexed	No					
3100BC LC10	F.7.7221	intramural	pit-brick lined inhumation	1	F	18-22	flexed, with crossed legs and arms	Yes		yes	unknown- copper/bronze staining on hand		The pit had 3 courses of burned and unburned brick. Maybe a freestanding brick structure?
3100BC LC11	F.9	intramural	pit-inhumation	1		adult	face down, flexed with arms folded up by skull.	No					
3100BC LC12	F.22	intramural	intersecting pits burial	2									
3100BC LC13	F.22(1)					young adult	nearly complete, articulated, on the back, and flexed knees.	Yes		yes	ball headed bronze pin near legs		
3100BC LC14	F.22(2)					middle aged/ older	very fragmented	Yes	frags: pedestal base, carinated bowl, fine ware bowl	no			
3100BC LC15	F.7.7104	intramural	pit-inhumation	1	f	40	frags	No					
3100BC LC16	F.7.7200	intramural	pit-brick lined	1		18m-2	Fragments	No					
3000BC LC/ EBA I	G.7.38	intramural	vessel burial	1		1 to 2		No	burial vessel				

TABLE A.4 (CONTINUED)

<b>Date/ Time Period</b>	<b>Grave</b>	<b>Location</b>	<b>Style</b>	<b># of Indiv.</b>	<b>Sex</b>	<b>Age (yrs/mos)</b>	<b>Osteo findings</b>	<b>Artifacts?</b>	<b>Ceramics</b>	<b>Metals?</b>	<b>Metal Types</b>	<b>Other</b>	<b>Comments</b>
3000BC LC/ EBA I	G.7.25	intramural	pot burial	1		3 to 5		No	burial pot				
3000BC LC/ EBA I	G.7.28	intramural	pot burial	1		2 to 4		No	burial vessel				

TABLE A.5:  
LIST OF BURIALS AT ASAGI SALAT

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M3	extramural	stone cist w/t stone cover- greenish/blac k pebble lining of grave	1			hocker position	Yes	fine-wear plate, 3 medium to fine bowls, and 2 vases	no			robbed, the skeleton is highly thrown around and broken.
3000B C EB I	M4	extramural	stone cist w/t stone cover- greenish/blac k pebble lining of grave				disturbed	Yes		yes	bronze pin		robbed

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M5	extramural	stone cist w/t stone cover- greenish/ black pebble lining of grave	1			only some bones from legs and arms	Yes		yes	4 bronze pins		robbers were able to only disturb the grave slightly. The high number of pins indicative of perhaps shroud?
3000B C EB I	M6	extramural	simple stone cist grave- oval pit closed with sandstone cover				tiny frags.- only 1 identifiable tooth	Yes		no		2 mountain crystal oval beads	robbed, skeleton disturbed, the stone cover is broken
3000B C EB I	M7	extramural	stone cist grave with supporting stone structure on the outside.				highly disturbed	no?					

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M8	extramural	stone cist w/t stone cover- greenish/blac k pebble lining of grave	1			disturbed , but lying on the left	no?					
3000B C EB I	M9	extramural	stone cist grave with supporting stone structure on the outside- 2/3 rows of small/medium stones	1		older adult	fragments found on the outside of the grave	Yes	2 well made bowls, a baby bottle, 3 high neck bowls, and a closed vessel	no?		zoomorphi c clay figurine of ram	

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M10	extramural	simple stone cist grave- oval pit closed with sandstone cover. The cover stone is bigger than the actual grave-floor is lined with black greenish pebbles					Yes				zoomorphi c clay figurine of ram	
3000B C EB I	M11	extramural	simple rectangular stone cist w/t stone cover broken in half. No supporting stones. Scattered floor lining.					no?					

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M12	extramural	oval simple stone cist grave, with stone cover. Pebble lining of grave	1		older adult	very fragmented	Yes	long neck bowl, a closed vessel with base,				
3000B C EB I	M13	intramural - under house floor	vessel burial	1		infant	hocker position	Yes		no		15 bone beads	
3000B C EB I	M14	extramural	rectangular stone cist grave w/t 3 piece stone cover. The 4 corners are lined with 4 cut limestone slabs.	1	m	30	fragmented but complete, hocker position, and face facing forward.	Yes	ceramic vase	yes	large bronze needle with incised head, found at the clavicles . Possible to hold a shroud	a stylized bone idol, and a cylinder- beaded frit stone necklace	only one of 2 graves that has not been robbed



TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M15	extramural	rectangular stone cist grave w/t 3 piece stone cover. The grave is quite destroyed. Floor lined with large stones					Yes	a baby bottle, a pot-stand, and open bowl	no		a stylized female bone idol, with hands crossed at breasts.	most finds on the outside of the grave
3000B C EB I	M16	extramural	stone cist grave with destroyed stone cover. Supporting stones and scattered stones on the bottom of the grave	1			fragmented , with bones scattered in and out of the grave	Yes		no?		3 mountain crystal oval beads , and an oval brown bead	
3000B C EB I	M17	extramural	simple stone cist grave in a oval pit. Lined with pebbles.					Yes	2 fine walled bowls, and a vase	no?			

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
3000B C EB I	M18	extramural	simple stone cist grave in a oval pit. Lined with pebbles.				highly fragmented skeleton	Yes	vase frogs	yes	bronze pin with riveted décor on tip		very disturbed and original shape is unclear
3000B C EB I	M19	extramural	rectangular stone lined cist grave				highly fragmented skeleton found mostly outside of the grave	no?					
3000B C EB I	M20	extramural	rectangular, stone lined cist grave				a few scattered arm bones	no?					animal bones intermingl ed with the human bones- evidence of ritual feasting?
3000B C EB I	M22	extramural	simple stone cist grave in a oval pit. Covered by a conglomerate	1		older adult	scattered bones inside	no?					
3000B	M24	extramural	rectangular	1		adult	disturbed,	no?					

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
C EB I			simple stone cist grave with a limestone cover, and medium supporting stones.				and in hocker position						
3000B C EB I	M25	extramural	oval simple stone cist grave, with stone cover. Pebble lining of grave	1		6 to 7	fragmented	no?					
3000B C EB I	M26	extramural	stone cist w/t stone cover- greenish/blac k pebble lining of grave. The grave is surrounded by 2-3 rows of stone	1		8	fragmented	Yes	baby bottle , high base bowl	no		clay weight	
3000B C EB I	M27	extramural	rectangular simple stone cist grave with a limestone cover, and medium supporting				fragmented	no?					

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			stones.										
3000B C EB I	M28	extramural	simple rectangular stone cist w/t conglomerate. Supporting medium sized stones				no skeletal fragments found	No					
3000B C EB I	M31	extramural	simple rectangular stone cist grave, with 1/2 limestone cover and 1/2 conglomerate. The grave has medium stones as support for the covers.	1			fragmented , hocker position	Yes	2 pots, 3 bowls, 2 cups- high quality, thin walls	yes	bronze needle, spiral top		simple form grave. One of the biggest inventories
3000B C EB I	M32	extramural	stone cist grave w/t stone cover, and lined with green, red, and black pebbles				fragmented	Yes	2 vases,	no		3 cylinder fiance beads	smallest grave
3000B C EB I	M34	extramural	stone cist grave with oval form and stone cover.				2 "hand" bones	yes	a thin walled jar	yes	bronze needle with curled		

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			Very disturbed from later horse burial								head		
3000B C EB I	M36	extramural	simple stone cist grave w/t broken stone cover, lined with peddles. Medium sized stones outline the grave				fragments	no?					
3000B C EB I	M37	extramural	rectangular stone cist grave outlined with medium stones, and pebbles line the grave				mandible and long bone fragments	Yes	5 bowls- 4 with long bases, 2 pots- one with long base, 1 baby bottle	no		a necklace from 45 round and elliptical beads made from fiance	one of the graves with biggest inventory. Both inventory and individual found inside and outside of grave- disturbed and partly robbed
3000B C EB I	M36	extramural	rectangular stone cist grave- surrounded by a neat row of stones.	1			rib and phalange frags.	Yes	3 bowls , 1 long based jar	yes	a bronze needle with spiral head		

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			Floor is lined by pebbles.										
3000B C EB I	M39	extramural	simple rectangular stone cist grave, outlined with medium sized stones				fragmented hand bones	no?					very disturbed grave
3000B C EB I	M40	extramural	simple rectangular stone cist grave, outlined with medium stones and lined with pebbles.	1			in hocker position, hands in front of face, very bad condition	Yes	3 bowls- 1 long necked. 1 jar with closed rim, and geometric parallel lines as decorations around neck.	yes	a bronze needle with spiral head	necklace from 150 fiance beads, white and black in color. Mostly oval in form but some are knotted.	one of the only 2 graves that was not robbed.
3000B C EB I	M41	extramural	a rectangular stone cist grave, lined with pebbles- mostly destroyed					no?					
3000B C EB I	M42	extramural	oval simple stone cist grave, with stone cover. Pebble lining				no skeletal fragments found	Yes	1 vase with 2 pierced bud handles	no			

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			of grave										
3000B C EB I	M43	extramural	rectangular stone cist grave, outlined with medium sized stones, and lined with a stone slab				long bone fragments on the slab	no?					
3000B C EB I	M44	extramural	oval simple stone cist grave, with stone cover.					no?					very disturbed and destroyed grave
3000B C EB I	M45	extramural	rectangular stone cist grave with stone cover. Medium sized stones surround the grave	1			fragments of skull - lying on the side	Yes	3 vases with 2 pierced bud handles, 2 jars, 1 bowl, and 1 baby bottle	no		2 long cylindrical beads from greenish beige stone	only beads found inside- vessels found outside of grave as a result of robbing activities
3000B C EB I	M46	extramural	rectangular stone cist grave, lined with pebbles, and surrounded by medium				some skull fragments	Yes	a 4 handle jar, a bowl, and cup	no			

TABLE A.5 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv .	Se x	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			sized stones										



TABLE A.6:  
LIST OF BURIALS AT OYLUM HOYUK

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1	Extramural	chamber tomb with door	1		Child	very fragmented and disturbed	yes	10 open conic cups, 6 U shaped cups, 7 bows, platter, long base bowl, 14 bottles, 3 perfume bottles, 2 sprouted jars, long sprouted jar, short sprouted jar, plate, 4 jars, 6 tripod bowl, miniature jar (6.3cm tall)	yes	2 bronze axes with hole for handle, 2 bronze bracelets, oval bronze bead, a bronze spear/ lance, 3 bronze pin- head needles, 3 bronze threading needles	3.1cm gray stone jar, bone plaque, bone awl, green- stone axe with hole for handle	one of 5 such graves.

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez2	Extramural	pot burial	1	female	25-27	position is not clear and disturbed	yes	cooking rough ware, miniature bowl, open rim bowl, open rim bottle, bowl, triode bowl, big U shaped cup	no			
2467- 1942 BC Early Bronze III	OYMez3	Extramural	pot burial	1			only foot phalanges were recovered	yes	closed form long necked jar	no			right under grave 2
2467- 1942 BC Early Bronze III	OYMez4	Extramural	pot burial	1	male	Adult	teeth recovered- skeleton is there but no info- cannot be aged	yes	2 plates- 1 with cover, a bowl, a closed form long necked jar, an open form jar, a jar, and a Syrian jar.	yes	3 bronze threading needles, 1 bronze bead		

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez5	Extramural	pot burial	1			very fragmented and disturbed	yes	long based cup, conic cup, a Syrian bottle, a bottle, and a perfume bottle	no			
2467- 1942 BC Early Bronze III	OYMez6	Extramural	pot burial	1			very fragmented and disturbed	yes	2 plates, open form bottle, a bottle	yes	2 bronze pin needles		
2467- 1942 BC Early Bronze III	OYMez7	Extramural	pot burial	1	female	45-50	skeleton was found from the head to the waist in the burial pot.	yes	plate, u shaped cup, a jar, a bottle	yes	a bronze pin headed threading needle		the skeleton's 1/2 has sank away from the rest of the body

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez8	Extramural 1	pot burial	1			very fragmented and disturbed, hands in front of the face	yes	a plate, a lentil bodied bottle	yes	2 copper rings, a copper collar, 9 bronze pin headed threading needles, 2 bronze pin head needles, 1 bronze needle, , and 1 bronze stamp	1 fiance stamp	
2467- 1942 BC Early Bronze III	OYMez9	Extramural 1	pot burial	1	male	40-45		yes	short sprouted vessel, a plate, 2 bowls, 2 Syrian bottles, a jar	yes	2 bronze pin headed threading needle with screw decorations, a bronze ring		

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1 0	Extramura 1	pot burial	1		6.5-7	fetal position on the left side	yes	a plate, a lentil bodied bottle	yes	a silver ball bead, a gold diadem made from sheet gold with filigree decorations and rhomboids around the corners, long silver needle, a copper bracelet, and 3 bronze threading needles	5 ivory cylinder seals, a carnelian barrel bead, a necklace from 43 white ceramic, 16 black and 6 red stoned beads	

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1 1	Extramura 1	pot burial	1	male	20-22	arm around stomach, lying on the left.	yes	2 plates, a jar, open mouth bottle, a bowl, a perfume bottle and Syrian bottle	yes	a copper needle		skeleton was placed in the burial pot after the pot was broken, and then the pieces were placed back in place
2467- 1942 BC Early Bronze III	OYMez1 2	Extramura 1	pot burial	1	male	35-40	disturbed but in good condition.	yes	a bottle, 2 long based cups	no			
2467- 1942 BC Early Bronze III	OYMez1 3	Extramura 1	pot burial	1			right arm is over pelvis, left arm is over the body, lying on the back, legs are contracted	yes	2 plates, 3 open form jars, bowl, and 2 conic cups	yes	a bronze dagger		

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1 4	Extramura 1	pot burial	1	femal e	19-20	laid on the left in contracted position	yes	tripod bowl/plate	yes	3 bronze pin headed threading needles	a "comb" needle, "beads" from fiance- white and black	inventory mentions "assorted goat bones" but the context is unclear
2467- 1942 BC Early Bronze III	OYMez1 5	Extramura 1	pot burial	1		adult		yes	2 U shaped cups	yes	a bronze threading needle		
2467- 1942 BC Early Bronze III	OYMez1 6	Extramura 1	pot burial	1			lying on the back with knees contracted	yes	Syrian bottle, a bowl, a long sprouted jar	yes	a copper ring, broken copper collar, a bronze bracelet		

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1 7	Extramural 1	pot burial	1			only two leg bones are found	yes	a long necked bottle, a long sprout pouring vessel, 5 U shaped cups, 5 plates, jar, a wide rim jar, 2 Syrian bottles, conical cup, wide mouth bottle, 3 bottles, 3 perfume bottles, and 2 tripod pots	yes	1 copper collar, a broken bronze needle, a bronze pin headed needle, 5 pin headed threading needles, 3 copper bracelets, 2 spiral copper earrings		a big stone closes the mouth of the bot. The pot is found on the wall of the chamber tomb used to close its door along with other small stones



TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez1 8	Extramural	pot burial	1		adult	bad condition	yes	a plate, oval rim jug, a bottle, U shaped cup, long sprouted pouring pot, wide rimmed bowl	yes	2 silver earrings, 2 silver rings, copper hoop, 2 bronze needles- 1 broken, 3 bronze spiral pin headed threading needles, 2 pin headed threading needles, an unidentified silver object, an eroded bronze cluster	sheep or goat bones	
2467- 1942 BC Early Bronze III	OYMez1 9	Extramural	pot burial	1		4.5	folded left arm and right arm over the knee. The knees are contracted	yes	plate, a wide mouthed pot, a tripod open mouth bowl, a jug with a	no			

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
									short zoomorphi c ram sprout at the mouth				
2467- 1942 BC Early Bronze III	OYMez2 0	Extramura 1	cooking vessel burial	1		3mos	In a squatted position	no					
2467- 1942 BC Early Bronze III	OYMez2 1	Extramura 1	cooking vessel burial	1		0-6mos	only a few craniofacia l bones	no					
2467- 1942 BC Early Bronze III	OYMez2 2	Extramura 1	cooking vessel burial	1		2.5-3	lying on its right side, only some leg bones preserved	yes	a bottle	no			
2467- 1942 BC Early Bronze III	OYMez2 3	Extramura 1	cooking vessel burial	1		3mos		yes	around the burial vessel, some other pot's body fragments	no			
2467- 1942 BC Early Bronze	OYMez2 4	Extramura 1	cooking vessel burial	1		0-6mos		yes	a plate, bottle	no			

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
Period III													
2467- 1942 BC Early Bronze Period III	OYMez2 5	Extramural 1	cooking vessel burial	1		6-9mos		yes	a cooking vessel/ bowl, U shaped cup	yes	a tube shaped bronze/copper bead	a female statuette / figurine, a stone tube bead, a stone wheel bead	
2467- 1942 BC Early Bronze Period III	OYMez2 6	Extramural 1	cooking vessel burial	1		sub-adult		yes	a bottle, 2 bowls	yes	a bronze ring		
2467- 1942 BC Early Bronze Period III	OYMez2 7	Extramural 1	cooking vessel burial	1		0-6mos		no					
2467- 1942 BC Early Bronze Period III	OYMez2 8	Extramural 1	cooking vessel burial	1		1-1.5	lying on its right side	yes	the bottom of a vessel with stumps	yes	2 bronze bracelets		
2467- 1942 BC Early	OYMez2 9	Extramural 1	cooking vessel burial	1		1.5		yes	fragments from a vessel, a conical	yes	2 bronze spatulas, a bronze threading		

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
Bronze III									cup, a wide rimmed jar		needle		
2467-1942 BC Early Bronze III	OYMez30	Extramural 1	cooking vessel burial	1		3-3.5		yes	a broken cup	yes	2 copper bracelets, a bronze pin headed threading needle		
2467-1942 BC Early Bronze III	OYMez31	Extramural 1	cooking vessel burial	1		2-3mos	lying on its right side	no					
2467-1942 BC Early Bronze III	OYMez32	Extramural 1	cooking vessel burial	1		3		yes	a long sprouted pouring jar	no		sheep or goat bones	
2467-1942 BC Early Bronze III	OYMez33	Extramural 1	cooking vessel burial	1		infant/sub-adult		no					
2467-1942 BC Early Bronze III	OYMez34	Extramural 1	cooking vessel burial	1		3.5-4	lying on its right side	yes	a plate, a U shaped cup, 2 wide rimmed pots,	yes	a pin headed needle - bronze?		
2467-1942	OYMez35	Extramural 1	cooking vessel	1		6mos		no					

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
BC Early Bronze III			burial										
2467- 1942 BC Early Bronze III	OYMez3 6	Extramura 1	cooking vessel burial	1		6mos		yes	a U shaped cup, perfume bottle	yes	bronze sewing needle, and a pin headed bronze needle		
2467- 1942 BC Early Bronze III	OYMez3 7	Extramura 1	pit burial	1	femal e	25-30	in a contracted position	yes	a plate, a bowl, bottle, and a conical cup	no			
2467- 1942 BC Early Bronze III	OYMez3 8	Extramura 1	pit burial	1				yes	a plate	no			
2467- 1942 BC Early Bronze III	OYMez3 9	Extramura 1	pit burial	1				yes	open rim pot	no			
2467- 1942 BC Early Bronze III	OYMez4 0	Extramura 1	pit burial	1		6mos		no					

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
2467- 1942 BC Early Bronze III	OYMez4 1	Extramura 1	pit burial	1				yes	a long based bowl, 2 open rimmed pots, a bowl	no			
2467- 1942 BC Early Bronze III	OYMez4 2	Extramura 1	pit burial	1		9mos	in a contracted position	yes		no		a necklace made from reddish and white stone beads and glass glaze beads	
2467- 1942 BC Early Bronze III	OYMez4 3	Extramura 1	pit burial	1		1	in a contracted position laid on the right side	yes	a tripod bowl	no		a necklace made from 24 red, 3 gray, 23 white, and 3 black colored tube shaped beads made	

TABLE A.6 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
												from stone, glass glaze, and slate	
2467- 1942 BC Early Bronze III	OYMez4 4	Extramura 1	pit burial	1		6	looks disturbed, and as if it a secondary burial	yes	an opened rimmed pot, a bowl	no		a glass glaze or bone bead	
2467- 1942 BC Early Bronze III	OYMez4 5	Extramura 1	pit burial	1		7-7.5	in a contracted position laid on the right side	no					
2467- 1942 BC Early Bronze III	OYMez4 6	Extramura 1	pit burial	1	male	25-30	in a contracted position	no					

TABLE A.7:  
LIST OF GRAVES AT CHARCHEMIS

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comment s
Chalcolithi c (older/ lower stratum)	#1	under house floor	pot	1		subadult	skull noted as present	no		no			
Chalcolithi c (older/ lower stratum)	#2	under house floor	pot	1		adult	2 large bones.(long? )	no		no			
Chalcolithi c (older/ lower stratum)	#3	under house floor	pot	1			skull noted as present	yes	a few frags.	no			
Chalcolithi c (older/ lower stratum)	#4	under house floor	pot	1		adult	skull noted as present	no	2 pots covering opening	no			
Chalcolithi c (older/ lower stratum)	#5	under house floor	pot	1			skull noted as present	yes	bowl of a champagn e cup	no			



TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
Chalcolithic (older/ lower stratum)	#6	under house floor	pot	1	male	adult	skull noted as present	yes	frags from another pot	no			
Chalcolithic (older/ lower stratum)	#7	under house floor	pot	1		subadult	skull noted as present	no		no			
Chalcolithic (older/ lower stratum)	#8	build in pebble house floor against inner wall	pot	1			skull noted as present	no		no			
Chalcolithic (older/ lower stratum)	#9	sealed with stones shallow grave pit /under house floor	pot	1		infant	crouched on the right	no	the bowl of champagne cup used as lid	no			
Chalcolithic (older/ lower stratum)	#10	under house floor	pod	1		adult	contracted on left side	no		no			
Chalcolithic (older/ lower stratum)	#11	under house floor	pot	1		infant	a few fragments on bottom of pot	yes	some fragments from another pot	no			

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
Chalcolithic (younger/ upper stratum)	#12	under house floor	pot	1			badly preserved	yes	small cup with lug ears, champagne vase bowl as lid,	no		beads of frit, crystal lentoid, and tubular with spiral	
Chalcolithic (younger/ upper stratum)	#13	under house floor	pot	1		adult	skull on top bones curled underneath	yes	small drinking pot, and a pot under a stone slab	no			clay basin in burial poy
Chalcolithic (younger/ upper stratum)	#14	under floor of later court- surrounded by rough stones foundation of court	pot	1	male	elderly adult	contracted on left side with right arm across body and left hand under cheek	yes	4 champagne vase pots with incised zigzag decoration under	no			
Chalcolithic (younger/ upper stratum)	#15	on rough stones of foundation walls	pot	1			only rib and clavicle bones	yes	bowl	yes	2 bracelets	2 mud spinning whorls, beads	

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
Chalcolithic (younger/ upper stratum)	#16	next to/under house wall foundations - surrounded by stone slabs	pot	1			on its left- badly preserved	yes	1 champagne cup, a bowl, a small rough made bottle, and a large rough red clayed pot with rope pattern prints	no		2 small spheroid blue- glazed frit beads	
Chalcolithic (younger/ upper stratum)	#17	next to/under house wall foundations - urn set in brick foundation	pot	1		child	head was on the east	yes	fragments from 3 champagne cups, decorated vase,	no		spheroid beads of glazed frit	body is sprinkled with lime
Chalcolithic (younger/ upper stratum)	#18	under house floor	pot					yes	bowl of a champagne cup used as lid, large urn, 2 small vases, vase of red clay	yes	bronze pin		
Chalcolithic (younger/ upper stratum)	#19	under house floor	pot					yes	urn with bowl of	no			

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
upper stratum)									champagne up used as lid.				
Chalcolithic (younger/ upper stratum)	#20	under house floor	pot					yes	red clay vase	no		charcoal in the vase, 5 goat horns	charcoal in the vase, 5 goat horns
EBA	#1	under house floor	stone lined cist grave	1		child	badly preserved, contracted on it's left	yes	4 champagne vases, bottle, a bowl	yes	2 bronze spears, 2 bronze pins with heads		
EBA	#2	under house floor	stone lined cist grave	1		child	contracted on it's left	yes	4 champagne vases, a stemmed bowl, a bowl, and a bottle	yes	bronze pin with zoomorphic loops, bronze pin with head, a bronze objects	crystal and carnelian ring beads, and spheroid beads from frit and crystal, cylinder- seal with handles	wood fragments under the burial
EBA	#3	under house floor	brick cut cist grave with one side stone lined					yes	18 champagne vases, 5 bowls, 2 pots, and a vase	no			grave plundered in antiquity
EBA	#4	under house	stone					yes	9	no			

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
		floor	lined cist grav e						champagn e vases				
EBA	#5	under house floor	cist grav e					yes	3 pots, 1 vase, 2 jars	no			
EBA	#6	under house floor	stone lined cist grav e	possibl y more than one			damaged, and cut antimortem	yes	26 champagn e cups	yes	4 bonze pins	beads of green paste	
EBA	#7	under house floor	stone lined cist grav e	3+			noted as "sacrificed"	yes	40 "pots"	yes	bronze: 3 pins, some nails, 1 axe, 2 daggers	string of beads and bead scatters- white ribbed tubular, and red and crystal spheroid	
EBA	#8	under house floor	stone lined cist grav e	2				yes	16 champagn e vases	yes	a "few" bronze pins		it is mentioned that the tomb is completely cleared, but in what sense is unclear
EBA	#9	under house floor	stone lined cist	1			good condition, the skull was	yes	a jug, a shallow basin, 58	yes	bronze: 2 axes, 4 spears, a	string of beads from green/whit	

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comments
			grav e				laid on a flat stone		champagn e vases		chisel, a dagger, and a few pins	e paste, string of beads from white stones, and one from red stones	
EBA	#10	under house floor	cist grav e					yes	19 vases, 2 champagn e vases,	yes	2 bronze pins	2 flint cores	note of a cist grave cutting into this one
EBA	#11	under house floor	stone lined cist grav e	1			skull crushed under fallen roof of grave	yes	3 champagn e vases	yes	a bronze pin	beads from ceramics and crystal	
EBA	#12	under house floor	cist grav e					yes	27 champagn e vases	yes	a bronze pin	bead necklace	
EBA	#13	under house floor	cist grav e					yes	4 champagn e cups, 2 reserved slip ware	yes	silver eyeleted pin bronzes: 4 pins, 2 daggers, mace-head, an unknown object, and 4 poker- spears	beads from gray and white steatite	
EBA	#14	under house floor	stone lined					yes	4 champagn	yes	bronzes: chisel, 2		maybe more but

TABLE A.7 (CONTINUED)

Date/ Time Period	Grav e	Location	Style	# of Indiv.	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramics	Metals ?	Metal Types	Other	Comment s
			cist grav e						e vases, 5 cups, 7 jars, 2 bowls with long base		daggers, 5 spears, 4 axes		only photos left
EBA	#15	under house floor	cist grav e					yes		yes	bronzes: 2 daggers and 2 spears and 1 poker- shaped spear		only 1 picture of the bronzes

TABLE A.8:  
LIST OF BURIALS AT TEPE GAWRA

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
5000BC Ubaid	7/80	intramural	simple inhumation wrapped in reed matting	1		Adult		yes	pained jar	no		palette, pendant, 2 marble bowls	not clear what the palette and pendant are made of
4900BC Ubaid	7/52	intramural	simple inhumation	1		Child	sharply contracted skeleton, hands on face	yes		no		string of beads	
4900BC Ubaid	7/62	intramural	simple inhumation	1		Adult	sharply contracted skeleton, hands on face	yes	painted bowl, painted jar	no		string of beads	
4900BC Ubaid	7/61	intramural	simple inhumation	1		Adult	sharply contracted skeleton, hands on face	yes		no		string of beads	



TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
4900BC Ubaid	7/66	intramural	?	2		Adult	infant lying on the right hand of the adult; adult is contracted with arms extended away from the body	yes	ceramic bowl, 2 painted jars	no		stamp seal, 2 marble bowls	
4900BC Ubaid	7/57	intramural	simple inhumation	1		Child	sharply contracted skeleton, hands on pelvis	yes		no		string of beads	
4800BC Ubaid 3a-b	7/37	intramural	simple inhumation	1		Infant		yes	rattle (probably ceramic)	no		animal figurine	
4300 BC Terminal Ubaid/ LC1	G36- 106	intramural	vessel burial/ pise burial	2		child, infant		yes		no		engraved bead	
4100BC Early LC2	167	intramural- public building	pit inhumation	1		Child		yes		yes	1 gold foil over bitumen ear ornament; gold ornament near left ear.	white beads; white beads on neck	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
4100BC Early LC3	238	intramural- temple/ fortress	pit inhumation	1		adolescent		yes		no		1 oolite mace head; bone bead spreader	
4100BC Early LC4	243	intramural- temple	pit inhumation	1		child		yes		no		511 small white ring beads; shell rind bead, 588 tiny white rind beads, 605 small obsidian ring beads, reed matting	
4100BC Early LC5	36- 006	intramural- street	vessel burial	1		infant		yes		no		186 white ring beads	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
4100BC Early LC6	36- 060	intramural- fortress/ temple	dried sunbrick chamber covered with libn brick	1		child		yes	small brown ware jar	no		3075 beads, 3300 ring beads, ivory rosette ornament, reed matting, yellow paste rosette pendant	beads at neck and wrist, jar is held over the head
4100BC Early LC7	36- 077	intramural- Round House	vessel burial	1		infant		yes		no		beads	
4100BC Early LC8	36- 082	intramural- Round House	vessel burial	1		infant		yes		no		4 beads	
4100BC Early LC9	36- 134	intramural- temple	dried sunbrick chamber covered with libn brick	1		adult		yes		no		white paste stamp seal	
4100BC Early LC10	36- 171	intramural	vessel burial	1		child		yes		no		bone pipe/ whistle	
4100BC Early LC11	7-026	intramural- administrative building	side wall burial	1		adult		yes		no		paste seal	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3900BC LC2	122	intramural	pit inhumation	1		infant		yes		no		blue cylinder bead	next to the face
3900BC LC3	127	intramural	pit inhumation	1		infant		yes		no		27 small white beads and 1 shell	
3900BC LC4	128	intramural	vessel burial	1		infant		yes		no		small white bead	
3900BC LC5	137	intramural	vessel burial	1		infant		yes		no		stone acorn	
3900BC LC6	138	intramural	pit inhumation	1		infant		yes		yes	gold disk	small white ring beads	
3900BC LC7	142	intramural	pit inhumation	1		adolescent		yes		yes	gold rosette	slate axe head, thousands of beads from lapis, carnelian, Blackstone, and white ring and carinated beads	gold object is near ear, so probably an ornament
3900BC LC8	144	intramural	pit inhumation	1		child		yes		no		mother of pearl necklace, decomposed orange/brown object near chest, white ring beads	
3900BC LC9	154	intramural	pit inhumation	1		child		yes		no		2 white stone beads	at neck
3900BC LC10	159	intramural	pit inhumation	1		infant		yes		no		miniature white beads	around wrists

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3900BC LC11	163	intramural	pit inhumation	1		child		yes		no		2 lapis ring beads, 2 turquoise pebble beads, buff pebble bead	2 of beads are on the head
3900BC LC12	180	intramural	dried sun brick chamber covered with libn brick	1		child		yes		no		large beads, lapis lazuli pendant, white stone bead,	
3900BC LC13	181	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		yes	gold rosette, gold disk, gold beads	2 alabaster objects, 2 spheres, and 3 hemispheres, 2 marble spheres, carnelian and shell beads	
3900BC LC14	193	intramural	vessel burial	1		infant		yes	undefined vessel	no		dentalia shell, 167 small white beads, 6 spherical beads, Plano convex bead	
3900BC LC15	221	intramural	side wall burial	1		adolescent		yes		no		obsidian blade	obsidian blade is associated with the ribs of the skeleton
3900BC	226	intramural	dried	1		infant		yes		no		thousands of	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
LC16			sunbrick chamber covered with libn brick									white paste ring and carinated beads, incised plano convex bead, rectangular blackstone bead, 2 carnelian ring beads, carnelian cylinder bead	
3900BC LC17	228	intramural	pit inhumation	1		child		yes		no		740 small white carinated ring and cylinder beads	
3900BC LC18	242	intramural	side wall burial	1		3 to 4		yes		no		25 white stone bead, 26 gray stone beads, 79 white ring beads, 19 obsidian ring beads, obsidian rough bead, 3 gray stone ring bead	some beads were around the waist and some around the wrist
3900BC LC19	266	intramural	pit inhumation	1		2 to 3		yes		yes	copper beads, gold earring	macehead, white and lapis beads	macehead held by the chest with hand, but not clear

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
													what the object is made of
3900BC LC20	315	intramural	vessel burial	1		infant		yes	ceramic dish	no		beads	
3900BC LC21	318	intramural	pit inhumation	1		infant		yes		no		small acorn from stone	
3900BC LC22	36- 027	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		white paste and carnelian beads, 2 white ring beads, 960 cowrie shells	
3900BC LC23	36- 041	intramural	vessel burial	1		infant		yes		no		12 beads	
3900BC LC24	36- 088	intramural	vessel burial	1		infant		yes	ceramic vessel	no		beads	
3900BC LC25	36- 100	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		paste beads	beads in hand
3900BC LC26	36- 104	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes	painted and smoothed green are pot, brown slipped gray ware pot	no		1 bead	
3900BC LC27	36- 110	intramural	dried sunbrick	1		adult		yes	small jar	no		blackish steatite stamp	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
			chamber covered with libn brick									seal	
3900BC LC28	36- 129	intramural	vessel burial	1		adult		yes	gray slipped brown pot	no		black stamp seal	
3900BC LC29	36- 135	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes	gray vessel	yes	copper double spiral pendant	obsidian discoid pendant,	
3900BC LC30	36- 137	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		paste ring beads	at waist
3900BC LC31	36- 144	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		650 white paste beads near arm	
3900BC LC32	36- 168	intramural	pit inhumation	1		infant		yes		no		tiny beads	
3800BC LC2	113	intramural	pit inhumation	2		child		yes		no		100 small white and yellow beads; 1 black stone	



TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
												bead	
3800BC LC3	100	intramural- under wall	vessel burial	1		infant		yes		no		1 green stone pendant, 1 tiny white paste bead	
3800BC LC4	102	intramural- vicinity of shrine complex	dried sunbrick chamber covered with libn brick	1		adolescent		yes	red ware bowl	no		obsidian spouted pot; obsidian spouted bowl; marble macehead; 7 marble spheres; 2 marble discs; 3 marble stones; 204 shell ring beads; 56 carnelian and carinated ring beads; 24067 white ring beads; 1125 obsidian ring beads	
3800BC LC5	107	intramural- floor of shrine room	dried sunbrick chamber covered with libn brick	1		adult		yes		no		6 alabaster spheres	
3800BC LC6	108	intramural- tripartite building	dried sunbrick chamber	1		child		yes		no		carnelian bead; turquoise	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
			covered with libn brick									bead	
3800BC LC7	109	intramural- temple floor	dried sunbrick chamber covered with libn brick	1		adult		yes		yes	gold ribbon- rosette ornament; 4 gold rosette ornaments; 50 gold studs; 6 gold ornaments; gold ferrule; 20 gold crescent ornaments; 3 gold and lapis eye shape ornaments; 90 gold bangles; 125 gold beads; 34 large electrum beads; 76 small electrum beads; 2 electrum spherical	marble jar; oolite bowl; alabaster bowl; 21 turquoise beads; 366 lapis beads; 1 lapis stamp seal; large lapis carved bead; 15 various shaped lapis beads; 432 carnelian beads, 390 turquoise beads; 3 white carinated beads; 5 carnelian ring beads; 11 carnelian carinated beads; 52 lapis ring beads; 3 lapis carinated beads; 5 lapis cylinder beads; 3 lapis	traces of blue pigment on head, chest and forearms.

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
											beads; 2 gold beads; 9 electrum beads; 1 gold and lapis fly figurine; a bone, gold, lapis and turquoise hair ornament.	irregular beads; 5 turquoise carinated beads; 5 turquoise teardrop beads; 2 turquoise flat square beads; 23 turquoise natural pebble beads; carnelian beads; 28 lapis beads; 24 turquoise beads; 2 obsidian blades; a ceramic object; bone comb; 145 shell beads; ceramic sphere	
3800BC LC8	110	intramural	dried sunbrick chamber covered with libn brick	1		adolescent		yes		yes	5 gold rosette ornaments; gold ribbon-rosette ornament; 18 gold cylindrical	2 eye ornaments; lapis stamp seal, 6 brown marble spheres, 2 marble mace heads, 2 serpentine	traces of blue and green pigment on chest and femora

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
											bead;	cups, 2stone beads, 198 carnelian spherical beads, 3 lapis beads	
3800BC LC9	111A	intramural- temple	dried sunbrick chamber covered with libn brick	3		adult		yes	ceramic jar	yes	gold hoof pendant; gold spatula pendant; gold spiral ornament	stone bead; 19 carnelian; 2 lapis beads; 40 turquoise beads;	only this of the 3 adults had these internments
3800BC LC10	114	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes		yes	electrum wolf head figurine; stone with gold band honing stone; bone with gold band hair ornament; 64 gold beads; gold rosette ornament with lapis center	hematite mace head; alabaster macehead, 6 red jasper stones; 3 bone ornaments; lapis stamp seal, 45 shell beads, 88 carnelian beads, 282 lapis beads, 399 turquoise beads	Red jasper stones placed near the northwest wall of the tomb and arranged in rows of three
3800BC LC11	177	intramural- temple	pit inhumation	1		child		yes		no		35 stone beads found at the pelvis	
3800BC LC12	202	intramural- tripartite	Cist burial with stone	1		child		yes		no		354 small white ring	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
		building	cover									beads; 62 small white carinated beads; 22 obsidian carinated beads; turquoise natural pebble bead	
3800BC LC13	208	intramural- tripartite building	side wall burial	1		child		yes		no		1084 white ring beads; 2 black stone ring beads; 2 obsidian ring beads; 2 carnelian ring bead; 24 dentalia shells. Cylindrical and medium sized beads formed a bracelet and tiny white beads formed a necklace. 3 carnelian beads at the chin and a number of beads at the knees.	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3800BC LC14	256	intramural- north central houses	pit inhumation	1		child		yes		no		985 tiny white paste carinated beads; 4 small black stone ring beads; 346 tiny brown paste barrel beads.	Found at hands and knees.
3800BC LC15	269	intramural- north central houses	vessel burial	1		infant		yes	ceramic dish	no		38 white stone ring beads; 7 obsidian ring beads; 54 grey stone ring beads	
3800BC LC16	36- 013	intramural	dried sunbrick chamber covered with libn brick	1		adolescent		yes		no		mother of pearl triangular pendant; a bead	
3800BC LC17	36- 016	intramural	pit inhumation	1		child		yes		no		56 white paste ring beads	around the neck
3800BC LC18	36- 020	intramural	pit inhumation	1		child		yes		yes	gold bead	black stone, carnelian, white stone bead	
3800BC LC19	36- 026	intramural	cist burial lined with stone	1		child		yes		no		reed matting, marble bead	
3800BC	36-	intramural-	dried	1		child		yes		no		white and	around the

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
LC20	034	room of temple building	sunbrick chamber covered with libn brick									black paste, obsidian, carnelian, dentalia shell, and gray stone beads, in the thousands	neck, fingers, waist, and wrists
3800BC LC21	36- 040	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		177 beads from brown paste, dentalia shell , and white stone?	around wrist
3800BC LC22	7-009	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		4 small white paste beads	
3700BC LC3	1	intramural	pit inhumation	1		infant		yes		no		4 white paste beads	
3700BC LC4	2	intramural	cist burial	1		child		yes	jar spout	yes	traces of copper oxide on bones, but not clear where	lapis, limestone, and carnelian beads, black and white beads strung into strings	
3700BC LC5	4	intramural	pit inhumation	1		infant		yes		no		beads	
3700BC LC6	5	intramural	pit inhumation	1		infant		yes		no		shell barrel, ring , pink stone, and	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
												obsidian beads	
3700BC LC7	10	intramural	pit inhumation	1		infant		yes		no		100s of beads: white ring, white shell ring, white shell barrel, black stone ring, carnelian ring, turquoise ring	
3700BC LC8	11	intramural	pit inhumation	1		infant		yes		no		white stone ring, white shell ring, black stone ring, black stone wheel, carnelian flat, turquoise, crystal ring, and shell fluted beads, rose quartz pendant	
3700BC LC9	12	intramural	pit inhumation	1		infant		yes		yes	3 gold plated bitumen ornaments, 4 gold beads, a lump of iron	100s of beads: white, turquoise ring, lapis, black stone, white paste, carnelian; turquoise pendant, 2	



TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
												lapis bird figurines, and carnelian pendant	
3700BC LC10	13	intramural	pit inhumation	1		infant		yes		yes	3 gold ornaments	100s of beads: white stone ring, white shell ring, black stone ring, black stone wheel, carnelian flat, turquoise, crystal ring, and shell barrel, white shell spherical, green stone ring, gray stone, carnelian ring, turquoise ring, turquoise triangular, red and white variegated ring, white spherical, amethyst irregular, cowrie shell	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3700BC LC11	14	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		8 white ring beads, 2 shell barrel beads, 530 black stone ring beads, carnelian carinated bead	
3700BC LC12	16	intramural	pit inhumation	1		infant		yes		no		white ring beads, black stone ring beads, small brown paste barrel beads, and 23 dentalia shells	
3700BC LC13	24	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes		yes	1 bone comb with blue pigment (from copper/ bronze), traces of blue/green pigment on chest, hair ornament made from gold, bone, lapis, and turquoise	oolite ointment jar	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
3700BC LC14	25A & B	intramural	dried sunbrick chamber covered with libn brick	2		adults		yes	slipped ware jar	yes	gold discoid pendant	turquoise pendant	
3700BC LC15	29A & B	intramural	dried sunbrick chamber covered with libn brick	2		adolescent, adult		yes		yes	adolescent: gold ribbon rosette ornament, gold rosette, red and blue/green pigment on chest	bone hemisphere button, obsidian blade, limestone footed mortar,	all grave finds associated with youth
3700BC LC16	30A & B	intramural	dried sunbrick chamber covered with libn brick	2		adult, child		yes		yes	adult; green/blue pigment around head		
3700BC LC17	31	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes		yes	16 gold spherical beads, gold-foil ribbon rosette ornament, 11 gold over bitumen core hemisphere	256 beads, 2 crystal beads, 32 white shell beads, 57 carnelian beads, 29 lapis beads, 120 turquoise beads, alabaster ointment vase, bone	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
											studs, traces of green pigment on chest, animal bones with traces of green pigment, remains of gold foil found on the nose of the skull	zigzag hair ornament, translucent serpentine ointment dish, oolite ointment vessel, ivory or bone plaque seal, Mosul marble double ointment dish, carnelian pendant, 2 Mosul marble eye or hut idol, and 2 bone combs	
3700BC LC18	34	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes		no		carnelian carinated bead, 2 large shell beads, black stone ring bead, carnelian ring bead, 2 small lapis ring beads, 2 turquoise ring beads, bone spatula, bone comb,	grave likely robbed

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
												limestone macehead	
3700BC LC19	37	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		yes	2 copper pins	white shell ring bead, white shell barrel bead, 4 white shell spherical beads, 8 Blackstone ring beads, Blackstone spherical bead	
3700BC LC20	45	intramural	dried sunbrick chamber covered with libn brick	1		?		yes		no		green serpentine bowl, marble lugged jar, alabaster globular jar	grave likely robbed
3700BC LC21	46	intramural	dried sunbrick chamber covered with libn brick	1		adult		yes		yes	1 gold foil rosette ornament, gold bead, traces of blue pigment on head	6 shell ring, 48 green stone ring, 28 blue stone ring beads, 8 rose quartz ring beads, stone frog bead	grave likely robbed
3700BC LC22	47	intramural	dried sunbrick chamber covered with libn	1		child		yes		yes	gold head band around the head, bronze	21 carnelian carinated beads, 2 lapis beads, 26 green stone	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
			brick								beads, 15 gold spherical beads	beads, blue stone bead,	
3700BC LC23	52	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		ceramic ballista	
3700BC LC24	60	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		carnelian bead, 2 green stone bead, barley in the hands and feet of the infant	
3700BC LC25	61	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		Blackstone beads, tiny white beads	on the chest
3700BC LC26	62	intramural	dried sunbrick chamber covered with libn brick	1		child		yes		no		Wheat	disturbed
3700BC LC27	203	intramural	simple inhumation in pit	1		child		yes		no		white stone beads, carnelian bead bracelet	
3700BC	209	intramural	dried	1		child		yes		no		14 white ring	beads

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
LC28			sunbrick chamber covered with libn brick									beads, 381 black stone beads, 3 small carnelian yellow beads, 40 dentalia shells	found on the top of the skeleton's head
3700BC LC29	212	intramural	pit inhumation	1		child		yes		no		30 shell cylinder beads, 90 black stone ring beads, 79 quartz ring beads	30 shell cylinder beads, 90 black stone ring beads, 79 quartz ring beads
3700BC LC30	213	intramural	cist burial	1		child		yes		no		18 white ring beads	
3700BC LC31	214	intramural	vessel burial	1		infant		yes		no		282 white carnelian, white carinated, 3 white barrel, 107 obsidian ring, 114 gray stone ring, gray stone barrel, and 18 dentalia shells	
3700BC LC32	36- 036	intramural	dried sunbrick chamber covered	1		infant		yes		no		white limestone cylinder, Blackstone,	

TABLE A.8 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv.	Sex	Age(yrs/mos)	Osteo findings	Artifacts?	Ceramics	Metals?	Metal Types	Other	Comments
			with libn brick									carnelian, jadeite, white marble, and pinkstone beads, and blackstone pendant	
3700BC LC33	A	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		shell beads, blackstone beads, carnelian beads	
3700BC LC34	AAI	intramural	vessel burial	1		infant		yes		no		obsidian blade	
3700BC LC35	AAII	intramural	vessel burial	1		infant		yes		yes	copper fragment	ceramic spindle whorl	
3700BC LC36	B	intramural	dried sunbrick chamber covered with libn brick	1		?		yes		no		alabaster jar	
3700BC LC37	?	intramural	dried sunbrick chamber covered with libn brick	1		infant		yes		no		lapis acorn bead, lapis animal head, lapis square bead, crystal ring bead	



TABLE A.9:  
LIST OF BURIALS AT TELL EL KERKH

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
6400B C Proto- Hassun a	Locus 145	intramural- associated with a structure	inhumatio n	1		0-6 mos		no					
6400B C Proto- Hassun a	concentratio n 1	extramurall - associated with a lime block	multiple burial	7									
6400B C Proto- Hassun a	concentratio n 1(1)		inhumatio n		mal e	30	flexed skeleton on the left side, with head rested on stone pillow	yes	dark faced burnished jar	no			
6400B C Proto- Hassun a	concentratio n 1(2)		skull burial			adult	Skull						

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
6400B C Proto- Hassun a	concentration 1(3)		skull burial			adult	Skull						
6400B C Proto- Hassun a	concentration 1(4)		skull burial			adolescent	Skull						
6400B C Proto- Hassun a	concentration 1(5)		skull burial			adolescent	Skull						
6400B C Proto- Hassun a	concentration 1(6)		skull burial			adolescent	Skull						
6400B C Proto- Hassun a	concentration 1(7)		skull burial			child	Skull						
6400B C Proto- Hassun a	concentration 2	extramural- square pit surrounded by stone rows	multiple burials	7-8									

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
6400B C Proto- Hassun a	concentration 2(1)		inhumation surrounded by stone rows		male	late 20's	skeleton on its back, legs folded on the left	yes		no		agate beads near hand	
6400B C Proto- Hassun a	concentration 2(2-7/8)		inhumation surrounded by stone rows	6 to 7									not described
6400B C Proto- Hassun a	Locus 141	intramural- associated with a structure	multiple burial	2									
6400B C Proto- Hassun a	Locus 141(1)		inhumation			0-5 mos		no					
6400B C Proto- Hassun a	Locus 141(2)		inhumation			0-5 mos		no					
6400B C Proto- Hassun a	Locus 142	intramural- associated with a structure	inhumation	1		0-5 mos	Fragmented						

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
6400B C Proto- Hassun a	Locus 153	intramural- under the floor of a building	inhumatio n in pit walls lined with pebbles, paved with large flat stones	1		0-5 mos	Complete	yes		no		amuq type of flint point on the corpse	top of pit full of animal bone fragments
6400B C Proto- Hassun a	Locus 155	intramural- under house floor	inhumatio n	1		0-6 mos	Fragmente d	no					
6400B C Proto- Hassun a	Locus 166	intramural- under house floor	inhumatio n	1		0-6 mos	Fragmente d	no					
6400B C Proto- Hassun a	Locus 44	intramural- associated with a structure	inhumatio n	1		young adult	skeleton without a skull	no					
6400B C Proto- Hassun a	Locus 45	intramural- associated with a structure	inhumatio n	1		18-24 mos	only a few crania and rib fragments	no					
6400B C Proto- Hassun a	Locus 48	intramural- associated with a structure	inhumatio n	1		9 mos	mostly complete	no					
6400B	Locus 76	intramural-	multiple	2									

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
C Proto- Hassun a		associated with a structure	burial										
6400B C Proto- Hassun a	Locus 76(1)		inhumatio n			infant	fragmentar y skeleton	no					
6400B C Proto- Hassun a	Locus 76(2)		inhumatio n			infant	an extra scapula	no					
6400B C Proto- Hassun a	Str. 712	extramural	inhumatio n above a pebble lined pit	1	F	20's		yes		no		2 lithic blades	
6400B C Proto- Hassun a	Str. 715	extramural	inhumatio n	1	M	40's	contracted, hands to face	yes		no		limestone vessel, conch shell bead, flint blade	
6400B C Proto- Hassun a	Str. 725	extramural	inhumatio n in pit	1	F	20	flexed skeleton on its back, holding left elbow with right hand. Legs folded left	no					
6400B C	Str. 726	extramural	inhumatio n in pit	1		1-2	flexed skeleton on	no					

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
Proto-Hassuna							its right						
6400B C Proto-Hassuna	Str. 729-1	extramural	inhumation in pit	1	F	20	skeleton on its back, legs folded on the stomach	yes		no		serpentine stamp seal, flint blade	
6400B C Proto-Hassuna	Str. 729-2	extramural	inhumation in pit	1		child		no					
6400B C Proto-Hassuna	Str. 729-3	extramural	inhumation in pit	1		child		no					
6400B C Proto-Hassuna	Str. 732	extramural	inhumation in pit	1	F	20	skeleton prone on the right, legs folded, lying face down	yes		no		a large wild cattle metacarpal	the metacarpal is held by the skeleton
6400B C Proto-Hassuna	Str. 739	extramural	inhumation in pit	1	M	40	flexed skeleton on its right, head resting on arm	yes		no		7 beads	
6400B C Proto-Hassuna	Str. 746	extramural	cremation burial	1		child	burnt skull and humerus, along with	no					

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
a							a heap of very fragmented burn bones						
6400B C Proto- Hassun a	Str. 748	extramural	multiple burial	2									
6400B C Proto- Hassun a	Str. 748(1)		inhumatio n			6-12 mos		no					
6400B C Proto- Hassun a	Str.748(2)		inhumatio n			20	skeleton is prone, legs folded in front of chest, head faces down, cradling the infant	no					
6400B C Proto- Hassun a	Str. 751	extramural	inhumatio n in pit	1		5-6	badly preserved	yes		no		turquoise and serpentine bead, limestone stamp seal	
6400B C Proto- Hassun a	Str. 757	extramural	inhumatio n in pit	1		7-8	skeleton is flexed, on the right. Legs are folded to	yes		no		bone awl	

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
							the abdomen						
5800B C	?	Intramural- outside of stone foundations	inhumatio n	1		infant	contracted	no					
5800B C	?	intramural- outside of stone foundations	inhumatio n	1		infant	contracted	no					
5800B C	?	intramural- related to stone foundation area	inhumatio n	1		infant	contracted	no					
5800B C	?	intramural- related to stone foundation area	inhumatio n	1		infant		no					not described
5800B C	Locus 19	intramural	vessel burial	1		0-5 mos	skull, long bones, mandible, rib, vertebrae fragments	no					
5800B C	Locus 22-1	intramural	cremation burial in pit	1		infant	only a few burnt bones	yes	shallow bowl and a hole mouthed jar	no			found in a "ritual pit" which had bones, vessel fragments, and the pits were



TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
													filled with carbonized ash
5800B C	Locus 22-2	intramural	vessel burial	1		2 yrs	a few bone fragments including cranial	no					
5800B C	Locus 223	intramural	inhumatio n	1		9 mos	fragmented	no					
5800B C	Locus 226	intramural	inhumatio n	1		0-6 mos	post cranial fragments	no					
5800B C	Locus 23	intramural	inhumatio n	1		9-12 mos	cranial, rib, left tibia and ulna, mandibular fragments	yes	small vessel				
5800B C	Locus 246	intramural	inhumatio n	1		adult	skeleton placed on its back	no					
5800B C	Locus 29	intramural	inhumatio n	1	mal e	adult	very contracted- knees to head and very poorly preserved	no					
5800B C	Locus 331	intramural, near a stone foundation	inhumatio n	1		infant	contracted	yes	large fragment of dark burnished ware covering the body, small dark	no		113 small flat stone beads made from mostly serpentine , and 6 small turquoise	

TABLE A.9 (CONTINUED)

Date/ Time Period	Grave	Location	Style	# of Indiv .	Sex	Age(yrs/mos )	Osteo findings	Artifacts ?	Ceramic s	Metals ?	Metal Type s	Other	Comments
									faced burnished bowl			sphere beads	
5800B C	Locus 35	Intramural	inhumatio n	1		9 mos	very fragmented and poorly preserved	no					
5800B C	Locus 60	Intramural	inhumatio n	1		adolescent/ young adult	fragmentar y skeleton with no cranial remains	no					

APPENDIX B:  
CORTICAL BONE DATA

The data in the following table intends to present the measurements that were used in the statistical tests in chapter 7, and the resulting analysis. Every table here lists cortical bone length, and measurements for cortical thickness or density, while listing the burial details.

TABLE B.1

## CORTICAL BONE THICKNESS- TITRIŞ HÖYÜK FEMORA

Bone #	Grave #	L/R	Sex	Age	Period	Scan #	L	A25T	P25T	M25T	L25T	A50T	P50T	M50T	L50T	A75T	P75T	M75T	L75T
1f	651x	R femur	m	adult	EBA III	Scan 1	215	0.6	0.5	0.9	1	0.7	1	0.8	0.9	0.4	0.49	0.41	0.5
2f	93x	L femur	m	adult	EBA II	Scan 1	198	0.5	0.8	1	1	0.9	1	1	0.8	0.5	0.36	0.55	0.4
3f	93x	R femur	m	adult	EBA II	Scan 1	186	0.5	0.6	0.7	1	0.6	1	0.6	0.7	0.4	0.5	0.35	0.5
4f	96001	R femur	m	35-40	EBA II	Scan 1	231	0.4	0.5	0.4	0	0.6	1	0.6	0.9	0.4	0.44	0.39	0.4
5f	80090	R femur	x	adult	EBA III	Scan 1	.	.	.	.	.	.	.	.	.	0.4	0.53	0.43	0.3
6f	80090	L femur	x	Adult	EBA III	Scan 2	185	0.6	0.6	0.8	1	0.5	1	0.5	0.6	0.4	0.38	0.37	0.4
7f	80090	L femur	x	adult	EBA III	Scan 2	207	0.6	0.7	0.8	1	0.7	1	0.7	0.7	0.5	0.6	0.35	0.4
8f	80090	R femur	x	adult	EBA III	Scan 2	.	0.4	0.6	0.8	1	0.5	1	0.8	0.7	.	.	.	.
9f	80090	R femur	x	adult	EBA III	Scan 2	223	0.5	0.7	0.9	1	0.7	1	0.8	0.7	0.4	0.4	0.3	0.3
10f	80090	R femur	x	adult	EBA III	Scan 2	193	0.6	0.5	0.8	1	0.7	1	0.9	0.9	0.5	0.49	0.52	0.4
11f	81008	R femur	f	33-46	EBA II	Scan 3	213	0.4	0.4	0.4	0	0.5	1	0.6	0.5	0.4	0.45	0.43	0.3
12f	5271	R femur	f	38-42	EBA II	Scan 3	.	0.4	0.2	0.6	0	0.4	0	0.7	0.5	.	.	.	.
13f	5271	L femur	f	38-43	EBA II	Scan 3	.	.	.	.	.	0.3	0	0.7	0.6	0.2	0.41	0.3	0.3
14f	63202	L femur	m	adult	EBA III	Scan 3	.	.	.	.	.	0.5	1	0.8	0.5	.	.	.	.
15f	840	R femur	f	y adult	EBA III	Scan 3	196	0.4	0.4	0.6	1	0.4	1	0.5	0.6	0.4	0.4	0.56	0.5

TABLE B.2:  
CORTICAL BONE DENSITY- TITRIŞ HÖYÜK FEMORA

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1f	651x	1795	1321.1	1639.13	1671.86	1761.6	1430.38	1413.88	1595.4	1627	1247.3	1545.13	1447.88
2f	93x	1649	1768	1908.86	1703.75	1836.8	1960.2	1789.63	1987.8	1456	1877.6	2048.13	1772.13
3f	93x	1402	1786.4	2068.78	2120.22	1645.4	1307.33	1717.13	1671.3	1453	1287.7	1672	1868.86
4f	96001	1577	1838	1516.63	1847.88	1999.4	2004.13	1999.71	1658.8	1887	1799	2093	1975
5f	80090	.	.	.	.	.	.	.	.	1306	1047.4	1029.38	1082
6f	80090	850.6	840.2	624.22	765.5	1165.7	990.38	1015.75	906.67	935.4	1156	828.89	1179.56
7f	80090	1040	878.44	705.38	841.67	1256	1075.5	1025.33	1269.8	1014	965.89	1022.44	1181.75
8f	80090	1244	1046.8	1378.63	1293.92	1609.1	770.33	1261	1462.1	.	.	.	.
9f	80090	1213	1069.9	1076.33	1269.22	1315.7	696.33	1340.44	1213	1238	1172.3	965.33	1053.11
10f	80090	1200	822.75	927.11	854.25	1120.3	1104	1043.11	885.8	1259	827.33	1087.33	1140.78
11f	81008	556.3	929	818.22	942.89	751.88	962.3	830.5	498.22	930.1	621.88	782.56	561.89
12f	5271	234.8	317.63	439.38	726.33	681.9	362.56	424.5	464.33	.	.	.	.
13f	5271	.	.	.	.	595.09	509.22	908.44	923.2	1018	868.63	903.1	1009.89
14f	63202	.	.	.	.	905.33	857	884.89	994.11	.	.	.	.
15f	840	1091	1012.5	1113.88	1096.78	862.8	996.78	1184.11	1057.7	1240	1092.9	1056.67	757.08

TABLE B.3:  
CORTICAL BONE THICKNESS- TITRIŞ HÖYÜK HUMERİ

Bone #	Grav e #	L/R	Sex	Age	Perio d	Scan #	L	A25T	P25T	M25 T	L25T	A50T	P50T	M50 T	L50T	A75T	P75T	M75 T	L75T
1h	65166	L humerus	m	older adult	EBA III	Scan 1	.	.	.	.	.	0.54	0.6	0.65	0.55	0.66	0.47	0.6	0.56
2h	96001	R humerus	m	35-40	EBA II	Scan 1	185.6	0.25	0.3	0.23	0.3	0.57	0.6	0.69	0.46	0.56	0.49	0.64	0.5
3h	5271	R humerus	f	38-42	EBA II	Scan 1	145.4	0.11	0.16	0.21	0.2	0.17	0.1	0.28	0.21	0.21	0.13	0.25	0.19
4h	5520	R humerus	m	41-50	EBA I	Scan 1	174.2	0.19	0.16	0.23	0.2	0.41	0.4	0.33	0.47	0.46	0.45	0.51	0.45
5h	65x	R humerus	x	adult	EBA III	Scan 1	162.9	0.33	0.34	0.39	0.4	0.6	0.6	0.55	0.75	0.7	0.56	0.64	0.66
6h	65165	R humerus	f	40-45	EBA III	Scan 2	.	.	.	.	.	.	.	.	.	0.73	0.55	0.55	0.57
7h	80071	R humerus	x	adult	EBA III	Scan 2	.	.	.	.	.	.	.	.	.	0.53	0.64	0.52	0.61
8h	80071	R humerus	x	adult	EBA III	Scan 2	.	0.28	0.22	0.16	0.2	0.28	0.4	0.46	0.37	.	.	.	.
9h	80071	R humerus	x	adult	EBA III	Scan 2	.	.	.	.	.	0.38	0.3	0.41	0.31	0.41	0.32	0.38	0.6
10h	80071	R humerus	x	adult	EBA III	Scan 2	.	.	.	.	.	.	.	.	.	0.64	0.39	0.58	0.48
11h	80071	R humerus	x	adult	EBA III	Scan 3	.	.	.	.	.	0.64	0.6	0.61	0.58	0.63	0.49	0.69	0.52
12h	80071	L humerus	x	adult	EBA III	Scan 3	.	.	.	.	.	0.65	0.6	0.63	0.54	0.6	0.56	0.52	0.57

TABLE B.3 (CONTINUED)

Bone #	Grave #	L/R	Sex	Age	Period	Scan #	L	A25T	P25T	M25T	L25T	A50T	P50T	M50T	L50T	A75T	P75T	M75T	L75T
13h	80071	L humerus	x	adult	EBA III	Scan 3	.	.	.	.	.	0.32	0.5	0.46	0.44	0.53	0.4	0.44	0.4
14h	80071	L humerus	x	adult	EBA III	Scan 3	.	.	.	.	.	0.54	0.5	0.45	0.57	0.7	0.45	0.56	0.61
15h	80071	L humerus	x	adult	EBA III	Scan 3	.	0.35	0.29	0.45	0.3	0.51	0.5	0.46	0.48	0.42	0.34	0.29	0.46

TABLE B.4:  
CORTICAL BONE DENSITY- TITRIŞ HÖYÜK HUMERİ

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1h	65166	.	.	.		473	750.25	733.75	788.75	665.5	354.25	316.33	585
2h	96001	1033.75	627.5	640	402.33	929.8	945.67	799.75	704.5	1069.33	618.75	787.75	536
3h	5271	173.25	217	760.25	512	341.5	365.5	912	430	508	485.33	802.25	436.25
4h	5520	368.33	634.25	830.25	717	913	753	698.5	866	483	1021.67	572.33	929.5
5h	65x	806	348	535	374	573	309.67	763.25	477	707.67	359.67	264.25	322.33
6h	65165	.	.	.	.	.	.	.	.	976.86	564	827.43	648.5
7h	80071	.	.	.	.	.	.	.	.	831	856.6	692.75	533.83
8h	80071	732.67	480.67	514.5	614.67	906.5	508.75	837.83	608.5	.	.	.	.
9h	80071	.	.	.	.	833.67	714	813.5	745	1121.33	758.75	664	785
10h	80071	.	.	.	.	.	.	.	.	962.17	816.2	829.67	814
11h	80071	.	.	.	.	2354.25	1627.5	1526	1964	1965.4	1800.5	1447.5	2439.75
12h	80071	.	.	.	.	2120.8	1267.25	1641	1947.75	2159.67	1788.75	2305.75	1710.75
13h	80071	.	.	.	.	1755	1600	1471	1895.75	1745	1942.33	1891.33	1901.75
14h	80071	.	.	.	.	1701.33	1715.33	1777.33	1486.75	2096.33	1380.75	1727.67	1311.5
15h	80071	1668.75	1185.5	1037.17	1260.25	1522.75	1584.5	1319	1501.67	1423.25	1798.25	1477.25	1472.5



TABLE B.5:  
CORTICAL BONE THICKNESS- BAKLA TEPE FEMORA

Bone #	Grave #	L/R	Sex	Age	Period	Scan #	L	A25T	P25T	M25T	L25T	A50T	P50T	M50T	L50T	A75T	P75T	M75T	L75T
1f	G107/3	R femur	m	m adult	EBA I	Scan 1	221.9	0.57	0.62	0.6	0.6	0.7	0.89	0.82	0.8	0.57	0.65	0.8	0.45
2f	G118	R femur	f	m adult	EBA I	Scan 1	172.5	0.3	0.52	0.77	0.63	0.5	0.56	0.51	0.5	0.37	0.42	0.32	0.34
3f	G113/1	R femur	f	y adult	EBA I	Scan 1	200.2	0.45	0.43	0.39	0.59	0.5	0.76	0.62	0.7	0.33	0.4	0.46	0.42
4f	G40/1	R femur	m	m adult	EBA I	Scan 1	.	.	.	.	.	0.5	0.45	0.68	0.8	0.37	0.46	0.49	0.51
5f	G106	R femur	f	m adult	EBA I	Scan 2	165.5	0.26	0.56	0.37	0.44	0.4	0.79	0.58	0.7	0.43	0.49	0.72	0.74
6f	G24	R femur	m	y adult	EBA I	Scan 2	185.6	0.48	0.68	0.61	0.74	0.5	0.72	0.74	0.6	0.38	0.58	0.49	0.48
7f	G266/1	R femur	f	m adult	EBA II/III	Scan 2	153	0.51	0.6	0.62	0.76	0.5	0.61	0.55	0.9	0.45	0.54	0.63	0.68
8f	G231/1	R femur	f	m adult	EBA II end	Scan 2	176.9	0.35	0.38	0.52	0.49	0.4	0.5	0.5	0.7	0.28	0.35	0.43	0.43
9f	G319/1	R femur	f	y adult	EBA II/III	Scan 3	231.1	0.4	0.51	0.74	0.6	0.5	0.74	0.75	0.7	0.3	0.43	0.3	0.33
10f	G305/4	R femur	m	adult	EBA II end	Scan 3	200.7	0.3	0.45	0.77	0.59	0.4	0.69	0.77	0.7	0.32	0.42	0.56	0.31
11f	G243/3	R femur	m	m adult	EBA II end	Scan 3	202.9	0.47	0.56	0.56	0.45	0.5	0.51	0.63	0.7	0.36	0.59	0.42	0.61
12f	G305/2	R femur	m	adult	EBA II/III	Scan 3	211.6	0.42	0.6	0.87	0.92	0.4	0.99	0.93	0.8	0.33	0.38	0.29	0.32

TABLE B.6:  
CORTICAL BONE DENSITY- BAKLA TEPE FEMORA

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1f	G107/3	941.33	#	962.25	580.58	967	720.25	880.5	656	1063	767	782.3	619
2f	G118	1016.25	#	1106.9	736.73	1019	936.17	906.2	929	1229	696	1099	895
3f	G113/1	1216.18	#	1213.8	1037.15	1296	1105.92	1334	1140	1261	967	1345	1084
4f	G40/1	.	.	.	.	1075	1086.25	1238	1046	1096	1202	1056	879
5f	G106	1109.71	#	778.57	610.57	930	871.13	791.9	958	721	871	836.1	623
6f	G24	1297	#	1130.3	1134.5	1503	1182.71	1225	1210	1583	969	1428	835
7f	G266/1	777	#	1348.8	817.38	1097	847.57	1291	681	1398	831	1200	957
8f	G231/1	929.86	#	918.83	711.86	953	913.5	694.1	743	1084	1067	829.6	751
9f	G319/1	1006	#	800.5	634	993	1032.63	1170	991	905	908	1022	705
10f	G305/4	684.22	#	963.56	839.88	703	794.43	938.4	673	1162	747	902.5	871
11f	G243/3	1043.57	#	1130.5	979.5	1134	979.63	1176	881	.	1243	1433	1386
12f	G305/2	899.56	#	887.67	714.63	1112	824.29	909.3	992	964	929	810.8	709

TABLE B.7:

## CORTICAL BONE THICKNESS- BAKLA TEPE HUMERI

Bone #	Grav e #	L/R	Sex	Age	Perio d	Scan #	L	A25T	P25T	M25 <sub>T</sub>	L25T	A50T	P50T	M50 <sub>T</sub>	L50T	A75T	P75T	M75 <sub>T</sub>	L75T
1h	G107/3	R humerus	m	m adult	EBA I	Scan 1	154.1	0.24	0.34	0.3	0.31	0.7	0.75	0.63	0.7	0.62	0.52	0.58	0.56
2h	G118	R humerus	f	m adult	EBA I	Scan 1	.	.	.	.	.	0.43	0.32	0.33	0.3	0.41	0.29	0.33	0.32
3h	G113/1	R humerus	f	y adult	EBA I	Scan 1	161.2	0.29	0.3	0.31	0.34	0.53	0.45	0.58	0.5	0.56	0.4	0.66	0.51
4h	G40/1	R humerus	m	m adult	EBA I	Scan 1	131.3	0.37	0.48	0.44	0.37	0.5	0.5	0.53	0.5	0.55	0.66	0.45	0.53
5h	G106	R humerus	f	m adult	EBA I	Scan 2	.	.	.	.	.	0.44	0.29	0.3	0.4	0.37	0.37	0.51	0.43
6h	G24	R humerus	m	y adult	EBA I	Scan 2	.	.	.	.	.	0.56	0.54	0.52	0.5	0.58	0.49	0.63	0.52
7h	G266/1	R humerus	f	m adult	EBA II/III	Scan 2	.	0.45	0.31	0.37	0.57	0.37	0.32	0.46	0.4	.	.	.	.
8h	G231/1	R humerus	f	m adult	EBA II end	Scan 2	138.3	0.16	0.25	0.21	0.21	0.33	0.32	0.38	0.3	0.4	0.3	0.41	0.35
9h	G319/1	R humerus	f	y adult	EBA II/III	Scan 3	184.5	0.23	0.35	0.23	0.31	0.52	0.34	0.4	0.5	0.49	0.41	0.56	0.49
10 h	G305/4	R humerus	m	adult	EBA II end	Scan 3	.	.	.	.	.	0.47	0.41	0.44	0.4	0.52	0.36	0.43	0.49
11 h	G243/3	R humerus	m	m adult	EBA II end	Scan 3	.	.	.	.	.	0.44	0.42	0.45	0.4	0.53	0.39	0.4	0.55
12 h	G305/2	R humerus	m	adult	EBA II/III	Scan 3	166.6	0.24	0.31	0.25	0.34	0.47	0.33	0.56	0.4	0.62	0.37	0.68	0.51

TABLE B.8:  
CORTICAL BONE DENSITY- BAKLA TEPE HUMERI

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1h	G107/3	1032.25	615.25	710.5	599.5	1051	1115.75	904.75	331.75	1199.75	968	1074.8	807.25
2h	G118	.	.	.	.	785	1006	1014.5	838.5	1354	993.5	927.5	1022.5
3h	G113/1	1237.75	1018.25	989.75	1004.25	1042.25	1234	982.75	875.75	1009	1008.6	1245.5	907.67
4h	G40/1	990.33	1071	915.5	1093	922.75	745.75	926.75	1030.75	1018.67	1120.25	807.25	928.75
5h	G106	.	.	.	.	947.33	716.67	614.67	370.25	965.5	811.67	628.33	711.5
6h	G24	.	.	.	.	1015.33	894.5	887.75	1444	1053	671.5	1225	493
7h	G266/1	939.75	976	1191.25	503.75	960	823	1113.33	734	.	.	.	.
8h	G231/1	739	459.5	414.5	626.75	876.75	682.67	405.67	467.75	956.33	434.67	806	440
9h	G319/1	600.5	602.33	456	253	561	379	666	170.5	771.67	651.33	464	218
10h	G305/4	.	.	.	.	1045.67	521.25	875	388.75	775.75	490	748.67	781.33
11h	G243/3	.	.	.	.	1217	1043	796.25	320.5	1315	655.25	1073.5	1306.67
12h	G305/2	558.33	701.75	623	460.67	715	477.75	668.75	312.25	1090	612.75	339	690.33

TABLE B.9:  
CORTICAL BONE THICKNES- HAKEMI USE FEMORA

Bone #	Grave #	L/R	Sex	Age	Period	Scan #	L	A25T	P25T	M25T	L25T	A50T	P50T	M50T	L50T	A75T	P75T	M75T	L75T
1f	564	R femur	M	m adult	LN	Scan 1	207.9	0.56	0.46	0.87	1.11	0.52	0.78	0.61	0.63	0.4	0.51	0.37	0.37
2f	211	R femur	F	m adult	LN	Scan 1	222.8	0.46	0.43	0.58	0.69	0.55	0.91	0.7	0.74	0.41	0.49	0.42	0.4
3f	468	R femur	M	m adult	LN	Scan 1	196.3	0.46	0.57	0.71	0.73	0.47	1.21	0.64	0.72	0.37	0.4	0.33	0.25
4f	368	R femur	M	m adult	LN	Scan 1	202.7	0.46	0.62	1.11	0.94	0.59	0.8	0.83	0.72	0.52	0.59	0.46	0.45
5f	148	R femur	F	y adult	LN	Scan 1	222.8	0.38	0.4	0.32	0.39	0.5	0.77	0.7	0.62	0.49	0.48	0.83	0.65
6f	304	R femur	F	m adult	LN	Scan 2	207.9	0.42	0.41	0.66	0.63	0.39	0.52	0.76	0.64	0.29	0.31	0.36	0.37
7f	567	R femur	M	adult	LN	Scan 2	223.5	0.83	0.75	0.54	0.55	0.89	0.63	0.7	0.66	0.34	0.17	0.35	0.4
8f	340	R femur	F	m adult	LN	Scan 2	196.3	0.39	0.38	0.76	0.7	0.4	0.68	0.57	0.71	0.31	0.35	0.4	0.36
9f	13	R femur	F	y adult	LN	Scan 2	202.8	0.41	0.38	0.69	0.74	0.35	0.7	0.68	0.62	0.42	0.42	0.43	0.28
10f	6/A	R femur	M	adult	LN	Scan 2	221.5	0.41	0.52	0.57	0.82	0.44	0.89	0.69	0.52	0.31	0.46	0.3	0.32
11f	404	R femur	F	y adult	LN	Scan 3	218.3	0.42	0.52	0.66	0.67	0.53	0.74	0.71	0.47	0.41	0.41	0.27	0.27
12f	355	R femur	M	y adult	LN	Scan 3	214.4	0.57	0.56	0.86	0.88	0.62	0.65	0.89	0.63	0.37	0.54	0.4	0.4
13f	455	R femur	M	adult	LN	Scan 3	.	0.48	0.65	0.38	0.39	0.59	0.44	0.45	0.39	.	.	.	.
14f	352	R femur	F	m adult	LN	Scan 3	.	0.26	0.28	0.72	0.57	0.26	0.28	0.34	0.35	.	.	.	.
15f	291	R femur	M	m adult	LN	Scan 3	216.3	0.53	0.62	0.8	0.62	0.48	0.57	0.87	0.83	0.29	0.5	0.63	0.4

TABLE B.10:  
CORTICAL BONE DENSITY- HAKEMI USE FEMORA

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1f	564	1195	1208	1299.5	1130.8	1170.3	1296.5	1216.2	1379.8	1075.2	1271	1148	1162.5
2f	211	1288	1061	1204.67	1471	1614.5	1318.5	1355.3	1418	1376.3	1811	1654	1686.75
3f	468	1337	1197	1374.33	1419	1335.67	1315.7	1407	1444.3	1063.5	1167	1350	1160.17
4f	368	1393.3	1380	1555.5	1604.5	1463.67	1591	1566.3	1504	1365.8	1374	1119	1513.33
5f	148	1222.5	1237	1057.17	1178.8	1360	1292.3	1217.5	1269.7	1233	1297	1232	1128.75
6f	304	1320.6	1225	1118.16	1133.4	1251.33	1310.9	1247.6	1199.2	1075.9	1160	1199	1089.9
7f	567	1443.6	1522	1333	1556.1	1448.5	1499.7	1513.4	1399.5	1289.5	1111	1378	1594.56
8f	340	1044.4	1015	1280.8	1129.9	1223.4	1291.2	1354.5	1296.4	856.33	1105	1309	1311
9f	13	1391.2	1206	1140.42	1658.9	1452.92	1179.9	1461.4	1707.6	1302.4	1227	1528	1365.36
10f	6/A	1168.8	1055	1126	1110.9	1355.73	1279.5	1304.5	1291.4	1245.5	1334	1323	1059.93
11f	404	1377.3	1287	1448.83	1348.8	1279.11	1497.8	1466.8	1448.5	1229	1410	1143	1353.45
12f	355	1206	1113	1349.73	1306.6	1051.67	1193.5	1056.3	1057.9	1151	1289	1379	1398.55
13f	455	1032.5	1374	1445.92	1519.4	1369.09	1375	1435.2	1445.8	.	.	.	.
14f	352	832	918	1324.45	1274.1	1055.36	915.36	1302.7	1308.2	.	.	.	.
15f	291	1248.3	1339	1321.11	1105.8	1194.1	1166.5	1383	1252.4	1348.6	1367	1342	1249

TABLE B.11:  
CORTICAL BONE THICKNESS- HAKEMI USE HUMERI

Bone #	Grave #	L/R	Sex	Age	Period	Scan #	L	A25T	P25T	M25T	L25T	A50T	P50T	M50T	L50T	A75T	P75T	M75T	L75T
1h	211	R humerus	f	m adult	LN	Scan 1	130.9	0.5	0.25	0.32	0.29	0.46	0.43	0.52	0.59	0.51	0.44	0.47	0.49
2h	564	R humerus	m	m adult	LN	Scan 1	.	.	.	.	.	0.6	0.35	0.46	0.41	0.5	0.4	0.39	0.56
3h	468	R humerus	m	m adult	LN	Scan 1	172.3	0.21	0.31	0.24	0.32	0.39	0.43	0.37	0.45	0.5	0.45	0.54	0.44
4h	148	R humerus	m	m adult	LN	Scan 1	170.4	0.35	0.36	0.39	0.3	0.6	0.48	0.59	0.47	0.6	0.38	0.53	0.57
5h	304	R humerus	f	y adult	LN	Scan 1	.	.	.	.	.	0.36	0.32	0.35	0.33	0.44	0.36	0.37	0.32
6h	567	R humerus	f	m adult	LN	Scan 2	.	.	.	.	.	0.46	0.46	0.52	0.37	0.55	0.35	0.47	0.41
7h	567	L humerus	m	adult	LN	Scan 2	166.5	0.19	0.21	0.23	0.22	0.39	0.34	0.34	0.47	0.43	0.48	0.42	0.48
8h	340	R humerus	f	m adult	LN	Scan 2	163.5	0.12	0.12	0.23	0.18	0.28	0.22	0.35	0.28	0.37	0.34	0.37	0.34
9h	13	R humerus	f	y adult	LN	Scan 2	.	.	.	.	.	0.37	0.36	0.51	0.44	0.42	0.32	0.56	0.38
10h	6/A	L humerus	m	adult	LN	Scan 2	.	.	.	.	.	0.4	0.19	0.36	0.32	0.61	0.35	0.36	0.46
11h	404	R humerus	f	y adult	LN	Scan 3	180.1	0.3	0.26	0.23	0.28	0.45	0.48	0.5	0.41	0.52	0.43	0.42	0.48
12h	355	L humerus	m	y adult	LN	Scan 3	.	.	.	.	.	0.53	0.45	0.51	0.45	0.61	0.34	0.51	0.44
13h	455	R humerus	m	adult	LN	Scan 3	175.5	0.44	0.34	0.25	0.32	0.41	0.38	0.43	0.36	0.53	0.35	0.53	0.53
14h	352	R humerus	f	m adult	LN	Scan 3	.	.	.	.	.	0.28	0.2	0.3	0.21	0.18	0.2	0.26	0.18
15h	291	L humerus	m	m adult	LN	Scan 3	142.5	0.25	0.3	0.27	0.28	0.54	0.62	0.63	0.57	0.52	0.56	0.59	0.57

TABLE B.12:  
CORTICAL BONE DENSITY- HAKEMI USE HUMERI

Bone #	Grave #	A25D	P25D	M25D	L25D	A50D	P50D	M50D	L50D	A75D	P75D	M75D	L75D
1h	211	1293.7	1210	1007	1190	1378.67	1229.3	1099.8	1207.8	1270	1227	1577	1265
2h	564	.	.	.	.	1520.25	1225	1320.3	1387	1131.3	1525	1230	1604
3h	468	1220.3	1362	1253	1372	1172	1323	1512.3	1204.3	1356.5	1305	1348	1419
4h	148	1186.8	1175	1320.5	1113	1215.5	1407.5	1279.5	1302.5	1113.5	1403	1207	1136
5h	304	.	.	.	.	1164.33	1352	1312	1012	1229.5	1186	1208	1039.67
6h	567	.	.	.	.	1232.71	1125.8	1143.2	1140	1363	1298	1125	1100.25
7h	567	1041.8	1275	1247.86	1212.3	1119.29	1524.3	1635.8	1572.8	1336	1732	1773	1560.14
8h	340	438	684.5	701.75	871	1022	1157.6	1349.8	1332.3	1308.5	1189	1256	1539.5
9h	13	.	.	.	.	1144.57	1675.3	1385.3	1216.3	1596.8	1514	1565	1437.75
10h	6/A	.	.	.	.	1064.4	1144.3	1302	1194.5	1130.8	1391	1237	1360.25
11h	404	1114.5	1214	1977.17	1151.3	1361.67	1303.5	1262.8	1294.3	1557.8	1417	1265	1135.67
12h	355	.	.	.	.	1477.25	1483.3	1579.2	1485	1355	1322	1344	1371
13h	455	1392.5	1495	1496.17	1478.5	1148.83	1539	1509.2	1644.3	1470.3	1447	1557	1463
14h	352	.	.	.	.	1131.67	952.25	1283.3	1101.8	1242.3	1087	1225	1343.17
15h	291	1248.2	1407	1301.5	1291.5	1215.25	1573.5	1407.8	1497.2	1472.5	1499	1405	1466.83



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